BENCHMARKING PERFORMANCES OF AIRLINE MANAGEMENT MODELS AMONG DOMESTIC AIRLINES IN NIGERIA

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CERTIFICATION

This is to certify that this thesis "**BENCHMARKING MANAGEMENT MODELS AMONGST DOMESTIC AIRLINES IN NIGEIA**" was carried out by **ENGR. JEREMIAH DAVID ARAUKO (Reg. No. 20204257018)** in the Department of Transport Management Technology, School of Management Technology, Federal University of Technology, Owerri, in partial fulfilment of the requirements for the award of Master of Science (M.Sc) Degree in Air Transport Option of the Department of Transport Management Technology.

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DEDICATION

This Thesis is dedicated to God The Father, The Son and The Holy Spirit.

To Him be all glory now and forever more in Jesus Name! Amen

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ABSTRACT

This study considers Benchmarking of Airline Management Models amongst Domestic Airlines in Nigeria. To guide the study, four research questions and four hypotheses were formulated. The population consisted of Station Managers of the airlines, and Airline personnel, Airport workers, regulatory representatives which consisted of NCAA, NAMA, FAAN from across four Airports in the South-South, Nigeria. A sample size of 180 respondents randomly selected from the four (4) airports in the study area. Airport management model questionnaire were developed. The instrument was validated and tested for reliability using the Split-half method. The instrument yielded a reliability coefficient 0f 0.85. Descriptive Statistics (Pearson Product Moment Correlation [PPMC] and nonlinear Regression Statistics) were used to test the hypothesis. Four (4) dependable variables which comprises of customer satisfaction, operational profitability, operational efficiency, and operational safety of the sampled Airlines were analyzed regarding each airlines management models. The result show that all four variables analyzed were above .05 level of significant, at the degrees of freedom of the respective numbers of observations therefore the null hypotheses for the objectives were not retained. The findings show that the overall performances of Domestic Airlines in Nigeria are largely dependent on management models' compositions: significant improvement on customer Satisfaction, airline profitability, operational efficiencies, and operational safety will certainly make Airlines operations very profitable in Nigeria. It was therefore recommended among other things, efforts should be made upgrade their operational performances through Benchmarking for a more improved customer satisfaction, productivity, efficiency, and safety of the airlines.

***Key words*: Airline management models, customer satisfaction index, operational profitability index, operational safety index, and Airline efficiency, overall airline performance, moribund.**

CHAPTER ONE

INTRODUCTION

1.1 Background information

Airline Business is a capital-intensive business, and most airline operators and investors have over the years been very concerned, worried, and dazzled at the frequency at which airlines fizzle out of operation in the Nigerian Airspace. For some, it seems to have become a norm for airlines to go moribund in Nigeria given the antecedents of earlier operators which also include the National carriers which have failed on several attempts. As captured in a publication by Daily Trust dated 10 0ct. 2022, no fewer than sixty-two airlines have become extinct since Nigeria's independence in 1960 (https://daily trust.com). In 2023, it was also reported in 'this day' e-magazine, of two airlines declaring their inability to continue to operate Domestic flights in Nigeria due to claims of rising cost of operations (https/ thisdaylive.com). This agrees with the already existed notion that Nigerian airlines do not have capacities to last long in business. Although there have been observations of improvement of Airline Businesses in the aviation in recent times, the survival of airlines business on the long run has continued to be of great concern to many over the years. Those familiar with activities in the aviation business in this country have attributed the attrition rates to many factors such as inadequate funding, poor technical and professional staffing, unhealthy maintenance culture, and government policies amongst others.

The uncertainty of airline survival in Nigeria has remained the core reason leadership of governments have been criticized for their interest in re-venturing into having another National carrier. Critics perceived such interest as venturing into 'a white elephant project'. Indeed, experts have cautioned that the new airline if and when commissioned, might not be insulated from the unhealthy business models and unfriendly business environments which have bedeviled previous efforts over years in the country. For this reason, there has always been many dissenting voices on this issue as analyzed by Aligbe (2018), in his article "*National Carrier: Our ten failed attempts* (1960-2014)".

Similarly, the positions of many concerned Nigerians over the news that the government of Akwa Ibom state were mustering efforts to have the first state-owned Airline was not a surprise. In their perceptions, such huge financial investments should have better served other needs of the state than to venture into what the Federal Government of Nigeria had tried and failed at different times. However, to the great amazement of all, IBOM AIR, the Akwa Ibom State owned airline is making giant strides in the industry and setting the pace for other airlines. Nevertheless, there is still fears in the heart of many, the salient question in their hearts are, "can Ibom Air success story be sustained?" or will it also fizzle out after a while just the same way other Airlines which once ranked topped in the industry did?

Besides these fears, it is also worthy of note that since the 2008 deregulation of the transport sector, the aviation sector in Nigeria has undoubtedly experienced significant growth and competition amongst airlines have also evolved drastically. The deregulation helped in the removal of several restrictions on routes, fares, frequencies, and fights schedules and allows airline operators to fly into any city of their choice within the country's economic area and fix their fares as they consider appropriate. The overall impact is that the airline business in the country has further been transformed into a market driven system with continuous improvement in the standard of operations, quality of services, and high competitiveness amongst Domestic airlines.

Notwithstanding, the volume of most airline passengers that access airports across major cities in Nigeria has not risen to the expected peak of their respective origins and destinations on the Domestic wings. This volume is primarily generated by the number of enplaning and deplaning of passengers using airports; and this also affects the income Airports generated from aeronautic and non-aeronautic revenues which largely depends on the air-passenger traffic volume in any Airport. Airports generate more aeronautical revenues when there is rise in demand for airline services within in the airports, and also, as airlines and other support service providers also pay for office and parking spaces in the airports. The implication here is that most times, airlines with very low commercial activities within Airports are not always able to generate enough revenue to pay up or renew airport charges, pay staff salaries, and consistently handle the required Aircraft checks and routine maintenance required to keep their airlines operationally safe; they also find it difficult to engage in continuous staff trainings and certifications required to keep airlines services and operations in good competitive state in the industry. The ultimate effect is that such airlines fizzle out of business leaving huge financial liabilities to their operating Airports, maintenance contractors/workshops, and staff who are being thrown back into the job seekers market to search for alternatives.

1.1.1 Definitions:

i. Benchmarking

According to Air Transport Management Journal, 5 (1999) 105-112, Benchmarking is defined as the pursuit by organizations of enhanced performance by learning from the successful practices of others. Benchmarking activities gives avenues through which key industry internal processes are reviewed, performances monitored, new comparisons made with the best performers in the industry to enable adequate changes to be explored.

Despite the possible tendencies for lack of trust between fierce industry rivals to share best practices, the airline industry global body, the International Air Transport Association (IATA), monitors Airlines performances through industry wide surveys. It reveals that passenger satisfaction monitoring program provides benchmark ratings for 29 elements of airline service from check-in efficiency to cabin crew courtesy (International Air Transport Association, 1998). Each airline is compared with the best and worst airline scores for each service element to provide a measure of relative performance. It is likely that these performance indicators and the benchmark ratings act as starting points for the benchmarking process by enabling airlines to make comparisons of their own position in relation to industry standard. Organizations which really succeed in using benchmarking to improve difficult areas of activity could be expected to gain wider benefits in terms of change management and organizational learning. In the airline industry benchmarking provide the crucial means to gain competitive advantage in a rapidly changing market were intense competition places premium on cost control and operational efficiency.

Since the arrival of Ibom Air, aviation businesses have not remained as they used to be for many airlines, passengers, and Airports. From the home airport in Akwa Ibom state to other airports within the country's Domestic wings, the airline has made significant impacts in terms of service quality, schedule reliability and safety, and has gained significant recognition and acumen. Within in the same operating environment where most airlines find difficult to maintain their fleet, few other Airlines are soaring high and weathering the storm with strong positive impact in the industry, then there is need for one to probe further to find out what is being done differently by the thriving airlines within industry both within and beyond the Nigerian airspace for a more sustainable airline business in both locally and internationally.

According to Schefczyk (1995) airlines operators on the international scene recognize the importance of performance indicators such as cost per available seat kilometer, yield per revenue passenger kilometer and labour productivity per available ton kilometer. Within the context of a competitive and dynamic marketplace, comparisons with other carriers are seen as vital in the quest to achieving superior performance. O'Toole (1998) reveals that comparisons at the international operations are made at a general level through the performance information published in industry journals such as the Avmark Aviation Economist, Airline Business, Air Transport World and Flight International. At other instances, performance measures are obtained through investigative studies of other operators by examining the public views.

ii. **Management Model**:

A management model is a set of decisions the leadership team at a company makes about the future direction of a system, process, or business. These decisions directly shaped particular behaviors and practices in a company. The model helps managers make informed decisions that benefit the company and its employees. Management models comprises of decisions targeted at strengthening certain aspect of the company's business and operations in other to keep the company in high competitivity amongst others in the same business or industry. Consequently, airline management models are sets of decisions that define the process of operations and ethical considerations of airlines in their business drives and endeavors.

1.2 Problem Statement

The inability of Airline operators to adopt to a more competitive and profitable Airline management models in their operations in Nigeria have continued to challenge the survival of Airlines business in Nigeria. One would naturally assume that Nigeria being the largest population in Africa and blessed with both human and natural resources should become a pace setter in the aviation business both in the sub-region and in Africa as a whole, but this is far from it. Instead, it has been observed that other smaller countries with very little resources and human capacity are being noted for great airline business successes, whereas Nigeria is still being recognized as one with a very huge number of moribund airlines since her independence. This abnormally is indeed a cankerworm that should be tackled with every sense of urgency. On this premise, it is pertinent to investigate the management strategy of airline in Nigeria with respect to their business models, because we cannot continue to accept that sustainable airline business in this country is not achievable. In view of these discoveries, certain key performance indicators that would help reveal the unprofitability and unsustainability of airline business in Nigeria in comparison to the successes of airline businesses recorded elsewhere must be explored.

This research, therefore, is set to study individual management models of selected Airlines to ascertain their operational competitivity and make recommendations that could result in a more lasting, profitable, and sustainable airline business in Nigeria.

1.3 Aim and Objectives of the study

This study is aimed at addressing the challenges of poor performances of airline in Nigeria through Benchmarking management models of Domestic Airlines in Nigeria.

The specific objective of this study is to:

(a) Determine the effect of airline management models on Customer Satisfaction index of Domestic airlines Nigeria.

(b) Ascertain the effect of airline management models on the profitability index of Domestic airlines in Nigeria.

(c) Verify the effect of airline management models on operational efficiency index of Domestic airlines in Nigeria.

(d) Discover the effect of airline management models on operational safety index of Domestic airlines in Nigeria.

1.4 Research Questions

The following are questioning this research wishes to answer:

RQ-1: What effect does airline management models have on customer satisfaction index of Domestic airlines in Nigeria?

RQ-2: What effect does Airline management models have on the profitability index of the Domestic Airlines in Nigeria?

RQ-3: What effect does airline management models have on the operational efficiencies index of Domestic airlines in Nigeria?

RQ-4: Which effect do airline management models affect operational safety index of Domestic airline in Nigeria?

1.5 Statement of Hypotheses

(Ho_1): There is no significant effect of Airline Management Models on Customer Satisfaction index of Domestic airline in Nigeria?

(Ho_2): There is no significant effect of Airline Management Models on profitability index of Domestic airlines in Nigeria.

(Ho_3)**:** There is no significant effect of Airline Management Models on Operational Efficiency index of Domestic Airlines in Nigeria.

(Ho_4)**:** There is no significant effect of Airline Management Models on operational safety index of Domestic airlines in Nigeria.

1.6 Significant of the Study

First, this research is an indispensable contribution to knowledge. It brings to light the indispensable benefits of Benchmarking of management models of our Domestic airlines for a more profitable and sustainable airline business in Nigeria. It will serve as a reference source and as a stimulant for any individual or research institutions to pursue full-scale research. One will see that the academia will consult with the findings of this study to refer and to support the right views on Airline Benchmarking Practices for enhance performances.

The second contribution is in the aspect of policy making. This study will serve as a guideline which would prove very useful in drawing policy for all stakeholders in the airline business to draw inspiration from. It will help airline managers understand the limiting factors to their operational sustainability, and how to eliminate the constraints stifling their operations. And help to unfold the necessary performance indicators that make airline operation sustainable in any given environment. Once this practice is in place, airline managers who still allow their airlines operate models that are unprofitable may have to face the consequences of their unprofessional management styles by being shown the exit door.

The third contribution of this study is to the aviation industry in Nigeria. This study will be of tremendous value to the successful evolution of Airline Business in Nigeria. It will make it easier for operators to adopt management models for higher competitive advantages and sustainability of airline business in the country.

All these are justified by the fact that airline business over the years in Nigeria were not sustainableas evident in the huge number of moribund airlines recorded in the past years; and Benchmarking has been recognised globally as a sure way of enhancing profitability and sustainability of airlines anywhere in the world.

1.7 Scope of Study

Although the subject of this research is broad, this study seeks to investigate what airline management model is best suitable to tackle the challenges militating against airline profitability and sustainability in Nigeria by narrowing down Domestic airline operations. The stifling conditions emanating from government policies, business environment, internal corporate governance, cost of maintenance, tax policy, and impacts of local and international regulatory authorities, shall be duly explored.

This study also attempts to make compares of the aviation industry in Nigeria with those of other West African sub region in other to draw inference and modalities that will help in the formulation of policies, models, and recommendations capable of addressing the cankerworm of unsustainable airline business holistically. Research into the management models of airlines in Nigeria is a huge task that require huge funds and availability of time. The unavailability of sufficient funds on my part to carry out this research exhaustively was one of my greatest limitations in this study. This affected the number of Airports and Airlines visited and the number of days spent at each location visited as payment for hotel bills and other logistics were cut down to fit my limited resources.

Secondly, time constraint was also very challenging as most Airports and Airlines surveyed took more time to get the data for the report than was estimated. Another area of time constraint was that I had to handle a lot of other matters pertaining to personal, family, religion, and social within the same time available, while striving to meet up with the academic calendar. Time constraint was a major limitation.

Thirdly, the inability of Airline managers to give free hand to carry out this survey of airlines as intended was frustrating. The only cooperation received was the distribution of the questionnaires. The few of the managers who gave audience to the interviews did not give enough time to address some of the areas that this research was seeking to explore. Almost all the airlines had the feelings that they were already doing the right things to make them sustainable even the one that have lost customer confidence as filtered from the primary data obtained through the questionnaires.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURES

2.1 Conceptual Review

2.1.1 Concept of Airline service quality and customer satisfaction:

According to studies by to Gronroos (1988) and Mersha (1992), Airline's quality of customer service influences satisfaction, loyalty, repeat business, and profitability. Service quality is generally viewed as a multidimensional concept. Generally, customers evaluate a variety of dimensions on a company's products or services. Service quality on one end, is the result of comparison that customers make between their expectations about a service and their perceptions of the actual service performance. Oliver, (1981) defined Customer satisfaction, as an emotional feeling by the customer after experiencing a certain service which in turn leads to an individual overall attitude towards purchasing of service. Kotler & Keller, (2009) reveals customer satisfaction as an individual' feeling of pleasure or disappointment resulting from comparing a products perceived performance or outcome with their expectations. Oliver, (1997) explains 'Satisfaction' as the consumer's fulfillment response. He opines that it is customer's judgement that a product or service feature, or the products service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under – or over fulfillment.

