SERVICE QUALITIES IN THE CARGO LOGISTICS INDUSTRY IN NIGERIA

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ABSTRACT

The air cargo logistics is a service sector within the aviation industry responsible for the distribution of goods through airports. The sector has been faced with struggles to deliver service for customer satisfaction. This study examines the service qualities that cargo customers consider to be important for their satisfaction at airports in Nigeria. Data for the study was collected using a well-designed questionnaire administered to stakeholders at the Murtala Mohammed International Airport, Lagos. The study successfully surveyed a total of 223 respondents by simple random sampling. The data collected was analysed using exploratory factor analysis to determine the service quality dimensions that satisfy cargo customers in Nigeria. The study found that tangibility, reliability, and responsiveness are the most important service quality factors that customers expect for their satisfaction with the air cargo logistics service industry. The finding provides insight into the service quality dimensions that must be improved for cargo customer satisfaction. The study recommends that the air cargo logistics industry focus on improving indices that offer reliable and responsive delivery of goods.

Keywords: Air Cargo, Logistics Industry, Service Qualities, Customers Satisfaction.

1. INTRODUCTION

The positive contribution of air cargo services to the global economy cannot be overemphasised. Air cargo distribution services allow many world economies to exchange goods and services. Air cargo services have also contributed to the improvement in production and distribution across nations, with a resultant increase in people's standard of living. Also, the air cargo industry has contributed greatly toward economic development through tax returns and poverty eradication by creating jobs for the people and encouraging community integration. The categories of job opportunities within the air cargo logistics industry include manufacturers, shippers, freight forwarders, and off-airport freight consolidators. However, air cargo transportation is responsible for a 9% average of airline returns and twice that of first-rate passenger returns (IATA, 2019). Due to high demands for the speedy movement of goods and services, air cargo transportation has recorded massive development for distributing different cargo types, such as pharmaceuticals, electronics, and perishable goods (Asch et al., 2019). However, cargo handling requires compliance with international procedures, rules, or important documents that give access to the shipment of valuable and emergency goods (Alkaabi & Debbage, 2011).

Despite the importance of air cargo service quality for customer satisfaction, the industry must adapt to various challenges to provide quality service. The changes are due to

intensive competition, technological development, new social trends, and a dynamic environment. These result in challenging factors facing quality service delivery in the air cargo logistics industry (Gilaninia et al., 2013).

Service quality is essential in a competitive business like the air cargo industry. Maintaining a competitive edge is based on efficient service quality delivery, which is important in satisfying customer needs (Zumrah, 2014). A good service quality can be defined as one that meets or surpasses the customer's demands (Parasuraman et al., 1985). Service quality is critical for firms to increase customer loyalty, revenue, and market share, leading to enhanced sustainability. Also, it substantially impacts the competitive advantage and overall success of the air cargo sector since it shows the industry's ability to fulfil or even exceed consumer expectations.

Nwaogbe et al. (2017) studied the quality of airline services at an initial Category 1 (CAT1) national airport, which handles all types of scheduled airline operations with at least 31 passenger seats, with a specific focus on Mallam Amino Kano International Airport, (KAN). Their findings suggested that the quality of airline services at the airport under study influenced the independent variables. The service quality analysis demonstrated a statistically significant association between consumers' views of airline services at the airport. Nwaogbe et al. (2021) stated that service qualities affect not just consumers' expectations of what they should receive but also their opinion of the level of service offered by service providers. Nwaogbe (2017) found that service qualities are statistically associated with passengers' opinions of dependability, comfort, and affordability for airline services.

According to Parasuraman et al. (1985), service quality is determined by the alignment between customers' expectations of what they should receive and what is provided. This study examines the five dimensions of the service qualities model postulated by Parasuraman (1985) to determine the service quality factors that stakeholders consider most significant in Nigeria's air cargo logistics industry.

