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Measuring the Correlation between Logistics Service Quality and Consumer Satisfaction in Nigeria

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ABSTRACT

This study measured the level of correlation between the qualities of logistics services and consumer and /or customer satisfaction as a basis for determining the influence of logistics service quality in demand for logistics services and choice and/ or selection of logistics service providers (firms) in Nigeria. The study also examined the relationship between the quality of logistics services and consumers' perception and expectations (needs). Using the survey method and employing data obtained from questionnaire responses from logistics services consumers and operators in the six geopolitical zones of Nigeria, the study adopted the statistical method of correlation analysis in analysing the data obtained and inferences were draw from the analysed data. The hypotheses were tested using the coefficient of correlation method. It was found that logistics service quality is dependent on the perception and expectation of the customers. The study also found that logistics service quality influences consumer satisfaction derived from such services by as much as 86%. Recommendations were given upon which logistics firm could depend on to improve their consumer base and earn greater competitive advantage by continuously improving logistics service quality base relative to consumer perception and expectations to maximize satisfaction.

Keywords: Logistics Service, Consumer Satisfaction, Nigeria.

1.1 INTRODUCTION

Logistics describes the entire process of materials and products moving into, though, and out of firm. Inbound logistics covers the movement of material received from suppliers. Materials management describes the movement of materials and components within a firm. Physical distribution refers to the movement of goods outward from the end of the assembly line to the customer. Finally, supply-chain management is somewhat larger than logistics, and it links logistics more directly with the user's total communications network and with the firm's engineering staff.

As competition in the services sector is constantly increasing, the ability of companies to understand their customers and ensure their satisfaction with the services received is becoming more and more significant. Most scientists in their work, such as: Campos & No'brega (2009), Chee & Noorliza (2010), Chen, Chang & Lai (2009), Huang & Huang (2012), Davidavičienė & Meidutė (2011), Jaiswal (2008), Jayawardhena (2010), Juga, Juntunen & Grant (2010), Lu & Jang (2007, 2010), Meidutė, Litvinenko & Aranskis (2012), Mentzer, Flint & Kent (1999), Mentzer, Flint & Hult (2001), Kilibarda, Zečevic & Vidovic (2012), Panayides (2007) noted that the client is the most important part of any business of the service sector. Assessing this, it is important to keep in mind that the activity of the service sector is oriented exactly to the clients and its results are directly dependent on customer choice.

According to Liu & Xie (2013), Xie, Wang & Lai (2011), Rahman (2008), Tapiero & Kogan (2007), Hays & Hill (2006), Balachandran & Radhakrishnan (2005), quality is the basis for the functioning of the service sector, thus one of the main tasks of the rapidly growing service sector is to ensure the quality of service to the customers. Considering this, it is safe to say that one of the most important current logistics business success guarantors is the quality of the provided services, especially knowing that a service is an impalpable act or process (Chen, Chang, & Lai, 2009, Huang, Wang, & Xue, 2012), therefore it is closely related to the satisfaction of the clients' needs.

According to many authors (Zeithaml, Berry, & Parasuraman, 1993; Woodall, 2001; Chapman, Soosay, & Kandampully, 2003; Gorla, Somers, & Wong, 2010), expectations' manifestation depends on how customers perceive and interpret the environmental factors influencing the formation of expectations. Some factors may be controlled by a company, foreseen and be prepared for, but other factors depend on the clients in a larger extent (psychological, cultural, social), therefore logistics companies face a huge challenge to understand their customer, find out his needs and strive to meet customer expectations. Considering this, logistics companies need to keep in mind that in seeking competitive advantage and customer circle's growth, they must immediately ensure the customer's acknowledgement as a service provided one time is remembered for a long time, and the fact, whether it was good quality or not will further determine the client's choice; and this, to the logistics company determines if it was able to attract or retain a customer or not.

Moreover, according to Jia, Mahdiraji, Govindan & Meidutė (2013), Lu & Yang (2006), Yao, Lee & Yang (2010), Yang, Marlow & Lu (2009), Esper, Fugate & Davis-Sramek (2007), Meidutė & Raudeliūnienė (2011), Meidutė, Litvinenko & Aranskis (2012), Sandberg & Abrahamsson (2011), the effective economic development of the country as well as its industrial and commercial business success is not possible without logistics services that create added value for businesses, ensuring the expediency of products' time and place, and meeting the client's needs.

