



PROBLEMS ASSOCIATED WITH THE MANAGEMENT OF AIRPORT FACILITIES: THE CASE STUDY OF MURITALA MUHAMMED AIRPORT, LAGOS, NIGERIA

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Abstract

Airports are very essential to air transportation and play critical role in connecting people and goods between locations as no two locations can effectively relate without adequate transportation. The airport is thus described as a “business card”, a major point of attraction and an indicator of the level of infrastructural growth and management of a country. In line with the foregoing, the study assessed the problems associated with the management of airport facilities using Muritala Muhammed Airport, Lagos as a case study. The target population for the study are the facility managers/concessioners engaged in the airport for the management of the various services in the airport. Data was collected through the administration of structured questionnaires and analysed using descriptive statistics, weighted mean score and factor analysis. The study noted that the mode of facility management practice is directly related to the nature of ownership and operation of the airport which indicated the use of concessioning combined with public management practice. The services mostly provided in the airport includes information management; building and property management; civil services; procurements and logistics management; technical services, infrastructure, commercial and space management. The results of the factor analysis show that the problems associated with the management of airport facilities were suppressed into four (4) components with a cumulative percentage of 78.972. It must be stated without doubt that the problems associated with the management of airport facilities must be critically looked into towards ensuring adequate performance, increase passenger satisfaction and provide an environment for safe, secure and economically viable air transportation.

Keywords: *Facility Management, Airport, Airport Facilities, Air Transport, Airport Management*

Introduction

Transportation networks such as road, water and air are seen as important part of human activity and endeavour which forms the basis of all socio-economic interaction (Avanenge & Zizi, 2016). Hence, no two locations can effectively interact without effective transportation. However, the ease, efficient and time saving characteristics

of air transportation have propelled its choice of usage amongst other transportation networks. The air transportation network is done through the use of various means of transports such as airplanes, helicopters, jets amongst others in airports. Thus, the airport is a critical aspect of the aviation which is a major and integral part of the socio-economic life of the country.

According to International Civil Aviation Organization (ICAO), an airport (or aerodrome) is an area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft. Airports are vital national resources which serve a key role in transportation of people and goods and in regional, national, and international commerce. For many countries, airports are center of attractions, activities and of great importance to any country because the level of development, infrastructure management, administration and economic development can be attributed to the standards of development and operation of the airports in the country. This view is further corroborated by Anastasia (2014) who noted that in many cases, airports create the first impression that tourists and passenger's sees on arrival in a country based on the level of availability and maintenance of its services, facilities and infrastructures. Hence, Edward (2005) described airports as the "business card" of the country. Therefore, the need for adequate management of airport facilities is a worldwide phenomenon in order to ensure effective airport operations. Temilade (1997) and Hassan (2015) noted that airports require adequate management because of its integrated systems. Akerele (1999) also noted that airport safety and patronage is influenced by the level of services provided and its management which is evident in the large number of airport users and operations.

In the light of this, Stephens and Ukpere (2011) noted that there has been a rise in air transportation in the last two decades as result of the increase in global wealth, relative reduction in global level of poverty and the choice of transportation for the rich and those in positions of authority. It was therefore noted that the aviation sector will continue to play an important role in the future prosperity of Nigeria and world economics. According to the report of Oxford Economics (2012) on Nigeria report in the aviation industry, the aviation sector comprising of the airlines together with the airports, air navigation and other essential ground services which makes up the transport infrastructure carries over 8.3 million passengers and 1.5 million tones of air freight to and fro Nigeria with more than 15,200 scheduled international flight and 66,800 domestic flights annually destined for 32 international airports in 30 countries and 18 local airports contributes N119 billion (0.4%) to Nigerian GDP, supports about 159,000 jobs and generates N3.5 million in gross value added annually which is nearly 7 times more productive than the average in Nigeria.

Owoputi (2015) further noted that the aviation industry has a significant benefit in the Nigerian economy, supporting Nigeria GDP of about 4% and job creation of about 159,000 of Nigerian working force, contribution to tourism industry and foreign investment in Nigeria economy. An annual tax paid NGN 8.5 billion. Passenger VAT of NGN 17 billion with NGN 8.9 billion government revenue and another supply chain of NGN 7.1 billion through taxation. All these figures demonstrates the fact that aviation sector provides significant economic benefits to the Nigerian economy and its citizens which are unique and essential to the operation of modern economies. Though, the sector was also affected by the economic recession in 2016, in 2017, the aviation sector recorded a 12.8% growth rate and contributed about \$8.2 billion to Nigerian Gross Domestic Product (GDP) in 2017. The sectors potential and performance is however hinged to the alignment of its infrastructural programmes and plans to meeting International Civil Aviation Organisation (ICAO) standards by some of its airports.

As at today, the contribution of aviation industry to the Nigerian GDP is never in doubt. Thus, it must be stated without doubt that the effective realization of the potentials of the aviation sector; sustaining and improving its economic value and operation; improving aviation infrastructure and expanding its operation to more international market for wider operation and increasing the contribution to GDP can be achieved through effective facility management practice at the airports.

Airport activities are diverse and complex as well as inter-related requiring adequate facility management so as to ensure effective asset and facilities management which are critical to airline operation continuity as well the satisfaction of the users. The facility management practices in airports are further necessitated as a result of the special and complex dynamic system with constant interactions between internal and external factors thereby requiring functional, comprehensive and robust facility management plan and practice round the clock daily for 365 days a year and all round facility management practice (Marks, Riestsema and Al-Ali, 2015). Adeniyi (1994) noted that the operation of an airport of significant size must be able to supply or administer the following facilities; servicing, maintenance and engineering of aircraft, airline operations including aircrew, cabin attendants, ground crew, terminal and office staff, business necessary for the economic stability of the airport (concessionaires, leasing companies etc), aviation support facilities amongst others.

