



INVESTIGATING THE INFLUENCE OF THIRD-PARTY LOGISTICS PROVIDERS ON THE PHYSICAL DISTRIBUTION OF MANUFACTURED PRODUCTS. A STUDY OF MDS LOGISTICS.

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Abstract

The impact of third-party logistics providers will emphasise the pivotal distribution agents for manufacturing output. However, despite the importance of this role, it has hardly been investigated on its contributions. This study examines the influence of third-party logistics providers (3PL) on the physical distribution of manufactured products. The study uses a 3PL company named MDS logistics. One hundred returned questionnaires from the staff of Guinness Nigeria, using purposive sampling and a well-structured questionnaire. The hypothesis tested reveals a significant influence of third-party logistics providers on the physical distribution of manufactured products. The findings supported this hypothesis using the chi-square statistical tool (with a considerable level of 0.000). The study recommends the need for manufacturing firms to implement a unique distribution strategy (adoption of a third-party logistics provider) to achieve a significant competitive advantage and attain a desirable level of performance. Secondly, manufacturing firms should always embrace supply chain management to lower costs, grow the market and sales, and build strong relations with third-party logistics clients.

Keywords: *Third-party logistics, physical distribution, manufactured products, Nigeria*

Introduction

Manufacturers are becoming increasingly aware that, to gain a competitive advantage in the current economic conditions and retain a place in the globalising market, they need to focus on their core activities and outsource their logistics (Asian & Nie 2014; Perçin, 2009). Third-Party Logistics providers, as a fast-growing business, can lead to several positive results, such as reduced costs, improved performance and increased flexibility through lean operations, and delivering agile and accurate services (Aguezzoul, 2014; Kumar, 2008; Li et al., 2017, 2018). 3PL helps organisations focus on their core activities, create competitive advantages and support other interdependent operations (Li et al., 2018).

Products must be transported to the correct location, at the right time, in the proper condition and for the right price. It is essential for companies – such as shippers and Logistics Service Providers (LSPs) – to create effective distribution structures, using transport and distribution centres in an optimal configuration. Distribution structures involve the spatial layout of the freight transport and storage system used to move goods between production and consumption locations. Goods can be distributed to the customer using direct transport or via one or more intermediate storage points.

A good distribution structure is essential to meet customer service levels, for example, by delivering the right product on time (Christopherson & Belzer, 2009; Oluwakoya & Ogundipe, 2019). Second, good decisions can reduce logistics costs by bundling goods or inventory (Korpela & Tuominen, 1996). Third, it helps companies to adapt to rapid changes in consumer preferences. Fourth, distribution structure selection is a strategic decision that asks for substantial investments. From a public policy perspective, decision-making knowledge can help policymakers predict better distribution centre locations pattern facilitating sustainable transport policies' designees (Klaunenberg, Elsner, & Knischewski, 2016). Knowing the critical factors can also improve the quality of distribution centre tied to location optimisation models, which are criticised for omitting relevant location factors or having incorrect factor weights (Mangiaracina, Song, & Perego, 2015).

In this context, warehouse operations play a significant and critical role in achieving better performance through various improvement methods such as manufacturing postponement and

centralised distribution (Nair, 2005; Tse et al., 2012), adopting autonomous vehicle-based storage and retrieval systems (Roy, Krishnamurthy, Heragu & Malmborg, 2012) and optimally coordinating and integrating the interrelated decisions of production sequencing and vehicle routing (Park & Hong, 2009).

According to the Logistics Glossary, the definition of Third Party Logistics service (3PL) is the act of outsourcing to a specialist company all or a significant portion of the company's logistics operations (Ukwueze, 2017). Robinson (2014) considered the term Third-Party Logistics' 3PL' used for the first time in the early 1970s. The focus was on recognising inter-modal marketing companies (IMCs) in transport contracts. Still, the definition has extended to include the re-branding, in these services offered by 3PL, of every logistics company which provides some logistics service, including transportation or freight management. (Including warehousing technology, freight management, accounting), public and contract warehousing, freight consolidation and distribution management.

Outsourcing logistics functions such as distribution to third-party logistics (3PL) providers have been a competitive advantage for most companies. Companies cite greater flexibility, operational efficiency, improved customer service levels, and a better focus on their core businesses as part of the advantages of engaging the services of 3PL providers. 3PL alliances began with companies outsourcing some or all of their transportation and distribution functions. Most 3PLs have offered a single function to integrated logistics provision, offering two or more functions simultaneously. Among specific logistics services provided by 3PL providers are inventory management, IT services, such as tracking and tracing, value-added activities, such as secondary assembly and installation of products and adding to transportation and distribution services (Berglund et al., 1999). By outsourcing, logistics companies can leverage the expertise of logistic service providers while concentrating on their core competencies but is logistics outsourcing imperative in physical distribution management.