In the aviation industry, Huang (2009) states that service quality affects customer satisfaction, and that customer satisfaction affects customer behavior, including repurchase intention and word of mouth. Similarly, Yunus et al (2013) suggests also that the quality-of-service delivery by airlines has significant effect on customer satisfaction, which in turn affects customer loyalty. This is a fact that brings about customer retention in the competitive space.

Hynes & dredge (1998) highlights some dimensions of airline service to include safety, customer complaint handling, courtesy of crew, on-time departures and arrivals, comfort and cleanliness of seats, flexibility, friendliness, and honesty. Wang et al. (2011) examined evaluation criteria of service quality in the airline companies and found that passengers are more concern with comfort, internal decoration, and the services of airline companies most of the times.

2.1.2 Concept of Acceptable Operational Safety of airlines

In the aviation business, Airline's operational safety are the basically the concerns of the all-stake holders. IATA works with the managements across the industry to implement safety programs that centers around identifying and controlling these safety elements. It is expedient therefore on the part of the airline operators to adapt to or implement safety programs that are holistically acceptable and profiting to the total well-being of the crew, passengers' safety and the airline. In other words, a substandard safety policy cannot guarantee operational and technical safety of the aircrafts, cargo, and airline passengers and cannot be accepted by the regulatory authorities.

IATA's data-driven assessments and analysis, together with safety experts from member airlines identify some key safety issues of airlines to include the following:

a) Cabin Safety
b) Loss of Control in-flight (LOC-I)
c) Control Flight into Terrain (CFIT)
d) Runway Safety
e) Mid-air Collision
f) Fatigue Management
g) Carriage of Cargo, Mail and Baggage

h) Aircrafts Handling and Manual Flying Skills Report

i) Carriage of Energy Devices

j) Operational Notices

Absolutely, safety is generally an unachievable and very expensive goal. Therefore, industry considers the concept of acceptable safety in risk bearing. The acceptable level of safety expresses the safety goals of an oversight authority, an operator, or a service provider. According to 'ICAO annex 11, attachment E' provisions are made in respect of the minimum safety objectives acceptable to the oversight authority to be achieved by the operator/service provider while conducting their core business functions.

The acceptable level of safety is generally defined in terms of the probability of an aircraft accident occurring. It is defined individually for each operator/service provider on the basis of the target level of safety set by the regulator. An array of factors such as complexity of operations, the operational context, past safety performances, existing safety regulatory framework, applicable safety standards etc. This concept of acceptable level of safety is expressed by two specific matrices, namely safety performance targets and safety performance indicators. (Source: skybrary.aero)

2.1.3 Concept of Airline Profitability

The IATA reported that airlines made a little over $8 per passenger in 2015. From the inception of the aviation industry, technological evolution has allowed continuously lower costs, which also encourages higher demand. However, because the industry remained highly competitive, these factors have not resulted in higher profit margins. This entry names the factors that affect the aviation industry's profit margins, with an emphasis on the cost structures.

2.1.3.1 Factors Affecting Profit Margins

Profit is equal to ‘total operating revenu**es’** minus ‘total operating costs. Therefore, the level of profit margins depends on factors affecting both sides of the equation: i.e., the revenues sides and the costs sides.

a. **Operating Revenues**

Many factors affect airlines’ revenue side. Initially, the airline industry was heavily regulated, with only one national carrier per country. The prices were high, and most people couldn’t afford to fly. However, after the deregulation of air travel in the late 1970s and 1980s, new low-cost carriers entered the industry, driving the prices of air travel down despite a general trend of increasing fuel price. Airlines are susceptible to unexpected events that could jeopardize their profitability because they operate on such a slender profit margin. Air travel decreases during volatile economic times or unexpected events. Incidences such as the 9/11 attacks, COVID 19 pandemic and commercial plane crashes, all affects airlines adversely by lowering potential passengers’ inclinations to fly and can bankrupt the airlines.

b. **Operating Costs**

On the cost side, several factors are important. Airline business requires an important initial investment, especially because the suppliers of the aircrafts enjoy significant power in that there are essentially two main suppliers of commercial planes, Boeing and Airbus. Such a duopoly allows them to charge premium prices for the planes. Once the -investment is made, like most other businesses, airlines incur fixed costs that do not vary with the number of passengers transported or flights made (overhead costs) and variable costs that do vary (operating costs)

Cost structure differs in some respects between National flag carriers (FCs) operating on the international scale, and low-cost carriers (LCCs) which operate Domestic routes. Overhead costs include marketing and management and tend to be airline specific. FCs tend to have higher marketing budgets than do LCCs; because LCCs offer lower fares, less effort is made to market ticket sales, and tickets are sold directly through websites rather than travel agents to save on commission costs. Direct operating costs are mostly similar between both types of carriers.

The highest contributing share of operating costs for most airlines comes from labor, followed by fuel, which makes up 35% of total operating expenses, depending on current market prices. Fuel price is a commodity and thus has the same basic price for all carriers.

However, there are a few differences between LCCs and FCs in the category of landing fees/tax, staff expenses, and additional services. Airports often represent monopolies that force airlines to pay very high landing taxes and surcharges to land. However, many LCCs benefit from agreements with state-run airports just as IBOM AIR has with VICTOR ATTAH INTERNATIONAL AIRPORT that exempt them from landing fees for the purpose of stimulating tourism in the destination state entry by bringing low-budget travelers who would have been unable to afford a trip otherwise.

Staff expenses of LCCs tend to be less than those of FCs because LCCs have a lower staff per passenger ratio. LCCs attempt to lower labor prices by resorting to online stores and check-in methods and by adding a mandatory surcharge to any who fail to check in using the online portal. In addition, LCCs attempt to provide a basic transportation service and to minimize all amenities commonly associated with air travel by eliminating the in-flight meal or decreasing the baggage allowance. This enables LCCs to have a lower variable cost component, which they pass directly to customers by charging lower prices than FCs. On the other hand, FCs try to compensate for their higher cost structure by selling more expensive seats primarily targeted to business travelers, who also tend to fly more frequently.

2.1.4 Concept of Airlines Efficiencies

Forsyth et al. (1986) reveals that ‘Airline efficiency’ is the airline's ability to attain maximum performance while minimizing resource consumption. Numerous studies have defined and measured airline efficiency, focusing on operational efficiency and consumption of assets to produce revenue Sengupta, (1999), the effect of marketing and passenger services on airline efficiency Scheraga, (2004), the impact of route *configuration strategy* and related costs on airline efficiency, and unionization as a possible factor in airline efficiency Greer's (2009). While studies have typically focused on the impact of operational and cost factors such as labor, average load factor, and fleet optimization on airline efficiency, recent studies have considered broader factors such as socioeconomic and environmental factors.

According to Gössling & Peeters, (2007), environmental impact of aviation has received particular attention given the projected increase in aviation CO2 emission, from approximately 3.5 % of the Global Greenhouse Emissions in the 1990 s to 15%-40% by 2025; Intergovernmental Panel on Climate Change.

These categories of efficiencies are necessary in the rating of the overall efficiency of airlines. Through Benchmarking amongst airlines in the same operating environment, each airline efficiency ratings are discovered for better improvements. Efficiency is an important attribute because all inputs are scarce. The industry has a history of continuous improvement in efficiency. Until the pandemic, there was a steady improvement in the passenger load factor to a record average of over 82% in 2019. Operational efficiencies have resulted in a 55% improvement in fuel burn per passenger km since 1990. (www.iata.org)

Operational performance-efficiencies of airlines are measured by an assessment of different aspects of airline operations, which include delay against schedule, flight time variability, and flight cancellations. The costs incurred as the result of delays against schedule as well as additional time that airlines build into their schedules in anticipation of delay are very crucial to the operating efficiency of airlines.

In determining the efficiencies of airlines on terms of cost factors, it is important to note that cost per available seat kilometer (CASK), and Revenue per available seat miles are measures of efficiencies and are calculated by taking Total operating cost and dividing by available seat kilometer (ASK). Revenue per available seat mile is calculated by dividing the airline's total revenue by its total available seat miles (ASM).

Mathematical model for calculation of efficiency as stated above are:

i. Efficiency (f) = Total operating cost/ASK = CASK……………(i)

OR

ii. Efficiency (f) = Total Revenue/ASM = RASM ……….………(II)

An Operations Key Performance Indicator (KPI) or metric is a discrete measurement that an airline uses to monitor and evaluate the efficiency of its day-to-day operations. These operations KPIs help management identify which operational strategies are effective, and those that inhibit the airline competitive advantage in the industry.

2.2 Theoretical Framework

For any field of study to develop, the underlying theoretical framework must be put in place.

The following theories are reviewed to give standardization to this research on Benchmarking Airline Management Models.

The theories are:

i. **Theory of Constraints (2004)**

ii. Adaptive Management (AM) Theory (2011)

iii. System Theory (2023)

2.2.1 The Theory of Constraints (TOC)

The Theory of Constraints (Boyd & Gupta, 2004) suggests that every system has complex and interrelated activities, and is bombarded with an array of problems, or at least one constraint, which impedes its performance. An optimal usage of the constraints will, therefore, cause optimal performance outcome, whereas the maximum utilization of non-constrained resources will create excess inventory.

Watson, Blackstone, and Gardiner (2007) submit that "TOC is a pragmatic and holistic approach to continuous improvement, covering disparate functionalities under a common theoretical foundation, and consists of an integrated suite of tools focused on those things that limit greater performance relative to the goal". Gupta & Boyd, (2008) sees it as a unifying theory in operations management that finds applicability in manufacturing and service sectors as well as organizations of various sizes.

According to Watson et al (2007), TOC philosophy has been deployed by managers of a number of high-profile companies such as "3M, Amazon, Boeing, Delta Airlines, Ford Motor Company, General Electric, General Motors and Lucent Technologies" (p. 388), who publicly acknowledged that their organizations had significant improvements due to the adoption of TOC techniques. Goldman (1990), and Ronen and Pass (2007) also submits that managers are responsible for the identification of the constraints (weakest links) that prevent organizations from achieving their goals, and the subsequent readjustment of structures and processes to close performance gaps.

A weakest link could be viewed as the most expensive or scarce resource in the organization - be it tangible or intangible. For Büyükyılmaz and Gürkan (2009), constraints or weak links should be classified into categories for effective management. Such categories could be market demand constraints, plant/labour capacity constraints, political constraint, raw materials constraints, logistics constraint, behavioral constraints, and managerial constraints. Moreover, goal incongruence, changing business cycle and customers' taste can also constitute constraints.

Specifically, in the airline industry, these limiting factors include lack of good infrastructure, unfavorable policies (Schragenheim & Dettmer, 2000), low market demand, lack of qualified personnel and competent managers, poor corporate governance, weak regulatory environment, multiple taxes, poor maintenance practice and overstaffing, amongst others (Xu & Dioumessy, 2019). Moreover, even though constraints cannot be totally eliminated from a system, a repeated practical application of the theory leads to continuous improvement and increased profitability. The set of tools espoused by Theory of Constraints include:

(i) The Five Focusing Steps (5FS),

(ii) (ii) The Thinking Processes, and

(iii) (iii) Throughput Accounting.

(iv) The Five Focusing Steps (5FS) of the Theory of Constraints call for managers to focus on bottlenecks for continuous improvement, through the following continuously iterative five steps:

(v) (1) Identify the system's constraint(s),

(vi) (2) Develop a plan on how to exploit the system's constraint(s),

(vii) (3) Organize everything else to fit into this plan by subordinating all actions to the decision made in step 2,

(viii) (4) Elevate the system's constraint(s),

(ix) (5) and if a constraint is broken in the previous steps, go back to the initial step to identify any new constraint that should be eliminated.

Dan-Trietsch (2005) added step zero to the steps suggesting that the manager must first "select an objective function and decide how to measure it". The thinking processes involve decision making activities of changing organizational processes, policies, and strategies (Goldratt, 1990; Cox, Blackstone & Schleier, 2003; Gupta, Boyd & Sussman, 2004). During this process, managers develop "*cause and effect*" tools, root-define the causes of undesirable effects (UDEs) (Groop, Ketokivi, Gupta & Holmström, 2017) and then eliminate the UDEs without bringing about new ones.

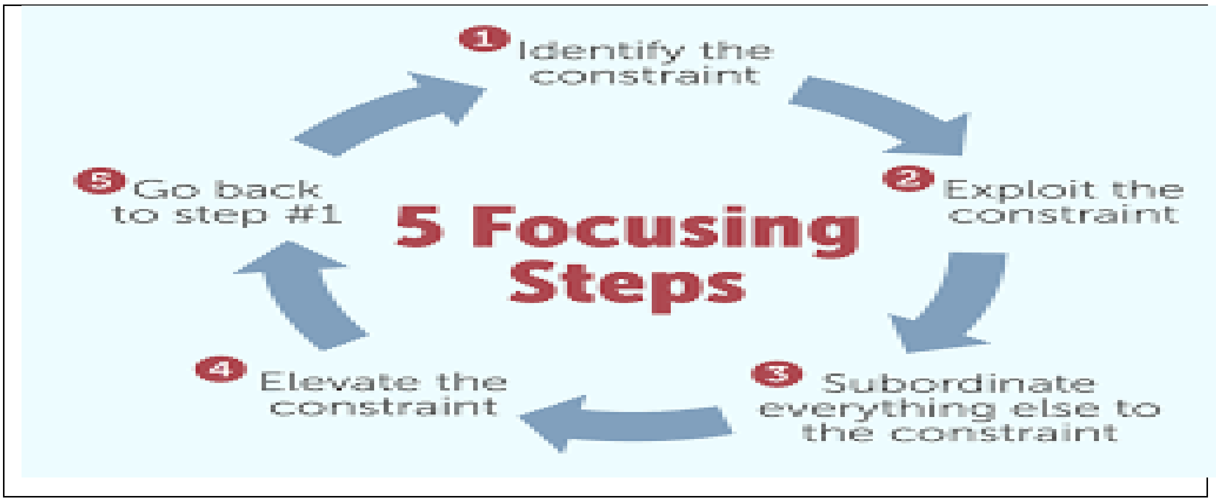

Figure 2.1: Theory of Constraint – John Yorke

Source: www.google.com

The basic questions that arise from the thinking processes are:

(i) What needs to be changed?

(ii) What should it be changed to?

(iii) What actions will cause the change? (Goldratt, 2007; Watson et al, 2007).

Throughput Accounting (TA) is an accounting technique for measuring performance and aiding decision making, which aims to remedy the limitations of the traditional accounting framework. Scholars (e.g., Goldratt, 1990; Srikanth & Robertson, 1995) have argued that the traditional accounting practices encourage behaviours that are inimical to the long-term profit maximizing goal of organizations. Thus, TA was advanced as a better performance measurement technique which focuses on behaviours that foster higher levels of financial performance (Lockamy & Spencer, 1998; Smith, 2000). Managers of various organizations, including those in the aviation industry, deploy the Throughput Accounting (TA) aspect of Theory of Constraints to enable the system make money in the present and in the future, using Net Profit (NP), Return on Investment (ROI), and Cash Flow (CF) as performance measures (Goldratt, 1983).