In Nigeria, the literature about service qualities in the air cargo logistics industry is scanty, as most literature on service qualities focuses on other aviation industry sectors. It implies that researchers in the transport and logistics industry have overlooked the importance of air cargo to the economic development of nations. It also indicates that the subsector will lack innovative ideas and solutions to poor service delivery. Specifically, the literature on service qualities in the air transport industry in Nigeria is limited to airline services (Nwaogbe et al., 2017; Ezenwa et al., 2012; Rahim, 2016), airport services (Nwaogbe, 2021) and passenger services (Gambo, 2016; Rahim, 2016). Among the few studies focussing on air cargo, Ayatoyinbo and Gbadegesin (2022) examined the characteristics of air cargo delivery and found that some operational characteristics of cargo service delivery were rated negatively by the respondents. The literature review indicates a knowledge gap about service qualities for satisfactory air cargo delivery to customers. This study, therefore, fills the knowledge gap by examining the five dimensions of service qualities in the air cargo logistics industry. The study adopted the SERVQUAL model as the theoretical framework.

This paper is presented under 4 sections. After this section, section 2 dwells on the methodology adopted for data collection and analysis, section 3 presents the results and discussion, and section 4 concludes the paper with recommendations.

2. DATA AND METHOD

The study is exploratory research in nature. It, therefore, employed the exploratory research design for data collection and quantitative analysis to achieve the study's objective. The goal is to examine the service quality dimensions that air cargo stakeholders consider more significant to delivering goods in Nigeria. The data for the study were collected using a well-designed questionnaire administered to 223 respondents at the Murtala Muhammed International Airport (MMIA), Lagos (LOS). The respondents include airline staff, cargo handling companies' staff (i.e. Nigerian Aviation Handling Company - NAHCo Aviance and Skyway Aviation Handling Company Ltd - SAHCOL staff), cargo agents, Customs officers, and Federal Airport Authority of Nigeria (FAAN) staff at the cargo terminal. The questionnaire was administered using a simple random technique to ensure that all the respondents had an equal chance to participate in the survey.

The questionnaire was designed to have two (2) sections. Section A focused on the demographic information, while Section B focused on the service quality dimensions. The study used the five (5) service quality dimensions proposed by Parasuraman (1985) to examine the service qualities in Nigeria's air cargo logistics industry. The five (5) service quality dimensions are reliability, responsiveness, assurance, empathy, and tangibility. Each dimension was presented on a Likert scale, a rating for measuring opinion, attitudes, or behaviours, with four (4) items in statement form. Thus, the questionnaire has twenty (20) items to examine air cargo service delivery in Nigeria. The items were presented on a 5-point Likert scale for the respondents to assign a weight to their perception of each statement under each service dimension to examine the significant service qualities of air cargo service delivery in Nigeria. The Likert scale was ordered from 1 – not significant to 5 – highly significant, for the respondents to rate the listed items in order of their significance to service quality delivery in Nigeria's air cargo logistics industry.

The data was analysed using exploratory factor analysis (EFA). The EFA was adopted to reduce the twenty (20) items to a few orthogonal ones that will represent the others in explaining the service quality dimensions for air cargo service delivery in Nigeria. EFA utilises the variance of the items to identify the most significant service quality dimensions in the air cargo logistics industry. The analysis provides information about the common factors and estimates the correlation between the observed variables. The acceptability of the final output of EFA follows some procedures, which include Kaiser-Meyer-Olkin (KMO) and Bartlett tests, communalities, extraction of variance with an eigenvalue greater than 1, factor rotation with varimax technique, and extraction using principal axis factoring (Ledesma et al., 2021) serving as the preliminary tests for the suitability and reliability of data.

The statistical tests for the analysis require adequacy and suitability tests of data using the Kaiser-Mayer-Olkin Measure of sampling adequacy and Bartlett's Test of sphericity, respectively. The communalities test determines the variance of each item suitable for their contribution to form the significant factors among the variables. The total variance test produces the number of factors the entire variables will be reduced to by determining their eigenvalues. Eigenvalues are scalar values that are associated with sets of linear equations in a matrix. The criterion for the test is that the number of factors with eigenvalues greater than one (1) will be the number of factors the analysis will produce. The final output of the analysis is the rotated factor matrix, which shows the grouping and reduction of the items into a few.