Manufacturing companies have continuously researched methods to minimise the distribution cost and maximise the flow of shipping each unit of a commodity to and fro across the supply and demand nodes. Though warehousing has smoothened out the fluctuations in demand and

supply at a marketplace yet, significant constraints encountered in assigning supply and correctly matching orders placed during redistribution to final retailers' outlets

Authors conducted several studies in Nigeria about third-party logistics providers (3PL) and physical distribution; Ikegwuru and Elvis (2018) empirically investigated the adequacy of logistics outsourcing on the success of physical distribution management in clearing and forwarding companies in Nigeria. Emah et al. (2017) studied the challenges and the critical success factor of sourcing for an indigenous 3PL by International oil companies in Nigeria. Some investigated the impact of 3PL on performance in the fast-food industry (Akinbola, 2012), while others explored the influence of 3PLs on firms in the manufacturing sector (Akewushola & Elegbede, 2013) and its implications on employment trends (Adegbam, Makinde, & Shiyabade., 2014).

This study intends to explore the influence of third-party logistics providers on the physical distribution of manufacturing products.

Literature Review

Logistics alliances and partnerships Bagchi and Virum (1996) explained that a logistics alliance reveals a close and extensive relationship between a customer and a supplier beyond service offerings. Hence, the parties in a logistics relationship ideally consider each other as partners and collaborate in understanding and defining the customer's logistics needs. On the other hand, Virum (1993) believed that the primary significance of these relationships was information sharing. Both parties participate in designing and developing logistics solutions and measuring performance. In the early 1990s, an initial survey across Europe showed that alliances were reasonably limited in scope and size. However, this eventually changed as value-added activities began to feature (Van Laarhoven et al., 2000). Hence, achieving this partnership between service providers and service-user firms remains a crucial study area for researchers in this field.

Extant literature on outsourcing logistics functions indicates an increased interest in managing 3PLs. Several studies conducted in the past show trends in three major classes, namely, 3PL practices showing regional differences, those with emerging global strategies, and those on logistics outsourcing practices (Arroyo et al., 2006; Rahman, 2011).

Physical Distribution Management

Physical distribution involves a company's broad range of activities concerned with efficiently moving goods and materials from the end of the production line to the customers. This process involves various activities, including transportation, warehousing, inventory management, material handling, packaging, and order processing. The role of distribution is to provide a company with the accomplishment of delivering the product at a suitable time, place, and quantity at a minimum cost. Physical distribution management focuses on managing finished goods distribution to meet customer expectations at the lowest possible price. In addition to transportation, physical distribution management involves close liaison with production planning, purchasing, order processing, material control and warehousing. Physical distribution involves systems which will manage to interact with each other to provide the level of services that the customer demands and at a cost that the company can afford. In its broadest sense, when it refers to the whole economic system, distribution is the allocation of income and assets within one society. In business economics, physical distribution is the share of goods to the recipients. Physical distribution generally includes all activities that transfer material and economic power over tangible and intangible goods from one financial subject to another. According to Domschke and Schield (1994), Physical distribution "encompasses all activities related to the transfer of economic interests between manufacturers and consumers. It entails the coordinated assembly of produced items according to their kind, volume, location, and timing to meet supply deadlines (order fulfilment) or effectively meet anticipated demand.

Facets of Physical Distribution

The distribution process begins when a supplier receives an order from a customer. The customer is not concerned with the design of the supplier's distributive system or any supply problems. In practical terms, the customer is only concerned with the efficiency of the supplier's distribution. That is the likelihood of receiving goods at the time requested. Lead-time is the period that elapses between placing an order and receiving the goods. This period can vary according to the type of product and the type of market and industry considered. Lead-time in the shipbuilding industry will be in fractions or multiples of years, whilst days and hours are common in the retail sector. Customers make production plans based on the lead-time agreed upon when they will place the order. Customers now expect the quotation to be adhered to, and late delivery is no

longer acceptable in most purchasing situations. Physical distribution management ensures that the efforts of the individual components that make up the distributive function are optimised to realise a common objective. This approach is called the “systems approach to distribution management, and a significant feature of Physical distribution management is that these functions will integrate. These functions include;

- **Order processing-** The efficiency of order processing directly affects lead times. It receives orders from the sales team through the sales department. Order-processing systems should function quickly and accurately.
- **Stock levels or inventory-** Inventory management is a critical area of physical distribution management because stock levels directly affect service and customer satisfaction levels. The optimum stock level is a function of the type of market in which the firm operates.
- **Warehousing-** Many companies function adequately with on-site warehouses from where goods are dispatched directly to customers.
- **Transportation-** The manufacturer carried out transportation in bulk form to respective warehouses, where stocks wait for further distribution to the customers.