Adequate facility management practice in airports is very important. Stephens and Ukpere (2011) noted that constructions of airports are only justifiable when the facilities are optimally utilized and managed. Inadequacies of the terminal buildings, air conditioning system and crowd handling capacity of the terminals; inadequate facilities to satisfy passengers while awaiting check-in amongst others were major

problems witnessed in Airports in Nigeria requiring adequate facility management practice. Pitt, Werven and Price (2011) reiterated the importance of facilities management practice in airports as it also helps in attraction of other major airlines; enhance capacity of the airports and provision of high qualities facilities. However, Adeniran and Gbadamosi (2017) noted that most airports infrastructures in Nigeria require considerable rebuilding and restoration as most rehabilitation and upgrading of airports in the country were majorly to enhance transportation network and develop air transportation. However, its important to note no consideration was given to the management of the facilities there-in.

It is a common sight to witness inadequacies and non-functionality of common-use airport applications such as check-in counters, passenger processing, terminal services, curbside services, janitorial services, ramp control, cargo operations, ramp and ground handling, communications infrastructure, and business software systems. Onasanya (2005) reported that Nigeria airspace was blacklisted by the International Federation of Airline Pilots (IFALPA) as lacking in effective communications, navigation, surveillance and air traffic management facilities, services and procedure. Furthermore, reports of the presidential task force which was set up in 2006 to look into the decay in the aviation sector, revealed that all the airports in the country lack basic operational facilities that could make for smooth operations of modern airports. The decay in facilities was attributed to long years of neglect and corruption. Onwuanyi, Oyetunji and Eyakwanor (2018) noted that airports in Nigerian have attained a somewhat poor reputation in terms of service quality and facilities. The poor state of the airports in Nigeria is further identified from the 2018 survey by the Guide to Sleeping in Airports (2019). The survey using services & facilities, terminal cleanliness, customer service, comfort (gate seating & availability of rest zones), food options, immigration/security, navigation and ease of transit as the major criteria's rated two of Nigeria's international airports as been among the very worst airports in the world. Whilst the Port Harcourt International Airport was ranked the 3rd worst airport in the world, the Lagos Muritala Muhammed International Airport was ranked 5th.

Dennis (2012) however noted that the success of airports is dependent on the adequacy of the maintenance and management by the facility management unit. The report linked facility management in airports directly to customer satisfaction and the most recent results published by indicate that top-ranked airports prioritize maintenance fundamentals such as clean facilities, comfortable waiting areas, and ease of movement throughout the airport. Hence, the importance of these great centers of activity (airports) has resulted in a research on the problems associated with the management of airport facilities in Nigeria using Muritala Muhammed Airport as a

case study because of its strategic importance and location in the Nigerian Aviation industry and serving both domestic and international traffic of both cargoes and passengers.

Literature Review

Concept of Airport

An airport is a meeting ground and exchange point for people and goods arriving and departing on a variety of air and surface vehicles having differing spatial and other requirements. With the view of operational control airport is divided into 2 zones: air side (AIR) and land side (LAND) (ENO Foundation for Transportation, 1986). On the assumption of international context, all airports can be divided into 3 categories: gateway airports, regional international airports and domestic airports. Vreedenburg (1999) described airports as an operation system comprising infrastructure, facilities, equipments, systems and personnels which collective provides a range of services to customers and users (processing facility for passengers, baggage and freight as well as a service facility to aircrafts and airlines).

The International Airport Transport Association (IATA) India (2015) noted that there is no official definition of the word “airport” and the international Civil Aviation Organisation does not define, it thus defined airport as a facility where a transfer is made between the surface mode and the air mode. This definition therefore introduces the concept of inter-modal processing. Abdussamet (2018) noted that airports which are counted as an essential part of the air transport system have a critical role to connect various stakeholders such as individuals, government and private institutions for the purpose of supporting regional and national growth over the past quarter century. Furthermore, Encyclopedia Americana described an airport as an area of land (including buildings, installations and equipment intended to be used, either wholly or in part for the take-off, landing, and ground movement of aircraft. The size of an airport and the size and variety of its facilities depend on the character and volume of its flight activity, the volume of its air traffic (passengers, mail, express and freight, the number and types of aircraft that use it as a base, and the runway length and approach and departure-area protection required to accommodate the most demanding aircraft likely to use the airport.

An airport designed to accommodate only light, single engine aircraft may require only a short, turfed landing strip, a turfed area for the open storage of aircraft and a single grade of aviation fuel. An airline airport serving a large metropolitan area, however, may require several paved runways, each with a length of three kilometres or more. It may require large and small hangers for the storage and repair of all types of aircraft; a system for the storage and the into-plane delivery of several types of aviation fuel;

one or more terminals for the handling of passengers and their baggage between aircraft and ground vehicles with related amenities, specialized terminals for the handling of air mail, air express and air freight; beacons and other approach and landing aids, and a control tower.

Airport Transportation in Nigeria.

According to Avanenge and Zizi (2016) airport services are seen as veritable instruments in transportation; meeting ends; means of globalization and market expansion; political and cultural integration and destination value enhancement. It is known and established facts that Airport in Nigeria have witnessed various policy interventions and innovations such as deregulation and liberalization, recapitalization, institutional framework as well as globalization and concession policies. The aim of the several policies established was to bring about a more viable and effective airport management system.

However, Akpoghomeh (1999) noted that the deregulation of the air transport services brought reality to air transport services in Nigeria. Similarly, the institutional restructuring, recapitalization policies and reforms of government's agencies have created a regime of efficiency and effectiveness which have impinged on air services operations in Nigeria. The effects led to acquisition of brand new aircraft, route expansion and capital base enlargement without adequate recourse to the effective management of the airports and its facilities.

Despite the fact that the laudable policy intervention and globalization have impacted positively on the airline services in Nigeria and brought a new paradigm of competition, innovation which has impacted on service delivery among the airline operators in Nigeria. Facility management practice in the airports have remain grossly under-researched. Hence, the importance of this current study cannot be over-emphasized.

Facilities Management in Airports

Pitt (2001) noted that facility management in airports represents a real challenge in the field of facility management because of its diverse nature and scope. Brown and Pitt (2001) therefore classified facilities management in Airports into:

- i. Aeronautical services and
- ii. Non-aeronautical services.