3. RESULTS AND DISCUSSION

The result of the KMO (0.940) indicates that the data is adequate for the analysis. The Bartletts test of sphericity with a Chi-Square value of 2937.307 is significant at $p<0.001$, indicating that the data is suitable for EFA (See Table 1). The result indicates that the data is adequate and suitable for exploratory factor analysis. The KMO result of 0.940 is more than the acceptable value of 0.500.

Table 1: KMO and Bartlett test for data adequacy and suitability

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.940
Bartlett's Test of Sphericity	Approx. Chi-Square	2937.307
	Df	190
	Sig.	.000

The communalities of the analysis are the estimates of the factors representing the variance of the variables in the data. As presented in Table 2, the communalities show each variable's initial and extracted values. The communalities estimates imply that variables with extracted values lesser than 0.400 are considered small and contribute little to the analysis's output (Laudau & Everitt, 2004). Most of the variables in this study have communalities values greater than 0.400 after extraction. However, item Res1, with a communality value of 0.388, which is very close to 0.400, may not have a significant contribution to the overall common service qualities in the air cargo logistics industry.

Table 2: Communalities of Air Cargo Service Quality Dimensions

Code	Item Statements	Initial	Extraction
	Reliability		
Real1	Providing services as promised	.495	.489
Real2	Dependability in handling customers' service problems	.644	.649
Real3	Providing service at the promised time	.619	.651
Real4	Maintaining error-free records	.568	.557
	Responsiveness		
Res1	Keeping customers informed about when services will be performed	.473	.388
Res2	Prompt services to customers	.622	.662
Res3	Willingness to help customers	.644	.678
Res4	Readiness to respond to customer's enquiries	.587	.517
	Assurance		
Ass1	Employees instil confidence in customers	.552	.494
Ass2	Making customers feel safe in their transactions	.618	.576
Ass3	Employees are consistently courteous	.688	.611
Ass4	Employees who have the knowledge to answer customers' questions	.542	.510
	Empathy		
Emp1	Giving customers individual attention	.534	.492
Emp2	Employees deal with customers with a caring heart	.660	.594
Emp3	Having the customers' best interest at heart	.571	.518
Emp4	Employees understand and respond to customers' needs	.683	.640
	Tangibility		
Tang1	Visual appealing facilities	.651	.655
Tang2	Employees have a neat, professional appearance	.641	.664
Tang3	Visually appealing material associated with service	.698	.693
Tang4	Visual appealing facilities are available for customers	.593	.561

Extraction Method: Principal Axis Factoring

The information in Table 3 guides the number of factors representing the variables in the analysis. The total variance of the factors affecting air cargo service quality, as presented in Table 3, shows three factors with eigenvalues greater than one (1). These factors accounted for 64% of the cumulative eigenvalues of all the variables. It implies that the eigenvalues offer a background understanding of the dimensions of factors affecting air cargo service quality, which has been reduced to three. Eigenvalues are the percentage of the total variance in data summarised by a factor. The data shows that a 3-factor solution is responsible for the common variance of about 58% of the total variance after extraction.

Table 3: Total variance explained of air cargo service quality factors

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.482	52.408	52.408	10.070	50.349	50.349	4.654	23.272	23.272
2	1.330	6.652	59.060	.931	4.654	55.002	3.507	17.535	40.807
3	1.004	5.021	64.081	.598	2.992	57.994	3.437	17.187	57.994
4	.827	4.134	68.215						
5	.726	3.632	71.848						
6	.680	3.398	75.245						
7	.597	2.983	78.229						
8	.529	2.647	80.876						
9	.507	2.534	83.410						
10	.483	2.415	85.825						
11	.427	2.136	87.961						
12	.385	1.926	89.887						
13	.341	1.705	91.592						
14	.307	1.535	93.127						
15	.301	1.506	94.633						
16	.268	1.340	95.973						
17	.229	1.143	97.116						
18	.208	1.042	98.158						
19	.190	.948	99.106						
20	.179	.894	100.000						

Extraction Method: Principal Axis Factoring.

After identifying that three (3) common factors would serve as significant service qualities in Nigeria's air cargo logistics industry, Table 4 presents the final output of the analysis indicating the significant service quality factors.

