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The Operational Performance of Oil and Gas Companies in Logistics Outsourcing Process in the Niger Delta Region

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Abstract

The study aimed at the Operational performance of the Oil and Gas Companies in Logistics Outsourcing Process in the Niger Delta Region. The study adopted a cross sectional research design; the population of interest for this study was drawn from oil and gas companies operating in Niger Delta; a total of fifty-one (51) oil and gas companies were identified. The data collected for this study was analyzed using descriptive statistics and SPSS analysis tools. The study revealed that, the failure of outsourcing firms to manage providers properly and a lack of understanding of the other party, insufficient sharing of business information among the parties with subsequent problems to provide an appropriate context for co-operation. The study conclude that the process employed by oil and gas companies in the Niger Delta in logistics outsourcing with logistics service

providers were key in influencing performance of their operation positively. The study recommended that, just-in-time concept or approach, payment duration, welfare approach and sustainable communication channels should be included in measuring the performance of oil and gas companies in logistics outsourcing process. The study suggest the following parameters to be included in sourcing or selecting logistics service providers to ensure professionalism is taken care of; logistics services providers (firms) must have a professional certificate to back their nature of operations and Logistics service providers should show some level of professionalism, commitment, and improve quality delivery to enable major oil and gas companies to completely outsourced jobs to them since they currently practice partial outsourcing in the industry.

Keywords: Operational Performance, Outsourcing Process, Cost, Oil and Gas Companies, Logistics Service Providers, Just-in-time

1. Introduction

According to Sink and Langley (1997) ^[1], outsourcing is a corporate strategy wherein a company delegates its internal non-core functions to external service providers, enabling the company to maintain control over its resources and distribute risks. Additionally, Mohiuddin and Su (2013b) ^[2] define the term outsourcing as acquiring of components or services from outside sources rather than producing in-house. The principal company only focuses on core matters necessary for survival and growth. This strategy encompasses outsourcing and relocating to low-cost suppliers from advanced firms to lower entire costs of production by realizing benefits from competitive factors of production and gain more profits. Numerous companies have adopted logistics outsourcing as a business strategy to revamp their distribution networks and secure a competitive edge. Furthermore, logistics outsourcing can be characterized as the engagement of a third-party logistics provider in either full or partial management of the organization's logistics activities. This approach has been employed by numerous companies for an extended period, and it is observed that firms prioritizing outsourcing have gained access to cost-effective inputs from specialized companies, ultimately resulting in the restructuring of production (Mohiuddin & Su, 2013a). Over time, this strategy has evolved into an efficient method for reducing logistics costs. In the era of business reforms, many firms adopted outsourcing strategy to forge away in altering business operations and retain core activities to achieve competitive advantage. Companies undertaking the restructuring of their supply chain network have essentially engaged in the reorganization of their logistics activities. This encompasses transportation, storage, forwarding, warehousing, and additional value-added services such as packaging and labeling (Barret, 1982; Cooper & Kaplan, 1991) ^[3, 4]. Quelin and Duhamel (2016) ^[5] argued that for the

past 20 years, outsourcing of logistics activities has been one of the most used services in many companies. Companies that used this new strategy of using third party logistics scored greater logistics performances instead of sourcing them from within.

Logistics Service Providers (LSPs) outsourcing has become an integral part of organizational supply chain processes. It entails outsourcing certain logistics activities, either partially or entirely, to an external entity for execution. Organizations are progressively adopting this practice, yielding significant advantages such as reduced operational costs, enhanced flexibility and operationalization of logistics services, diminished capital investment, and more (Rahman, 2011; Zacharia, Sanders, & Nix, 2011) ^[6, 7]. Giri and Sarker (2017) ^[8] suggest that companies have recourse to Logistics Service Providers (LSPs) to reduce the load of logistics processes and achieve customer satisfaction and competitive advantage (Chen, Goan, and Huang, 2011).

Oil and gas operations involve cross border transactions; exploration and drilling equipment are frequently moved around locations; O&G personnel travel round local and international asset locations and research and development centres; and oil and gas products are also transported internationally, involving long-term global supply agreements (Guajardo, Kylinger, & Ronnqvist, 2013; Shyshou, Gribkovskaia, Laporte, & Fagerholt, 2012) ^[12, 11]. The Oil and Gas industry faces challenges in providing fit-for-purpose in-house logistics solutions: Unfavourable local conditions for the IOCs (International Oil Companies), in-house capacity to deliver specialized logistics solutions, and resource inefficiencies arising from in-house resources that could better be harnessed for O&G's core activities. Within the Oil and Gas (O&G) industry, logistics is not deemed a core activity, as it does not align with the primary operations of exploration, production, and refining, which primarily revolve around mechanical processes. The O&G sector necessitates external involvement to bring in the human element, a crucial aspect in effective logistics service delivery. This approach aims to untangle the logistics responsibilities from the routine O&G operations, harness assets to achieve economies of scale and scope, and offer specialized logistics services to the oil and gas industry. In this context, Zhu, Ng, Wang and Zhao (2017) ^[10] acknowledge that logistics outsourcing is being increasingly adopted by firms to "reduce costs and increase flexibility".