Pitt (2001) described aeronautical services as diverse and ranging from runways to air-traffic management and ground services. The non-aeronautical services are even more diverse and require great facility management to deliver for the functionality of the

airport. Examples of non-aeronautical services include bus transportation, parking services, lounges, health cares, security, cleaning, custodial services amongst others. In another classification Frankfurt AFM (2003) and Munich AFM (2003) classified facilities management in airports to include:

- i. Technical
- ii. Infrastructure
- iii. Commercial and
- iv. Space Management

The technical management according to Frankfurt AFM (2003) and Munich AFM (2003) consists of maintaining and developing all technical systems needed for the swift operation of the airport. This wide service ranges from vehicle maintenance, security and fire protection down to small technical services. The infrastructure management on the other hand involves logistics management, including parking, public transport and also the arrangement of cleaning staff, medical services and workplace development. The commercial management function mainly controls relations with third parties (for example, retailers) and contractors, but also performs functions such as business administration and marketing. Airport space management includes building, property and surface management. It provides a framework to support all the other AFM activities (Pitt *et.al*, 2011).

Pitt, Werven and Price (2011) further noted that the management activities in airports can be grouped into five main areas:

- i. Information Management
- ii. Building and Property Management
- iii. Civil Services
- iv. Procurement and logistics management
- v. Legal services.

Modes of Management of Airports

According to Tae, Nicole and Chunyan (2005), airport ownership/governance models can be classified into:

- i. Government agency or department operating an airport directly;
- ii. Mixed private-government ownership with a private majority;
- iii. Mixed government-private ownership with a government majority ;
- iv. Government ownership but contracted out to a management authority under a long term lease;
- v. Multi-level governments form an authority to own/operate one or more airports in the region;
- vi. 100% government corporation ownership/operation.

There are a number of surveys of empirical studies on efficiency that compare private and government owned firms. The results are far from conclusive. For example, De Alessi (1980) and Bennett and Johnson (1980) provided rather strong evidence for the view that private firms would perform better than government owned firms, whereas Millward and Parker (1983) found that “there is no systematic evidence that public enterprise are less cost effective than private firms”, Boyd (1986) agrees with this finding.

Tae, Nicole and Chunyan (2005) examined privatization, corporation, ownership forms and their effects on the performance of the world’s major airports. The study based on extensive cross-sectional time series dataset (2001-2003) for the major Asia-Pasific, European and North American Airports revealed that there are strong evidences that airports with government majority ownership and those owned by multi-level of government are significantly less efficient than airports with a private majority ownership. Also, there is no statistically significant evidence to suggest that airports owned and operated by U.S. government branches, independent airport authorities in North America., or airports elsewhere operated by 100% government corporations have lower operating efficiency than airports with a private majority ownership. Furthermore, airports with a private majority ownership achieve significantly higher operating profit margins than other airports; whereas airports with government majority ownership or multi-level government ownership have the lowest operating profit margin. In addition, on average, airports with a private majority ownership derive a much higher proportion (56%) of their total revenue from non-aviation services than any other category of airports while offering significantly lower aeronautical charges than airports in other ownership categories excluding U.S. airports.

Graham, Saito and Nomura (2014) examined airport management in Japan; regarding lessons learnt from the United Kingdom. The study noted that United Kingdom has a mixed private-public sector airport industry with a variety of different governance model as listed below:

- i. Private ownership (e.g. London City Airport)
- ii. Private share flotation (e.g. the former company BAA - now Heathrow Airport)
- iii. Holdings. This operator is now delisted)
- iv. Total private trade sale (e.g. Leeds Bradford, Bristol, Liverpool)
- v. Partial private trade sale (e.g. Manchester, Birmingham, Newcastle, Norwich)
- vi. Concession agreement with public ownership (e.g. Luton)
- vii. Public ownership (e.g. Cardiff, Highland and Islands (HIAL))

Literatures on Management of Airport Facilities

Stephens and Ukpere (2011) conducted a research on the performance and efficiency analysis of airport capacity utilization in Nigeria. Using Muritala Muhammed Airport, the study examined air traffic flow, landings and take-off times, arrival times and interval times spent at the airports. The study revealed that the airports were grossly under-utilized; inadequacies of the terminal buildings, air conditioning system and crowd handling capacity of the terminals; inadequate facilities to satisfy passengers while awaiting check-in amongst others were major problems witnessed in Airports in Nigeria requiring adequate facility management practice. Pitt *et. al* (2011) examined the problems of competition and complexities of airport facilities management alliances. The study examined the airport facilities management function; its importance and its strategic and competitive direction. The study revealed that there are inherent problems in airports facility management which can be effectively managed through well written contractual documentation.

Suleiman (2012) conducted a research on an analysis of air transportation in Nigeria. The study noted that there is an increase in the use of air transportation in Nigeria as well as the evidence of several problems militating against the efficiency of system. These factors include absence of a coherent air transport policy, bad management, decaying facilities, loose security, closure of airports, intermittent air crashes amongst others. Sakti (2012) also examined passenger perception on airport terminal facilities performance using Soekarno International Airport, Indonesia as a case study. The research adopted the importance-performance analysis to analyse the perception of the passengers at the terminal of the airport. The study revealed that waiting room; food and beverage were priority for expanded; airline counters frontage/check-in, lobby and inspection (lobby and ticketing), and departure lounge were in good condition but must be maintained; baggage claim and baggage inspection areas indicated affecting the satisfaction of service users; and airlines ticketing office, supporting services, and concourse were not affecting the interest/satisfaction of service user. In another dimension, Omoleke (2012) examined the constraints to optimal safety of air transportation in Nigeria through a review of the legal policy and aviation industry in Nigeria. The study was necessitated as a result of frequent happenings in the aviation sector resulting in heavy losses of lives and properties in plane crashes. Using primary and secondary sources of legal materials, the study revealed that the aviation industries in Nigeria and Africa in general were grossly underfunded resulting in the inadequacies of cargo screening machines, security personnel, obsolete navigational facilities, dependence on old planes, high maintenance costs amongst others.

