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Original Research Article

Flight Safety-Airline Performance Equation: Assessing the Effect of Safety Management System on Kenyan Airlines

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Abstract: The airline industry contributes immensely to the Kenyan economy but performed dismally from 2016 to 2022 as compared to other regional airlines. Circumstances related to flight safety resulted to this dismal performance. The study sought to examine safety management systems' effect on performance of airlines in Kenya. Specifically, safety policies, safety risk management, and safety awareness effect on performance of airlines. Resource Based View, Balanced Score Card and Contingency theories anchored the study while descriptive research design was applied. Target population was 33 airlines and proportionate stratified purposive sampling technique was used with a sample size of 7 airlines. Fifty-seven respondents filled the semi-structured questionnaires for primary data collection while a document review tool assisted to collect secondary data. Pilot study involved 8 respondents from Safari Link Airlines ascertaining the questionnaires appropriateness via content and construct validity while its reliability proven by 0.792 Cronbach's Alpha test. Descriptive and inferential statistics were employed to analyze data. The results indicated that safety management system significantly affected airline performance with strong contribution from safety policies, safety risk management and safety awareness. The study concluded that safety management system having significantly contributed to positive airline performance necessitated airlines to strengthen frameworks for hazard identification and risk management to reduce prevalence of accidents. This study recommends incorporating other sectors of the aviation for findings to be fully representative of Kenya's aviation sector and for comparison with other countries. It also recommends investigating the influence of industry regulations and political interference as mediating and moderating variables that may be restrictive to management's autonomy. Finally, the study recommends airlines and industry regulatory bodies to freely avail substantial secondary data to compliment the primary data for eliminating bias and comprehensive analysis of findings.

Keywords: Flight Safety; Safety Management System; Airline Performance.

INTRODUCTION

Customers' preference for service quality verses airlines' profit maximization desire have greatly influenced airline performance (Kasim & Mahmut, 2020). Performance of airlines pertains to operational efficiency, financial performance, customer satisfaction, and safety status for a competitive advantage in the aviation environment. Being a service industry, critical to airline performance is customer perception that is based on reputation and flight safety status of the airlines (Kalemba & Campa Planas, 2019). Flight safety is the freedom of harm to crew and passengers or damage to equipment that has a direct impact to airline's reputation and thus performance. For airlines to remain competitive in aviation environment on matters service quality and profitability performance, airlines have to adopt various flight safety change management strategies including safety management system.

The airline sector is a huge and complex industry that is critical to the world economy to attune of USD 2.7 trillion (3.6% of global economic output) and way of life in terms of trade, transport and tourism (Gill, 2016; Kearns, 2018). In spite of this growth, airlines operate in a volatile environment with exposures like the exogenous shocks of terrorism and natural disasters that

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negatively affect their performance. For instance, the 2008 great recession that negatively affected airline industry to attune of approximately USD 5.2 billion. (Vasigh *et al*, 2018). This performance can be measured in financial, operational and service quality perspectives (Kasim & Mahmut, 2020) and can be evaluated through various metrics like customer satisfaction, safety records, baggage handling and financial stability that determine aviation industry's evolution.

Since the beginning of the 21st century, aviation industry has witnessed constant growth on the global scale except for periods of natural mishaps like Covid-19 pandemic (IATA, 2020; Dube *et al.*, 2021) that caused unprecedented financial losses. However, it regained its steady path post the pandemic dent with increased carrying capacity from 21.8 billion passengers in 2020 to 2.2 billion in 2021 translating to 18.6% increase in airline performance (AFRAA, 2022). This performance was mimicked by the U.S airline industry from 2000 to 2009 due to severe demand downturn after 9/11 terrorist attack (Ito & Lee, 2019) and covid pandemic (Hotle & Mumbower, 2021). The European airline industry (Drakos, 2019) and China's airline industry (Zhang *et al.*, 2022) experienced similar fate in performance as result of same circumstances.

The future of the airline industry in Africa is positive with an expected linear and gradual growth trajectory (Njoroge, & Samunderu, 2021). However, its performance since 2000 has also been a mix of challenges and growth. The challenges include; high operating costs, limited infrastructure, and competition from international airlines that have rendered African airlines inferior in performance as compared to others. The African Airline Association report (2022) indicates that African continent was the weakest contributor to the global air traffic at 1.9%. However, African airlines had managed to improve from 61 to 95.6 million passenger capacity in the year 2010 and 2019 respectively (AFRAA, 2022).

Organizational Performance

Organizational performance is how effective an entity can achieve its purpose and objectives by evaluating various factors that gauge its accomplishments and success. (Heydari *et al.*, 2020). Organizational performance is an important measure on an organizations' productivity consisting of both financial and non-financial results. Financial performance indicators like favourable return on investment and company profits equate to an increase in flight volumes and financial success in the aviation industry (Olaganathan, 2021). The organizational financial performance is an indicator of how well an organization competes in the industry.

The non-financial indicators of strategy decisions and understanding, resource availability, effectiveness of organizational structure, and adoption of advanced technology are critical in improving organizational performance (Serrano & Kazda, 2020). The view that both the organizational financial and non-financial matters are critical to evaluating its achievements or shortcomings primarily is the reason why organizations have adopted the Balanced Score Card approach of measuring performance. This approach employs the perspectives of finance, customer, internal processes, and learning and growth to measure performance (Tawse, & Tabesh, 2023).

Adoption of technology is instrumental in enhancing customer satisfaction, improving cost-effectiveness, and ensuring safety and compliance. A study by Lien *et al.*, (2021) on passenger's embrace of self-service systems in Taiwan airport showed that services like self-check-in, document scanning, and bag recovery, significantly influenced behavioural control and usefulness. Farooq *et al.*, (2018) research on how service quality impacts customer satisfaction in Malaysia airlines concluded that airlines should put much emphasis on service quality dimensions especially personnel services and image in order to enhance their customer satisfaction levels. Being a very competitive industry, airlines with improved service quality have high capacity to satisfy and retain their customers for competitive performance. This study measures airline performance on the basis of financial profitability, operational efficiency, and employee satisfaction with emphasis on utilizing a sound safety management system for good reputation, customer satisfaction, competitive advantage, and sustainable performance.