The benefits of outsourcing are well documented; the pitfalls and problems have received less attention. Furthermore, there is a compelling argument that there exists clear evidence indicating that, in certain instances, "Logistics outsourcing has become a source of corporate failure and disappointment." The primary factor influencing the outcomes of Logistics Service Providers (LSPs) appears to revolve around the relationship between the outsourcing firm and the logistics service provider. This assertion aligns with broader findings on outsourcing, where it is contended that the nature of the relationship between the parties is crucial, whether in 'standardized' outsourcing (Smyrlis, 2006) ^[15] or more 'advanced' outsourcing (Lei, 2007) ^[14]. The authors delve into issues such as the failure of outsourcing firms to effectively manage providers and a lack of mutual understanding between the involved parties. These conditions, in turn, are attributed to insufficient sharing of business perspectives. These challenges are heightened by the often-asserted ambiguity in the allocation of

responsibilities between the two partners.

However, there are many literatures written on oil and gas companies but only few or no literature is available on logistics outsourcing process for performance of oil and gas industry in Nigeria. Therefore, this research will focus on the gap of knowledge on operational performance of oil and gas companies in logistics outsourcing process in the Niger Delta Region.

The aim of the study is to determine the operational performance of oil and gas companies in logistics outsourcing process. The postulated hypotheses were tested at 0.05 alpha level and hypothesis stated as the performance of oil and gas companies in logistics outsourcing processes is not a function of operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

Outsourcing is a term that has been applicable many years and still something companies progressively implement as part of their strategy and organizational restructuring. In the oil and gas industry, the rate of implementing outsourcing is something that has varied with time and oil prices. To find business strategies that is less affected by the fluctuating oil price, is also a good reason to examine experiences around this phenomenon.

The scope also is limited to logistics activities of oil and gas and outsourced companies with respect to the operations of Logistics Outsourcing processes and Performance for parties involved. The study focusses on the benefits resulting from the operational performance of the companies in logistics outsourcing processing, parameters use for selection LSPs and the types of services provided to oil and gas companies by LSPs, when operating with LSPs with limited scope to the Niger Delta Region in Nigeria. The scope is limited to eleven (11) out of the forty-five multinational and indigenous of the oil and gas companies in the Niger Delta region in Nigeria where logistics outsourcing operations are high in the selected oil and gas companies listed as follows; Exxon Mobil, Chevron, Shell, Agip, Petrobras, Total, NLNG, Seplat Petroleum Company, Schlumberger Nig Ltd, Nestoil and Halliburton Energy Services Nigeria Limited.

2. Literature Review

2.1 Concept of Outsourcing

Over the years there have been several definitions of what outsourcing is, but an unambiguous definition of the concept is still not settled. Kern (2002) ^[22] offers a more detailed definition: "A process whereby the company decides to sell or move the company's assets, people and or activities to a third-party vendor that supplies complex services back for an agreed sum over an agreed period of time". The concept outsourcing deals with allocating specific business process to an external service company, which are often experts in those activities that are outsourced. These entail the procedure of designating a third-party entity with specific business processes and subsequently procuring services from said external entity. When organizations delegate tasks to service providers in different nations or foreign branches, this is commonly referred to as "offshoring," but it is also recognized as offshore outsourcing. In this thesis, the terms outsourcing and offshoring are used interchangeably, both referring to the overarching concept of outsourcing. In this thesis, outsourcing and offshoring are intended to be the same generic term, namely outsourcing. Pros and cons of outsourcing is a controversial topic and there are several

reasons that companies decide to outsource or choose not to outsource. However, outsourcing strategy may be initiated due to companies unable to cope with all the activities within the organization, or it may be initiated because the company does not want to hire in-house staff to perform temporary activities (Flatworld Solutions, 2015) ^[24]. Activities are everything that happens in an organization can be described in terms of activities, and most activities are cost drivers (Hoff, 2009) ^[25]. Administrative control by the outsourcer will during normal activities be in the form of daily management reports and internal guidelines.