Anastasia (2014) examined customer satisfaction on facility services in terminal 2 of Tampere Airport. Using excel and SERVQUAL technique which was related to airport

terminal characteristics and technical requirements, the study revealed that the level of customer satisfaction on terminal facilities was poor and there were some problems associated with the cleanliness of the facilities. There is no doubt the fact the satisfaction of the users and cleanliness of the facilities can be enhanced through adequate facility management practices. Towards examining customer's satisfaction, Ben and Adebola (2014) conducted a research on the determinants of customers' satisfaction in the Nigerian Aviation Industry, using Analytic Hierarchical Process (AHP) model. The study was modeled on both airline and airport indicators. The focused airline services in their study are ticket and reservation, on-board services, ticket fees, flight schedule, speed on responding to request, information or reconfirmation, ticket purchase time limit, convenience of ticket purchase, convenience of flight schedule, courtesy and helpfulness staff, and information related to flight. The focused airport services in the study were orderliness and cleanliness of check-in-area, speed of check-in process, information on flight status, boarding process, on-time departure and services at transit point, baggage handling services, and airport facilities and services.

Owoputi (2015) examined the development of aviation industry in Nigeria economy. The study noted that aviation creates links and connections between cities, nations and markets, and enables foreign investment. The study further noted that the aviation industry has a significant benefit in the Nigerian economy, supporting Nigeria GDP of about 4% and job creation of about 159,000 of Nigerian working force, contribution to tourism industry and foreign investment in Nigeria economy. An annual tax paid NGN 8.5 billion. Passenger VAT of NGN 17 billion with NGN 8.9 billion government revenue and another supply chain of NGN 7.1 billion through taxation. In another view, Hassan (2015) analysed emergency response procedures and air traffic accidents in Nigeria. The study noted there is a growing rate of air accidents in Nigeria with ineffective management. The results of the chi square analysis further revealed that Nigerian aviation industry is not in compliance with the Internal recommendation of International Civil Aviation Organisation as regards effective management. In addition, Marks, Rietsema and Al-Ali (2015) conducted a study on airports information systems-landslide management information systems. The study noted that just like other sectors of the economy, the aviation sector must also incorporate new and existing technologies whether in aircraft systems, airports or other aerospace related industries. The study therefore noted that for airports to become more effective and efficient in their operations, they need to understand the competitive advantage of landslide management information systems and how to align them together to better serve their stakeholders.

Avanenge and Zizi (2016) conducted a research on the analysis of issues and challenges of transportation in Nigeria and Egypt. Using secondary data, the study revealed that the major challenges associated with transportation in Nigeria and Egypt include lack of coherent air transportation policy, weak and inadequate management, obsolete facilities, insecurity, air crashes, bad roads due to lack of maintenance, non-functioning of airports supports systems, among others. With the introduction of concessioning in Nigeria, Adeniran and Gbadamosi (2017) conducted a study on lessons from developed countries on concessioning as a strategy for enhancing Nigeria's airports operational efficiency. The aim of the study was to provide basis for adapting the experiences from other countries towards the adoption of concession as a strategy for improving the efficiency of the operations of the Nigerian airports. The study noted airport concessioning has the capacity to enhance the efficiency of airport operation; reduce cost of airport services to stakeholders; decreased cost to the government for the support of airport sector and attract private sector participation to free public resources for public services.

Furthermore, Fadare and Adeniran (2018) conducted a comparative analysis of public operated airport terminals and concessioned airport terminal in Lagos, Nigeria. With a focus in Lagos Nigeria, the study compared the quality of airport services rendered in Murtala Muhammed International Airport (MMA1) which is the public operated airport and international terminal, and in Murtala Muhammed Airport (MMA2) which is the concessioned airport and domestic terminal. The study revealed that respondents were satisfied with the quality of airport services provided in MMA2 than the quality of airport services provided in MMA1. Also, using Gap analysis for the service quality attributes, the study revealed that the respondents in MMA1 were satisfied with reliability attribute and tangibles attribute, while the respondents in MMA2 were satisfied with reliability attribute. Furthermore, the study revealed that there is a relationship between passengers' satisfaction and service quality.

Onwuanyi, Oyetunji and Eyakwanor (2018) also conducted a research on professionalizing service delivery in Nigeria's public buildings using facility management with a focus on the Lagos Murtala Muhammed International airports. Using the 2015 published worldwide survey and ranking of international airports, the study noted that adequate and determined attention has not been given to quality service delivery; there is also low managerial capacity and an inappropriate, bureaucratic management models which has failed to deploy modern business techniques as well as appreciate the importance of the human element in that particular environment.

Methodology

The research design is a survey research and the target population of this study comprises the facility managers at the Muritala Muhammed Airport. The sample size of the study consists of about 200 facility managers/concessioners engaged by the Federal Airport Authority of Nigeria and other airport operators for the management of the various services within the three (3) terminals of the airport. Structured questionnaires were randomly administered on the target population consisting of the facility manager / Concessioners managing the various services at the airports on facility management practice at the airport.

Questionnaires were randomly distributed to the respondents; thus a total of Two hundred (200) questionnaires were sent out to the respondents of which a total of 134 representing 67.0% were completed and retrieved which was then used for the analysis. Data were entered into statistical package for social sciences (SPSS) for analysis. Descriptive, weighted mean score, correlation analysis and factor analysis were employed to analyze the data.