Accessing the effect of the services sector on the performance of different companies, logistics service quality becomes the main object of research for researchers and practitioners (Autry, Zacharia, & Lamb, 2008; Bhargava & Sun, 2008; Brah & Lim, 2006; Breja, Banwet, & Iyer, 2011; Carmignani, 2009; Foster & Ogden, 2008; FuentesFuentes, Lorens-Montes, & Albacete-Saez, 2007; Hoang, Ige,l & Laosirihongthong, 2010; Juga, Juntunen, & Grant, 2010; Hsieh & Liu, 2010; Rafig & Jaafar, 2007; Tse & Tan 2011; Karia & Wong, 2013; Wong & Karia, 2010; Pantouvakis, Chlomoudis, & Dimasa, 2008). And this certainly underlines the relevance of the problem being investigated.

This study focuses its attention on the analysis of the concept of customer satisfaction and the understanding of service quality, as further investigation is conducted specifically aiming at service companies, i.e. logistics companies. The scientific analysis of these topics is relevant because the goal in this study is to determine how customers evaluate logistics service quality and what the index of their satisfaction with the services is. Also this study and the performed research will attempt to justify (or refute) the raised study hypotheses.

Because of the sophisticated characteristics of logistics, it is difficult to survey the needs of customers and to create a comprehensive quality requirements system. On the joint points of logistics chain, we always find a seller-buyer relation. The buyer has his quality requirements to be satisfied by the seller.

The logistics system has the following areas with quality concerns:

- logistics facilities;
- logistics process and its sub processes;
- Human factors of service, organization, management.

Quality will be assessed by the consumers. It is not possible to find just one consumer in the logistics process to satisfy his requirements (but the final consumer is the real target), on the joint points of logistics chain, there is always a seller-buyer relation. A buyer always has his quality requirements; the seller has to satisfy them. To evaluate the level of satisfaction derived by customers from consumption of logistics services of the Nigerian providers as a basis for pricing and service selection has always problematic.

1.2 Objectives of Study

The basic objectives of the study are:

- To evaluate the quality of logistics services provided in Nigeria.
- To determine the direct effect of Logistics Service Quality on customer satisfaction..

1.3 Research Hypothesis

H_{01}: Logistics service quality performance does not depend on the consumers' perception and expectation.
H_{02}: The quality of logistics services has no effect on customer satisfaction.

2.0 LITERATURE REVIEW

2.1 Overview Of Logistics

Council of Logistics Management (1991) defined that logistics is 'part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements'. Johnson and Wood's definition (cited in Tilanus, 1997) uses 'five important key terms', which are logistics, inbound logistics, materials management, physical distribution, and supply-chain management, to interpret.

The commonality of the recent definitions is that logistics is a process of moving and handling goods and materials, from the beginning to the end of the production, sale process and waste disposal, to satisfy customers and add business competitiveness. It is 'the process of anticipating customer needs and wants; acquiring the capital, materials, people, technologies, and information necessary to meet those needs and wants; optimizing the goods- or service-producing network to fulfill customer requests; and utilizing the network to fulfill customer requests in a timely way' (Tilanus, 1997). Simply to say, 'logistics is customer-oriented operation management'.

2.2 Components of Logistics System

Figure1 below provides an overview of the logistics system. Logistics services, information systems and infrastructure/resources are the three components of this system and are closely linked. The interaction of the three main components in the logistics system is interpreted as follows. Logistics services support the movement of materials and products from inputs through production to consumers, as well as associated waste disposal and reverse flows. They include activities undertaken in-house by the users of the services (e.g. storage or inventory control at a manufacturer's plant) and the operations of external service providers.

Logistics services comprise physical activities (e.g. transport, storage) as well as non-physical activities (e.g. supply chain design, selection of contractors, freightage negotiations). Most activities of logistics services are bi-directional. Information systems include modelling and management of decision making, and more important issues are tracking and tracing. It provides essential data and consultation in each step of the interaction among logistics services and the target stations. Infrastructure comprises human resources, financial resources, packaging materials, warehouses, transport and communications. Most of the fixed capital is for building those infrastructures. They are concrete foundations and basements within logistics systems.