Safety Management System

Safety is the condition or state of freedom from hazards and risks that could lead to prevalence of incidents and accidents (Li & Guldenmund, 2018). Since the Airline Deregulation Act of 1978, safety remains a critical aspect in the management of the commercial airline industry as all stakeholders endeavour to prevent the prevalence of mishaps (Kalemba & Campa Planas, 2019). Robust safety management system is crucial to flight safety performance (Majid *et al*, 2022). Airlines with a good flight safety record often have a positive brand image and reputation for being reliable, trustworthy, and responsible, offering it a competitive edge in increased market share and customer preference. For the airline industry to leverage on the benefits derived from the good flight safety record, it has to employ a sound flight safety management system that are superior to its competitors.

Safety Management System incorporates a comprehensive management blueprint adopted by ICAO as a standard for aviation safety in November 2006 (Kioko & Bwire, 2021). It aims to support flight safety by implementing systematic approaches to managing safety risks and hazards within the aviation environment augmented by its pillars that promote a safe working environment by ensuring the safe conduct of flight

operations (Chaves, 2020). Research by Stolzer *et al.*, (2023) concluded that in order to promote proactive safety in aviation, the safety management system components comprising policy, assurance, promotion and risk management have to be enshrined in organizational systems.

Measurement of safety performance may be in the form of accident rates, serious or fatal, and regulatory compliance including safety inspections and accident reporting. For example, KCAA National Aviation Safety Plan (2023) indicated an accident rate of 0.21 in 2022 as compared to 0.51 in 2021 while the accident fatality rate was zero in 2022 as compared to 0.27 in 2021 per 10,000 commercial scheduled flights. This data shows that the safety performance in Kenya airline industry improved in 2022 as compared to 2021 based on the reduction of national accident rates and fatal accident rates.

Airlines in Kenya

Airline sector in Kenya has come of age with multiple airlines operating in the country. The existence of multiple airlines in Kenya has led to a healthy competition within the Kenyan aviation sector with improved services. Kenya Civil Aviation Authority (KCAA), a legitimate regulatory entity enforcing safety compliance and issuance of licenses to the Kenyan airlines, registered 49 airlines operating both domestically and internationally. Kenya Airways (KQ) is Kenya's national carrier operating from JKIA with over 40 aircraft.in its fleet (ACF, 2020).

KCAA regulations (2018) requires all airline license holders to make monthly returns for monitoring the aviation sector in Kenya. The airline industry has been a significant contributor to Kenya's economy. The importance of air transport in Kenya report (2018) indicated that the overall industry spending stood at US $3.2 billion which was an equivalent of 4.6% of the Kenya's GDP. However, airline financial performance in Kenya as compared to regional counterparts over the years has been found to be low (Chege, 2022).

The Kenya airline industry has had a steady growth path since the beginning of the 21st Century with an indication in the rise of license issuance by KCAA. For instance, air passengers visiting Kenya rose from 1,671, 900 in 2014 to 2,027,700 in 2018 (ACF, 2020). Despite the challenges that this industry continues to face, IATA (2018) forecasts Kenyan airline sector to grow by 249% by the year 2037 resulting in an additional 11.8 million passengers. The development of the Kenyan airline industry is majorly contributed by domestic and African travels. Africa is the main source of foreign passengers to Kenya standing at 70% of total visitors annually.

From the onset of the 21st Century, two major circumstances have significantly affected the performance and survival of the airline industry; the 66% decline in world revenue passenger kilometres in 2020 as a result of the pandemic (ACF, 2020) and 2001 airline terrorists attack effects (Kioko & Bwire, 2021), that all point to aviation safety and security issues. The negative effects felt in the global aviation environment including the United States, Europe, China, Africa, were also felt in Kenya in similar or equal measure in relation to flight safety having a significant effect on the performance of airlines. Therefore, adoption of strategies like sound safety management system by airlines is critical to improvement of their performance.

Statement of the Problem

Airline industry in Kenya realized dismal performance improvement from 2016 to 2022 as compared to other regional airlines (Skytrax World Airline Awards report, 2022). African Airlines Association (AFRAA) report (2023) indicated that Ethiopian Airlines handled 11.3 million passenger traffic as compared to Kenya Airways' 2.7 million in the year 2022. Therefore, the overall performance of Kenyan airline industry during this period was below the expected level in comparison with other regional airlines.

Kenya Airways PLC consolidated statement (2023) showed that the last full-year operating profit was in 2017 at Kshs. 1.6 billion and since then, the airline has been operating on losses including 2022 at Kshs. 5.6 billion loss. Moreover, KCAA National Aviation Safety Report (2023) indicated that the Kenyan airlines had a total of 54 flight accidents with 39 fatalities for the period between 2017 and 2022 that had a significant dent on customer and employee satisfaction. In effect, there was a higher employee turnover at 55% and passengers' preference shifted to other airlines that had good image and reputation. Airlines having good reputation withstand tough times because of preference by the passengers and customer loyalty leading to sustainable performance. While airlines with tainted reputation have reduced passenger capacity leading to reduced performance and in worst case scenario, receivership.

Kenyan airlines have performed differently due to varied passenger reputation ratings as a result of employee satisfaction indexes, on time performance and safety standings. Internally, Kenya Airways' relatively good reputational rating resulted to a 53% customer retention while Fly Sax Airlines with a lower rating had a 23% that even forced it to cease operations in 2019 and later renamed to EastAfrican Airlines (Matara, 2018). Furthermore, Silverstone Air, founded in 2017, ceased operations in 2019 partly due to a relatively a higher accident rate (Nyagudi, 2021). Therefore, it was critical to determine specific factors influencing airline reputation that ultimately determined it performance when faced with safety-related situations like flight accidents and natural occurrences like pandemics.

Studies have been done on how other internal factors like leadership styles had affected airline

performance in Kenya but limited studies have been carried out on how safety management system as a flight safety strategy had influenced airline performance in Kenya. Mwikya (2019) focused on safety management system in relation to aviation safety standards on airports in Nairobi but not the airlines. This research helped fill the existing knowledge deficit on how safety management system contributed to performance not only in airports but also in the airlines. Kalemba and Campa Planas (2019) showed that airline revenue performance improved in Spain as a result of the application of a robust safety management system. This study sought to find out whether conclusions in Spain's study were similar to those in Kenya.

Previous studies indicated relationships between internal factors and airline performance in Kenya but limited literature existed to show how safety management system influenced that performance. The prevalence of aviation accidents, operational efficiency and professionalism in terms of service quality, have shaped the operations of aviation industry in Kenya on matters flight safety. Therefore, flight safety is vital in determining airline performance in Kenya. Based on this standing, this study explored the effects of safety management system on the performance of airlines in Kenya.

Objective of the Study

The study sought to determine the effect of safety management system on the performance of airlines in Kenya.