In service industries, throughput is money generated from selling the service (Siha 1999). Other performance measurements under the TOC are inventory management and operating expense (Goldratt & Cox, 1984). Thus, in order to be successful in a highly competitive environment, airlines are expected to institutionalize thinking processes geared towards profit maximization and satisfying passenger requirements - by increasing revenue generation, and reducing inventory (e.g. un-booked seat on a flight) and operating expense (Chou, Lu & Tang, 2012). From the foregoing, the applicability of the Theory of Constraints in the aviation sector is underscored by the need for airline managers to identify the various operational activities and environmental factors that constitute bottlenecks, and device strategies to tackle each of them based on their degree of manifestation. Furthermore, it is when managers of the airlines are aware of such constraints that decisions could be made quickly to "exploit, subordinate and elevate" the system for increased throughput, in accordance with the tenets of the Theory of Constraints.

2.2.2 Adaptive Management (AM) Theory (2011)

Williams (2011) defines active AM as an approach that evaluates management alternatives for reducing uncertainty about ecological processes and how those processes are influenced by management actions. Adaptive management is an approach to natural resource management for people who must act despite uncertainty about what they are managing and the impacts of their actions (Allen and Garmestani, 2015). Adaptive management is an alternative to conventional, reductionist management that should enable effective action within complex socio-ecological systems (Pahl-Wostl, 2007). Adaptive management is not blind or aimless trial and error, but is purposeful and deliberate (Allan and Stankey, 2009) and structured (Pahl-Wostl et al., 2010). Whether learning is the result of planned experimental learning (i.e., *active* adaptive management) or from careful reflection on management actions (i.e., *passive* adaptive management), the central aim of adaptive management is to consider the consequences of actions undertaken for management, and to improve future management actions through that consideration.

The review of Adaptive management theory **(AM)** is considered adequate for this research. It is also referred to as ***Adaptive Resource Management (ARM) theory.*** The aim is to reduce the uncertainty through monitoring of the system. The theory, according to these authors, seeks to create a policy framework that would be helpful to stakeholders, organizations, and their managers, to be aware and take advantage of unannounced events. By adopting this structured and iterative process, decision making would enhance resources management objective and the information received would be used in the future. It is a medium to learn and change a system.

This theory is a systematic way for improving environmental management policies and practices, it has demonstrated to be effective in other disciplines and spheres of life that wants to be sustainable such as the aviation industry and specifically, the airport, which needs prudence in the deployment of scarce resources to infrastructure development which are very capital intensive and taking longer incubation periods before it can be recouped.

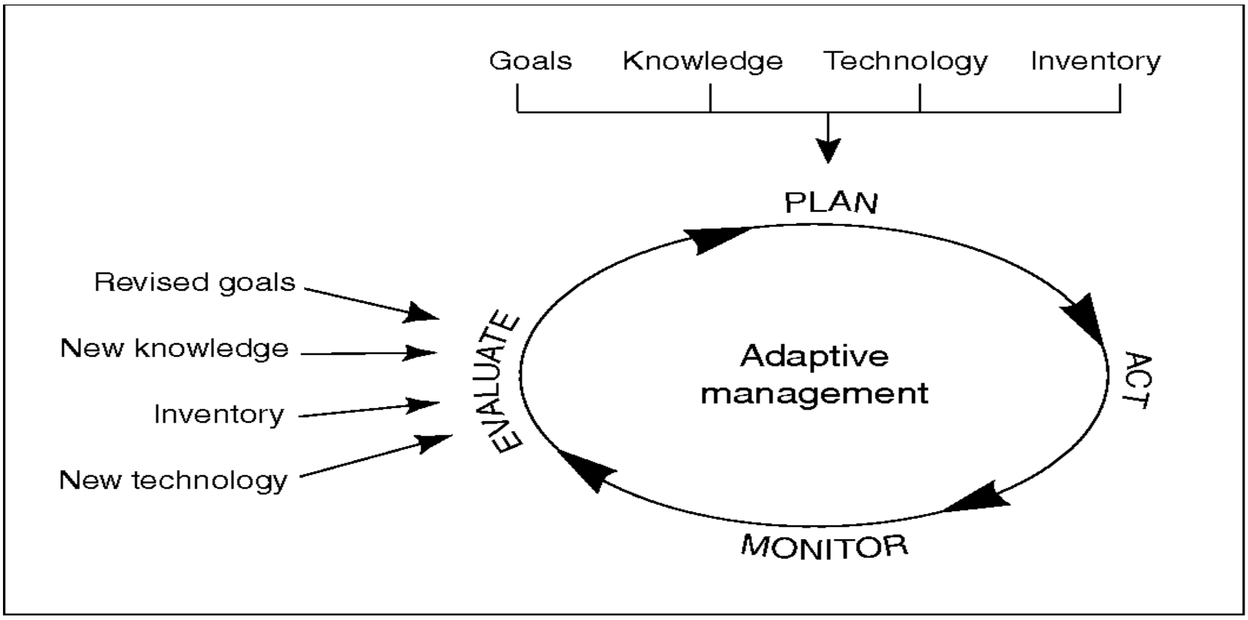

Figure 2—The adaptive management cycle (USDA USDI 1994: E–14).

Overview of Adaptive Management

Source: Research Gate

Adaptive Management, according to Bormann, Wagner, Wood, Cunningham, Brooks, Friesema, Berg, and Henshaw (1999), evolved through decision makers, managers and scientists in natural resource management whose intent was on coming up with a model to discover important uncertainties and key assumptions. According to these authors, the AM methodology, emphasizes why an organization must adjust to suit the environment. The strategies employed in this theory is an ideal tool for an organization like the airport seeking sustainability methodologies in an environment of constant change (passenger management, technology, security, and other wise).

For the Airlines to remain competitive, meet up with demands and stringent regulatory requirements concerning safety and security and to render optimum services to customers (passengers and other stakeholders), adopting the Adaptive Strategic Planning model would ensure that the airline is prepared for unannounced uncertainties of the future and also brace for the ever changing environment of airline operations and the dynamic nature of the aviation industry in general in respect to environmental concerns, demand, infrastructure provision, technology, non-aeronautical activities, surge in aviation passenger traffic and their expectations, privatization, commercialization, legislation, concession, etc.

According to Dunphy, et al (2007) adopting this approach will help the airports to learn, adjust and perform as an integrated system having learned from a multifaceted chain of influences. By applying the AM strategy in the running of an airline, the operators would learn to integrate the various needs of stakeholders. For instance, the airlines need adequate infrastructure while passengers demand and expect comfort and adequate levels of service (LoS) before, during, and after their journey. While not compromising on safety and security, the operator is expected to ensure the demands and expectations of all customers are met. This approach would aid in developing management models that offers framework for decisions that intends to support a sustainable future operation of the Airline, and which would guarantee a memorable airline experience for the passengers and at the same time putting the airlines in the league of best airlines in the world. Testing the efficiency of Adaptive Management concept to other concepts is difficult. The major issue is that if a system is already being run with one strategy, it becomes difficult to know how the other approaches would also have worked.

2.2.3 System Theory (2023)

System theory is another theory reviewed in this research. The theory was propounded by Ludwig Von Bertalanffy, a biologist. The theory states that real systems interact and is open to its environments and that they can acquire qualitatively, new properties through emergence, resulting in continual evolution. The theory focuses on the arrangement of a system and relationship between its component parts. System approach as a management concept, regards an organization as composing of three purposively arranged parts that are interrelated. These are input, process and output. According to Meadow and Wright (2008, p11) systems consist of more than just the sum total of its components which are ‘elements, interconnections, and the purpose'. According to these authors, purpose the last component part of the system, known as goal, is vital. Looking at the airlines from a system perspective, will permit for deeper understanding of the various stages of evolution and growth and development of airline models specifically as it relates to transformation of airlines competitiveness in the areas of safety, efficiency, productivity, and operations sustainability.

This approach regards airlines as having three parts which are distinct, purposively designed and interconnected. They are the input, process, and output. Input in the system denotes the provision of infrastructures and facilities to aid in management of passengers. Process refers to the monitoring of the entire operation, harnessing the various functions of management to enhance the flow of passengers in the terminal during facilitation at various stations to identify deviations for which corrective measures would be affected. Output is the goal (efficient passenger and cargo transport management) of the airline.

The system approach emphasizes the need for feedback to improve the system and effect necessary change and corrections. As an interdisciplinary principle that considers both the technical and essential requirements of passengers, the approach ensures quality of service to meet passenger's expectations.

The system theory has developed and evolved into non-linear, casual, complex and chaos theory. The complex system theory according to Marson (2008) is a combination of theories. It seeks to create an understanding and explanation to how behavioral patterns are formed from the interactions in self-organizing and adaptive systems to better understand growth and change. The complex theory is a theory of a system surviving, evolving, developing and adapting to change. The theory sees organization as a system that is complex and made up of several component parts that are connected and interacting with each other in different ways.

From this perspective, the Airlines with all their components (assets) fix and mobile, humans and machines, governmental bodies, and agencies, etc., is a complex system. For the Airline companies to attain its goals of facilitating the movement of freight and passengers, it has to evolve, develop and adapt to the environment-technology and otherwise.

Mason (2008) also reveals that the emergence concept within the complex system theory is an essential concept. It is the point at which a system is at critical level and is transiting or evolving, leading to new entities which were not a part of the system before, but rather emerging into new directions and patterns towards other behavior. Linking this to the Airline Business, it is observed that the trend in Airline management and operation has changed and is still evolving. The discuss today amongst Airline operators and the regulatory bodies centers on acceptable level of Aircraft operational safety, customer retention, profitability, and overall efficiency of airlines.

The system approach provides feedback from stakeholders (passengers, regulatory agencies, Airport operators and passengers, etc.), which gives a good basis for control, leading to improvement of the system and a higher service output.

2.3 Empirical Review

2.3.1 Airlines Internal Process Benchmarking

Britannia (2000) opined that the importance of focusing on processes rather than just outputs-metrics was crucial for effective benchmarking of airline. it stressed the need for internal benchmarking of business processes to provide a yardstick over time that could compliment benchmarking against external partners. Internal benchmarking proved a useful learning experience and starting point for more adventurous benchmarking activities. Externally, benchmarking with partner airlines could be a slow and cautious process that requires mutual trust, something that can be enhanced with the formalization of the relationship at an early stage. However, even when a benchmarking partnership is established, comparability of key performance measures is only valid if the organizations concerned can be sure that like is being compared with like.

Benchmarking has continued to be the pattern of major leaders in the Airline Business all over the world. According to publication of Air Transport Intelligence, (1998) the case of Britannia Airways is as a classic example. The publication revealed that Britannia Airways since its inception 1962, has grown to become UK's largest charter airline carrying approximately 8.4 million passengers per annum on its fights from 16 UK airports to over 100 destinations around the world. A comparison with its competitors reveals that Britannia are over one third larger than their nearest three competitors in terms of aircraft fleet size and available seat capacity.

The airline accounted for about 6% of the UK air passenger market (Keynote, 1997), second to British Airways and are & ranked among the world’s 30 most profitable airlines. According to discovery made by Kingsley-Jones, (1998) Britannia had become part of the vertically integrated Thomson Travel Group, which controls travel agents Lunn Poly and Thomson Holidays. Thomson is one of the top three providers of holiday packages in the UK. The link with Thomson is such that 90% of all Britannia fights are operated for their sister company.

Britannia typify the approach of many airlines to benchmarking by drawing on the published data within aviation journals to gain an idea of how well they had performed in the aviation industry in the United Kingdom. However, different airlines calculate certain performance statistics in different ways and so the validity of the statistics can be of limited use unless the method by which the figures are calculated is known. Benchmarking has been observed to be common within the activities of Britannia for several years. Key performance management statistics and customer service questionnaires have been generated and used internally in different parts of the airline. Externally Britannia had benchmarked its operational activities against a number of foreign airlines. It was considered as very important for Britannia to develop its own approach to benchmarking because the IATA scheduled service customer satisfaction information, mentioned previously, was of marginal relevance to Britannia. As a charter operator, serving a different market segment, it possessed distinctly different operational characteristics.

Maintenance costs are one of the few major expenses that are within airlines' control (Ebbs, 1997). According to Shields, (1998), this has accounted for about 9 to 13% of an airlines' operating costs and have therefore become a legitimate management target for cost savings and efficiency gains. Shields, (1998) also reveals that benchmarking within Britannia's maintenance division of was introduced following the discoveries from the study of its Engineering division which concluded that the Engineering division was highly competent in terms of the technical maintenance but was deficient in its ability to control major costs. In direct operating costs (DOCs) were described as a 'black hole', which led to the recommendation that the engineering division should have its own Finance department resulting in the recruitment of an accountant to head the department who has also become responsible for championing much of the benchmarking activity of the Airline.

2.3.2 Airline Human Resources Practices

According to study by Uboma et al (2008), benchmarking has revealed that the Human Resources (HR) practices in Nigerian domestic airlines are still in its infancy. Uboma et al (2008) observed that Domestic Airlines (DA) were yet to realize the full potential of the HR programs. The study however noted that most of the DAs believe that the HR programs could help improve their organizational performance. The benchmarking result showed that HRM philosophy is being gradually accepted by the DAs in Nigeria and will be one of the significant factors for gaining global competitive advantage in the future. The benchmarking study covered eight aspects of HRM practices and, the comparative analysis of the results obtained was severely limited to the number of variables considered.

The eight dimensions that were included in the survey were:

1. the reasons for the introduction of Human Resources (HR) practices in Nigerian domestic airlines (DAs).
2. the extent to which information is shared with the employees.
3. the extent to which organizational power is shared.
4. the success (or failure) of power-sharing practices.
5. the determinants of performance – based rewards.
6. the success (or failure) of pay-for-performance practices.
7. facilitating factors; and
8. barriers to HR practices.

The results reveal that DAs need to realize that the organizational profile of a rigid pyramid, where managers control all work and decision-making, must give way, sooner or later, to a flexible, team-oriented structure where managers support increased employee involvement and innovation.

2.3.3 Service Attributes of Airlines Service Quality

according to some service attributes derived from determinants of airline service quality as identified by Gardner (2004), Gursoy et al. (2005), and Bowen and Headley (2012). These attributes of air service quality include air safety, baggage handling, on-time arrival/departure, employee courtesy, airplane cleanliness, amenity, flight schedules, and the alternate flight arrangements for a missing flight. Airlines that are determined to be at the top of the competitive ladder have to response adequately to the customers perceived expectations of the quality of services to be offered from the booking period to the final arrival at their respective destinations of travel. These service quality parameters also serve as performance indicators for benchmarking activities and ratings in the industry.

2.3.4 Challenges Faced by Airlines in Nigeria

Uboma et al (2008) has shown that one of the drawbacks in the Nigerian aviation industry is that the country is yet to have very strong airlines that could operate and compete with international carriers. Uboma et al (2008) observed that although airlines have been striving to break even, some of the major challenges they face currently are responsible for the failures of most airlines in the past. These challenges according to the study, are grouped into nine categories: Infrastructural, Financial, Policy and Regulatory, Corporate Governance, Managerial, safety, security, and environmental challenges. Some of these challenges are discussed empirically below:

(a) Infrastructural Challenges

Infrastructural challenges of the domestic airline sector include Poor quality of airport infrastructure, inadequate provision of power, inadequate number and small fleet sizes of aircrafts, lack of perimeter fencing of airports and poor technology. The substandard quality of key infrastructure in Nigeria's airports poses a challenge to both the domestic and international airlines operations. For instance, many airports do not have modern landing aids such as adequate airfield lighting and Instrument Landing Systems, to allow planes land at night. Moreover, many airports in the country are deficient in basic infrastructure such as standard runway and terminal facilities (Phillips, 2015).