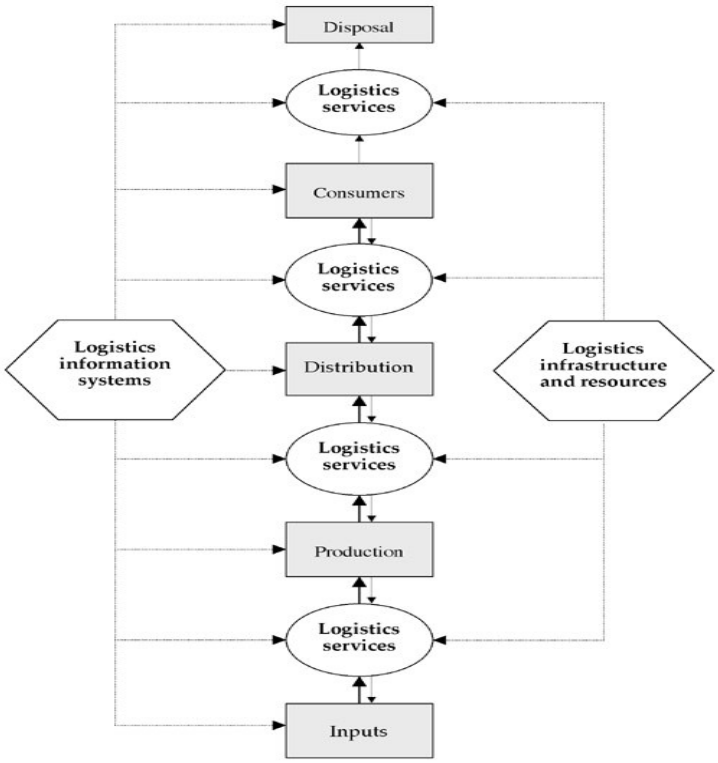

Figure 1: Overview of Logistics System (source: BTRE, 2001)

2.3 Interrelationships between Transportation and Logistics

Without well-developed transportation systems, logistics could not bring its advantages into full play. Besides, a good transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality. The improvement of transportation systems needs the effort of both public and private sectors. A well-operated logistics system could increase both the competitiveness of the government and enterprises.

The transport system is the most important economic activity among the components of business logistics systems. Around one third to two thirds of the expenses of enterprises' logistics costs are spent on transportation. According to the investigation of National Council of Physical Distribution Management (NCPDM) in 1982 (Chang, 1988), the cost of transportation, on average, accounted for 6.5% of market revenue and 44% of logistics costs.

BTRE (2001) indicated that Australian gross value added of the transport and storage sector was $34,496 million in 1999-2000, or 5.6% of GDP. Figure 3 shows the components of logistics costs based on the estimation from Air Transportation Association (Chang, 1988). This analysis shows transportation is the highest cost, which occupies 29.4% of logistics costs, and then in order by inventory, warehousing cost, packing cost, management cost, movement cost and ordering cost. The ratio is almost one-third of the total logistics costs. The transportation cost here includes the means of transportation, corridors, containers, pallets, terminals, labours, and time. This figure signifies not only the cost structure of logistics systems but also the importance order in improvement processing. It occupies an important ratio in logistics activities. The improvement of the item of higher operation costs can get better effects. Hence, logistics managers must comprehend transport system operation thoroughly.

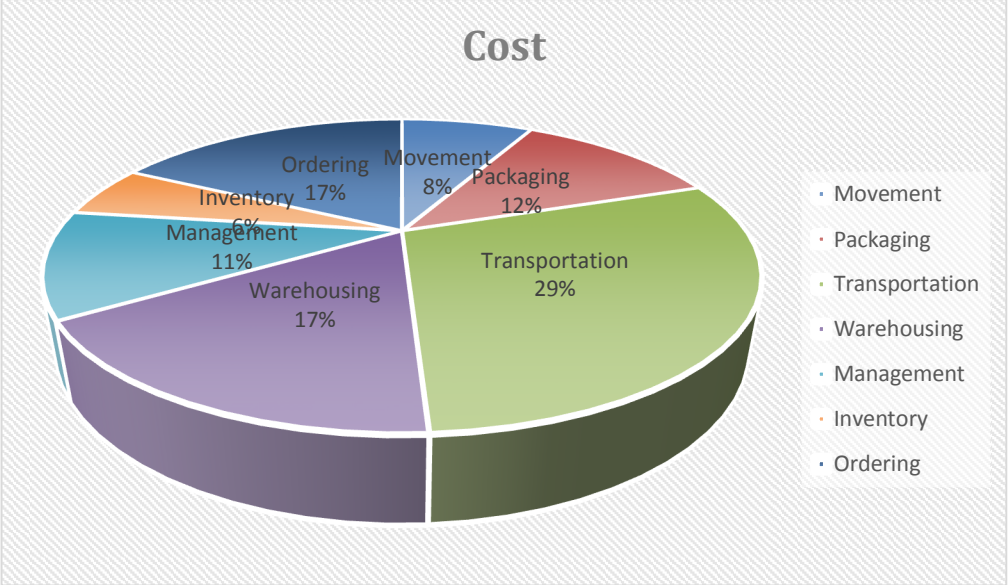

Figure 2: Cost ratio of logistics items (modified: Chang, 1998)