LITERATURE REVIEW

Both theoretical and empirical literatures were reviewed in relation to the contribution of safety management system to airline performance in Kenya. Regarding the theoretical review, the study was guided by Resource-Based View, Balanced Score Card theory, and Contingency theory.

Resource-Based View

The Resource Based View originally founded by Penrose (Penrose, 1959) and later refined by Wernerfelt (1984) and Barney (1991) premised on the basis of organization's competitive advantage in relation to its internal resources and capabilities. This gives relevance in achieving superior organizational performance (Yu, *et al*., 2018). Organizations achieve the competitive edge over others so long as they possess resources that are considered valuable, rare, imperfectly imitable, and non-substitutable (Nason & Wiklund, 2018; Chen *et al.,* 2021).

The organizational resources include both tangible and intangible assets in various forms including physical, financial, personnel, and organizational resources (Clarke & MacDonald, 2019; Freeman *et al.*, 2021). Tangible resources are physical assets owned by the organization while intangible resources hold no physical but provide more sustainable source of competitive advantage like intellectual property and brand reputation (Manikas *et al.,* 2019). Capabilities encompass mobilization, reconfiguration and deployment of organizational resources to achieve superior organizational performance (Collins, 2021). They represent the unique strengths and competencies enabling organizations to function more efficiently than their competitors (Jawed & Siddiqui, 2019).

Akpur (2024) research on human requirement evolution in aviation argued that the advancing technology had led to the reduction in human interactions and personnel numbers in the airline operations. This capability has enabled airlines to have a bulk of ground services self-administered by the passengers themselves thus streamlining processes with minimal errors. This unique capability is key to preventing flight accidents and increasing operational efficiency as advanced by the safety management system perspective of improving the overall performance. Airlines having these resources and capabilities can effectively manage flight safety evolving environment for superior performance.

Batuwangala *et al.,* (2018) posited that Airworthiness organizations can improve their safety performance by correctly employing SMS framework. In doing so, it will not only be in compliance with ICAO Annex 19 regulation but will benefit operational matters, design and production considerations of the organization like structure, policies and procedures. SMS as an organizational capability for proactive identification of hazards and risks before they materialize to accidents, integrate strategic risk management, operational efficiency and safety culture to improved safety records. This will cement the image and reputation of the organization for sustainable performance.

Balanced Score Card

Kaplan and Norton (1992) introduced the Balanced Score Card theory focusing on comprehensive evaluation of organizational performance by measuring finance, customer, internal process, and learning and growth metrics that organizations can use to identify all important features of their strategy and to continuously improve on their performance (Aryani & Setiawan, 2020; Tawse & Tabesh, 2023). These perspectives allow for the planning and control of the organization's strategy in a holistic manner (Sartor, 2019). Therefore, the BSC balances between external metrics and internal measures tied to essential processes (Quesado *et al.*, 2018).

The financial perspective focuses on the traditional financial metrics like profitability, revenue growth and cashflows that help the organization track its financial success. (Aryani & Setiawan, 2020). The customer perspective puts much emphasis on meeting customer needs and expectations that ultimately lead to achieving high customer satisfaction, customer retention,

improved market share, and high quality after sales services (Gupta *et al.,* 2020). Internal processes viewpoint centers on efficiency of internal operations driving the organization's delivery of products or services (Sartor, 2019). Learning and growth viewpoint centers on capacity of the organization to improve or adapt to the dynamic environment for future success by nurturing employee skills and adopting new technology (Mikula *et al.,* 2020).

Okuneye and Ogunyomi-Oluyomi (2022) in their study on the role of digitalization in Emirates Airline performance used a Balanced Scorecard approach to evaluate the airline performance. The study recommended that the airline integrates digitalization practices across all BSC perspectives in order to become sustainable. Airlines operate in an environment that is ever dynamic and therefore, the survival of specific airlines in the competitive landscape is dependent upon not only on the financial performance but also on quality of service, customer loyalty, safety standings and innovation as propagated by the safety management system.

Contingency Theory

Fiedler (1967) introduced the Contingency Theory to assess leadership styles and behaviors that are appropriate to an organization achieving its objectives at the prevailing circumstances. It advocates for no best approach to tackle all situations but rather the most popular choice of strategy variables is dependent upon various contingency factors like the environment, people and contextual elements (Farah *et al.,* 2018; Reams, 2023). That different situations or circumstances need different management styles and structures for optimal effectiveness or performance.

The leadership style as a safety management system strategy that has been proven to have been successful in one situation may not be effective in another. Organizational leaders should therefore be cognizant of the contingency factors to the emerging organizational issues at hand. Contingency factors play a significant role connecting sustainability initiatives and performance (Maletič & Gomišček, 2018). Contingency theory can be helpful in predicting organizational performance by the fit of different situational factors like strategy, organizational structure and technology (Liu, 2020). For the successful implementation of organizational strategies, the top management teams have to adapt their leadership and management styles to suit the prevailing situation as dictated by the appropriate safety management system approach.

Empirical Literature Review

This section identifies relevant data from previous studies and critically analyzes it to answer specific research questions relating to the connection between airline performance and safety management system (Renner *et al.,* 2022). Majid *et al.,* (2022) research on the effects of safety risk management on evaluating safety performance at Wamena Indonesia airport employing a quantitative approach by collecting data from 60 airport staff. The study revealed that safety risk management significantly influenced safety performance. It concluded that safety risk management indicators comprising of reports and risk assessment, control strategy, and management implementation processes, had major implications on flight safety performance. Therefore, aerodromes should endeavour to adopt safety risk management initiatives as part of organizational management framework geared towards reducing the prevalence of flight accidents that ultimately improve aviation performance.

A study by Thendu (2023) on effects of strategic firm level dimensions on safety management system examined the influence of safety policy dimensions on performance of SMS with an aim to arrest the rising prevalence of aviation accidents in Kenya. Data was collected by use of cross-sectional survey design and stratified random sampling involving 132 managers. Descriptive and inferential statistical methods analyzed data. The study revealed safety policy dimensions having dominance on performance of SMS. Study recommended that aviators' deep consultations, standardized training and top management commitment were ideal for the formulation and operationalization of safety policies in line with the desired performance of safety management system.