Outsourcing delineates the association between a customer and a supplier through defined job specifications and mutually agreed-upon service standards. Consequently, outsourcing serves as a precise management instrument, enabling the monitoring and measurement of discrepancies in the agreement, leading to potentially reduced and more foreseeable costs (Aase, 2005) ^[23]. On the other side, outsourcing may also lead to hidden costs that are difficult to log which will be discussed further on in the paper in the analysis chapter. There are many different types and forms of outsourcing, and the following chapters will give an insight to the different types. When a firm chooses to outsource, it can mainly choose to unbundle corporate functions and outsource an internal supporting service such as HR, purchasing, or finance. The other choice is to choose a vertical disintegration. This is when suppliers make inputs that go into firm's final product or service. The manner in which this is accomplished, whether through corporate function or vertical disintegration, is outlined by Hoff (2009) ^[25], who presents four categorizations to define outsourcing. Operational outsourcing is a decision to outsource carried out from operational, technological, and capacity considerations. Background of operational outsourcing is often when technological activities in a company do not feel sufficient and adequate, seen from both quality and cost-related criteria. This type of outsourcing seems to be marked by a lack of awareness of a comprehensive strategy (Hoff, 2009) ^[25]. Strategic outsourcing means that the focus is on how outsourcing can both support corporate strategy while also creating new strategic options. The difference between strategic outsourcing in relation to operational outsourcing, is that the choices made in strategic context, comes because of reflected decisions associated with the organization chosen strategies and strategic objectives. These strategic decisions can be incorporated into management and control, consequently yielding long-term implications for the company's employees and domains (Hoff, 2008). There is also another element that explains that an outsourcing process is strategic: A close bond between the process and the critical success factors in the company enables outsourcing to be a success out of these factors. By transferring ownership to the supplier through changing staff and assets, the outsourcer company signals that it wants to create a trusting working relationship. Long-term contracts provide stability and facilitate a strategic partnership over time. The contract should also describe different levels of activity of the parties' commitments, enabling better management of strategic outsourcing (Quelin and Duhamel, 2003) ^[26]. Recognition and consider strategic outsourcing to be strategic, then it should be included as part of a corporate peculiarity.

Multi-sourcing can be described as a new operational model

based on outsourcing. Multi-sourcing has emerged because of the researchers Cohen and Young believes outsourcing methods, as we know them, is a process that is inefficient in today's complex markets. The researchers believe it is no longer enough to put out an activity. Multi-sourcing builds upon conventional outsourcing but aims not only for immediate cost reduction but also seeks to facilitate global expansion, enhance agility, foster capacity building, and secure competitive advantages. Achieving success through multi-sourcing requires the careful design of a resource acquisition strategy closely aligned with the overall strategy. It must also create an effective management system that continually monitors this (Cohen and Young, 2006) ^[27]. Business process outsourcing (BPO) involves subjecting an entire business process. The fundamental distinction between outsourcing a single service and outsourcing an entire business process lies in the allocation of responsibility. When outsourcing a single service, it falls upon the customer to integrate individual services into a cohesive whole, whereas if an entire business process is outsourced, this responsibility rests with the supplier. In the early stages, Business Process Outsourcing (BPO) primarily focused on outsourcing processes like payroll services. Over time, it evolved and expanded to encompass various other segments (Aase, 2005) ^[23].

2.2 Criteria for Selecting Logistics Service Providers (LSPs)

Logistics Service Providers (LSPs) are driving innovation in a number of areas, particularly within the last mile, Logistics Service Providers (LSPs) perform logistics services on behalf of another company, LSPs provides the management skills along with the physical assets, labour and systems technology to provide professional logistics services, thereby relieving companies of their major task/responsibility of performing these services themselves. As a result, the criteria utilized in this study is depicted in Fig 1, its variables are discussed as following;

Cost of service

It is the fare or price charged for a transportation service, payment terms, non-official cost or extra cost during transactions, cost saving after optimization and other handling cost (Tu, and Nguyen (2016) ^[34].

Reputation of the LSPs

The name of the brand endorses the quality, customer satisfaction, reliability, customer service level, and contract fulfilment. A brand name influence the shipper to step in to begin long-term relationship. Reputation of the LSPs services providers also guarantees sound financial position, which plays an important role in attracting shippers/customers for its selection. Lieb and Randall, (1996) ^[35] cited in Tu, and Nguyen (2016) ^[34], agreed that major producers and manufacturing companies reputation was one of the extra factor, which was considered by many LSPs users. They considered reputation of the LSPs as a factor which is linked to geographic spread, experience as a LSPs provider, specific industry focus, and array of services provided.

Operational performance

The operational performance of a LSPs company is either tilting negative or positive profit level. It assures effectiveness and efficiency of the LSPs services provider. High operational performance improves the business relations. Clear-cut goal in terms of quantitatively