Transport system makes goods and products movable and provides timely and regional efficacy to promote value-added under the least cost principle. Transport affects the results of logistics activities and, of course, it influences production and sale. In the logistics system, transportation cost could be regarded as a restriction of the objective market. The value of transportation varies with different industries. For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low-valued products, transportation occupies a very big part of sale and affects profits more, and therefore it is more regarded.

2.4 The Role of Transportation in Logistics Service Quality

The role that transportation plays in logistics system is more complex than carrying goods for the proprietors. Its complexity can take effect only through highly quality management. By means of well-handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands. It brings efficacy, and also it builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness.

- optimum combination of jobs (tasks) and facilities
- optimum packaging and load unit
- optimum logistics chain
- optimum route and time
- minimum transfer of goods
- minimum warehousing event and time
- organizing and managing logistics activities in environment-friendly way

  (Minimum noise, outside of housing estates, by-passes, etc.)

Indicators:

- capacity supply/capacity demand
- appear time/ordered time
- damage events/total activities (packaging also)
- missing volume/total volume (packaging also)
- error delivery/total delivery commitments
- physical performance/time, processing time
- performed commitments/demanded commitments
- number of customers/year

2.5 Concept of Quality of service

The concept of quality of service is best looked at from the consumers view point as a measure of the level of satisfaction derived by the consumer from consumption of specific logistics service. Quality of service therefore depends on human satisfaction and expectations on the performance of the services provided by the providers. The structure of organization and the human behaviour (way of thinking, decision etc.) are very important factors. A customer needs beyond physical performance, soft elements are also needed, such as how to reach the service company by telecommunication, how to get the phone number or address, after how many minutes will they pick up the receiver, is the proper person on the line to give information (price, time) and to make decision, and how much time does a commitment need altogether? It is important to give advice to the customer even if the company is not able to take the job. Logistics service quality indicators which may serve as motivational tools for increased customers patronage of particular logistics service company over others may include; quick access to service/product consumption information, exactness, reliability, advising, politeness, assisted quick and optimum decision, flexibility, quick response on complaints, flexible tariffs, Price elasticity and price optimality, adoption and use of e-business channels and computer network to limit transaction time and cost, and the ease of tracking & tracing among others(Tilanus, 1997).

3.0 METHODOLOGY

3.1 STUDY POPULATION

The sample population of this study consisted of Logisticians and Managers of logistics service companies that operate within Nigeria. The Logistics Companies surveyed are those involved in various forms of logistics operations such as Procurement logistics, Distribution logistics, After-sales logistics, Disposal logistics, Reverse logistics, Green logistics, Global logistics, Domestics logistics, Concierge Service, RAM logistics, Asset Control Logistics, POS Material Logistics, Emergency Logistics, Production Logistics. Questionnaires were distributed to the logistics operators based on which data was gathered.

3.2 Sampling Technique and Sample Size Determination

Seven clusters were randomly selected for sampling in the study. These are: South-South region; South-East region; South-West region; North-East region; North-West region; North-Central region; and FCT. These clusters represent the Nigerian geo-political zones and highlight the main distribution of Logistics companies around the country. The annual turn-over of the companies sampled was used as the selection criteria. This was used to determine the sample size in each cluster. The collected questionnaires indicated a total of 1634 Logistics service providing companies in Nigeria. The first characterization of the companies examined shows large sized companies with an average turnover of 32 million Naira and over 200 employees and an average Logistics investment of 5 percent of the total turnover, spanning all sectors of business in Nigeria. This characterization agrees with the results reported by Chuang et al. (2007) which identify company size as a key factor in Logistics service adoption. A total of 151 companies met the above criteria and were selected for the study.

The sample size for each cluster is represented by the Table 1 and Figure 1 below.