Mwikya (2019) conducted research on effects of safety standards on air transport in Kenya. Aviation safety standards is the foundation upon which safety management system is built by defining the minimum requirements and best practices for ensuring safe conduct of flight operations. Descriptive cross-sectional survey and correlational research design were used on sampled 224 respondents. Semi-structured questionnaires were utilized to collect data while descriptive and inferential statistical methods were employed to analyze data. Study concluded that air transport performance significantly depended on compliance of aviation safety standards. The standards served as frameworks for establishing best practices and requirements for safe flight operations as intended by safety management system of respective airlines. Compliance with aviation standards fosters a culture of safety awareness as aviators consider the importance of understanding standards and adhering to them for mitigating risks and reduce accident rates.

The researcher has identified safety risk management (Majid *et al.,* 2022), safety policies (Thendu, 2023), and safety awareness (Mwikya,2019) as key aspects of safety management system strategy that affect airline performance. These SMS aspects support both safety performance and organizational objectives of respective airlines that lead to sustainable airline performance.

RESEARCH METHODOLOGY

This part presents the research design, target population, sampling design, data collection instruments and procedure, validity and reliability, and analysis and presentation of data collected.

Research Design

Asenahabi (2019) posited that research design constitutes a framework depicting the total plan of undertaking research work to solve a research problem in a valid way. In order to adequately answer this study's specific questions, descriptive research design was employed in examining characteristics of population, existing problems in the airlines as well as variations in practices among airlines (Siedlecki, 2020). This design was appropriate as it employed various research methods in investigating the variables under study (Ansari, *et al.*, 2022). Other studies that had adopted this research design included Farah, Munga & Mbebe (2018), Kinyua (2020), and Kioko & Bwire (2021).

Target Population

Target population comprised elements satisfying the criteria for inclusion in the study based on research questions and objectives (Zehnalová & Kubátová, 2019). Target population included 33 airlines that have been registered and operating in Kenya as of the year 2022. These airlines had met the requirement of having a valid Air Operator Certificate (AOC) as issued by Kenya Civil Aviation Authority for passenger transportation and had their main hubs either at JKIA and Wilson Airports. They were categorized into three classes based on fleet size. Large airlines had more than 20 aircraft fleet, medium airlines had a fleet of between 5 and 20 aircraft while small airlines operated less than 5 aircraft.

The employees having a direct influence on flight safety in those airlines formed the unit of observation. This comprised of airline primary flight managers; pilots, cabin crew, and flight engineers and, the airline management teams constituting of safety managers, operation managers, and HR managers. The KCAA data (2022) indicated that 33.3% of the airlines had their main hub in JKIA while 66.7% of the airlines had theirs in Wilson Airport. The airlines have been categorized as; large (6%), medium (27%) and small (67%). The data shows that more airlines (66.7%) are domiciled in Wilson Airport than in JKIA while only 33% of the total airlines in the two hubs fit in the medium to large airlines category.

Sample Size and Sampling Technique

Thirty-three airlines formed the unit of analysis. They were stratified into those having their main hub either in JKIA or Wilson Airport. They were further classified on the basis of fleet size to include small, medium or large categories. This assisted in the understanding of their similarities and challenges as per the scale of operations and market presence. This study comprised of airlines operating from both the main hubs and satisfying the criterion of having at least five aircraft in their fleet. Therefore, the study involved the airlines in the medium to large categories.

Mugenda and Mugenda (2003) study on research methods for quantitative and qualitative approaches posited that the appropriate sample size for descriptive research should be 10% of population minimum. Eleven airlines fell in the medium to large categories out of which Safari Link Aviation was utilized in the pilot study. Seven airlines participated in the study, three in JKIA; Kenya Airways, 748 Air Services and Jambo jet, and four in Wilson Airport; Skyward Express, Renegade Air, Freedom Airline Express and Jetways Airlines in line with the intended proportionate stratified purposive sampling technique. This constituted a 21.2% sample of the target population and therefore meeting that criterion (Mugenda & Mugenda, 2003; Gay & Diehl, 1992).

The employees having a direct influence on flight safety in these airlines comprised of airline primary flight managers; pilots, cabin crew, and flight engineers and, the airline management teams constituting of safety managers, operation managers, and HR managers. For full representation and diversity of opinion, this study involved two respondents in each of the six departments and this equated to 12 respondents for each sampled airline. Therefore, 36 respondents were from JKIA while 48 respondents were from Wilson Airport. Ultimately, with a sample size of 7 airlines, the intended unit of observation was 84 participants.

Data Collection Instrument

Study used semi-structured questionnaires to obtain primary data. Questionnaires offered a good platform to access large amounts of data with ease and to make comparisons among respondents (Gartner, 2023). The questionnaire had a Likert scale that was filled by the sampled target respondents. The Likert scale, being a fundamental psychometric tool, measured the respondents' opinions and perceptions in quantifiable and structured manner (Mirahmadizadeh, *et al.*, 2018; Cheng, *et al.*, 2021). Given that a large amount of data on wide range of constructs like attitudes, beliefs, and perceptions on organizational flight safety was needed, Likert scale questionnaire was adopted.

Questionnaire structure was based on specific research objectives as well a section having demographic information. The questionnaires were shared by use of google forms via the respondents' email addresses. The respondents filled the questionnaires and a substantial response rate was achieved within four weeks. This was made possible with a follow up email on the respective respondents that had not filled the questionnaires in the expiry of the third week that resulted in a sizeable better response rate.

Secondary data that provided contextual understanding of trends and practices over time, was collected from authentic databases and reports by use of the document review tool. It included documents like policies, standards, procedures, minutes, and performance evaluation reports. It also included the public records from the Ministry of Transport, KCAA, ICAO, respective airlines' annual reports, airline accidents reports, aviation publications and media articles. Incorporating primary and secondary data sources ensured data complementation, mitigation of bias, depth addition to data collected, robust analysis of the findings, and enhanced credibility and reliability of results as recommended by Fusch *et al*. (2018).

Data Collection Procedure

Data was collected by sending google form questionnaires by email to 84 respondents from the 7 sampled airlines and a follow up email was sent as a reminder for a better response rate. Secondary data was extracted from authentic databases and documents from Ministry of Transport, KCAA, ICAO, respective airlines' annual reports, airline accidents reports, aviation publications and media articles by the use of document review tool. To initiate the process of data collection, an Introduction Letter from Kenyatta University and a Permit from National Commission for Science, Technology, and Innovation (NACOSTI) was obtained. Permission from respective airline managements and individual respondents was obtained before the commencement of data collection exercise. Respondents were given up to four weeks to fill and submit questionnaires using online google forms. Then, the collected data was finally arranged accordingly and collated for analysis.

Validity and Reliability of the Research Instrument

Questionnaires were analyzed for validity and reliability before subjecting them to respondents for data collection. This was intended to refine the questionnaires by identifying and rectifying any potential flaws and ambiguities for accurate measurements and consistent results that ultimately increase confidence in the research outcomes. This was done by conducting a pilot study.