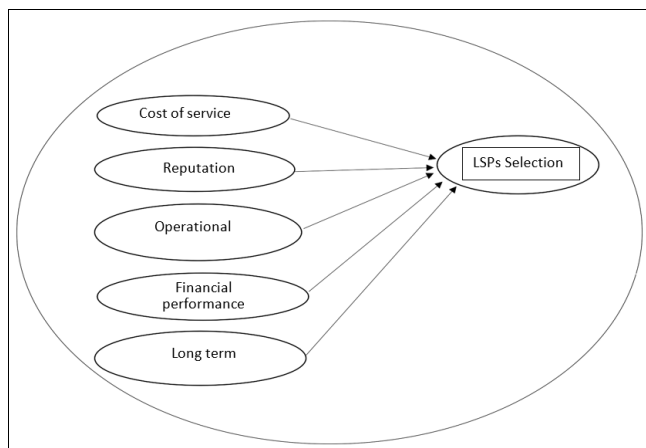
measurable and meaningful performance boosts long-term relationship (Bowersox and Daugherty, 1987) [37]. Higher operational performance eases up operation and structure. It also enhances performance-measuring ability, fault detecting, responsiveness, capability, detailed accounting information, system security, confidentiality of sensitive data, and ability to resolve a potential problem (Spencer *et al.*, 1994) [36, 38]. It also enables LSPs services provider to render an operational status report to the shipper regularly. In short, there are global capability, IT capability, delivery performance, satisfaction of employees, service quality, and continuing improvement represented.

Financial performance

The performance of a LSPs financially guarantee service continuity, service flexibility in billing and payment, net working capital, financial stability, ability of advanced payment, quality of fix assets, and size.

Long-term relationship

This can be sustainably developed through this factor; information sharing and mutual trust, suitability with users, readiness to use logistics manpower, gain sharing and risk management. These variables discussed are key emphasis on the model that act as a base for selecting a particular LSPs service provider.



Source: Extracted from Tu, and guyen (2016) [34]

Fig 1: Criteria for Selecting LSPs Providers

2.3 Performance of the Oil and Gas industry

Fernandez (2002) stated that the financial performance of a firm can be examined through its annual account reports, where information about growth, investments, earnings, and costs, among others are listed. In order to link these data with financial performance, indexes-ratios based in balance sheets are used, considering that a company's value resides in its balance sheet. Profitability is fundamentally rooted in assessing the comparison between the cash outflows necessary for implementing a strategic alternative and the expected cash inflows it will generate, as outlined by Michael (2013). Pandey (2006) expands on this concept by considering profitability in relation to both sales and investment. Athanoglou *et al.* (2008) highlight the widespread use of Profit after Tax (PAT) as a metric for financial performance. However, various researchers employ different factors such as shareholders' equity, liquid assets to assets, fixed assets to total assets, total borrowed funds to total assets, per capita Gross Domestic Product (GDP), the cost-to-income ratio, and customer satisfaction. In the context of financial performance, high-growth

situations are deemed desirable, given the consistent association between growth and profit across diverse circumstances (Capon, Farley, and Hoenig 2012). The indicator of growth serves as a crucial metric for assessing the prosperity of a firm. Firms grow to achieve their objectives, including increasing sales, maximising profits or increasing market share. Gilbert *et al.* (2006) suggested how and where questions are important in the context of the growth of a firm. They propose that various elements, such as managerial traits and access to resources like finance and manpower, influence the firm's growth and set it apart from a non-growing counterpart.

Market share also, is often associated with profitability and thus many firms seek to increase their sales relative to their competitors. Zagare (2011) while coming up with the game theory, suggested that while there may be uncertainty regarding the expectations and actions of a firm's rivals, a rational firm is expected to overcome uncertainty by forming competitive conjectures, subjective probability estimates of rivals' expectations and behaviour.

2.4 Network Theories (NT)

The network perspective emphasizes net value over least cost as the driver for its implementation (Skjoett-Larsen, 2000). The significance of these drivers in contractual relations is dependent on organizations' abilities to manage their contractual relationships. Further experience at managing these relationships results in the development and refinement of competitive routines for managing inter-firm transactions and information transfer across organization boundaries. The network perspective significantly enhances comprehension of the dynamics involved in third-party relationships among individuals within the parties. Mutual understanding and knowledge of each other's visions, attitudes, and past relationship experiences play a crucial role in the formation of third-party cooperation.

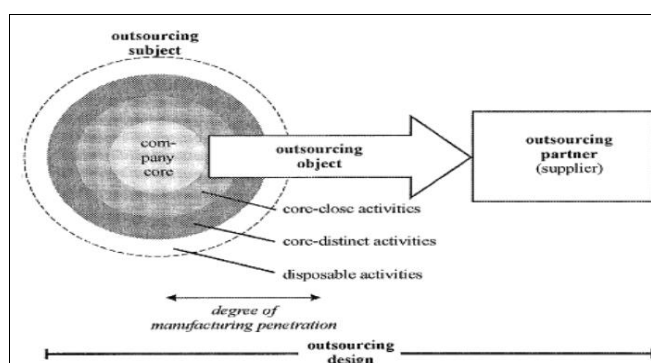
Applied to logistics outsourcing, network theory focuses on the formation of relationships, organizational structures, and alliances (Ellram and Cooper, 1990). According to the network perspective organizations lacking adequate in-house logistics capabilities enter close cooperation with third-party providers that possess complementary skills that these firms can use to deliver benefits. Transportation is the most outsourced activity, including related support services such as manpower, equipment, material management, facility design, warehousing, information technology, and maintenance, repairs and operation etc. The benefits primarily fall into two categories: Cost savings like on fuel, wages, asset reductions in fleets and warehouses and service improvements for example, reduction of order cycle time, inventory, and the cash-to-cash cycle (Coyle, Bardi and Novack, 2006).