Furthermore, the industry lacks commercial simulator facility, thus warranting airlines to spend not less than 16 million USD annually to conduct recurrent simulator training for pilots. The industry also lacks standard Maintenance Repairs and Overhaul (MRO) hanger. The absence of an MRO is also responsible for the rapid rate of deterioration of the carriers, which lifespan are cut-short to an average of 10 years. Worse still, most airlines in the country have some of the oldest fleets on the planet, with more than 70% of all aircrafts above 10 years of age. This scenario translates to higher maintenance costs, increased fuel consumption, more pollution, increased downtime and low safety/reliability.

Another disturbing issue that constitutes a bottleneck to the smooth operation of the airlines is government's negligence to provide reliable power via the national grid makes the airport authorities resort to alternative power (e.g. diesel powered generating sets), which is very costly and non-sustainable. The cost burden arising from this scenario is transferred to passengers in the form of increased airfares. This increase in airfare leads to sparse demand.

Another infrastructural challenge is the inadequate number and sizes of aircrafts. Adebukola and Fagbemi (2019), posits that many Nigerian airlines have only few aircrafts in their fleet. Apart from the major air traffic routes, there are several others that offer reasonable traffic potential. However, due to the small number of aircraft fleet, most operators prefer to stick to the more populated routes thereby limiting the available options to travelers. This ultimately translates to reduced quality of service. Although market potentials exist along several under-utilized air corridors; the smallness of airlines does not permit them to explore these potential routes. Airlines may not be able to break even given the low load factors that are likely to exist on such routes. Moreover, the small fleet size of most of the carriers makes them powerless to bargain for favorable rates with fuel suppliers.

According to Wallis, (1993), the rapid rate of technological innovations and changes in passengers' demand, in terms of tastes and preferences, require airports to be proactive in facilitating safe and secure trips with top notch experiential quality. Regrettable, Nigerian airlines are grappling with the adoption of latest technologies that will enhance their capacity to handle complex operations in a flexible manner. Thus, the transformational power of technology in the aviation sector has not been maximally harnessed. This has limited the industry's ability to improve passenger experience, aircraft communications, sharing of data among stakeholders, airport operations, baggage management and the subsequent growth in revenue. Technologies such as Virtual Modeling and Simulation, Artificial Intelligence (AI), Block Chain Technology, robotics, Internet of Things (IoT), big data and analytics, which are used for creating superior passenger experience and optimization of resource allocation and passenger flows are nowhere to be found in the airline sector of Nigeria.

(b) Financial Challenges

According to Xu and Dioumessy (2019), the operational cost of African carriers is higher than most carriers in other parts of the world. Adebukola and Fagbemi (2019), reveals that most of the materials, equipment and aircraft spares used in Nigeria are imported, and are paid for in foreign currencies. Also, a large proportion of the Maintenance, Repairs and Overhaul (MRO) activities need to be done abroad as there are no standard facilities in the country to carry them out. Consequently, airlines spend over $2 billion annually on C-check and other aircraft maintenance activities abroad.

An investigative study by Waribugo Sylvia & Chiedu Florence Amah (2021) revealed rising inflation and protracted scarcity of forex for airlines, coupled with a steady weakening of the naira against the dollar, thereby significantly increasing airlines' operational costs.

Another financial challenge airlines face is the high cost of aviation fuel (Jet A-1). In African countries, aviation fuel is about 20% more expensive, when compared with other continents (Xu & Dioumessy, 2019). Moreover, aviation fuel accounts for a shocking 40 per cent of the expenditure of airlines in Nigeria, making it difficult for them to break even (Mimi, 2008). Aside this, airlines pay up to 7% of the ticket price to travel agents (Chingosho, 2009) and are compelled to pay several charges and taxes to the government (Adebiyi, 2012). Faajir and Zidan (2016) submit that more than 30% of the airlines cannot service overhead costs and are also unable to pay salaries on a regular basis. In addition, despite the dotted monetary interventions for the aviation industry implemented by the government, the available resources cannot match the growing demand of the industry.

Pam, (2012) pointed out that aviation industry in African countries suffer setbacks due to lack of good strategies that can address the peculiarities of the sector. Omoleke (2012) stressed that the major problem facing the Aviation industry in Nigeria is Government's lack of political will to implement formulated policies. Also, there is misalignment between policies of ministries that oversee various aspects of the aviation industry. In several cases, supervising ministries such as Ministry of Science and technology, labour and transport send conflicting directives to the regulatory bodies, thus creating sub-optimal outcomes in the sector.

According to Phillips (2015) most of the policies (e.g. taxation) enacted by the regulatory bodies stifle the growth of industry rather than accelerate it; and decision making is highly centralized as the supervising ministry of aviation has a tight control over the aviation regulatory bodies. This excessive interference and overbearing control affect the speed of decision making within the sector. Omoleke (2012) opined that the agencies, commissions, corporations, and other parastatals are not adequately by the supervising ministries to make discretionary decisions to increase throughput.

Omoleke (2012), also observed lack of synergy between Nigeria's aviation policy and the policies of the African Civil Aviation Commission (AFCAC). This has made the sector not to optimally harvest the benefits of regional integration.

(c) Corporate Governance Challenges

Corporate governance and managerial challenges include uncontrolled corruption, inadequate planning skills and Human Resource Practices. Isah (2018) discloses that good Corporate Governance is a necessity in modern institutions because the management and ownership are usually not the same group of persons. Poor corporate governance and bad management has led to the proliferation of unethical practices and dubious activities which end up stunting the growth of the airline industry. According to Akpoghomeh, (1999), corrupt practices within the managerial cadre and its supervisory bodies has resulted in crisis in the Nigerian Civil Aviation industry following the decline and eventual collapse of the Nigeria Airways in 2003. Akpoghomeh, (1999), also revealed that transparency and accountability only exist in the theoretical realm.

The system is devoid of proper checks and balances, thereby opening a floodgate of monumental financial malfeasance.

(d) Managerial Challenges

Agbo, (2008), revealed that around project planning, airports are occasionally closed down for routine repairs and maintenance which sometimes last longer than initially projected, and this always goes with negative significant impact on all stakeholders. Agbo (2002) noted that the Port Harcourt International Airport which was closed down in August 18, 2006 for four-month maintenance, was not open for operations till December 18, 2007, making it six months of closure. Pam, (2013) also revealed that the industry is constantly strangulated by unfavorable human resource practices such as neglect of training and personnel development. This has resulted in deficiency in skilled manpower. Pam, (2013) stated that over the years, dearth of skilled personnel (pilots and aircraft engineers) has been a major constraint to Africa's ability to meet its safety oversight functions in the aviation industry. Pam, (2013) also projected that about seven hundred and fifteen (715) pilots and nine hundred and sixty (960) engineers are needed yearly in Africa for the next twenty years. This implies that the Nigerian aviation industry requires about one hundred and twenty-eight (128) pilots and one hundred and seventy-two (172) aircraft engineers every year.

Empirically, it appears as though the aviation industry in Nigeria may not close this gap in skilled personnel in the foreseeable future without rigorously embarking in training and development as a fundamental component of human resource practices. Regrettably, there is a just a few numbers of aviation training schools in the country; but unfortunately, most of the few persons trained end up leaving the country for greener pastures because they are uncomfortable with the reward system and are not sure of a smooth career growth. Currently a lot of specialists (high-skilled) jobs in the Nigerian aviation industry are handled by expatriates because of the shortage of competent nationals.

(e) Safety Challenges

According to Sylva (2020) airline operators are not only concerned with the safety of their employees and passengers, but also how their operations affect the safety of the environment and the immediate host community. There is a consensus among researchers and aviation enthusiasts that Africa scores very low in safety standards viewed against global best practices. The continent accounts for only 3% of the movement of goods and passengers, yet scores about

19% of total accidents on the planet. Moreover, with few exceptions like Ethiopian Airlines, South African Airways, Kenya Airways, Air Mauritius, Egypt Air, Royal Air Maroc, African World Airlines in Ghana and Air Peace in Nigeria, the accident rate keeps increasing on the continent, while accident rates of other continents have been reducing or staying at the same low level. According to report of IATA's industry-benchmark Operational Safety Audit in 2018, only few African airlines scored within the globally acceptable accident threshold of 1.35 accidents per million flights, while the majority recorded disturbing average of 9.179 accidents per million flights.

According to ICAO (2020), member state report on effective implementation of state safety oversight system reveals that only Egypt, Ghana, Kenya, Madagascar, Mauritania, Rwanda, South Africa, Sudan and Togo scored up to the recommended threshold of implementation on the following areas:(i) primary aviation legislation and civil aviation regulations (LEG); (ii) civil aviation organization (CAORG); (iii) personnel licensing and training (PEL); (iv) aircraft operations (OPS); (v) airworthiness of aircraft (AIR); (vi) aircraft accident and incident investigation (AIG); (vii) air navigation services (ANS); and (viii) aerodromes and ground aids (AGA).

Nigeria did not appear on the list because its aviation sector scored below the 75% safety implementation threshold. According to Aviation Safety Network (2015), Specifically, safety statistics of the industry in Nigeria reveals that there were 123 crashes between 1941 and 2013. The report further reveals that the years 2002, 2005 and 2006 recorded 154, 227 and 109 fatalities, respectively. Most of these incidences were attributed to equipment failure, flying of aircrafts that are not airworthy, negligence and human (pilot) error. Also, there have been reported cases of aircrafts skidding off the runway while landing because of faulty landing gear or slippery runway. There have also been emergency landings due to bad weather, as well as the falling from emergency exit door of aircraft carrying passengers. Other reasons attributed to poor safety climate in the industry are laxity in supervision and enforcement of traffic rules, poor maintenance culture, dearth of qualified inspectors, paltry operational budgets for the Civil Aviation organs, antiquated infrastructure, flying of old aircraft that were sold as scrap and later refurbished, poor emergency response procedures and inadequate training of technical personnel (IATA, 2019).

Pam, (2012), reveal unethical safety practices observed in the industry. Such practices include: (i) coaxing aircraft engineers to sign certificates of release for service even when the aircrafts are unserviceable, (ii) falsification of weights by dispatchers in order to accommodate all the available load for each flight, (iii) reprimanding and penalizing pilots who want to be strict on the rules (e.g., for not compromising to fly an unsafe aircraft). Pam, (2012) opines that such unethical culture sacrifices safety on the altar of short-term economic aggrandizement. These empirically identified factors resonate with the anecdotal submissions of mangers and aviation pundits. Moreover, scholars (e.g. Philip Lawrence, 2009; Pam, 2012; Ogunbodede & Detunde, 2016; Umoh & Sylva; 2016; Xu & Dioumessy, 2019; Sylva, 2020) have separately submitted that the civil aviation industry of developing countries suffers constraints such as: degraded airport infrastructure, insufficient funding, ambiguous policy, unhealthy government interference and multiple taxes, weak institutional ethics and low managerial and capacity planning skills, poor security and safety norms, noise and gas pollution, and climate change and natural disaster.

2.4 Research Gap

The literature review shows clearly that airline management is indeed complex and a very tasking one. The business is surrounded by lots of internal and external factors influence the performances of airlines. It also reveals that airlines operates on a very low profit margin but with high demands such as the need for continuous maintenance of acceptable level of safety of all operating aircrafts as stipulated by the regulatory bodies, like NCAA, IATA. The review also points out importance of continuous internal process and industry-based benchmarking as a strategy for airlines to close the productivity gaps inhibiting their performance and profitability following the high level of competitiveness existing amongst airlines.

Nevertheless, there exists a research gap in the literatures reviewed: None of them focused on the strategy of benchmarking performances of management models of airlines as a panacea to airline moribund in Nigeria. This study will fill the information gap by examining, among other things, the significant effect of Airline management models of airline on four key performance indicators such as customer satisfaction, airline profitability, safety, and overall efficiencies of airlines in Nigeria.

CHAPTER THREE

METHODOLOGY

3.1. Research Design

This study deployed the use of survey research design in which data was gathered from a group of people. With questionnaires and descriptive statistics which presents the results pictorially presenting the relationship existing between the Airline Management Models of Domestic Airlines in Nigeria and their customer satisfaction index, operational profitability index, operational efficiency index, and operational safety index. As such research tools that provide a quick, accurate and efficient means of accessing and presenting information from the chosen target population were deployed. The secondary data obtained from industry publications, Documented passenger traffic analysis by Airports authorities and regulating agencies, and Airline safety record amongst other were very useful for this study.

3.2. Population of the Study

The population of study for this research were all drawn from four major Domestic Airports in the South-South Nigeria. The population consists of sampled personnel from Ibom Airline, Air Peace, Dana Air, and Max Air. Others are the industry regulating agencies such as Nigerian Airspace Management Agency, Nigerian Civil Aviation Authority. The last set that form part of this population was Airport Managers, Airport Safety Managers, Airport engineering and technical personnel. The category of personnel included in the population consisted of adult male and female aged 18 years of age and above. The population was carefully selected based on their level of exposures and experiences in the Aviation and Airline Business. This as to ensure that guide the research to a logical conclusion. This population cannot be objectively estimated and as such is considered an indefinite population. Therefore, a sample of 210 respondents was drawn from the population.

PERFORMANCE INDICATORS EXAMINED

1	CUSTOMER SATISFACTION
2	OPERATIONAL PROFITABILITY
3	ACCEPTABLE LEVEL OF SAFETY
4	EFFICIENCY

Table3.1 Key Performance Indicators analyzed.
Source: field work 2023

Airline Managers have a serious task of making decisions that can respond positively to meet the demands of the potential travelers, as well as operate profitably and efficiently. According to Ukpere et al. (2012), the issue of choice for prospective air travelers and the choice of decision-making around route by airlines are critically examined during planning. Ukpere et al. (2012) reveals that in recent times, Nigerian domestic airlines have shown great improvement in their services and the major airlines have continually proven to be ahead of others based on various superior strategies. Ukpere et al. (2012) opined that by superior management model, airline's safety, the price of airline, frequency fly-er membership, network connections, promotions, service airlines that lead to customer purchase intentions are perceived. These superior performance indicators/ratings are obtained from the Data collected.

3.3 Method of Data Collection

3.3.1 Primary Data

Primary data for this survey are collected through a well-structured questionnaire and interview/discussion sessions. The questionnaire was distributed to the different levels of airline staff as well as some category of Airport personnel which include ground operations personnel, Nigerian Civil Aviation Authority (NCAA), and some senior personnel of Federal Airport Authority of Nigeria (FAAN). In cases where the questionnaires are not received, a follow up visit or phone calls are made so that adequate data for the survey is obtained. Efforts were put in place to ensure that at least three responds are received from each of the surveyed Airlines. Even when pockets of bias where observed in the responses from some of the airline and airport staff, efforts are made to ensure that their responses to the questions asked do not affect the overall outcome of the survey A total of 210 questionnaires were distributed out, and all recipients duly communicated to and requested to return the completed questionnaires within a period of not more than one month (30-days).