Pilot study is a feasibility exercise to test aspects of the research instrument and methods as will be applied to larger study (Lowe, 2019). This prevents researchers from engaging in main study deficient of requisite knowledge on adequacy and appropriateness of the research instrument. Piloting of the questionnaire was carried out on 12 respondents from Safari Link Airlines from Wilson Airport out of which 8 responded. This represented a 75% response rate which is desirable to make a conclusion on its appropriateness before the actual data collection (Mugenda & Mugenda, 2003). It also informed time estimate revision for filling the questionnaire from five weeks to four weeks (Daud *et al*., 2018).

Validity relates to the instrument measuring the quality or behaviour as intended (Sürücü & Maslakçi, 2020). There are numerous categories of validity but content validity and construct validity were of particular importance to this study. Content validity indicates each item in the instrument serving its intended purpose. The researcher obtained a comprehensive understanding of flight safety concepts through literature reviews and developed questions relating to those concepts that covered all aspects in the study. The questionnaire was then subjected to double checks and expert cross-check by the supervisor in ensuring that all variables were well covered.

Construct validity shows the extent the instrument purports to measure concept or quality as intended. It ensures that the questionnaire accurately measures what was intended and ultimately providing meaningful results to the study (Sürücü & Maslakçi, 2020). The researcher performed factor analysis by assessing questionnaire items' structure after collecting data and confirmed that they grouped as per the structure of variables in the questionnaire as expected. This helped identify patterns within a set of variables. It was achieved through correct operationalization of terms as regards to each variable to reflect the theories underpinning the study's conceptual framework.

Reliability relates to the instrument's stability and consistency over time under same circumstances (Daud *et al.,* 2018). It is the ability that the measuring instrument gives similar results when employed at different times. Sürücü and Maslakçi (2020) indicated that internal consistency measure was one of the most appropriate and frequently used method for determining reliability. It measures the degree for which items on research instrument assess same underlying construct. The study employed internal consistency measure to ascertain the questionnaire's reliability based on Cronbach's Alpha coefficient as presented in the Table 1 below.

Table 1 Reliability Statistics

Variables	Items	Reliability (Cronbach Score)	Remarks
Safety Management System	7	0.792	Accepted
Airline Performance	7	0.790	Accepted

Source: Pilot Test Data (2025)

The findings in Table 3.2 above established that the seven questions that were employed on the independent and dependent variables, had a Cronbach's Alpha score of 0.792 for safety management system and

0.79 score for airline performance. All the questions in each of the variables had an internal consistency of above 0.7 score. According to Taber (2018) the administered questionnaire was considered reliable and accepted if it achieved a Cronbach Alpha score of above 0.7 threshold. Therefore, the questionnaire for this study met the set internal consistency threshold and therefore did not warrant any revision before being utilized in the main data collection.

Data Analysis and Presentation

Descriptive and inferential statistical methods were used for analysis of quantitative data with the assistance of SPSS computer packages. Descriptive statistics summarized the essential features of sample research data and simplified communication of large datasets (Mishra *et al.,* 2019). Inferential statistics established the relationship between variables and conclusions deduced from data having random variation. Qualitative data was processed into coded form and triangulated with quantitative data so as to be presented in narrative form.

Conducting a proportionate stratified purposive sampling technique as well as having a larger sample size, minimized the likelihood of committing Type I and Type II errors. For the purposes of gauging the relationship between dependent and independent variables, regression analysis was employed with a five-level Likert scale model consisting of strongly disagree, disagree, neutral, agree and strongly agree. Airline performance was projected to be determined by safety management system and Beta value indicated the level of this variation.

The regression model below was adopted:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \varepsilon}$$

In which;

Y = Airline performance

β_0 = Constant or intercept

β_1 = Beta coefficient

X_1 = Safety management system

ε = Error term

RESEARCH FINDINGS AND DISCUSSIONS

This section presents research findings and follow-on discussions on response rates, demographic characteristics of respondents, variable descriptive statistics and regression analysis.

Analysis of Response Rates

The preliminary data on the number of questionnaires administered to the respondents in comparison to those filled and returned is presented in Table 2 below.

Table 2: Response Rates

Airline Organization	Distributed Questionnaires	Returned Questionnaires	Response Rate per Airline
Kenya Airways	12	8	66.7%
748 Air Services	12	8	66.7%
Jambo jet	12	7	58.3%
Skyward Express	12	7	58.3%
Jetways Airlines	12	9	75.0%
Renegade Air	12	10	83.3%
Freedom Airline Express	12	8	66.7%
Overall	**84**	**57**	**67.8%**

Source: Survey Data (2025)

Each of the airlines received 12 questionnaires, totalling to 84 questionnaires. Out of these, 57 questionnaires were filled and submitted representing a 67.8% response rate. Renegade Air had the highest response rate at 83.3%, followed by Jetways Airlines at 75% while Kenya Airways, 748 Air Services and Freedom Airline Express had 66.7%. Jambo Jet and Skyward Express both had a response rate of 58.3%. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate, 60% is generally good, while above 70% is excellent for analysis and reporting to generalize the opinions of the population on the study problem. This study received an overall response rate of 67.8% and therefore considered generally good to generalize the opinions of the population under study and to adequately draw inferences and make conclusions.

Descriptive Analysis of the Characteristics of Respondents

This section gives distribution of the respondents based on gender orientation, employment duration and position held in the airline organization. The results are presented in Table 3 below.

Table 3: Characteristics of Respondents

Characteristic	Category	Distribution	Percentage (%)
Gender	Male	41	71.9
	Female	16	28.1
	Total	**57**	**100**

Characteristic	Category	Distribution	Percentage (%)
Employment duration	1-5 Years	25	43.9
	6-10 Years	19	33.3
	Over 10 Years	13	22.8
	Total	**57**	**100**
Airline position	Pilot	10	17.5
	Cabin Crew	10	17.5
	Flight Engineer	9	15.8
	Safety Manager	11	19.3
	Operations Manager	9	15.8
	HR Manager	8	14.1
	Total	**57**	**100**

Source: Survey Data (2025)

All the respondents indicated their gender orientation as either male or female. The male respondents were at 71.9% while the female respondents were at 28.1%. This indicates a greater gender disparity in the Kenyan airline industry with male domination over female gender. The male domination in the Kenyan airline industry is the reflection of the global gender disparities in the aviation sector. Traditionally, the aviation sector key roles such as pilots and flight engineers, have been the preserve for the male gender. ICAO report (2023) on global aviation gender equality status revealed that women holding positions such as pilots, flight engineers and air traffic controllers stood at 4.9% in 2021.