Network theory represents an attempt to develop an opportunism-independent theory of the firm while broadening the focus from cost minimization to incorporate the management of multiple firms' resource base especially in the oil and gas companies (Madhok, 1997).

This theory is of relevance to the topic because it pointed out the relationship between the firm and third-party logistics and also point out how beneficiary outsourcing is relevant in terms of cost saving, service improvement and cycle time order which is the main reason why oil and gas companies outsourced their non-core activities to third party logistics.

2.5 Core Competencies Theory

Which kinds of activities in the firm could be outsourced are still surrounded in controversy. Most of the scholars hold the opinions that the firm's core activities are not proper to be outsourced. (Quinn and Hilmer, 1994; Arnold, 2000) As outsourcing of the core activities may reduce the incentives in firm's innovation, disclose of the critical technologies and increase the potential competitors, thus offset the benefits brought by outsourcing. Therefore, decision-makers opt to retain core activities while outsourcing activities that are considered "disposable and core-distinct" (Arnold, 2000) to external providers. Arnold develops a general outsourcing model to separate the firm's activities and illustrate the whole procedure of outsourcing design. As the Fig 2 shown below, four elements in the outsourcing model are outsourcing subject, object, partner and the whole design. Outsourcing subject refers to the economic institution which has to make outsourcing decision. Outsourcing object is the process and productions. All the activities in the firm are distinguished by four levels. The most important level is company core which refers to the crucial activities in a firm. Then the activities importance gradually decline with different kinds of activities. The final level encompasses activities with widespread availability. Outsourcing at this level is essentially a means for the firm to "transfer its decision rights and accountability" to the vendor, allowing the client to focus more on its core competencies. While the firm outsources its activities to the vendor, it also helps the firm to connect with the core competency of the vendor and share the information and knowledge with each other. The emphasis on outsourcing has evolved in recent years, shifting from mere cost savings to a strategic decision aimed at finding a "business partner who can contribute to the strategic efforts of the company by providing it with expertise and competencies that are not found in-house." This theory is of relevance to the topic because it pointed out the relationship between the oil and gas companies and third-party logistics and also point out the core activities outsourcing is relevant in terms of cost saving, service improvement and cycle time order which is the main reason why oil and gas companies outsourced their non-core activities to third party logistics.



Source: Howard *et al.* (1995)

Fig 2: Outsourcing model

2.6 Review on Logistics Outsourcing Strategies and Performance among Oil and Gas Companies in Nigeria

The Oil and Gas (O&G) sector encounters challenges in providing in-house logistics solutions tailored to specific

needs, including unfavorable local conditions for International Oil Companies (IOCs), limited in-house capacity for specialized logistics, and inefficiencies stemming from utilizing in-house resources that could be better utilized for the core activities of the O&G sector (Etokudoh *et al.*, 2017) ^[13]. Logistics is not considered a core activity within the O&G sector, as its primary focus lies in exploration, production, and refining operations that emphasize mechanical matrices. The O&G sector requires external expertise to address the human element, unburden logistics tasks from routine operations, leverage assets for economies of scale and scope, and provide professional logistics services to the industry. Logistics outsourcing is increasingly adopted by firms in the sector to reduce costs and enhance flexibility (Zhu *et al.*, 2017) ^[10].

In a study by Ihunwo & Ikegwuru (2023) focusing on logistics outsourcing and organizational performance of oil and gas firms in Rivers State, operational outsourcing services and manufacturing outsourcing were found to have a positive and significant correlation with organizational performance. The research recommends the use of effective logistics outsourcing strategies, such as operational outsourcing services and manufacturing outsourcing, by the management of oil and gas firms to enhance organizational performance.

Etokudoh *et al.* (2017) ^[13] investigated the feasibility of logistics outsourcing by the international oil and gas companies in the emerging business environment of Nigeria. An exploratory, multicase, qualitative approach was applied, involving 40 interviewees in three international oil companies and three of their logistics service providers. Findings reveal that vendors' capabilities, host community issues, joint venture influence, and employees' reactions challenge international oil companies' logistics outsourcing implementation while relationship management, contract management, and change management skills enable them handle these challenges. The results also show that surveyed organizations implement logistics outsourcing piecemeal and need to scale up their current capabilities to effectively integrate logistics outsourcing. The research confirms logistics outsourcing is achievable in Nigeria, but requires synergies and symbiosis between the oil companies and their local vendors.