Table 1: Geographical clusters with the distribution of sampled logistics companies

Geographical clusters	Distribution of Logistics Company	Percentage Distribution of Companies (%)
South-South	21	14
South-East	15	10
South-West	60	40
North-East	17	11
North-West	13	8
North-Central	18	12
F.C.T	7	5
Total	151	100

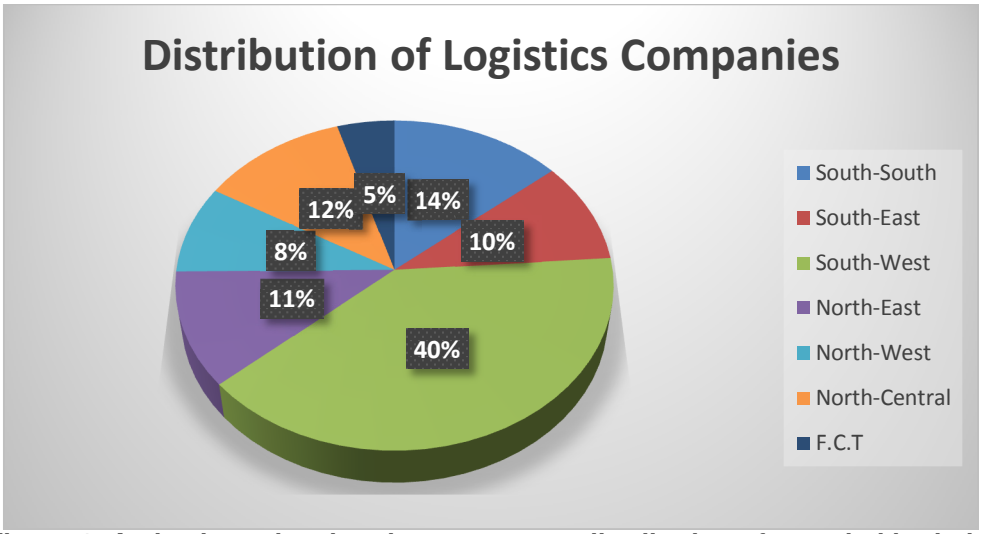

Figure 1: A pie chart showing the percentage distribution of sampled logistics companies within the geographical zones

Source: Authors Field work

3.2 Data Collection Procedure

Within the limits of this study, the customer satisfaction survey was conducted in three phases, where in the first stage initial data was collected and evaluated, in the second stage – raised hypotheses were examined. The primary data was collected through a cross-sectional, prospective and indirect pre-test survey where respondents were asked to answer to the questions of the prepared questionnaire. 151 companies and their customers were questioned in total.

The survey was conducted seeking to identify the respondents – companies' general parameters, the frequency of the need for logistics services, major logistical activities' implementation alternatives, to distinguish and evaluate the parameters determining the selection of the logistics service provider, to assess whether the parameters meet the customers' expectations, to assess separately the quality of logistics activities provided in Nigeria. Consumers of services were equally sampled to determine and rate their perception of logistics service quality and the expectations as well as consumer satisfaction.

3.2.1 Validity and Reliability of Instrument

Convergent validity shows the degree to which two or more attempts to measure the same concept agree. To measure this relationship in one-dimensional factors, the variables must have significant, high weighting (Anderson and (Gerbing, 1988). Validity was therefore checked through standardized loads for each dimension. Saturations were almost always above 0.05 and all the t-student statistic associated values were significant at 5 percent. We can therefore conclude that the scale has convergent validity (Anderson and Gerbing, 1988; Steemkamp and van Trijp, 1991).

To verify discriminant validity of the measurement scales, we calculated the square of linear correlations between each pair of scales, to see if this was lower than the level of variance extracted from each of them. Correlations between the different scales (standardized covariance's between factors) show evidence of discriminant validity as values are well below eigenvalue (lower than 0.8). After squaring, they are almost all lower than the extracted variance. In addition, confidence levels between parameters which indicate correlation between latent factors are sufficiently below the eigenvalue to guarantee discriminant validity of the latent variables or scales (Anderson and Gerbing, 1988).

3.2.3 Statistical Methods

To analyze the acquired data, descriptive statistics in the form of means, and charts were employed. Correlation analysis was also carried out in order to verify the relationship existing between the parameters and test the hypotheses; regarding the dependence of symptoms and seeking to determine whether any connection between the attributes exist, the research used the Pearson $\chi 2$ (criteria) and correlation coefficient as the compatibility criteria that indicate the statistical dependence and relationship between the variables.