Table 4 presents the rotated factor matrix of the four factors to form the solution to the EFA analysis. It is to be noted from Table 4 that the variables are well-loaded on each of the identified factors. The highest loading variable on each extracted factor is Tang2, with 73.7% on Factor 1, Real3, with 73.3% on Factor 2, and Res3, with 71.1% on Factor 3. These highest loading variables are important in discussing the air cargo service quality in Nigeria's air cargo logistics industry. Tangibility refers to a common value that the senses can perceive. Also, it has common values that have a form that can be touched, seen, measured, or examined to enhance service quality in the air cargo logistics industry in Nigeria.

The result of this research about tangibility as a significant factor affecting air cargo service quality in Nigeria's air cargo logistics industry supports some previous studies (see Ayantoyinbo & Gbadegesin, 2022). Reliability refers to a common value that can be perceived by the ability of a service provider to assure the customers of reliable and proper service. The result of this research about reliability as a significant factor that affects air cargo service quality in the air cargo logistics industry supports the study of Khan & Fasih

(2014) on the process in which service providers remain faithful in rendering services to their customers can be considered as the reliability dimension of service quality. Abd-El-Salam et al. (2013) argued that reliability assures the customer of a service provider's ability to consistently provide a perceived quality of service. The reliability dimension of service quality is vital for the safe and timely cargo delivery by air. Responsiveness refers to a common value that can be perceived by how fast service providers respond to customer queries and the willingness of service providers to assist customers and provide prompt services.

Table 4: Rotated Factor Matrix

Code	Statements	1	2	3
Tang2	Employees have a neat, professional appearance	.737		
Tang1	Visual appealing facilities for packages	.710		
Tang3	Visually appealing material associated with service	.700		
Tang4	Visual appealing facilities are available for customers	.672		
Emp4	Employees understand and respond to customers' needs	.648		
Emp2	Employees deal with customers with a caring heart	.610		
Real3	Providing service at the promised time		.733	
Real2	Dependability in handling customers' service problems		.682	
Real4	Maintaining error-free records		.633	
Real1	Providing services as promised		.616	
Res3	Willingness to help customers			.711
Res2	Prompt services to customers			.611
Res4	Readiness to respond to customer's enquiries			.602
Factor Name		**Tangibility**	**Reliability**	**Responsiveness**

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

The major finding of this study is that tangibility, reliability, and responsiveness are the significant service quality factors that air cargo customers expect to achieve satisfactory service delivery in Nigeria. The other service dimensions of empathy and assurance are not significant for service delivery in handling air cargo. However, the finding is unique to cargo service delivery importantly because goods are tangible, and delivery must be reliable and responsive. The finding implies that goods for air transportation must be in the right condition, safely and timely delivered to the customers at the right cost.

4. CONCLUSIONS

The study examined the service quality factors for air cargo delivery in Nigeria. The study adopted the service quality dimensions Parasuraman et al. (1985) developed, including reliability, assurance, empathy, tangibility, and responsiveness, to examine air cargo stakeholders' view of service qualities in the industry. Each factor was measured by 4 items on a 5-point Likert scale. The data for the study were collected using a questionnaire administered randomly to cargo stakeholders at MMIA. The data were analysed using exploratory factor analysis to reduce the number of items to a few that can explain the significant service quality factors in Nigeria's air cargo logistics industry. The study found

tangibility, reliability, and responsiveness to be the most significant service quality factors influencing air cargo delivery services in Nigeria.

The study findings have similar implications for Southern African Development Community (SADC) countries regarding the effective service quality of cargo delivery by air. It is implied that air cargo customers in SADC would prefer services that are also tangible, reliable, and responsive.

Therefore, the finding implies that the air cargo logistics industry provides services that ensure the delivery of goods in good and well-packaged conditions. The services by air cargo stakeholders should also ensure that goods are delivered at the right time and at minimum cost. A major recommendation from the study is that stakeholders in the air cargo logistics industry must pay attention to physical conditions and the efficient delivery of goods to achieve high service quality for customer satisfaction. The study recommends that the air cargo industry focus on improving indices that offer reliable and responsive delivery of goods.

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