Igbatayo (2019) ^[19] noted that outsourcing of non-core activities may result in 25% cost saving associated with on-/near-site operations and as much as 50-75% for offshore operations compared to the cost of engaging in same activities in-house. Apart from cost-cutting, other benefits associated with BPO include a stronger focus on core competencies; improved regulatory conformity and compliance; as well as access to a larger talent pool and novel technologies. The oil and gas industry has emerged as the cornerstone of Nigeria's economy, accounting for about 70% of annual government revenue and more than 90% of the nation's foreign exchange reserves. Since the 1990s, outsourcing has assumed an increasing dimension in the nation's oil and gas industry. Empirical studies reveal, for example, that up until the early 1990s, employees in the oil industry comprised about 70% and 30% of permanent and temporary employees, respectively. The temporary employees were initially focused on non-core activities. However, in recent time's core activities are increasingly

contracted to service providers, reversing the structure of employment in the industry by 2010, with 40% of permanent employees, while 60% were permanent employees. The increasing replacement of permanent employees with temporary ones has fueled concern in the industry, led by labour unions, which have expressed concern about the sub-standard welfare of contract workers. This development has led the Federal government of Nigeria to issue guidelines on staff contracting and outsourcing in the Nigerian oil and gas industry.

Onyebueke & Wordu (2017) ^[20] focused on Nigeria oil and gas industry and investigated Logistics outsourcing and how it contributes to organizational performance using selected oil and gas companies in Rivers State, Nigeria. The core competency the or was adopted for this work to provide a holistic analysis of the relationship between Logistics outsourcing and organizational performance. Two research questions and corresponding hypotheses were formulated. A questionnaire titled Logistics outsourcing and organizational performance questionnaire (LOOPQ) was designed to elicit primary information and data from respondents who were chosen from the oil and gas companies and service providers. Secondary data was obtained from company records. Simple statistic tools of percentages, tables and charts were used to analyze the data. The study found that there is a significant relationship between Logistics outsourcing and organizational performance in the selected oil and gas companies in Rivers State. The study conducted by Etokudoh *et al.* (2017) ^[13] explored the impacts of logistics outsourcing on the oil and gas industry. The findings indicate that logistics outsourcing brings financial savings by reducing labor and operation costs, enhances internal efficiency through decreased internal workload, improves service delivery through professional service providers, strengthens core competency, and ultimately contributes to increased organizational growth and productivity. The study employed an exploratory, multicase, qualitative approach involving 40 interviewees from three international oil companies and three logistics service providers. The challenges identified included vendors' capabilities, host community issues, joint venture influence, and employees' reactions, while relationship management, contract management, and change management skills enabled oil companies to handle these challenges. The study suggests that logistics outsourcing is achievable in Nigeria but requires collaboration between oil companies and local vendors.

Onyebueke *et al.* (2019) ^[21] investigated the challenges of logistics outsourcing in selected oil and gas companies in Rivers State. The study focused on managers and assistant managers in the selected companies and their logistics providers. Findings suggested that the failure of logistics outsourcing in the oil and gas companies could be attributed to various challenges. The study identified major challenges such as the need for new/standard equipment and regular maintenance by logistics providers, effective

communication networks between providers and oil companies, staff motivation, advanced customer/client relationship management, good quality assurance and control, and effective project monitoring. The study recommends strategic management of logistics outsourcing to overcome these challenges and enhance organizational performance in the oil and gas industry.

3. Methodology

The study adopted a cross sectional research design to examine the large oil and gas companies in Niger Delta Region especially the International Oil and Gas Companies (IOCs). Cross sectional is type of observational study that analyses data from a population, or a representative subset, at a specific point in time, that is a cross sectional data. A descriptive approach was adopted to achieve the aim of this study. The population of this study was generated from fifty-one (51) numbers of oil and gas companies operating in Niger Delta region which constitute these states, Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers states (Reconnaissance Survey, 2020). To arrive at the sample size, the Taro Yamane (1967) formula was applied to the total population of 1343 to determine the size. Reason being that the sample strata are of homogenous characteristics, while simple random sampling was used to sample the study population. The inclusion and exclusion criteria of sampling method was used to select the eleven (11) oil and gas companies based on the population characteristics of interest and the objective of the study.

Thus, Taro Yamane formula is:

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

Where

n – Sample Size

N – Population Size (Total)

1 – constant

E – Margin of error (0.05 based on research condition)

$n = 1343/1 + 1343(0.05)^2 = 1343/4.3575 = 308.20$

n = **308**, which is the sample size for this study

To obtain a proportional allocation of the questionnaire, which is the sampling instrument, to the sample strata, this method is being used for application of questionnaires on the staff of the selected companies. Table 1 below shows a proportional allocation method of the study instrument to each population strata:

$$\frac{N_p \times n}{N}$$

N_p - Population of each strata of oil and gas companies

N - Study sample size

N - Total population of the study

The data collections for this study were analysed using descriptive statistics such as percentage and frequency distribution and tables to explain and analyse the research questions.