In explaining the systems approach to distribution management, we must consider the following; Firstly, the success of an efficient distribution system relies on the integration of individual component efforts. The service achieved an overall objective, even though it may appear that some individual components of the system are not performing at maximum efficiency.

Secondly, providing full service at a minimum cost is never possible. The higher the level of service required by the customer, the higher the cost. Having decided on the necessary level of service, a company must then consider ways of minimising costs, which should never be at the expense of reducing the predetermined service level.

Theoretical Framework

System Theory

Physical distribution is a system of components linked together to move products efficiently. Physical distribution uses a system theory to describe; physical distribution elements, including;

customer service, transportation, warehousing, order processing, inventory control, protective packaging and materials handling (Miles, 1965). These components are interrelated; hence: decisions made in one area affect the relative efficiency of others. For example, a small business that provides customised personal computers may transport finished products by air rather than by truck, as faster delivery times may allow lower inventory costs, which would offset the higher cost of air transport. Viewing physical distribution from a systems perspective can be the key to providing a defined level of customer service at the lowest possible cost.

Research Methodology

Research Design

The research is conducted based on Guinness Nigerian Brewery, which is a significant client of MDS logistics. The study comprises an in-depth look into Guinness Nigerian brewery Products; and how the adoption of a third-party logistics provider in the physical distribution affects the effective distribution of Guinness products. The research seeks to assess the impact of third-party logistics providers on the physical distribution of manufactured products.

MDS Logistics

MDS Logistics has Guinness Nigeria Brewery as one of its clients. MDS Logistics Ltd (formerly known as Manufacturers' Delivery Services – MDS) was established in 1965 to provide warehousing services to GBO, the merchandising division of UAC of Nigeria PLC (UACN).

MDS Logistics has a clear strategy that is focused on the needs of the client and effortlessly handles the supply chain requirements of customers by collaborating with top-tier organisations to build a distinctive global logistics network. By establishing this network, they are able to provide a full range of supply chain and outbound logistics services. The MDS Logistics based its strategy on three primary keystones:

- i) By partnering with world-class organisations to provide a global competitive advantage for our clients in their chosen markets.
- ii) They use an information-driven supply chain solution that uses the right skilled people and integrates well with our customers' supply chain requirements.

- iii) They understood their clients' businesses by becoming their extension, anticipating their supply chain challenges and solving them quickly.
- iv) They are involved in the operational activities or services across several supply chain segments like; Warehousing, Haulage and Distribution.

Sample Size

The distribution department, transport department, and customer service unit of MDS Logistics across the nation were the targeted respondents due to the nature of the research. There were around 110 replies out of a total of 1780. The sample was taken from the sample size, which included the employees of the Guinness Nigeria Brewery and the contractual workers from MDS Logistics, using a purposive sampling approach.

Research Instrumentations

We use a questionnaire in the collection of data from the research respondents. A 5-point Likert scale questionnaire coded Strongly Agree (4 points), Agree (3 points), Disagree (2 points), and Strongly Disagree (1 point) was used in the collection. Mahmood & Soon (1991) used the 4-point survey instrument to measure inbound logistics; the 4-point outbound logistics measurement by Sethi and King (1994). Sarkar, Echambadi, and Harrison (2001) used 5-item instrumentation to measure the firm's performance. They introduced the tool as standardised instruments, including research, which adapt to different situations.

Statement of Hypothesis

Ho There is no influence of third-party logistics providers on the physical distribution of manufactured products.

Data Analysis and Interpretation

Socio-Demographic Data

The data presented below represents the socio-demographic characteristics of the respondents involved in the survey. The gender distribution of the respondents indicates that 84.5% are male, while 15.5% of the respondents are female. The age distribution varies between 1% for ages over

50, 15.5% for ages between 41-50, and 36.1% for 21-30 years. The majority of the age bracket falls between 31-40%. It reveals that about 83.5% of the respondents fall between the age bracket with high labour/energy. Physical distribution is uphill, requiring a high power to drive it efficiently. Over 50.5% of the respondents are single, and the married ones are about 44.3%. The divorced and widowed make up 5.2% of the respondents.

The educational background of the respondents ranges from HND/B.Sc. (53.6%), to M.Sc./MBA (27%), to OND/NCE (12.4%). This data reveals that more than half of the respondents are bachelor/first-degree holders, which in one way or the other could have a positive impact on the organisation; because their input and contribution towards an efficient physical distribution system could be precious.

Most respondents' management level indicates that they are in the middle management level (48.5%). Most of the respondents have a working experience of between 1 and 5 years, and most are primarily on contracts. This data implies that a high level of staff training is required to achieve an efficient organisational goal.