A study by Ferla and Graham (2019) on women slowly taking off in the aviation sector pinpointed discrimination, sexism, lack of female role models and balancing work life and family responsibilities as the main reasons for female underrepresentation in the industry. The study goes further to indicate the initiatives that the airlines and other entities are putting forward to address the gender diversity and equality issues in order to turn around the situation which agreed with the study by Casebolt (2023) on gender diversity in aviation.

The Survey Data (2025) shows that there is positive change in aviation gender roles in Kenya as 60% of the cabin crew were male while 20% of the pilots being female. This indicates that, whereas traditionally, cabin crew roles were the preserve of the female gender, it has now been adopted for both genders. Additionally, whereas the global women pilots stood at 4% (ICAO Report, 2023), the 20% women pilots' respondents is an indication that airlines have embraced positive change of recruiting women pilots into their organizations through initiatives like Women in Aviation Kenya.

The dominance of male respondents in this study may skew findings toward perspectives and experiences that align with male employees, potentially underrepresenting perceptions and challenges faced by female employees. This gender disparity may introduce bias in the interpretation of the study findings as male perspectives dominate over the female ones. As a result, the findings may be influenced by male-dominated viewpoints, particularly in relation to leadership and technical roles such as pilots and flight engineers, which have historically been male-centric.

The results also indicated that the airline employees had been on continuous employment terms for the varied duration. The respondents having worked with the respective airlines for the duration of less than five years stood at 43.9%, between six to ten years stood at 33.3% while those employed in excess of ten years stood at 22.8%. This indicates that most of the employees in the respective airline organizations have been in continuous working terms for the duration of less than five years. This in essence indicates a higher employee turnover.

International Air Transport Association report (2023) showed that turnover rates for the airline ground handling staff was as high as 50%. Overall, the high turnover rates in the airline sector have been a problem spanning decades that has resulted in organizational instability, impact on productivity and turnover associated costs like recruitment, training and development costs. Moreover, high turnover rates could damage the airline's image and reputation resulting in difficulty in attracting top talent. To mitigate these negative effects, Tabakovic (2024) advocates for the airline managers to enhance employee benefits and promptly addressing employee feedback in order to optimize airline operations.

The high percentage of employees with less than five years of employment indicating a high turnover rate could influence the findings of this study in relation to airline stability, employee satisfaction and retention strategies. Respondents with shorter employment durations may provide less accurate insights into long-term airline trends or policies compared to those with over ten years of experience. As a result, the responses largely reflect the experiences and perspectives of relatively new employees who are more exposed to recent policy implementation efforts and airline reforms as compared to the smaller proportion of long-serving employees having deeper insights into the airline growth and development aspects that are less represented in the findings.

Finally, the table also depicts the various airline positions that had an influence on the overall flight safety performance in the respective airline organizations. This included; pilots at 17.5%, cabin crew at 17.5%, flight engineers at 15.8%, safety managers at 19.3%, operation managers at 15.8% and human resource managers at 14.1%. The findings indicate that the primary flight managers comprising of pilots, cabin crew and flight engineers cumulatively were responsive at 50.8% against the airline management teams at 49.2%. This indicates that both the primary flight managers and the airline management teams are conscious of aviation safety needs in their airline organizations. Furthermore, the safety managers were the highest responsive at 19.3% as they consider themselves to be the primary consumers of research study outcome.

This high level of consciousness of safety matters among all the actors, primary flight managers and airline management teams, led to the effectiveness of the industry's safety oversight mechanisms. This underscores Kenya aviation industry's commitment to adhering to ICAO safety standards. As a result, the Federal Aviation Administration (FAA) in 2017 granted Kenya a Category 1 rating (FAA Report, 2017). It is therefore imperative for all the airline organizations to have a dedicated safety branch that ensures compliance with international standards and safety for all the industry players.

These findings capture a balanced perspective from all the operational and administrative dimensions within the aviation industry that ensures a broad perspective on airline dynamics and challenges across different levels. The employees in the management roles provided insights into the strategic decision-making processes while the operational staff provide insights into day-to-day process perspectives. This role diversity provides a comprehensive view of the industry but may also introduce biases based on positional hierarchies. However, the insights on changing trends based on positions are possible due to the inclusion of participants from traditionally gendered job categories, allowing a contrast between past and current employment patterns.

Descriptive Statistics on Safety Management System

The study aimed to determine the effect of safety management system on the performance of airlines in Kenya. To achieve this, respondents were requested to indicate their level of agreement on safety policy, safety risk management and safety awareness dimensions on a scale of 1-5 as shown in Table 4 below.

Table 4: Descriptive Results on Safety Management System

Statement	Mean	Std. Dev
Implementation of safety management system has improved the airline's overall performance	4.49	0.539
Safety policy compliance reduces the occurrence of flight safety incidents and accidents	4.58	0.533
Adherence to safety standards and policies improves customer satisfaction and competitive advantage	4.53	0.658
Safety risk management practices have enhanced operational efficiency of the airline	4.60	0.623
Safety risk management protocols have led to the reduction of airline accidents	4.68	0.602
Safety awareness and training on emergency procedures for the staff lead to better handling of real emergencies	4.68	0.506
Passenger safety awareness through safety briefings has positive impact on customer satisfaction	4.19	0.667

Source: Survey Data (2025)

Table 4 above indicates strong agreement among the respondents that safety management system strategy had a critical bearing on the performance of airlines in Kenya as indicated by a mean of above 4. Respondents strongly agreed with a mean of 4.49 that the implementation safety management system strategies would result in the overall improvement of airline performance. With the mean values ranging from 4.19 to 4.68, respondents generally agreed that these strategies positively impacted performance of airlines. Low to moderate standard deviation of 0.539 indicates that as much as there is a general agreement of the impact of SMS strategies, some respondents had mixed perspectives on how their respective airlines have implemented these strategies hence leading to slight variations.

The safety policy statements; compliance leading to reduced incidents and accidents, and adherence resulting to improved customer satisfaction and competitive advantage, with a mean of 4.58 and 4.53 respectively, indicated that the respondents strongly agreed that safety policy compliance and adherence positively influence airline performance. With and average mean of 4.55 and a low to moderate standard deviation ranging from 0.533 to 0.658, suggested that although the respondents strongly agreed that safety policy positively contributed to airline performance, some airlines were not fully complying them and therefore needed to adhere to them in order to achieve the competitive edge in the industry.