Hypothesis (H₀): The performance of oil and gas companies in logistics outsourcing processes is not a function of operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost was tested using Multiple Linear Regression statistics.

Multiple Regression Analysis is use for hypothesis two (2), is based on the fact it has the ability to validate the relationships between dependent variable and two or more independent variables.

Model specifications for hypothesis three (3)

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon$$

Where:

Y= Performance values

X₁ = Manpower

X₂ = Material safety

X₃ = Equipment

X₄ = Information technology

X₅ = Just-in-time

X₆ = Transport cost

e = Error term

Table 1: Determination of Sample Size

S. No	International Oil and Gas Companies	Year of Establishment	Location	Numbers of Staff in Procurement Unit	Numbers of Staff in Logistics Unit	Numbers of Staff in Operations Unit	Numbers of Staff in Human Resource Unit	Total Sampled Size	Proportional Allocation method $\frac{N_p \times n}{N}$
1	Exxon Mobil	1999	Eket, Qua Iboe	34	32	40	23	129	30
2	Chevron	1991	Brass/Ogidigbe	27	28	45	27	127	29
3	Seplat Petroleum Company	2009	Sapele	18	24	26	15	83	19
4	Shell	1937	Rumumasi	34	37	49	37	157	36
5	Agip Oil	1962	Brass/Obio Akpo	31	35	40	32	138	32
6	Petrobras	2005	Bayelsa/Port Harcourt	25	23	30	20	98	22
7	Total	1956	Onne/Port Harcourt	35	32	50	37	154	35
8	Nestoil	1991	Aboloma	16	23	29	15	83	19
9	Halliburton Energy	1959	Trans-Amadi/Port Harcourt	12	15	30	18	75	17
10	SCHLUMBERGER NIG LTD	1970	Old Aba Road, Port Harcourt	37	35	46	28	146	34
11	NLNG	1989	Bonny	30	34	54	35	153	35
Total				299	318	439	287	1343	308

Source: Reconnaissance survey, 2021

4. Results and Discussion

Table 2: Parameters use in selecting logistics service providers (LSPs)

	SA (5)	A (4)	SD (3)	D (2)	UD (1)	Total	Mean	Standard Deviation
Service quality	99	124	43	24	0	290	4.0	3.6
Service price	159	109	18	4	0	290	4.5	4.0
Continuous improvement	89	107	67	20	7	290	3.7	3.5
Business scope and market	45	132	55	57	1	290	3.6	3.2
Professional and staff	34	109	67	66	14	290	3.3	2.9
Suitable IT system	45	78	89	61	17	290	3.3	2.9
Culture and strategy	31	77	80	89	13	290	3.1	2.6
Supporting business expansion	97	121	34	27	11	290	3.9	3.5
Cumulative Mean							3.7	

Source: Computed from Field Survey, 2022

Table 2 shows the data obtained from the survey questionnaire utilise in this study. The variables identified by the study respondents revealed a cumulative mean of 3.7. This imply that all the parameters used as basis in selecting or approving logistics service providers (LSPs) for oil and gas companies across the Niger Delta were significant; that

cumulative mean of 3.7 was greater than the comparable mean value of 3.0 as stipulated in this study. Emphasizing on the various parameters in this objective, the study revealed Service quality as one of the major parameters and it was significant at a mean value of 4.0 (with standard deviation of 3.6), third party logistics

providers service price was significant with a mean value of 4.5 (standard deviation of 4.0) that is far greater than the mean of comparison. Other parameters identified are Continuous improvement (was significant with a mean value of 3.7, with a standard deviation of 3.5), Business scope and market (significant mean value of 3.6, standard deviation of 3.2).

65% of oil and gas companies in the Niger Delta agreed to select and appoint service providers base on their Staff and Professionalisms, it was an acceptable variable as it was significant with a mean value of 3.3 (with standard deviation of 2.9), while Suitable I.T (information technology) system was significant on a mean value of 3.3 (standard deviation of 2.9) that is slightly above the mean (3.0) value of comparison.

Thus, culture and strategy were not left out as one of the parameters. Culture and strategy recorded a significant mean value of 3.1 (with a standard deviation of 2.6), while supporting business expansion recorded a significant mean value of 3.9 (with standard deviation of 3.5) as part of the major indices considered by major oil and gas companies in selecting in selecting logistics service providers (LSPs) across the Niger Delta.