4.0 DATA ANALYSIS, RESULTS AND FINDINGS

In an attempt to evaluate quality assurance in logistics service and compliance to customer needs, two objectives and two hypotheses had been raised as follows:

- To evaluate the quality of logistics services provided in Nigeria.
- To determine the direct effect of Logistics Service Quality on customer satisfaction.

The corresponding Hypotheses include:

H_{01}: Logistics service quality performance does not depend on the consumers' perception and expectation.
H_{02}: The quality of logistics services has no effect on customer satisfaction.

The first hypothesis (H_{01}) is aimed to establish the connection between consumer expectations, perceptions and the assessment of customer satisfaction or service quality. The hypothesis is made that the companies properly perceiving customers' needs provide (better assessed) logistic services of better quality. For the verification of the hypothesis, initial data of questionnaires and questions were used, directly asking users to evaluate the service provider separately for perceptions of consumer expectations and provided service quality. The table below indicates the correlation coefficient.

Table 4.1: Relationship between Logistics service quality and consumer perception and expectations

Assessment of Logistics Service Quality relationship on customer perception and expectation.	Correlation coefficient	Pearson (Criteria) χ2
Correlation between logistics quality of service and consumers expectation	0.69	0.57
Between logistics service quality and customer perception	0.52	0.41

Source: Authors computation.

The correlation coefficient calculated according to the obtained data showed the existence of a positive strong relationship and/or connection, between both customer expectation and customer perception. This indicates that the logistics service quality is dependent on the perception and expectation of the customers. While the correlation coefficients of 0.69 and 0.52 indicate 69% and 52% levels of influence of logistics service quality on consumer perception and expectation, the Pearson's correlation coefficient of 0.57 and 041 respective for consumer perception and consumer expectation shows a lower degree of relationship between each criteria and the logistics service quality. Therefore, it can be said that a logistics company, in order to provide high-quality logistics services must properly understand and assess customer needs and expectations as these form the basis for quality assessment by the consumers. Thus we reject null hypothesis H_{01} to accept the alternate that Logistics service quality depends on consumer perception and expectations.

Table 4.2: Relationship between Logistics service quality and customer satisfaction

• To determine the direct effect of Logistics Service Quality on customer satisfaction.	Correlation coefficient	Pearson (Criteria) χ2
Correlation between logistics quality of service and consumers satisfaction	0.86	0.73

Source: Authors computation.

The second hypothesis (H_{02}) states that logistics service quality has no effect on customer satisfaction. The coefficient of correlation between logistics service quality and customer satisfaction is 0.86, which shows a strong positive relationship between the duo. The implication is that logistics service quality influences consumer satisfaction derived from such services by as much as 86%. Thus we reject null hypothesis H_{02} and conclude that logistics service quality significantly affects customer satisfaction. Thus the choice of logistics service provider by a consumer is influenced by the level of satisfaction the consumer derives from the provider's services which equally is influenced by the quality of logistics services provided. Furthermore, the size of the customer base of a logistics service company is determined by the quality of services provided to consumers as well as the fulfillment of consumer perception and expectations.

It should be noted that the consumer receiving a high quality product will expect the same level of service and will apply to the service provider again, skipping its competitors, but it is likely that disappointment in services encourages users to look for alternative service providers and to make a comparative analysis of service providers despite an increase in the time cost.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

It is evident from the research findings that a logistics company, in order to provide high-quality logistics services, must properly understand and assess customer needs and expectations as these forms the basis for quality assessment by the consumers of logistics service. This is so because consumer perception and expectations influences logistics service quality as about 69% correlation exists between the two. Also, logistics service quality significantly affects customer satisfaction.

Service providers, seeking to attract potential service users, must first properly understand the expectations of consumer needs while equally understanding the consumer's perception regarding the services that they offer. The research demonstrated that both customer perception and expectations directly affects customer satisfaction. The high quality of services will increases consumer satisfaction while also improving the service provider's competitive advantage over rivals; and maintain consumer loyalty. Lastly, logistics service quality as a parameter is dependent on customer satisfaction.

5.2 Recommendations

Based on the foregoing, it is recommended that logistics companies, in order to remain competitive and retain or improve their customers' base, must constantly aspire to understand customer perception of quality of service and meet the needs of their customers through the anticipation of consumer expectations and needs.

They should equally continuously seek to improve service quality by employing customer satisfaction maximizing strategies since logistics service quality is dependent on customer satisfaction.

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