3.3.2 Secondary Data

Data such as total number of passengers flown, Airline scheduled flight operations, profitability, and safety records, and current industry ratings of each Airline were also obtained from industry publications and documents. Other studies and reports from textbooks, periodicals, journals, and internet were also found to be very helpful for the study. This method was utilized as an economical way of providing information used immensely for literature review. It also made available statistical data which proved indispensable to back up relevant critical views on this survey.

3.4 Research Sample and Sampling Procedures

Because the population for the study was an indefinite one and the researcher needed to get to the target quickly, purposive sampling approach was applied in this work. Using this method, 210 persons consisting of staff of surveyed airlines, Senior Airport staff from five Airports with high daily passenger traffic within the country among whom are Airport Managers, Heads of Aviation Securities and Safety, NAMA, NIMET, and Engineering/Maintenance were selected for the study.

3.5 Validity and Reliability of Research Instrument

Face validity, referring to the way the questionnaire items appear to address the relevant content in the subject area of interest was established for the instrument. The questionnaire was scrutinized by the supervisors of the research work and other experts in Airline Transport Management. Their comments alongside those drawn from Airline regulatorswere considered in the final production of the instrument. The split-half method of reliability was used to establish the reliability of the instrument as 0.85 indicating that the instrument was substantially reliable to be used for the study. This method was adopted because of the fact that some respondents may be absent should test-retest method be used. According to Frankel, Wallen and Hyun (2012) for research purpose, a useful rule of thumb is that reliability should be at least 0.7 and preferably higher. Going by this assertion and the coefficient of 0.85, the research instrument was affirmed as reliable.

3.6 Administration of Data Collection Instrument

A structured questionnaire was used as the instrument for the collection of data required for the study. The instrument comprised of two sections. Section 'A' was used to collect data on the personal perceptions of operational models of the sampled Airlines. Section 'B' contained factors identified from literature that are key performance indicators that impact performances and sustainability of Airlines in the industry in any given environment. The Section B of the instrument was rate from 1 to 5, where:

5 = strongly agree
4 = agree
3 = disagree
2 = strongly disagree
1 = neutral

The numbers assigned to the important (5,4,3,2,1) do not indicate that the interval between scales is equal, nor do they indicate absolute quantities. They are merely numerical labels based on Likert scale as opined by Ugwu and Haupt, (2007). Copies of questionnaire were distributed by hand to Airline staff, Airport managers, Aircraft Engineering/maintenance personnel, Heads of Airport Safety and Securities, NCAA, and NAMA staff. Other respondents received their copies by direct delivery/post agents. Personal visits and phone calls were made to retrieve the questionnaires within the stipulated time frame.

3.7 Method of Data Analysis

Methods of data analysis that was employed in this study with respect to the outline's objectives are as follows:

Objective One: To determine the effect Airline management models on Customer Satisfaction index of Domestic Airlines in Nigeria. Descriptive statistics were used to analyze the data obtained. This was achieved by applying PPMC and multiple regression analysis to a fitted model developed using the combination of two different sets of items, X (X_1, X_2, X_3, X_4,) and A (A_1, A_2, A_3, A_4,) culled from Section I and Section II of the questionaire. The model for the multiple regression was given as $\mathbf{A_n = k_n + a_1x_n + a_2x_n + a_3x_n \_ \ldots + a_9x_n}$ **equation. (1)**

Where:

$\mathbf{A_n}$ = customer satisfaction index of specific Airline

k = slope of the model

n = number assigned to airlines

a_n = determinants of Airlines customer satisfaction index

a_1 = quality of inflight service

a_2 = airline safety record

a_3 = schedule reliability

a_4 = customer service friendliness

a_5 = reliable on-line booking/check in service

a_6 = comfort and cleanliness of seats

a_7 = airline flexibility

a_8 = flight fares

a_9 = fast response to complaints

x_1 = Ibom Air

x_2 = Dana Air

x_3 = Air Peace

x_4 = Max Air

The decision rule for the research questions and hypotheses was based on the r-values. If the calculated r-value at .05 level of significance is greater than the critical or table r- value, the null hypothesis was rejected. But if the calculated r-values are not greater than the critical r-value at .05 level of significance, the null hypothesis was accepted.

Objective Two: To ascertain the effect of airline management models on Profitability index of Domestic airlines in Nigeria. Descriptive statistics were used to analyze the data obtained. This was achieved by applying PPMC and multiple regression analysis to a fitted model developed using the combination of two different sets of items, X (X_1, X_2, X_3, X_4,) and B (B_1, B_2, B_3, B_4,) culled from Section I and Section II of the questionaire. The model for the multiple regression was given as: $\mathbf{B_n = k_n + + b_1x_n + b_2x_n + b_3X_n + \ldots b_8X_n}$ **……equation 2**

Where:

$\mathbf{B_n}$ = Operational Profitability index of specific Airline

k = slope of the model

n = number assigned to airlines

b_n = determinants of Airlines Profitability index of Airlines

b_1 = operating revenue

b_2 = total operating cost

b_3 = type of Airplanes in fleet (FCs and LCC)

b_4 = marketing of product

b_5 = cost per available seat kilometer (CASK)

b_6 = revenue per available seat mile (RASM)

b_7 = environmental impacts

b_8 = fuel economy of airplanes

x_1 = Ibom Air

x_2 = Dana Air

x_3 = Air Peace

x_4 = Max Air

The decision rule for the research questions and hypotheses was based on the r-values. If the calculated r-value at .05 level of significance is greater than the critical or table r- value, the null hypothesis was rejected. But if the calculated r-values are not greater than the critical r-value at .05 level of significance, the null hypothesis was accepted.

Objective three: To verify the effect of management models on the operational efficiency index of airlines in Nigeria**.** Descriptive statistics were used to analyze the data obtained. This was achieved by applying PPMC and multiple regression analysis to a fitted model developed using the combination of two different sets of items, X (X_1, X_2, X_3, X_4,) and C (C_1, C_2, C_3, C_4,) culled from Section I and Section II of the questionaire.

The model for the multiple regression was given as:

$\mathbf{C_n = k + C_1x_n + C_2x_n + C_3x_n + \ldots C_8x_n}$ ……..………………….. **equation** 3

Where:

$\mathbf{C_n}$ = Operational Efficiency index

k = slope of the model

n = number assigned to airlines

c_n = determinants of operational Efficiency of Airlines

c_1 = delays against schedules

c_2 = flight time variability

c_3 = flight cancellations

c_4 = advertisements/marketing

c_5 = cost per available seat kilometer (CASK)

c_6 = revenue per available seat mile (RASM)

c_7 = environmental impacts

c_8 = fuel consumption

x_1 = Ibom Air

x_2 = Dana Air

x_3 = Air Peace

x_4 = Max Air

The decision rule for the research questions and hypotheses was based on the r-values. If the calculated r-value at .05 level of significance is greater than the critical or table r- value, the null hypothesis was rejected. But if the calculated r-values are not greater than the critical r-value at .05 level of significance, the null hypothesis was accepted.

Objective four: To discover the effect that airline management models on the **operational safety** index of Domestic Airlines in Nigeria. Descriptive statistics were used to analyze the data obtainedThis was achieved by applying PPMC and multiple regression analysis to a fitted model developed using the combination of two different sets of items, X (X_1, X_2, X_3, X_4,) and D (D_1, D_2, D_3, D_4,) culled from Section I and Section II of the questionaire. The model for the multiple regression was given as:

$\mathbf{D_n = k_n + d_1x_n + d_2x_n + d_3x_n + d_4x_n}$ ……………………….**equation (4)**

Where:

$\mathbf{D_n}$ = Operational Safety index of specific Airline

k = slope of the model

d_n = determinants of operational safety of Airlines

d_1 = average age of airplanes in fleet

d_2 = standardized airline safety program

d_3 = instrument landing capability of Airplanes

d_4 = environmental impact on Airplanes

x_1 = Ibom Air

x_2 = Dana Air

x_3 = Air Peace

x_4 = Max Air

3.8 Decision Rule

The decision rule for the research questions and hypotheses was based on the r-values. If the calculated r-value at .05 level of significance is greater than the critical or table r- value, the null hypothesis was rejected. But if the calculated r-values are not greater than the critical r-value at .05 level of significance, the null hypothesis was accepted.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.1 Results

4.1.1 Questionnaire Distribution and Responses

A total of two hundred and ten questionnaires were distributed to different Airline companies, Airport operations personnel, regulatory agencies, and some airline passengers from the surveyed airlines, and only one hundred and eighty were returned in acceptable state and considered fit for this study. The percentage response to the distribution is captured in the table below:

S/N	Names of Recipients of Questionnaires	Number of Questionnaires Administered	Number of Questionnaire Returned	Percentage (%)
1	Ibom Airline company	30	28	0.93
2	Air Peace Airline company	30	26	0.87
3	Dana Air	20	18	0.9
4	Max Air	30	22	0.73
5	Airline passengers	30	26	0.87
6	Nigerian Airspace Management Agency (NAMA)	20	12	0.60
7	Airport Operations personnel	45	42	0.93
8	Nigerian Civil Aviation Authority (NCAA)	15	6	0.60
	TOTAL	**210**	**180**	**0.86**

Table 4.1 Percentage of responses from the distributed questionnaires

Source: Field work 2023

The above results of the total data collated show that out of two hundred and ten questionnaires sent out, only one hundred and eighty were returned; and this results to an approximately 86% (0.86).

4.1.2 The Socio-Demographic Characteristics of Respondents

The personalities of respondents were collated and classified into the following variables: gender, age, specialization, level of education, Airport and Air-travel experience. While the second group had the following variables, name of airline, status of employment, level of engagement, and years of service.

From the analysis of the socio-demographic characteristics of the respondents as presented on Table 4.2; we see that the analysis of the sex distribution indicates the female were more than the male. Approximately 67% of the respondents were female while approximately 33% were male. We also observed that the breakdown of the age distribution shows that respondents between the ages of 21 – 30 years old were 19%; 31 – 40 years old were 40%; 41 and above were 41% respectively.

S/N	SAMPLE CHARACTERISTICS		NUMBER OF RESPONDENTS	%
1	Gender	Male Female	73 107	41 59
2	Age	18-30 31-40 41-above	69 56 55	38 31 31
3	Level of Education	OND HND/ BSc. Master's Degree Doctorate Degree	51 75 38 16	28 42 21 1
4	Years of Airport/ Air-Travel Experience	< 10 years < 15 years < 20 years >20 years	64 56 34 26	36 31 19 14

Table 4.2 Analysis of the Demographic Characteristics of Respondents
Source: Field survey, 2023

Analysis of level of education of respondents indicates that 28% of the respondents had OND or its equivalent; 42% of the respondents were holders of B.Sc./HND or equivalent; 38 of the respondents representing 21% had M.Sc.; and 1% of the respondents had Ph.D. in terms of Airport/ Air-travel Experiences, 36% were less than 10 years, 31% were less than 15years, 19% had less than 20 year, while those with more than 20 years' experience were 14%. These analyses attest to the fact that the respondents were of an enlightened class with good background in the Airport-Airline operations in Nigeria.

A. Analysis of socio-demographic characteristics of surveyed airlines

S/N	Airline Company	Number of Responder's in Favour of Airlines	Number on Full Employment		Number on contract/Casual Employment		Nationality			
							Nigerian		Non-Nigerian	
				%		%		%		%
1	Ibom Air	65	61	94	4	.06	61	94	4	.06
2	Dana Air	35	35	100	0	0	35	100	0	0
3	Air Peace	55	55	100	0	0	55	100	0	0
4	Max Air	29	27	93	2	.07	28	96	1	.035

Table 4.3 Analysis of demographic survey of performances
Source: field survey 2023

From the analysis on Table 4.3 above, one can see that out of the 180 respondents sampled, 65 (36%) were IBOM AIR, 35 (19%) were DANA AIR, and 55(31%) were the AIR PEACE, and 29 (16%) were MAX AIR.

4.2 Findings

4.2.1 Research Question 1, and Hypothesis 1

Q_1: What effect does airline management models have on customer satisfaction index of Domestic Airlines in Nigeria?

Ho_1: There is no significant effect of Airline Management Models on Customer Satisfaction index of airlines in Nigeria.

This hypothesis was formulated to correlate the Airline Management Models and Customer satisfaction index of Domestic Airlines. To test the hypothesis, the Pearson Product Moment Correlation (PPMC) statistic was used to analyze the data. The result is as shown in table 4.4 below.

Values obtained for Airlines Customer Satisfaction Index (A)

S/N	DOMESTIC AIRLINES SURVEYED	TOTAL NUMBER	AIRLINE CONSTANTS	**TABLE r-value**	UNSTANDADISED COEFFICIENT (b)	R^2	CAL. F-VALUES
1	IBOM AIR (X_1)	65	57.37	.244	.723	.443	50.067
2	DANA AIR (X_2)	35	55.69	.334	.680	.556	41.273
3	AIR PEACE (X_3)	55	55.1	.266	.381	.125	7.561
4	MAX AIR (X_4)	29	53.517	.367	.417	.241	8.598

Table 4.4 Showing Summary of the results obtained from the regression for variables of Airline Management Models (X) and Customer Satisfaction Index (A)
$P \leq .05$; df = 178

Customer Satisfaction Index ($\mathbf{A_n}$) = $k_n + a_1X_n + a_2X_n + a_3X_n + \ldots a_nX_n = k_n + ax_n$ **where $a = a_1 + a_2 + b_n$**

i. For Ibom Air ($A_{1)}$ = $A_1 = k_1 + aX_1 = 57.37 + .723X_1$

ii. For Dana Air (A_2) = $A_2 = k_2 + aX_2 = 55.69 + .680X_2$

iii. For Air Peace (A_3) = $A_3 = k_3 + aX_3 = 55.1 + .381X_3$

iv. For Max Air (A4) = $A_4 = k_4 + aX_4 = 53.517 + .417X_4$

The regression values obtained from the analysis as shown in table 4.4 above, shows that 44.3% of the total variability of Ibom Airline performance, 55.6 % of Dana Air's performance, 12.5% of Air Peace, and 24.1 % of Max Air performances are explained by the use of customer satisfaction index, the remaining 55.7% for Ibom Air, 44.4% of Dana Air, 87.5% of Air Peace, and 75.7% of Max Air are factors not captured in the Models of the Surveyed Airlines. Also from Table 4.4 we find that the obtained r-values for the Airlines are higher than the table values obtained at 0.05 significance level and degrees of freedom equivalent to the number of observations of each surveyed Airline. Based on this finding, the null hypothesis was not retained. Management Models affects customer Satisfaction Index of Domestic Airlines in Nigeria.

4.2.2 Research Question 2, and Hypothesis 2

Q_2. What effect does Airline management models have on the Profitability index of Domestic Airlines in Nigeria?

Ho_2: There is no significant effect of Airline Management Models on the Profitability index of Domestic airlines in Nigeria.