DATA PRESENTATION

Table 1: Management Practice at the Muritala Muhammed Airport

Management Practice	MP	P	UD	NP	MNP	Mean	Std. Dev	Rank
Concession Granted combined Public Management Practice	94(70.1)	31(23.1)	6(4.5)	3(2.2)	-	4.6119	.68178	1 st
Public Management Practice	47(35.1)	78(58.2)	6(4.5)	3(2.2)	-	4.2612	.64806	2 nd
Private Share Floatation Practice	-	30(22.4)	77(57.5)	27(20.1)	-	3.0224	.65427	3 rd
Partial Private Trade Sale Management Practice	-	28(20.9)	29(21.6)	53(39.6)	24(17.9)	2.4552	1.01578	4 th
Holdings Management Practice	-	9(6.7)	66(49.3)	34(25.4)	25(18.7)	2.4403	.87153	5 th
Private Ownership Management Practice	-	-	14(10.4)	68(50.7)	52(38.8)	1.7164	.64437	6 th
Total Private Trade Scale Management Practice	-	-	6(4.5)	57(42.5)	71(53.0)	1.5149	.58471	7 th

Where: MP: Mostly Practiced: P: Practiced: UD: Undecided: NP: Not Practiced: MNP: Mostly Not Practiced.

Source: Field Survey, 2019

The study noted that the mode of facility management practice is directly related to the nature of ownership and operation of the airport. As revealed during the course of the study, the research noted that the concessioning combined with public management practice was ranked 1st with a mean score of 4.6119. The concessioning involved the facility management operations of the various services concessioned to various companies with some services still been managed by the Federal Airport Authority of Nigeria (FAAN). The public management practice which majorly involved management practiced carried out by the Federal Airport Authority of Nigeria (FAAN) only was ranked 2nd with a mean score of 4.2612 while private share floatation practice was ranked 3rd with a mean score of 3.0224.

In all, the study therefore furthered showed the operational management practices conducted by the concessionaires and the Federal Airport Authority of Nigeria (FAAN) in the management of facilities and services at the Muritala Muhammed Airport.

Table 2: Services and Facilities Available at the Muritala Muhammed Airport, Lagos.

Services and Facilities	MP	P	UD	NP	MNP	Mean	Std. Dev	Rank
<i>Information Management</i>								
Air Traffic Control	96(71.6)	29(21.6)	6(4.5)	3(2.2)	-	4.6269	.67914	1 st
Control Room/Systems Integration	95(70.9)	30(22.4)	6(4.5)	3(2.2)	-	4.6194	.68050	2 nd
ICT Tools	93(69.4)	32(23.9)	6(4.5)	3(2.2)	-	4.6045	.68297	3 rd
Airline Counter	71(53.0)	54(40.3)	6(4.5)	3(2.2)	-	4.4403	.68837	4 th
Support Services	54(40.3)	71(53.0)	6(4.5)	3(2.2)	-	4.3134	.66511	5 th
<i>Building & Property Management</i>								
Passenger Terminal	78(58.2)	47(35.1)	6(4.5)	3(2.2)	-	4.4925	.69093	1 st
Hangers and MRO Facilities	76(56.7)	49(36.6)	6(4.5)	3(2.2)	-	4.4776	.69061	2 nd
Baggage Handling	47(35.1)	64(47.8)	20(14.9)	3(2.2)	-	4.1567	.75448	3 rd
Airport Facilities	31(23.1)	61(45.5)	39(29.1)	3(2.2)	-	3.8955	.77817	4 th
Project Management and Supervision	33(24.6)	46(34.3)	45(33.6)	10(7.5)	-	3.7612	.91091	5 th
Cargo Systems	16(11.9)	68(50.7)	47(35.1)	3(2.2)	-	3.7239	.69792	6 th
<i>Civil Services</i>								
Master Planning	80(59.7)	45(33.6)	6(4.5)	3(2.2)	-	4.5075	.69093	1 st
Runway & Pavement Design and Refurbishment	45(33.6)	72(53.7)	14(10.4)	3(2.2)	-	4.1866	.70623	2 nd
Infrastructure Provision	38(28.4)	71(53.0)	22(16.4)	3(2.2)	-	4.0746	.73194	3 rd

Ground Services	15(11.2)	87(64.9)	29(21.6)	3(2.2)	-	3.8507	.63135	4 th
Integrated Transport Area	9(6.7)	91(67.9)	22(16.4)	12(9.0)	-	3.7239	.71915	5 th
Procurement & Logistics Management								
Support Services	44(32.8)	72(53.7)	15(11.2)	3(2.2)	-	4.1716	.71004	1 st
Operation Studies	40(29.9)	77(57.5)	14(10.4)	3(2.2)	-	4.1493	.68833	2 nd
GeoTechnical Services	52(38.8)	49(36.6)	30(22.4)	3(2.2)	-	4.1194	.83211	3 rd
Environmental Services	31(23.1)	78(58.2)	22(16.4)	3(2.2)	-	4.0224	.69873	4 th
Purchases and Supplies	39(29.1)	58(43.3)	27(20.1)	10(7.5)	-	3.9403	.89073	5 th
Technical Services								
Aircraft Maintenance	79(59.0)	46(34.3)	6(4.5)	3(2.2)	-	4.5000	.69097	1 st
Security	64(47.8)	61(45.5)	6(4.5)	3(2.2)	-	4.3881	.68178	2 nd
Fire Protection	49(36.6)	60(44.8)	22(16.4)	3(2.2)	-	4.1567	.77415	3 rd
Vehicle Maintenance	40(29.9)	47(35.1)	44(32.8)	3(2.2)	-	3.9254	.84628	4 th
Emergency Management	7(5.2)	62(46.3)	54(40.3)	11(8.2)	-	3.4851	.72273	5 th
Infrastructure								
Cleaning and Maintenance	79(59.0)	46(34.3)	6(4.5)	3(2.2)	-	4.5000	.69097	1 st
Parking	51(38.1)	74(55.2)	6(4.5)	3(2.2)	-	4.2910	.65837	2 nd
Workplace Development	16(11.9)	62(46.3)	21(15.7)	35(26.1)	-	3.4403	1.00757	3 rd
Building Management and Maintenance	8(6.0)	59(44.0)	46(34.3)	21(15.7)	-	3.4030	.82370	4 th
Public Transport	-	29(21.6)	61(45.5)	44(32.8)	-	2.8881	.73229	5 th
Commercial								
Business Administration	79(59.0)	46(34.3)	6(4.5)	3(2.2)	-	4.5000	.69097	1 st
Contract Management	71(53.0)	54(40.3)	6(4.5)	3(2.2)	-	4.4403	.68837	2 nd
Third Party Services	46(34.3)	55(41.0)	30(22.4)	3(2.2)	-	4.0746	.80996	3 rd
Retailers	23(17.2)	71(53.0)	37(27.6)	3(2.2)	-	3.8507	.72035	4 th
Marketing	14(10.4)	81(60.4)	36(26.9)	2(2.2)	-	3.7910	.64975	5 th
Space Management								
Hangers	71(53.0)	54(40.3)	6(4.5)	3(2.2)	-	4.4403	.68837	1 st
Space Allocation, control & management	54(40.3)	71(53.0)	6(4.5)	3(2.2)	-	4.3134	.66511	2 nd
Space Planning	54(40.3)	71(53.0)	6(4.5)	3(2.2)	-	4.3134	.66511	3 rd
Building and Terminal	50(37.3)	47(35.1)	34(25.4)	3(2.2)	-	4.0746	.84628	4 th
Apron	47(35.1)	45(33.6)	39(29.1)	3(2.2)	-	4.0149	.85826	5 th