Test of Hypothesis

H₀: The performance of oil and gas companies in logistics outsourcing processes is not a function of operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

H₁: The performance of oil and gas companies in logistics outsourcing processes is a function of operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

Table 3: Regression Analysis Output for hypothesis

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	236.173	1	236.173	2484.032	.000 ^b
	Residual	27.382	288	.095		
	Total	263.556	289			

- a. Dependent variable: Performance
- b. Predictor: (Constant): Operational attributes

Table 4: Model Summary on the performance of oil and gas companies

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.947 ^a	.896	.896	.30835

- a. Predictor: (constant), operational attributes

Table 3 above shows the analysis of variance of regression on the performance of oil and gas companies in logistics outsourcing processes and operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

Therefore, the F-value of 2484.032 is significant at 0.000. This indicate that the performance of oil and gas companies in logistics outsourcing processes was significantly related to the operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost. Decision, the null hypothesis of no significant linear relationship was rejected and the alternate hypothesis was upheld which state that the performance of

oil and gas companies in logistics outsourcing processes is a function of operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

The coefficient of determination (R²) is .896. This indicates that 80.28% of the variance in the performance of oil and gas companies in logistics outsourcing processes is explainable by variations in the predictor variable (operational attributes). Therefore, 80.28% of the variance in the performance of oil and gas companies in logistics outsourcing processes is predicted by operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

Table 5: Coefficients^a output of the Analysis of Variance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-.842	.086		-9.827	.000**
staff appraisal	1.068	.021	.947	49.840	.000**

(** Sig. at P < 0.05), dependent variable: Performance

Table 5 below indicate the t-values of the performance of oil and gas companies in logistics outsourcing processes and operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost.

To determine if the predictor variable (operational attributes) was significantly related to or predicted the performance of oil and gas companies in logistics outsourcing processes, the t-value was presented in Table 5. The t-value for operational attributes was (-9.827, P < 0.000). Operational attributes measured by of manpower, material safety, equipment, information technology, just-in-time and transport cost had insignificant relationship (P < 0.05) with and predicted the performance of oil and gas companies in logistics outsourcing processes.

4.2 Discussion of Findings

The study utilized a Five Point (5 to 1) Likert scale tool as an instrument to measure the perception of respondents on the various variables of interest as utilized in this study. The benchmark used as the standard for comparable mean in this study is the average mean of the values assigned to the five (5) point Likert scale, thus; the study statistically arrived at a mid-point of 3. All values from the mean of 3.0 and above is regarded to be statistically significant and accepted to be positive to this study variables of interest, and values below 3.0 is regarded to be insignificant and rejected.

4.2.1 Parameters used in selecting logistics service providers (LSPs)

The findings in this study is corroborated with that of Barney (1991)^[47]. It is important to note that this parameters were examined collectively across the oil and gas companies operating in the Niger Delta, 85% of the respondents revealed that major oil and gas companies do have distinct KPI (key performance indicators) put in place and considered carefully before selecting logistics service providers (LSPs), also known as third party logistics. In support of this findings, the Resource Based View Theory as utilized in this study proposes that companies are heterogeneous in nature, and they possess heterogeneous resources, that is; companies can have different selection strategies because they have different resource mixes. The

Resource Based View Theory focuses managerial attention on the firm's internal resources to identify those assets, capabilities, and competencies with the potential to deliver superior competitive advantages, since the tail-end reason of logistics outsourcing is to ensure they (3PLs) services providers renders quality service to satisfaction of all actors involve along the value chain.

4.2.2 The operational performance of oil and gas companies in logistics outsourcing process

Findings from this objective revealed a synchronizing support from the study of Hartman (2004) ^[48], and he proposed other indices that could measure in examining operational performance of oil and gas companies in logistics outsourcing process, which include; productivity and profitability tracking, and efficiency in tracking-operations. Ballou, (2003) ^[18] suggest that operational performance of logistics outsourcing companies and practices can be measured by minimization of costs and time used to create products. Effective logistics practices in business play a vital role in attaining the highest level of customer service. The views Ballou, (2003) ^[18] is applicable in production base firms that employ the services of LSPs, hence the variables like cost and time maximization are key indices and benefits of involving third party logistics providers by oil and gas companies in the Niger Delta.

5. Conclusions

The study conclude that the process employed by oil and gas companies in the Niger Delta in logistics outsourcing with logistics service providers were key in influencing performance of their operation positively. In view of sustainable performance of oil and gas companies, more improve approach or concept must be in practice.

5.1 Recommendations

The following recommendations are made base on the study findings'

1. The study recommends that just-in-time concept or approach, payment duration, welfare approach and sustainable communication channels should be included in measuring the performance of oil and gas companies in logistics outsourcing process.
2. The study suggests the following parameters to be included in sourcing or selecting logistics service providers to ensure professionalism is taken care of; logistics services providers (firms) must have a professional certificate to back their nature of operations.
3. To logistics service providers, service providers should show some level of professionalism, commitment, and improve quality delivery to enable major oil and gas companies to completely outsourced jobs to them since they currently practice partial outsourcing in the industry.

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