This hypothesis was formulated to regress and correlate the Airline Management Models and Profitability index of Domestic Airlines in Nigeria. To test the hypothesis, the Pearson Product Moment Correlation (PPMC) statistic was used to analyze the data. The result is as shown in table 4.5 below:

Values obtained for Airlines Profitability index

S/N	DOMESTIC AIRLINES SURVEYED	TOTAL NUMBER	AIRLINE CONSTANTS	TABLE r-value	UNSTANDADISED COEFFICIENT (b)	R^2	CAL. F-VALUES
1	IBOM AIR (X_1)	65	56.631	.244	.480	.340	32.437
2	DANA AIR (X_2)	35	55.457	.334	.531	.297	13.950
3	AIR PEACE (X_3)	55	55.873	.266	.513	.257	18.346
4	MAX AIR (X_4)	29	53.966	.367	.537	.328	13.171

Table 4.5 Showing Summary of the regression result for variables of Airline Management Models (X) and Airline Profitability Index (B)
$P \leq .05$; df = 178

Profitability Index (B_n) = $k_n + b_1 X_n + b_2 X_n + \ldots b_n X_n = K_n + bX_n$, where $b = b_1 + b_2 + b_3 + \ldots b_n$

i. For Ibom Air (B_1) = $B_1 = k_1 + bX_1 = 56.631 + .480X_1$

ii. For Dana Air (B_2) = $B_2 = k_2 + bX_2 = 55.457 + .531X_2$

iii. For Air Peace (B_3) = $B_3 = k_3 + bX_3 = 55.873 + .513X_3$

iv. For Max Air (B_4) = $B_4 = k_4 + bX_4 = 53.966 + .53737X_4$

The regression values obtained from the analysis as shown in table 4.4 above, shows that 34% of the total variability of Ibom Air performance, 29.7 % of Dana Air's performance, 25.7% of Air Peace, and 32.8 % of Max Air performances are explained by the use of profitability index; the remaining 66% of Ibom Air, 70.3% of Dana Air, 74.3% of Air Peace, and 67.2% of Max Air are factors not captured in the Models of the Surveyed Airlines. Also from Table 4.4 we find that the obtained r-values for the Airlines are higher than the table values obtained at 0.05 confidence level and degrees of freedom equivalent to the number of observations of each surveyed Airline. Based on this finding, the null hypothesis was not retained. Management Models affects Operational Profitability Index of Domestic Airlines in Nigeria.

4.2.3 Research Question 3, and Hypothesis 3

Q1. What effect does Airline management models have on the operational efficiency index of Domestic Airlines in Nigeria?

Ho_2: There is no significant effect of Airline Management Models on operational efficiency index of Domestic airlines in Nigeria.

This hypothesis was formulated to regression and correlation of the Airline Management Models and Profitability index of Domestic Airlines in Nigeria. To test the hypothesis, the Pearson Product Moment Correlation (PPMC) statistic was used to analyze the data. The result is as shown in table 4.6.

Values obtained for Airlines Operational Efficiency Index

S/N	DOMESTIC AIRLINES SURVEYED	TOTAL NUMBER	AIRLINE CONSTANTS	TABLE r-value	UNSTANDADISED COEFFICIENT (b)	R^2	CAL. F-VALUES
1	IBOM AIR (X_1)	65	55.785	.244	.735	.524	69.251
2	DANA AIR (X_2)	35	57.686	.334	.425	.233	9.214
3	AIR PEACE (X_3)	55	56.4000	.266	.597	.351	28.610
4	MAX AIR (X_4)	29	57.103	.367	.555	.228	9.227

From Table 4.6 Table 4.6 Summary of the regression for variables of Airline Management Models (X)and Operational Efficiency (C) of Domestic Airlines in Nigeria

Operational efficiency Index (C_n) = $k_n + c_1 X_n + c_2 X_n + \ldots C_n X_n = K_n + cX_n$, **where** $c = c_1 + c_2 + c_3 + \ldots c_n$

i. For Ibom Air ($C_{1)} = k_1 + CX_2 = 55.785 + .735X_1$

ii. For Dana Air (C_2) = $k_2 + CX_2 = 58.171 + .425X_2$

iii. For Air Peace (C_3) = $k_3 + CX_3 = 56.400 + .597X_3$

iv. For Max Air (C4) = $k_4 + CX_4 = 57.103 + .555X_4$

The regression values obtained from the analysis as shown in table 4.4 above, shows that 52.4% of the total variability of Ibom Air performance, 23.3 % of Dana Air's performance, 35.1 % of Air Peace, and 22.8 % of Max Air performances are explained by the use of Operational Efficiency index of the Airlines; the remaining 47.6% of Ibom Air, 76.7% of Dana Air, 64.9% of Air Peace, and 77.2% of Max Air are factors not captured in the Models of the Surveyed Airlines. Also from Table 4.4 we find that the obtained r-values for the Airlines are higher than the table values obtained at 0.05 confidence level and degrees of freedom equivalent to the number of observations of each surveyed Airline. Based on this finding, the null hypothesis was not retained. Management Models affects Operational Efficiency Index of Domestic Airlines in Nigeria.

4.2.4 Research Question 4, and Hypothesis 4

Q4. What effect does Airline management models have on the Operational Safety index of Domestic Airlines in Nigeria?

Values obtained for Airlines Operational Safety Index

S/N	DOMESTIC AIRLINES SURVEYED	TOTAL NUMBER	AIRLINE CONSTANTS	TABLE r-value	UNSTANDADISED COEFFICIENT (b)	R^2	CAL. F-VALUES
1	IBOM AIR (X_1)	65	57.969	.244	.593	.445	50.459
2	DANA AIR (X_2)	35	58.171	.334	.485	.233	10.013
3	AIR PEACE (X_3)	55	56.873	.266	.577	.240	16.710
4	MAX AIR (X_4)	29	56.724	.367	.576	.257	9.316

Table 4.7 Showing Summary of the regression values of mean and coeff. for variables of Airline Management Models (X) and Operational Safety (C) of Domestic Airlines in Nigeria $P \leq .05$; df = 178

From Table 4.7 Above

Operational Safety Index

$(D_n) = k_n + d_1X_n + d_2X_n + d_3X_n + \ldots d_nX_n = K_n + bX_n$, where $d = d_1 + d_2 + d_3 + \ldots d_n$

Using the available data from table above we have:

i. For Ibom Air $(D_1) = D_1 = k + dX_1 = 57.969 + .593X_1$

ii. For Dana Air $(D_2) = D_2 = k + dX_2 = 58.171 + .485X_2$

iii. For Air Peace $(D_3) = D_3 = k + dX_3 = 56.87 + .577X_3$

iv. For Max Air $(D_4) = D_4 = k + dX_4 = 56.724 + .576X_4$

The regression values obtained from the analysis as shown in table 4.4 above, shows that 44.5% of the total variability of Ibom Air performance, 23.3 % of Dana Air's performance, 24% of Air Peace, and 25.7 % of Max Air performances are explained by the use of Operational Safety index; the remaining 55.5% of Ibom Air, 76.7% of Dana Air, 76% of Air Peace, and 74.3% of Max Air are factors not captured in the Models of the Surveyed Airlines. Also from Table 4.4 we find that the obtained r-values for the Airlines are higher than the table values obtained at 0.05 confidence level and degrees of freedom equivalent to the number of observations of each surveyed Airline. This show high and positive relationships between the Airlines and Operational Safety index. Based on this finding, the null hypothesis was not retained. Management Models affects Operational Safety Index of Domestic Airlines in Nigeria.

4.3 Discussion of Findings

The findings of the study as revealed are discussed here with respect to the hypothesis formulated for the study:

4.3.1 Airline Management Models and Customer Satisfaction

The result of the data analysis in table 4.4 showed that Domestic Airline Management Models significantly relates to Customer Satisfaction of the Airlines. According to Oliver, (1981) Customer satisfaction, is an emotional feeling by the customer after experiencing a certain level of service quality which in turn leads to an individual overall attitude towards purchasing of service. It determines how happy customers are with a company's products, services, and capabilities. And if a product's quality meets or exceeds customer expectations, it directly leads to customer satisfaction and retention of the company's products and services.

Customer satisfaction is a major key indicator of airlines competitive advantages. It reflects how well an airline meets or exceeds the expectations and needs of its passengers. Unhappy or disengaged customers naturally mean fewer passengers and less revenue. It's important that customers have an excellent experience every time they travel. On-time flights or schedule reliability, good in-flight entertainment, more (and better) snacks, and more legroom might be the obvious contributors to a good experience and more loyalty.

4.3.2 Airline Management Models and Profitability index of Domestic Airlines

The result of the data analysis in table 4.5 showed that Domestic Airline Management Models significantly affects the Profitability Index of the Domestic Airlines in Nigeria.

According to Brain Beers (2022), Airlines have notoriously been known to have difficulty remaining profitable given their high fixed costs, the desire of passengers to find the cheapest tickets, and *seasonality* factors. The load factor helps investors and management determine how well an airline generates sales, covers its expenses, and remains profitable. Airlines have thin profit margins with many costs so having a high load factor is essential to an airline's success. A high load factor indicates that an airline has sold most of its available seats and is preferred over a low load factor. Using Available Seat Miles (ASM) can help improve the calculation of load factors of the airlines on the Domestic wing. The ASM of an airline measure how many passenger travel miles are available at a given time. This statistic expresses the capacity of the airline. Higher load factor values make the airline more profitable by spreading fixed-cost expenses across more passengers.

The break-even load factor is often used by airlines in strategic planning. An airline wishing to attract low-budget customers with cheap tickets will likely need a higher load factor to stay profitable and may need aircraft designed to carry more passengers. Pursuing service and a quality customer experience, the airline may decide to charge more per ticket and offer fewer seats while providing a higher level of comfort.

4.3.3 Airline Management Models and Operational Efficiencies of Domestic Airlines

The result of the data analysis in table 4.6 showed that Domestic Airline Management Models significantly relates to Operational Efficiency of the Domestic Airlines in Nigeria. Operational efficiency is the relationship between an organization's output and input, that when healthy, helps businesses cut down on unnecessary costs while increasing revenue. It’s what businesses strive to do: produce a high-quality product at scale with as few resources as possible.

It can be deduced from the result that most airlines operating within the Domestic wings in Nigeria are not healthy. The result agrees with Wang et al., (2017), which indicated that operational performance of airlines influence their customer loyalty, financial, internal, non-market, and overall efficiencies. Also, Y Chen, B Lin, L Lu, G Zhou –in his article in Managerial Auditing Journal (2020), confirms also that operations related services play major roles in improving firm operational efficiency**.**

4.3.4 Airline Management Models and Operational Safety of Domestic Airlines

The result of the data analysis in table 4.7 showed that Domestic Airline Management Models significantly relates to Operational Safety of Domestic Airlines in Nigeria. Operational safety risks are a global concern which rises during the delivery of a service or the conduct of an activity (e.g., operation of an aircraft, airports or of air traffic control). Operational interactions between people and technology, as well as the operational context in which aviation activities are carried out, are taken into consideration to identify performance limitations and hazards.

Safety of airlines operations is hinged on factors such as age of aircrafts in fleet, availability and cost of aviation fuel, nature of aircraft maintenance, effective communication between ATCT and cockpit, situational awareness, and flight crew judgment and trainings programs. To achieve airline operational safety, adequate budgeting and funding must be made available by the airlines. 'ICAO annex 11, attachment E' provides the minimum safety objectives acceptable to the oversight authority to be achieved by the operator/service provider while conducting their core business functions. This document therefore places the responsibility of maintaining airline operational safety on the management of airlines.

Accidents and reports of incidents and near misses involving any airline will certainly bring about setbacks and loss of customer confidence in the affected airline.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This research has been able to empirically establish a relationship between Airline Management Models and customer satisfaction, operational profitability, efficiency, and operational safety of Domestic Airlines in Nigeria. The study which comprises of four objectives and in view of the findings from the analysis of the test of formulated hypotheses, hereby concludes as follows:

5.1.1 Operational sustainability of Airlines in Nigeria

Based on the findings of the study and in relation to the discoveries from the literature review, it therefore emphatically concluded that Airline operational sustainability is not solely dependent on adequate funding, infrastructure upgrade and policy framework, but more greatly dependent on the capacity of the Airline Managers of the various Airlines: it is the expertise of these Airline Managers that determine the Management models designed for their Airline operations. This is what results in operational sustainability of the Airline or Airline Moribund as had been the cases in time past.

A healthy Airline Management Model is one that takes into cognizance the importance of the determinants of customer satisfactory/retention, operational efficiencies, profitability, and level of Airline safety program of the Airline, and they help keep the Airline in highly competitive advantage in the business/industry.

Quality of service delivery is a function of the effectiveness of the Airline Management model and is profiting to both the customers and the image of the Airline in general. Customer loyalty will always shift in favor of Airlines that give the customers maximum value for their money.

5.1.2 Lack of Periodic Benchmarking of Management Models

Learning is continuum, and aviation industry is a dynamic one; hence the need for continuous learning to upgrade Airlines operational techniques, procedures, and styles. It is further concluded that of the major reasons for most Airline Moribund in Nigeria was the lack of periodic Benchmarking of Management Models amongst Airlines with best operators in the industry. The vast nature of the aviation industry and the high demand for safety and efficiency makes it impossible for Airlines to operate profitably without recourse to industry rankings of Airlines in terms of customer satisfaction, safety, efficiency, and profitability. Therefore, for any Airline to increase their market share of Air-travelers in Nigeria and compel maximum number of customer loyalty, there is need for periodic benchmarking culture for improved performances.

5.2 Recommendations

On the bases of the findings of this study and the conclusions reached, the following recommendations are hereby adduced:

i. Domestic Airlines in Nigeria must adopt to the global benchmarking practices in other to attain or maintain competitive advantage in the industry.

ii. Using SWOT analysis, Airlines models should be designed to identify operational and administrative loopholes that inhibit operational profitability of the airlines. Adequate funds must be deployed to quickly address the issue(s) of technology and manpower defects in the airline operations.

iii. Airline operators should as a matter of urgency improve on customer relation and service offerings so that their portion in the overall market share of air travelers in the country.

iv. Industry regulators must ensure that no Domestic Airline is allowed to operate below the industry acceptable level of safety. Policy framework on aircraft safety should be made available to all stakeholders periodically.

v. Even though most Domestic Airlines are privately owned, the government may set aside intervention/bailout funds for challenging airlines so that safety and operational efficiencies of these airlines are not compromised but rather enhanced.

vi. To stay continually afloat in the airline business environment, leading airlines must continually benchmark their operations with airline leaders operating on the international scale. This will help them grow their profitability and capacity to operate competitively on the international scale.

5.3 Contribution to Knowledge

Due to very limited literatures around the study, the following are the addition to the subject of Benchmarking Airline Management Models amongst Domestic Airlines in Nigeria. They are: The study has successfully established the relationship between Domestic airline management models with customer satisfaction index, airline operational profitability, operational efficiency, and operational safety of airlines in the Domestic wing of the Nigerian. The study has been able to establish that with a well-structured management model, airlines can operate profitably and safely without going moribund. The study has also successfully established with the case of Ibom Air, that new airline company and other investors can still break-even irrespective of the prevailing challenges in the Nigerian aviation sub-sector.

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Appendix 1

APPENDIX - 1: SAMPLE - LETTER TO RESPONDENTS

Department of Transport Management Technology,
Federal University of Technology Owerri,
Imo State.