Where: MP: Mostly Practiced: P: Practiced: UD: Undecided: NP: Not Practiced: MNP: Mostly Not Practiced.

Source: Field Survey, 2019

The provision of the various services in the airports was further reviewed during the course of the research. the various services and facilities have been grouped under the following headings; information management; building and property management; civil services; procurements and logistics management; technical services, infrastructure, commercial and space management. The various opinions of the respondents there-in have been presented and ranked for ease of interpretation and understanding.

The information management services and facilities include air traffic control which was ranked 1st with a mean score of 4.6269; control room/systems integration was ranked 2nd with a mean score of 4.6169; ICT tools (4.6045); airline (4.4403) and support services (4.3134) were ranked 3rd, 4th and 5th respectively based on the major services and facilities provided at the airport. The services and facilities mostly provided based on building and property management services include passenger terminal (4.4925) which was ranked 1st, hangers and M.R.O. Facilities was ranked 2nd with a mean score of 4.4776 while baggage handling (4.1567); airport facilities (3.8955) were ranked 3rd and 4th with project management and supervision been ranked 5th with a mean score of 3.7612. Furthermore, the research revealed that the civil services mostly provided and available are master planning which was ranked 1st with a mean score of 4.5075; runway, pavement designs and refurbishment which was ranked 2nd with a mean score of 4.1866. Infrastructural provisions was ranked 3rd with a mean score of 4.0746 while ground services (3.8507) and integrated transport area (3.7239) were ranked 4th and 5th respectively.

For the procurement and logistics management services, the research revealed that services and facilities mostly provided includes support services (4.1716); operation studies (4.1493); Geo-Technical Services (4.1194); Environmental services (4.0224); purchase and supplies (3.9403) which have been ranked 1st, 2nd, 3rd, 4th and 5th respectively. Technical services are also provided which include aircraft maintenance (4.5000); security (4.3881); fire protection (4.1567); vehicle maintenance (3.9254) and emergency management (3.4851) which have also been ranked 1st, 2nd, 3rd, 4th and 5th respectively. The infrastructure maintenance services also includes cleaning and maintenance services (4.5000); parking (4.2910); workplace development (3.4403); building management and maintenance services (3.4030) and public transport (2.8881) which have been ranked 1st, 2nd, 3rd, 4th and 5th respectively.

The research further revealed that the commercial services mostly provided includes business administration (4.500); contract management (4.4403); third party services (4.0746); retailers management (3.8507) and (marketing (3.7910) which have been ranked 1st, 2nd, 3rd, 4th and 5th respectively. In addition to the other services and facilities at the airports, space management also shows that provision of hangers

(4.4403) was ranked 1st: space allocation, control & management and space planning (4.3134) were both ranked 2nd respectively while buildings and terminals were ranked 4th with a mean score of 4.0746 and apron was ranked 5th with a mean score of 4.0149.

Table 3: Problems Associated with the Management of Airport Facilities

Problems Associated with the Management of Airport Facilities	SA	A	UD	DA	SDA	Mean	Std. Dev	Rank
High Cost of support expected from the Government	85(63.4)	32(23.9)	8(6.0)	7(5.2)	2(1.5)	4.4254	.92888	1 st
Low Managerial Capacity and Inappropriation	86(64.2)	25(18.7)	14(10.4)	7(5.2)	2(1.5)	4.3881	.97264	2 nd
High Management and Maintenance Costs	81(60.4)	31(23.1)	13(9.7)	7(5.2)	2(1.5)	4.3582	.96091	3 rd
Ineffective Management	76(56.7)	38(28.4)	11(8.2)	7(5.2)	2(1.5)	4.3358	.94148	4 th
Inappropriate contractual documentation	76(56.7)	37(27.6)	12(9.0)	7(5.2)	2(1.5)	4.3284	.94810	5 th
Decaying/Obsolete Facilities	77(57.5)	31(23.1)	14(10.4)	10(7.5)	2(1.5)	4.2761	1.02151	6 th
Non-functioning of airport support systems	58(43.3)	53(39.6)	12(9.0)	9(6.7)	2(1.5)	4.1642	.95141	7 th
Complexity in Airport Facility Management	66(49.3)	42(31.3)	11(8.2)	12(9.0)	3(2.2)	4.1642	1.05627	7 th
Ineffective Management Policies and Plans	58(43.3)	49(36.6)	14(10.4)	11(8.2)	2(1.5)	4.1194	.99657	9 th
Inadequacies of Terminal Buildings, facilities and Infrastructure	40(29.9)	77(57.5)	8(6.0)	7(5.2)	2(1.5)	4.0896	.83588	10 th
inadequate maintenance plan	52(38.8)	53(39.6)	20(14.9)	7(5.2)	2(1.5)	4.0896	.93762	11 th
Routing and Scheduling of Flights	42(31.3)	55(41.0)	22(16.4)	13(9.7)	2(1.5)	3.9104	.99972	12 th
Inadequate Qualified Personnel	59(44.0)	32(23.9)	17(12.7)	18(13.4)	8(6.0)	3.8657	1.27904	13 th
Absence of coherent Air Transport policy	43(32.1)	51(38.1)	22(16.4)	12(9.0)	6(4.5)	3.8433	1.10946	14 th
Inadequate Emergency Response	33(24.6)	48(35.8)	29(21.6)	21(15.7)	3(2.2)	3.6493	1.08481	15 th
Inability to Incorporate new and existing Technologies	26(19.4)	54(40.3)	27(20.1)	25(18.7)	2(1.5)	3.5746	1.05043	16 th