Table 1
Showing the Socio-Demographic Data of Respondents

	Frequency	Percentage
Gender		
Male	82	84.5
Female	15	15.5
Age		
21-30 years	35	36.1
31-40 years	46	47.4
41-50 years	15	15.5
> 50 years	1	1.0
Marital Status		
Single	49	50.5
Married	43	44.3
Divorced	3	3.1
Widowed	2	2.1
Educational Status		
OND/NCE	12	12.4
HND/B.Sc.	52	53.6
M.Sc./MBA	27	27.8

Others	6	6.2
Management Level		
Senior Level	32	32.9
Middle Level	47	48.5
Supervisory Level	12	12.4
Others	6	6.2
Working Experience		
1-5 years	51	52.6
6-10years	33	34.0
11-15 years	10	10.3
>15 years	3	3.1
Employment Type		
Expatriate	4	4.1
Permanent	17	17.5
Temporal	15	15.5
Contract	52	53.6
Casual	9	9.3
Field study, 2020		

Table 2

Showing the Analysis of the influence of third-party logistics providers on the physical distribution of manufactured products.

	Frequency	Percentage (%)
Customers' Services		
Strongly Agree	78	80.5
Agree	14	14.6
Disagree	3	3.7
Strongly Disagree	2	1.2
Speedy Distribution		
Strongly Agree	50	51.2
Agree	45	46.3
Disagree	2	2.5
Strongly Disagree	0	0
Delivery Lead Time		
Strongly Agree	17	17.1
Agree	79	81.7
Disagree	1	1.2
Strongly Disagree	0	0
Customer Satisfaction		
Strongly Agree	73	75.6

Agree	17	17.1
Disagree	7	7.3
Strongly Disagree	0	0
Flexible Distribution and Warehousing		
Strongly Agree	91	93.3
Agree	6	6.7
Disagree	0	0
Strongly Disagree	0	0
Field study, 2020		

From the table above, the staff of Guinness Nigeria indicated that about 80% strongly agree that the adoption of 3PL services has positively influenced the physical distribution of their manufactured product in delivering good customer services. About 51.2% strongly agreed that 3PL services have resulted in speedy delivery of manufactured products to their registered distributors; this also results in roughly 81.7% firmly deciding that the delivery lead time reduced significantly.

Hypothesis Testing

H₀ There is no influence of third-party logistics providers on the physical distribution of manufactured products.

Table 3

Chi Square Summary showing the Influence of Third-Party Logistics Providers on the Physical Distribution of Manufactured Products

	There is no influence of third-party logistics providers on the physical distribution of manufactured products
Chi-Square	74.195
df	1
Asymp.Sig	.000

The analysis of the influence of third-party logistics providers reveals from MDS Logistics services that customer services are influenced positively by the use of a third-party logistics

provider. As shown in the analysis, the chi square is 74.195 with the degree of freedom 1 and significant at 0.000.

The use of a third-party logistics provider can significantly enhance speedy distribution. Adopting a third-party logistics provider has facilitated a quick distribution of Guinness Nigeria's brewed product. Lead time increases when a third-party logistics provider (MDS) adopts other products brewed with Guinness Nigeria. A better customer service performance will improve after adopting the services of a third-party logistics provider in distributing their products. This development has also brought about flexible distribution and better warehouse service performance.

Conclusion and Recommendations

In all indications, the third-party logistics providers have significantly impacted the physical distribution operations of Guinness Nigeria products. In this direction, the distributive chain covers warehousing, transportation and information systems from the organisation to the end-users. Every manufacturing firm now tries to adopt effective physical distribution by adopting a third-party logistics provider.

Third-party logistics providers compete in the competitive logistics market by staying on top of the latest technologies for inventory management, shipment monitoring, automation, and more. Innovators are always coming up with discoveries that improve the efficiency and customer-friendliness of operations.

The most straightforward approach to staying current is hiring a Third-party logistics firm that makes it their business to keep things moving ahead. It is essential to keep up with these ever-changing systems.

As a result, it will recommend that manufacturing firms constantly embrace supply chain management to lower costs, grow the market and sales, and build strong relations with third-party logistics clients. If the product can't reach its destination at the right time, it can damage the competitive advantage and lose customers. Leaving the physical distribution section of the supply chain to logistics clients who have competence in the area will enhance effective management of distribution channels, stimulate faster and cheaper transportation, guarantee

shorter lead time, and encourage higher customer demand. However, the main challenge businesses face is the power of consumers or buyers because the consumers are becoming increasingly intelligent and intolerable and don't want to wait for their products. Therefore, the firms must try to implement a unique strategy of distribution based on their competitive priorities and circumstances to achieve the desired level of performance.

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