20th June 2023

Dear Respondent,

BENCHMRKING AIRLINE MANAGEMENT MODELS

I am a post graduate student of the Department of Transport Management Technology, Federal University of Technology, Owerri (FUTO). I am currently conducting research on Benchmarking Airline Management Model, a case of Ibom Air. The attached questionnaire is my research instrument is to gather data required solely for research purpose and every information supplied by you will be treated with absolute confidentiality.

Please kindly express your opinion as it will not be used against you in anyway.

Thank you.

Yours Faithfully,

Engr. Jeremiah, David Arauko

Appendix 2
QUESTIONNAIRE

Section A

Name of Airline: ....

Personal Data

Instructions: Please fill the following data by ticking (√) as applicable to you.

1) Highest educational level attained SSCE/O'Level ☐ ND/NCE ☐ First Degree/HND ☐ master's Degree ☐ Doctorate Degree ☐

2) Age: Below 30 years ☐ 30-40 years ☐ Above 40 years ☐

3) Gender: Male ☐ Female ☐ status of Employment: Full ☐ Temporary ☐

Section B: DOMESTIC AIRLINES MANAGEMENT MODELS

Instruction: Please tick (√) against each statement as it applies to you. Use the following as key:

SA = Strongly Agree **A =** Agree **SD =** Strongly Disagree **D =**Disagree

S/N	QUESTION STATEMENTS	SA	A	N	SD	D
	A: Customer Satisfaction of Airline					
1.	Relatively new and attractive aircrafts					
2.	Offer competitive fares					
3.	Baggage handling is always good					
4.	Provide regular information on range of services					
5.	Quality and price relationship of service offered					
6.	Excellent Schedule reliability of airline					
7.	Rapid response to passenger's complaints					
8.	Excellent in-flight service					
9.	Low number of flight delays and cancellations					
10	Ease of access to online services					
	B: Operational Profitability of Airline					
1	Attract very high passenger traffic in all operating airports					
2	Depletion of fleet due to maintenance					
3	Moderate Overhead cost					
4	High return of assets and investment					
5	Number of product units and pricing is low					
	C: Operational Efficiency of Airline					
1	Minimal delays in passenger processing					
2	Low Aircraft Lease Cost					
3	Efficient internet services/information					
4	frequent technical malfunctions with regular flights delays and cancelations					
5	Lack real-time data about weather patterns					
	D: Operational Safety of Airline					
1	Comprehensive insurance of fleet					
2	Very low rate of aircraft incidences and accidents					
3	Good safety policy and practice					
4	Effective in-flight communicating on risk awareness and mitigation					
5	Sufficient budgetary allocation to airline safety management					

Appendix 3

Critical Values of the Pearson Correlation Coefficient

n	α = **0.05**	α = **0.01**
4	0.950	0.990
5	0.878	0.959
6	0.811	0.917
7	0.754	0.875
8	0.707	0.834
9	0.666	0.798
10	0.632	0.765
11	0.602	0.735
12	0.576	0.708
13	0.553	0.684
14	0.532	0.661
15	0.514	0.641
16	0.497	0.623
17	0.482	0.606
18	0.468	0.590
19	0.456	0.575
20	0.444	0.561
21	0.433	0.549
22	0.423	0.537
23	0.413	0.526
24	0.404	0.515
25	0.396	0.505
26	0.388	0.496
27	0.381	0.487
28	0.374	0.479
29	0.367	0.471
30	0.361	0.463
35	0.334	0.430
40	0.312	0.403
45	0.294	0.380
50	0.279	0.361
55	0.266	0.345
60	0.254	0.330
65	0.244	0.317
70	0.235	0.306
75	0.227	0.296
80	0.220	0.286
85	0.213	0.278
90	0.207	0.270
95	0.202	0.268
100	0.197	0.256

Note: *r* is statistically significant if *r* is greater than or equal to the value given in the table.

Appendix 4

Regression model showing customer satisfaction 0f Ibom Air

Descriptive Statistics

	Mean	Std. Deviation	N
CUSTOMER SATISFACTION	57.3692	7.73702	65
IBOM AIR (X1)	56.5692	7.12384	65

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.665[a]	.443	.434	5.82098

a. Predictors: (Constant), IBOM AIR (X1)

b. Dependent Variable: CUSTOMER SATISFACTION

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1696.460	1	1696.460	50.067	.000[b]
	Residual	2134.678	63	33.884		
	Total	3831.138	64			

a. Dependent Variable: CUSTOMER SATISFACTION

b. Predictors: (Constant), IBOM AIR (X1)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.486	5.823		2.831	.006
	IBOM AIR (X1)	.723	.102	.665	7.076	.000

a. Dependent Variable: CUSTOMER SATISFACTION

Correlations

		CUSTOMER SATISFACTION	IBOM AIR (X1)
Pearson Correlation	CUSTOMER SATISFACTION	1.000	.665
	IBOM AIR (X1)	.665	1.000
Sig. (1-tailed)	CUSTOMER SATISFACTION	.	.000
	IBOM AIR (X1)	.000	.
N	CUSTOMER SATISFACTION	65	65

IBOM AIR (X1)	65	65

Appendix 5

Regression model showing customer satisfaction 0f Dana Air

Descriptive Statistics

	Mean	Std. Deviation	N
customer satisfaction index	56.0857	5.54856	35
DANA AIR (X2)	55.6857	6.08649	35

Correlations

		customer satisfaction index	DANA AIR (X2)
Pearson Correlation	customer satisfaction index	1.000	.745
	DANA AIR (X2)	.745	1.000
Sig. (1-tailed)	customer satisfaction index	.	.000
	DANA AIR (X2)	.000	.
N	customer satisfaction index	35	35
	DANA AIR (X2)	35	35

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.745[a]	.556	.542	3.75408

a. Predictors: (Constant), DANA AIR (X2)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	581.670	1	581.670	41.273	.000[b]
	Residual	465.073	33	14.093		
	Total	1046.743	34			

a. Dependent Variable: customer satisfaction index

b. Predictors: (Constant), DANA AIR (X2)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.244	5.924		3.079	.004
	DANA AIR (X2)	.680	.106	.745	6.424	.000

a. Dependent Variable: customer satisfaction index

Appendix 6

Regression model showing customer satisfaction of Air Peace

Descriptive Statistics

	Mean	Std. Deviation	N
CUSTOMER SATISFACTION	55.0727	5.22407	55
AIR PEACE	56.1818	4.83847	55

Correlations

		CUSTOMER SATISFACTION	AIR PEACE
Pearson Correlation	CUSTOMER SATISFACTION	1.000	.353
	AIR PEACE	.353	1.000
Sig. (1-tailed)	CUSTOMER SATISFACTION	.	.004
	AIR PEACE	.004	.
N	CUSTOMER SATISFACTION	55	55
	AIR PEACE	55	55

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.353[a]	.125	.108	4.93300

a. Predictors: (Constant), AIR PEACE

b. Dependent Variable: CUSTOMER SATISFACTION

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	183.982	1	183.982	7.561	.008[b]
	Residual	1289.727	53	24.334		
	Total	1473.709	54			

a. Dependent Variable: CUSTOMER SATISFACTION

b. Predictors: (Constant), AIR PEACE

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	33.640	7.823		4.300	.000
	AIR PEACE	.381	.139	.353	2.750	.008

a. Dependent Variable: CUSTOMER SATISFACTION

Appendix 7

Regression model showing customer satisfaction of Max Air

Descriptive Statistics

	Mean	Std. Deviation	N
customer satisfaction index	56.1724	5.51018	29
MAX AIR (X4)	53.5172	6.49517	29

Correlations

		customer satisfaction index	MAX AIR (X4)
Pearson Correlation	customer satisfaction index	1.000	.491
	MAX AIR (X4)	.491	1.000
Sig. (1-tailed)	customer satisfaction index	.	.003
	MAX AIR (X4)	.003	.
N	customer satisfaction index	29	29
	MAX AIR (X4)	29	29

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.491[a]	.241	.213	4.88713

a. Predictors: (Constant), MAX AIR (X4)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	205.268	1	205.268	8.594	.007[b]
	Residual	644.870	27	23.884		
	Total	850.138	28			

a. Dependent Variable: customer satisfaction index

b. Predictors: (Constant), MAX AIR (X4)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	33.863	7.664		4.419	.000

MAX AIR (X4)	.417	.142	.491	2.932	.007

a. Dependent Variable: customer satisfaction index

Appendix 8

Regression model showing Operational Profitability of Ibom Air

Descriptive Statistics

	Mean	Std. Deviation	N
PROFITABILITY	58.6769	6.01069	65
IBOM AIR X1	56.6308	7.30490	65

Correlations

		PROFITABILITY	IBOM AIR X1
Pearson Correlation	PROFITABILITY	1.000	.583
	IBOM AIR X1	.583	1.000
Sig. (1-tailed)	PROFITABILITY	.	.000
	IBOM AIR X1	.000	.
N	PROFITABILITY	65	65
	IBOM AIR X1	65	65

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.583[a]	.340	.329	4.92217

a. Predictors: (Constant), IBOM AIR X1

b. Dependent Variable: PROFITABILITY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	785.869	1	785.869	32.437	.000[b]
	Residual	1526.347	63	24.228		
	Total	2312.215	64			

a. Dependent Variable: PROFITABILITY

b. Predictors: (Constant), IBOM AIR X1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.511	4.809		6.553	.000

IBOM AIR X1	.480	.084	.583	5.695	.000

a. Dependent Variable: PROFITABILITY

Appendix 9

Regression model showing Operational Profitability of Dana Air

Descriptive Statistics

	Mean	Std. Deviation	N
PROFITABILITY	56.4000	6.12709	35
DANA AIR (X2)	55.4571	6.28417	35

Correlations

		PROFITABILITY	DANA AIR (X2)
Pearson Correlation	PROFITABILITY	1.000	.545
	DANA AIR (X2)	.545	1.000
Sig. (1-tailed)	PROFITABILITY	.	.000
	DANA AIR (X2)	.000	.
N	PROFITABILITY	35	35
	DANA AIR (X2)	35	35

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.545[a]	.297	.276	5.21403

a. Predictors: (Constant), DANA AIR (X2)

b. Dependent Variable: PROFITABILITY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	379.258	1	379.258	13.950	.001[b]
	Residual	897.142	33	27.186		
	Total	1276.400	34			

a. Dependent Variable: PROFITABILITY

b. Predictors: (Constant), DANA AIR (X2)

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	26.926	7.940		3.391	.002
	DANA AIR (X2)	.531	.142	.545	3.735	.001

a. Dependent Variable: PROFITABILITY

Appendix 10

Regression model showing Operational Profitability of Air Peace

Descriptive Statistics

	Mean	Std. Deviation	N
PROFITABILITY	55.9636	5.46356	55
AIR PEACE (X3)	55.8727	5.39909	55

Correlations

		PROFITABILITY	AIR PEACE (X3)
Pearson Correlation	PROFITABILITY	1.000	.507
	AIR PEACE (X3)	.507	1.000
Sig. (1-tailed)	PROFITABILITY	.	.000
	AIR PEACE (X3)	.000	.
N	PROFITABILITY	55	55
	AIR PEACE (X3)	55	55

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.507[a]	.257	.243	4.75323

a. Predictors: (Constant), AIR PEACE (X3)

b. Dependent Variable: PROFITABILITY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	414.490	1	414.490	18.346	.000[b]
	Residual	1197.437	53	22.593		
	Total	1611.927	54			

a. Dependent Variable: PROFITABILITY

b. Predictors: (Constant), AIR PEACE (X3)

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	27.293	6.724		4.059	.000
	AIR PEACE (X3)	.513	.120	.507	4.283	.000

a. Dependent Variable: PROFITABILITY

Appendix 11

Regression model showing Operational Profitability of Max Air

Descriptive Statistics

	Mean	Std. Deviation	N
PROFITABILITY	54.8966	4.73848	29
MAX AIR (X4)	53.9655	5.05317	29

Correlations

		PROFITABILITY	MAX AIR (X4)
Pearson Correlation	PROFITABILITY	1.000	.573
	MAX AIR (X4)	.573	1.000
Sig. (1-tailed)	PROFITABILITY	.	.001
	MAX AIR (X4)	.001	.
N	PROFITABILITY	29	29
	MAX AIR (X4)	29	29

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573[a]	.328	.303	3.95605

a. Predictors: (Constant), MAX AIR (X4)

b. Dependent Variable: PROFITABILITY

c.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	206.131	1	206.131	13.171	.001[b]
	Residual	422.559	27	15.650		
	Total	628.690	28			

a. Dependent Variable: PROFITABILITY

b. Predictors: (Constant), MAX AIR (X4)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	25.920	8.018		3.233	.003

MAX AIR (X4)	.537	.148	.573	3.629	.001

a. Dependent Variable: PROFITABILITY

Appendix 12

Regression model showing Operational Efficiency of Ibom Air

Descriptive Statistics

	Mean	Std. Deviation	N
EFFICIENCY	55.6615	6.98274	65
IBOM AIR	55.7846	6.87498	65

Correlations

		EFFICIENCY	IBOM AIR
Pearson Correlation	EFFICIENCY	1.000	.724
	IBOM AIR	.724	1.000
Sig. (1-tailed)	EFFICIENCY	.	.000
	IBOM AIR	.000	.
N	EFFICIENCY	65	65
	IBOM AIR	65	65

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.724[a]	.524	.516	4.85754

a. Predictors: (Constant), IBOM AIR

b. Dependent Variable: OPERATIONAL EFFICIENCY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1634.022	1	1634.022	69.251	.000[b]
	Residual	1486.532	63	23.596		
	Total	3120.554	64			

a. Dependent Variable: EFFICIENCY

b. Predictors: (Constant), IBOM AIR

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	14.662	4.964		2.954	.004
	IBOM AIR	.735	.088	.724	8.322	.000

a. Dependent Variable: OPERATIONAL EFFICIENCY

Appendix 13

Regression model showing Operational Efficiency of Dana Air

Descriptive Statistics

	Mean	Std. Deviation	N
OPERATIONAL EFFICIENCY INDEX	58.1143	5.49744	35
DANA AIR (X2)	57.6857	6.03798	35

Correlations

		OPERATIONAL EFFICIENCY INDEX	DANA AIR (X2)
Pearson Correlation	OPERATIONAL EFFICIENCY INDEX	1.000	.467
	DANA AIR (X2)	.467	1.000
Sig. (1-tailed)	OPERATIONAL EFFICIENCY INDEX	.	.002
	DANA AIR (X2)	.002	.
N	OPERATIONAL EFFICIENCY INDEX	35	35
	DANA AIR (X2)	35	35

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.467[a]	.218	.195	4.93370

a. Predictors: (Constant), DANA AIR (X2)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	224.276	1	224.276	9.214	.005[b]
	Residual	803.267	33	24.341		
	Total	1027.543	34			

a. Dependent Variable: OPERATIONAL EFFICIENCY INDEX

b. Predictors: (Constant), DANA AIR (X2)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		

1	(Constant)	33.577	8.127		4.132	.000
	DANA AIR (X2)	.425	.140	.467	3.035	.005

a. Dependent Variable: OPERATIONAL EFFICIENCY INDEX

Appendix 14

Regression model showing Operational Efficiency of Air Peace

Descriptive Statistics

	Mean	Std. Deviation	N
EFFICIENCY	55.9818	6.25534	55
AIR PEACE (X3)	56.4000	6.40197	55