Inadequate facilities to satisfy passengers while awaiting boarding	6(4.5)	63(47.0)	53(39.6)	10(7.5)	2(1.5)	3.4552	.76203	17 th
Crowd Handling Capacity	19(14.2)	45(33.6)	50(37.3)	18(13.4)	2(1.5)	3.4552	.94682	17 th
Flow of Airport Traffic	15(11.2)	53(39.6)	26(19.4)	21(15.7)	19(14.2)	3.1791	1.24363	19 th
Intermittent Air Crashes	6(4.5)	30(22.4)	53(39.6)	42(31.3)	3(2.2)	2.9552	.90001	20 th

Source: Field Survey, 2019

The various problems associated with the management of airport facilities were further examined during the course of the research. The research revealed that the major problems associated with the management of airport facilities include High Cost of support expected from the Government which was ranked with a mean score of 4.4254; low managerial capacity and inappropriation was ranked 2nd with a mean score of 4.3881; high management and maintenance costs was also ranked 3rd with a mean score of 4.3582; ineffective management was ranked 4th with a mean score of 4.3358 while inappropriate contractual documentation was ranked 5th with a mean score of 4.3258 and decaying/obsolete facilities was ranked 6th with a mean score of 4.2761. non-functioning of airport support systems and complexity in airport facility management were both ranked 7th respectively with a mean score of 4.1642. Factor analysis was further used in discerning the problems associated with the management of airport facilities and the results are as produced in the tables below;

Table 4: KMO and Bartlett's Test on Problems Associated with the Management of Airport Facilities

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.807
Approx. Chi-Square		3108.223
Bartlett's Test of Sphericity	Df	190
	Sig.	.000

Source: Field Survey, 2019

The Bartlett's test of sphericity and sampling adequacy are presented in Table 4 and shows that the chi-square of 3108.223 is significant at $p < 0.000$ indicating that the sample used is adequate. The KMO is 0.807 indicating that the sample used is very adequate, falls into the range of being a great value and that the correlations are not too compact.

Table 5: Total Variance Explained on Problems Associated with the Management of Airport Facilities

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Routing and Scheduling of Flights	10.181	50.903	50.903	10.181	50.903	50.903	8.553	42.766	42.766
Complexity in Airport Facility Management	2.901	14.506	65.409	2.901	14.506	65.409	2.892	14.459	57.225
Flow of Airport Traffic	1.585	7.924	73.334	1.585	7.924	73.334	2.516	12.580	69.805
Inadequacies of Terminal Buildings, facilities and Infrastructure	1.128	5.638	78.972	1.128	5.638	78.972	1.833	9.167	78.972
Crowd Handling Capacity	.722	3.608	82.580						
Inadequate facilities to satisfy passengers while awaiting boarding	.655	3.276	85.856						
Inappropriate contractual documentation	.502	2.508	88.363						
Absence of coherent Air Transport policy	.447	2.235	90.598						
Bad Management	.407	2.033	92.632						
Low Managerial Capacity and Inappropriation	.313	1.563	94.195						
Decaying/Obsolete Facilities	.282	1.412	95.606						
Intermittent Air Crashes	.224	1.120	96.726						
High Management and Maintenance Costs	.188	.940	97.666						

Inadequate Qualified Personnel	.129	.643	98.308
Inadequate Emergency Response	.095	.475	98.784
Ineffective Management Policies and Plans	.087	.436	99.220
Inability to Incorporate new and existing Technologies	.054	.272	99.492
Inadequate maintenance plan	.044	.220	99.712
Non-functioning of airport support systems	.033	.164	99.876
High Cost of support expected from the Government	.025	.124	100.000

Extraction Method: Principal Component Analysis.

Source: Field Survey, 2019

Table 5 lists the eigen values associated with each linear component (problems associated with the management of airport facilities) before extraction, after extraction and after rotation. Before extraction, 20 linear components were identified within the data set. The eigen value associated with each factor represents the variance explained by that particular linear component and this is reflected in the table in terms of the percentage of variance explained. The table further shows that four (4) components were extracted under 5.638 eigenvalue minimum. The clustering of factors constituting the problems associated with the management of airport facilities and within the four (4) components generated normalized cumulative sums of squared loading of 78.972%. This shows that the four (4) components depict 78.972% of the characteristics of the twenty isolated factors. In other words, 78.972% of the total variation in the problems associated with the management of airport facilities is explained by cumulative effect of the four (4) components extracted. Thus, efforts to identify the problems associated with the management of airport facilities should be targeted at the four (4) major problems identified.

With a clear cut at third point from the Scree plot (the Figure below), four (4) factors were extracted for rotation using Varimax method.