The safety risk management statements; practices influencing operational efficiency and protocols resulting in reduced accidents, with a mean of 4.60 and 4.68 respectively, showed that the respondents strongly agreed that the safety risk management practices and protocols have positively contributed to the

performance of airlines. With the average mean of 4.64 and a low to moderate standard deviation ranging from 0.623 to 0.602, this indicates that although there was very strong agreement that safety risk management in airline operations was key to improving airline performance, some airlines have been slow in adopting and implementing various practices and protocols that have ultimately reduced their operational efficiency and in worse case scenarios, resulted to flight accidents.

The safety awareness statements; staff awareness and training on emergencies and passenger awareness through safety briefings, with a mean of 4.68 and 4.19 respectively, indicate that the respondents agreed that the safety awareness for both the staff and passengers positively contributed to airline performance. With average mean of 4.43 and a low to moderate standard deviation ranging from 0.506 to 0.667, indicating that although the respondents agreed that safety awareness for both the staff and the passengers was an ingredient to improving airline performance, most airlines have done well in rehearsing the emergency drills that have resulted in better handling of emergencies when they arise. On the other hand, there is relatively big margin on mixed reactions on how individual airlines have involved passengers on matters safety briefings and this could dent the respective airline's customer satisfaction index.

Overall, the respondents strongly agreed that safety management system strategies had positively impacted performance of airlines in Kenya. The findings of this study resonate with previous studies (Batuwangala *et al.,* 2018; Kałużna, 2024; Thendu, 2023) that safety management system provides the foundation for the management of safety through organizational policies and structures for efficient allocation of resources to combat against prevalent risks. This enables a predictive and proactive safety risk management approach to tackle hazards and risks before degenerating into failures, incidents and accidents that are very costly to the overall performance of the organization.

The results underscore SMS as a critical determinant to the performance in Kenya's aviation sector. The establishment and compliance of effective safety policies reduces flight accidents as this determines the attitudes and behaviours towards prioritization of safety in all undertakings. Proactive and predictive risk mitigation and management anchored on SMS frameworks reduces the prevalence of flight incidents and accidents required to increase operational efficiency by enhancing employee awareness and productivity ideal for differentiating airline in the competitive aviation industry.

Safety awareness and preparedness through training and drills on emergency procedures increase mishap handling capabilities among airline staff for operational efficiency. Employees that are well trained in emergency procedures are better equipped to handle real-life incidents, leading to more effective crisis management as they arise. This goes well along with passengers who are also well-informed about safety protocols that enhances their confidence in the airline's operations. However, airlines vary in how they communicate safety measures to their passengers and this ultimately influences the passengers' perceptions and satisfaction levels among competitors in the industry.

Therefore, airlines require strategic leadership and effective resource allocation to support SMS frameworks for the maximization of safety benefits. By adopting these measures, Kenyan airlines can achieve higher safety standards, operational excellence, and improved customer satisfaction, ultimately boosting their overall performance in the competitive aviation industry.

Descriptive Results on Airline Performance

The study looked at establishing the various dimensions and indicators of performance of airlines in Kenya in relation to implementation of safety management system constructs. The performance of airlines was determined by measuring both primary and secondary data. For primary data, respondents were requested to indicate their level of agreement on profitability, employee satisfaction and operational efficiency dimensions of airline performance on a scale of 1-5 as shown below.

Table 5: Descriptive Results on Airline Performance

Statement	Mean	Std. Dev
Minimal number of accidents, if any, have occurred for the past five years	4.67	0.476
Profit margins have increased in the past five years	4.77	0.423
The airline's profitability has exceeded the industry's average over the past five years	4.82	0.384
The airline has employees that are highly motivated with great job satisfaction index in the past five years	4.89	0.310
The relationship between management and employees is satisfactory	4.86	0.350
Operational efficiency for the past five years is at optimum levels	4.79	0.411
In-flight services, boarding process, and baggage handling, have been excellent during the last five years	4.53	0.538
Total	**32.92**	**2.892**

Source: Survey Data (2025)

Table 5 above demonstrates that respondents strongly agreed that airline performance in Kenya for the past five years has been on a higher trajectory as indicate by greater than 4.5 mean. Respondents strongly agreed that profitability, employee satisfaction and operational efficiency dimensions had all improved for the past five years. With the mean values ranging from 4.53 to 4.89, the respondents strongly agreed that all these performance indicators showed a robust airline performance during the period. The low standard deviation across all the performance indicators confirmed further that all the respondents concurred that the airlines had performed very well during that period.

The profitability statements; airline's profit margins and exceedance of industry's profit average, with a mean of 4.77 and 4.82 respectively, indicated that the respondents strongly agreed that airline profitability was excellent. With an average mean of 4.79 and a low standard deviation ranging from 0.384 to 0.423, it suggests that there was very little variation among airlines pertaining to the view that airline profitability had been excellent in the past five years. The profit margins have continued to increase due to the resurgence out of the Covid-19. This profitability is considered to have exceeded the industry average due to the fact that the airlines under study were drawn from the medium to large category only where performance is also considered better in comparison to other airlines in the small airlines category.

The employee satisfaction statements; highly motivated employees with great job satisfaction and satisfactory relationship between management and employees, with a mean of 4.89 and 4.86 respectively, indicated that the respondents strongly agreed that employee satisfaction was excellent. With an average mean of 4.87 and a low standard deviation ranging from 0.31 to 0.35, it suggests that there was very little variation among airlines pertaining to the employee motivation and job satisfaction. The aviation industry being a highly professional sector, would dictate that the management and staff read from the same script if flight operations are to be conducted in a safe and efficient manner. This would also lead to the staff being committed to their jobs as they feel more valued by the management leading to greater job satisfaction.

The operational efficiency statements; prevalence of flight accidents, operational efficiency and in-flight services, with value of 4.67, 4.79 and 4.53 respectively, indicated that the respondents strongly agreed that operational efficiency for the past five year was satisfactory. With an average mean value of 4.66 and low standard deviation ranging from 0.411 to 0.538, it suggests that there was very little variation among airlines pertaining to the view that airlines had been conducting flight operations in an efficient manner. The minimal number of accidents and efficiency in airline operations can be attributed to the adherence to the industry standards and the need to remain competitive in the industry that had just been extremely affected by the pandemic.

Overall, respondents strongly agreed that airlines continued experiencing good performance in the past five years. Employee satisfaction dimension was the greatest indicator of airline performance followed by profitability and operational efficiency in that order.