Correlations

		EFFICIENCY	AIR PEACE (X3)
Pearson Correlation	EFFICIENCY	1.000	.592
	AIR PEACE (X3)	.592	1.000
Sig. (1-tailed)	EFFICIENCY	.	.000
	AIR PEACE (X3)	.000	.
N	EFFICIENCY	55	55
	AIR PEACE (X3)	55	55

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.592[a]	.351	.338	5.08834

a. Predictors: (Constant), AIR PEACE (X3)

b. Dependent Variable: OPERATIONAL EFFICIENCY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	740.748	1	740.748	28.610	.000[b]
	Residual	1372.234	53	25.891		
	Total	2112.982	54			

a. Dependent Variable: OPERATIONAL EFFICIENCY

b. Predictors: (Constant), AIR PEACE (X3)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	23.353	6.139		3.804	.000

AIR PEACE (X3)	.579	.108	.592	5.349	.000

a. Dependent Variable: OPERATIONAL EFFICIENCY

Appendix 15

Regression model showing Operational Efficiency of Max Air

Descriptive Statistics

	Mean	Std. Deviation	N
EFFICIENCY	56.8966	5.73426	29
MAX AIR (X4)	57.1034	5.22593	29

Correlations

		EFFICIENCY	MAX AIR (X4)
Pearson Correlation	EFFICIENCY	1.000	.506
	MAX AIR (X4)	.506	1.000
Sig. (1-tailed)	EFFICIENCY	.	.003
	MAX AIR (X4)	.003	.
N	EFFICIENCY	29	29
	MAX AIR (X4)	29	29

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.506[a]	.256	.228	5.03782

a. Predictors: (Constant), MAX AIR (X4)

b. Dependent Variable: OPERATIONAL EFFICIENCY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	235.441	1	235.441	9.277	.005[b]
	Residual	685.249	27	25.380		
	Total	920.690	28			

a. Dependent Variable: OPERATIONAL EFFICIENCY

b. Predictors: (Constant), MAX AIR (X4)

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	25.211	10.445		2.414	.023
	MAX AIR (X4)	.555	.182	.506	3.046	.005

a. Dependent Variable: OPERATIONAL EFFICIENCY

Appendix 16

Regression model showing Operational Safety of Ibom Air

Descriptive Statistics

	Mean	Std. Deviation	N
EFFICIENCY	58.9846	5.76491	65
IBOM AIR (X1)	57.9692	6.47826	65

Correlations

		OPERATIONAL SAFETY	IBOM AIR (X1)
Pearson Correlation	OPERATIONAL SAFETY	1.000	.667
	IBOM AIR (X1)	.667	1.000
Sig. (1-tailed)	OPERATIONAL SAFETY	.	.000
	IBOM AIR (X1)	.000	.
N	OPERATIONAL SAFETY	65	65
	IBOM AIR (X1)	65	65

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.667[a]	.445	.436	4.32975

a. Predictors: (Constant), IBOM AIR (X1)

b. Dependent Variable: OPERATIONAL SAFETY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	945.940	1	945.940	50.459	.000[b]
	Residual	1181.044	63	18.747		
	Total	2126.985	64			

a. Dependent Variable: OPERATIONAL SAFETY

b. Predictors: (Constant), IBOM AIR (X1)

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	24.583	4.873		5.045	.000
	IBOM AIR (X1)	.593	.084	.667	7.103	.000

a. Dependent Variable: OPEARTIONAL SAFETY

Appendix 17

Regression model showing Operational Safety of Dana Air

Descriptive Statistics

	Mean	Std. Deviation	N
OPERATIONAL SAFETY	58.6286	6.44016	35
DANA AIR (X2)	58.1714	6.40076	35

Correlations

		OPERATIONAL SAFETY	DANA AIR (X2)
Pearson Correlation	OPERATIONAL SAFETY	1.000	.482
	DANA AIR (X2)	.482	1.000
Sig. (1-tailed)	OPERATIONAL SAFETY	.	.002
	DANA AIR (X2)	.002	.
N	OPERATIONAL SAFETY	35	35
	DANA AIR (X2)	35	35

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.482[a]	.233	.210	5.72578

a. Predictors: (Constant), DANA AIR (X2)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	328.280	1	328.280	10.013	.003[b]
	Residual	1081.891	33	32.785		
	Total	1410.171	34			

a. Dependent Variable: OPERATIONAL SAFETY

b. Predictors: (Constant), DANA AIR (X2)

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	30.389	8.977		3.385	.002
	DANA AIR (X2)	.485	.153	.482	3.164	.003

a. Dependent Variable: OPERATIONAL SAFETY

Appendix 18

Regression model showing Operational Safety of Air Peace

Descriptive Statistics

	Mean	Std. Deviation	N
OPERATIONAL SAFETY	56.0727	6.42580	55
AIR PEACE	56.8727	5.45369	55

Correlations

		OPERATIONAL SAFETY	AIR PEACE
Pearson Correlation	OPERATIONAL SAFETY	1.000	.490
	AIR PEACE	.490	1.000
Sig. (1-tailed)	OPERATIONAL SAFETY	.	.000
	AIR PEACE	.000	.
N	OPERATIONAL SAFETY	55	55
	AIR PEACE	55	55

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.490[a]	.240	.225	5.65558

a. Predictors: (Constant), AIR PEACE

b. Dependent Variable: OPERATIONAL SAFETY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	534.471	1	534.471	16.710	.000[b]
	Residual	1695.238	53	31.986		
	Total	2229.709	54			

a. Dependent Variable: OPERATIONAL SAFETY

b. Predictors: (Constant), AIR PEACE

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	23.265	8.062		2.886	.006
	AIR PEACE	.577	.141	.490	4.088	.000

a. Dependent Variable: OPERATIONAL SAFETY

Appendix 19

Regression model showing Operational Safety of Max Air

Descriptive Statistics

	Mean	Std. Deviation	N
EFFICIENCY	57.5517	5.37578	29
MAX AIR (X4)	56.7241	4.72755	29

Correlations

		OPERATIONAL SAFETY	MAX AIR (X4)
Pearson Correlation	OPERATIONAL SAFETY	1.000	.506
	MAX AIR (X4)	.506	1.000
Sig. (1-tailed)	OPERATIONAL SAFETY	.	.003
	MAX AIR (X4)	.003	.
N	OPERATIONAL SAFETY	29	29
	MAX AIR (X4)	29	29

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.506[a]	.257	.229	4.72032

a. Predictors: (Constant), MAX AIR (X4)

b. Dependent Variable: OPERATIONAL SAFETY

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	207.574	1	207.574	9.316	.005[b]
	Residual	601.599	27	22.281		
	Total	809.172	28			

a. Dependent Variable: OPERATIONAL SAFETY

b. Predictors: (Constant), MAX AIR (X4)

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	24.883	10.739		2.317	.028
	MAX AIR (X4)	.576	.189	.506	3.052	.005

a. Dependent Variable: OPERATIONAL SAFETY

Appendix 20

CUSTOMER SATISFACTION INDEX							
Ibom air (X_1)	Ax_1	Dana Air (X_2)	Ax_2	Air Peace (X_3)	Ax_3	Max Air (X_4)	Ax_4
50	50	50	57	53	50	45	45
50	45	50	58	55	53	61	59
58	40	58	60	59	57	50	56
57	56	57	55	57	58	53	52
61	62	61	60	55	52	45	45
60	60	60	63	58	51	61	61
47	61	47	50	59	58	65	62
63	60	63	63	58	59	60	63
50	53	50	53	60	62	50	54
45	45	45	57	59	60	45	55
61	59	61	58	57	52	61	56
50	56	50	52	53	49	50	50
53	52	53	51	55	50	53	59
45	45	45	50	51	53	45	52
61	61	61	59	55	58	61	53
65	62	65	62	54	55	51	61
65	63	65	61	50	53	46	50
61	56	61	52	56	58	61	58
47	45	47	43	47	50	47	64
50	54	50	50	59	57	50	57
53	57	53	53	52	50	53	50
49	43	49	45	53	52	49	55
67	65	67	60	61	58	61	63
53	58	53	53	50	48	45	54
62	68	62	67	62	60	62	60
61	66	61	60	51	53	61	51
57	54	57	57	57	53	52	57
54	56	54	50	50	51	54	60
60	64	60	65	62	54	55	67
56	60	56	58	63	57		
53	50	53	53	54	50		
59	65	59	60	60	65		
52	50	52	53	51	52		

53	60	53	53	57	55
61	60	61	62	60	62
60	70			67	54
51	49			50	60
64	65			60	51
60	69			65	57
43	65			60	60
62	67			60	67
67	70			67	65
65	67			58	51
50	58			51	50
51	49			52	49
50	49			50	53
49	47			50	64
53	55			53	50
64	67			63	40
50	55			50	50
45	45			50	63
53	57			63	60
57	60			55	57
67	69			56	58
58	60			57	55
63	59				
52	45				
65	61				
60	64				
53	45				
73	66				
45	56				
73	56				
65	65				
60	58				

Appendix 21

PROFITABILTY INDEX

Ibom air (X_1)	Bx_1	Dana Air (X_2)	Bx_2	Air Peace (X_3)	Bx_3	Max Air (X_4)	Bx_4
60	57	50	52	55	52	54	57
52	53	57	55	58	52	45	40
60	64	53	50	59	61	60	54
50	53	53	50	60	62	50	54
45	45	57	60	55	57	57	55
61	59	58	57	51	52	59	56
50	56	60	62	47	43	50	50
53	52	65	67	55	50	53	59
45	45	50	52	51	53	50	52
61	61	59	60	57	55	55	53
65	62	55	51	54	55	59	61
65	63	52	50	50	53	46	50
61	56	52	49	56	58	61	58
47	45	50	53	47	45	47	64
50	54	61	64	59	57	50	57
53	57	53	50	52	50	53	50
49	50	45	45	53	65	51	55
63	65	45	43	61	58	61	63
53	52	53	50	50	53	51	54
62	68	55	53	62	60	62	60
67	65	43	60	60	60	47	51
50	57	60	57	55	54	50	52
47	57	57	55	52	50	60	58
60	63	56	60	60	62	52	50
60	63	67	64	66	67	55	54
65	67	65	60	63	65	56	55
53	60	54	62	51	49	58	57
67	56	66	59	59	57	52	55
65	63	57	61	46	48	61	58
50	60	61	58	65	55		
64	62	55	66	40	67		
65	64	43	64	51	62		

63	62	54	60	60	60
48	44	66	63	64	61
50	53	54	52	53	52
50	65			45	43
43	57			59	58
53	61			61	53
65	73			58	55
50	67			57	60
40	54			64	63
55	64			56	57
56	68			62	60
68	60			58	57
63	62			62	50
56	56			53	55
52	62			55	58
62	58			52	53
54	62			55	56
45	53			60	62
51	55			56	54
53	52			52	56
45	55			54	52
62	60			59	57
62	56			58	59
67	52				
65	61				
61	65				
57	61				
65	63				
55	55				
67	63				
62	60				
60	65				
58	56				

Appendix 22

OPERATIONAL EFFICIENCY

Ibom Air (X_1)	Cx_1	Dana Air (X_2)	Cx_2	Air Peace (X_3)	Cx_3	Max Air (X_4)	Cx_4
57	55	60	56	57	53	57	61
60	63	64	64	60	57	60	59
50	55	50	52	54	51	50	53
49	50	57	59	51	49	49	54
59	60	50	51	64	60	59	62
62	58	50	55	59	57	55	56
70	73	68	75	60	62	52	57
59	61	58	68	55	55	59	59
57	53	54	58	51	53	57	52
66	65	61	59	47	49	54	53
56	63	56	58	55	57	53	50
50	53	56	54	51	50	50	50
65	61	62	53	57	59	65	66
60	62	65	62	61	63	63	64
63	57	60	63	50	48	63	64
65	56	56	54	56	58	52	50
64	67	63	60	47	46	55	62
64	61	63	61	59	61	62	63
56	70	68	65	52	54	56	54
56	58	53	52	53	52	56	60
65	63	60	60	61	59	65	51
56	53	55	52	50	50	56	57
55	57	56	53	62	58	55	60
52	50	52	55	60	62	52	67
54	60	61	63	55	64	54	50
66	67	65	53	52	50	66	60
54	52	50	52	60	57	54	54
56	60	54	63	66	60	56	55
62	59	60	57	63	62	60	66
70	65	63	56	51	56		
46	50	40	55	59	56		
61	56	60	57	46	62		
60	62	57	53	65	61		
52	54	62	59	40	42		
53	57	50	67	51	49		
50	53			60	62		
54	56			64	50		
76	76			60	58		
64	66			62	60		
50	54			58	61		
57	61			59	62		

60	59
62	60
56	54
56	62
62	64
61	62
61	62
49	55
62	57
50	60
58	60
56	60
61	57
62	63
62	61
51	54
52	52
46	67
65	65
40	45
65	57
54	63
61	52
55	51

61	62
62	51
53	52
62	46
63	65
59	40
60	53
56	56
60	76
57	66
63	54
60	57
54	55
55	56

Appendix 23

OPERATIONAL SAFETY INDEX

Ibom air (X_1)	Dx_1	DANA (X_2)	Dx_2	Air peace (X_3)	Dx_3	Max (X_4)	Dx_4
64	68	48	51	66	64	56	58
55	58	65	50	64	61	52	56
54	53	59	59	56	53	62	64
59	55	50	52	54	51	58	60
49	50	57	59	51	49	52	54
55	60	50	51	59	62	45	43
55	58	67	55	55	57	58	56
62	60	68	75	60	62	53	50
59	61	58	68	55	55	60	59
55	53	54	58	51	53	55	52
66	65	61	59	44	49	57	53
60	63	56	58	55	57	63	61
50	53	56	54	51	50	50	50
62	61	62	53	57	59	65	66
60	62	65	62	61	63	62	64
63	61	60	63	50	48	63	60
65	56	56	54	56	58	53	50
64	67	63	60	47	46	64	62
64	61	63	61	59	61	64	63
56	70	68	65	52	54	56	54
56	58	53	52	53	52	56	60
65	63	60	60	61	59	65	51
56	53	55	52	50	50	56	57
55	57	56	53	62	60	55	60
50	46	46	65	50	52	52	58
67	65	65	64	54	53	55	50
68	40	40	50	61	60	58	60
58	51	51	57	64	63	49	67
54	47	60	60	52	53	62	52
61	62	64	67	68	65		
52	50	60	68	66	68		
56	54	62	58	54	57		
42	40	59	60	56	56		

46	47	61	70	64	67
50	47	58	49	60	61
54	58			50	70
40	43			65	58
53	50			50	50
49	57			60	51
50	47			60	50
61	63			70	49
54	53			49	53
46	43			65	64
58	60			52	50
62	60			47	45
67	64			45	43
65	62			65	62
50	52			67	50
51	52			58	61
50	51			49	50
49	52			49	62
53	55			55	50
64	64			57	59
50	52			59	59
45	47			52	55
43	51				
50	53				
55	57				
58	61				
65	63				
46	45				
66	62				
51	57				
53	50				
55	59				