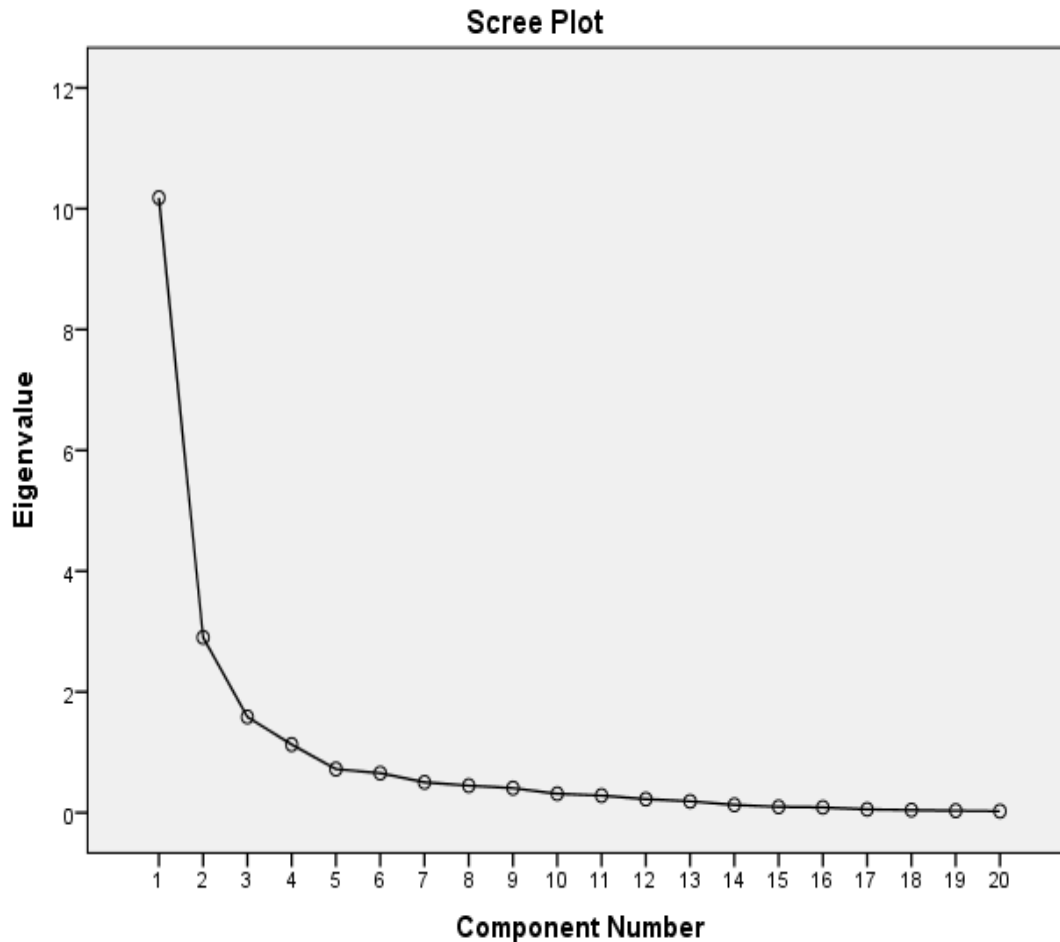


Fig 1: Scree Plot of The Problems Associated With The Management Of Airport Facilities

Source: Field Survey, 2019

The four (4) explored problems together explained 78.972% variation as seen in figure 1

Table 6: Rotated Component Matrix on Problems Associated with the Management of Airport Facilities

Problems Associated with the Management of Airport Facilities	Component			
	1	2	3	4
Routing and Scheduling of Flights			.609	
Complexity in Airport Facility Management	.842			

Flow of Airport Traffic	.927	
Inadequacies of Terminal Buildings, facilities and Infrastructure	.605	.472
Crowd Handling Capacity	.638	.642
Inadequate facilities to satisfy passengers while awaiting boarding	.492	.716
Inappropriate contractual documentation	.787	
Absence of coherent Air Transport policy	.759	
Bad Management	.796	
Low Managerial Capacity and Inappropriation	.853	
Decaying/Obsolete Facilities	.863	
Intermittent Air Crashes		.859
High Management and Maintenance Costs	.800	.406
Inadequate Qualified Personnel	.723	
Inadequate Emergency Response	.446	.691
Ineffective Management Policies and Plans	.828	
Inability to Incorporate new and existing Technologies	.418	.651
inadequate maintenance plan	.624	.575
Non-functioning of airport support systems	.770	
High Cost of support expected from the Government	.865	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Source: Field Survey, 2019

The rotated component matrix indicates sufficient loading on 4 components. The dominant variables on the first component are complexity in airport facility management, decay and obsolete facilities, low managerial capacity and inappropriation, ineffective management policies and plans, high cost of support amongst others. These have a common theme centered on complexity, obsolete facilities, managerial capacity, management policies and cost related factors. The second component centers on flow of airport traffic, inability to incorporate new and existing technologies, inadequate maintenance plan being high loading factors. On the third component, routing and scheduling of flights, crowd handling capacity, intermittent air crashes and inadequate qualified personnel's while the 4th component entails inadequate facilities to satisfy passengers while awaiting boarding and inadequate Emergency response.

CONCLUDING REMARKS

Air transportation failure and unreliability as a result if inadequate facility management practice can significantly influence the operation and usage of such

airports. Hence, the importance of facility management practices in the management of airport facilities cannot be over-emphasized. It is on this note that this study assessed facility management practice of airport facilities using Muritala Muhammed airport, Lagos, Nigeria as a case study. Despite the implementation of concessionairing policies, several problems associated with facility management practices of the airport facilities are still inherent. Hence, the need for appropriate reviews of such contractual documentation as well as the application of facility management practices in the management of airport facilities. It must be stated without doubt that the problems associated with the management of airport facilities must be critically looked into towards ensuring adequate performance, increase passenger satisfaction and provide an environment for safe, secure and economically viable air transportation.

Conclusively, the success of the airport largely depends on the adequate management and maintenance of the facilities by the facility management unit through adequate facility management practices.

Recommendations and Implementation Strategies

Recommendation One:

The Federal Government through its agencies should inculcate the tradition of effective facilities management practice towards curbing the problems associated with management of airport facilities.

Implementation Strategies:

- i. The Federal Airport Authority of Nigeria (FAAN) and other relevant agencies to review facility management plans and policies of airport facilities.
- ii. Employment of facility managers and the establishment of a facility management unit to be one of the major departments amongst airline operators and the Government units.

Recommendation Two:

There should be a review of the problems associated with the management of airport facilities towards ensuring best practices, standards and user's satisfaction.

Implementation Strategies:

- i. The Federal Government to ensure adequate provision and maintenance of airport facilities.
- ii. The relevant Government agencies related to airport operations to embark on a review of the methods of airport facility management practice.

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