The secondary data for the financial performance was derived from published financial documents for public limited companies. Out of seven airline companies under the study, only Kenya Airways and Jambo Jet are public limited companies, the rest are private limited companies that are legally not obliged to publish their financial statements. Jambo Jet being a fully-owned subsidiary of Kenya Airways, has its financial performance being consolidated within Kenya Airways Group's financial statements as stated in Kenya Airways Integrated Report (2022). The data in Table 6 below is for both Kenya Airways and Jambo Jet airlines analyzing the total profits, total assets, total liabilities, total equity and cash flows data as derived from the consolidated Annual Reports from year 2017 to 2022.

Table 6: Kenya Airways and Jambo Jet financial performance in billions

S/No	Airline	2017	2018	2019	2020	2021	2022
1	Total Profits	(9.24)	(5.94)	(8.85)	(46.26)	(19.17)	(24.75)
2	Total Assets	146.14	136.63	195.67	171.46	155.55	168.91
3	Total Liabilities	191.05	139.12	213.56	235.62 (64.16)	238.89	277.00
4	Total Equity	(44.91)	(2.48)	(17.89)	7.72	(83.33)	(108.09)
5	Cash Flows	9.17	6.43	3.09		6.09	9.63

Source: KQ's Consolidated Annual Reports (2017, 2018, 2019, 2020, 2021 & 2022)

Table 6 above indicates that the profitability of the two airlines consistently showed negative total profits from 2017 to 2022. However, there was profit performance improvement from Ksh -9.24 billion (2017) to Ksh. -8.85 billion (2019). As a result of pandemic outbreak, profits further dipped in 2020 to Ksh. -46.26 billion but the profits were rejuvenated to Ksh. -19.17 billion in 2021 and further slipped to Ksh. -24.75 billion in 2022 indicating persistent operational changes.

The annual reports for Kenya Airways for 2023 and 2024 have shown that the company has continued to have a positive profitability trend. The Kenya Airways press release (2024) reported that the company, for the

first time since 2013 made a profit after tax. The airline achieved after tax profit of Ksh 513 million compared to a Kshs 21.7 billion reported in the year ending 2023. The company attributed the results to operational excellence, customer satisfaction and innovation. This significant milestone in profitability is in concurrence with the Survey Data (2025) that indicated that the respondents strongly agreeing to profit margins positively increasing from the 2020 to 2025.

The total assets generally increased from Ksh 146.14 billion (2017) to Ksh 168.91 billion (2022) indicating a continuous investment in fleet modernization and general infrastructure that could tackle the safety needs of the company. The total liabilities grew significantly from Ksh 191.05 billion (2017) to Ksh 277.0 billion (2022) indicating an increase in operating costs to service the improving profitability trend. The results of liabilities exceeding the company's assets led to the shareholders' equity declining from Ksh -44.91 billion in 2017 to Ksh -108.09 billion in 2022.

Lastly, the cash flows remained positively stable ranging from Ksh 9.17 billion in 2017 to Ksh 9.63 billion in 2022. This indicated that despite the times when the airlines were making huge losses like in 2022 due to the effects of covid-19, the airlines still generated some liquidity. This is attributed to the efficient management of operations and sustainable ticket sales as a result of customer confidence, loyalty and strong safety reputation. This concurs with the Survey Data (2025) that the airlines strongly agreed to having achieved optimum operational efficiency levels from 2020 to 2025.

Regression Analysis

Findings of the regression model tested whether safety management system significantly predicted airline performanc in Kenya are presented in this section. The measure of performance included both financial and no-financial perspectives.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Airline Performance	0.738	0.544	0.518	0.84313

Predictor: (Constant), Safety Management System

Source: Survey Data (2025)

Table 7 above presents the model summary results showing R value of 0.738 indicating very strong correlation safety management system and the performance of airlines. Therefore, this model explains the substantial measure of variations on the airline performance as a result of safety management system. R Square value of 0.544 indicated that 54.4% variability in airline performance was a result of safety management system.

Table 8: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sig.
Airline Performance	Regression	44.991	3	14.997	21.097	.000b
	Residual	37.676	53	0.711		
	Total	**82.667**	**56**			

Predictor: (Constant), Safety Management System

Source: Survey Data (2025)

Results of variance in Table 8 above indicate the model having a high F-statistic of 21.097. This demonstrates that the model is significantly better to predict airline performance with safety management system predictor as compared to a model without it. Probability value of 0.000 confirms statistical significance of the overall model. This indicates that the model was valid and reliable to explain airline performance based on application of safety management system strategies.

Table 9: Regression Coefficients

		B	Std. Error	Beta	T	Sig.
Airline Performance	(Constant)	13.554	2.760		4.911	0.000
	Safety Management System	0.428	0.085	0.558	5.057	0.000

Source: Survey Data (2025)

Table 9 above indicate regression coefficients results that were used to test safety management system significance in predicting airline performance. Without the influence of SMS, the performance of airlines is expected to be at 13.554. This constant is statistically significant with a probability value of 0.000 that is less than 0.05. This demonstrates the existence of other factors not included study that influence airline performance in Kenya.

Results of regression model and follow-on analysis are presented below.

$$\mathbf{Y = 13.554 + 0.558\ X_1 + \varepsilon}$$

In which;

Y = Airline Performance

X_1 = Safety management system

ε = Error term

The safety management coefficient of 0.558 implies that, with the assumption of other variables remaining constant, increasing safety management system by a unit would result in the improvement of airline performance by 0.558 units. The p-value of 0.000 indicates high significance and therefore confirming that SMS has a strong positive impact on airline performance.

CONCLUSION OF THE STUDY

The study concluded that safety management system significantly affected airline performance in Kenya. This indicate that the structured safety management system frameworks embodying safety policies, safety risk management and safety awareness, were critical of improving overall airline performance of airlines concerning operational efficiency, profitability and employee satisfaction levels. Therefore, the respective airlines have to strengthen SMS frameworks that include policies and procedures for hazard identification, risk assessment and emergency response and regulatory bodies must ensure SMS compliance for the reduced prevalence of aviation accidents and improved airline performance.

RECOMMENDATIONS OF THE STUDY

Based on study findings and conclusion, the study recommends that airlines should develop and continuously update their internal safety policies to ensure consistency and full compliance with both local and international aviation safety standards and regulatory requirements. This includes integrating safety objectives, responsibilities, and procedures into daily operations and creating a culture where adherence to safety is non-negotiable. Robust safety policies enhance organizational commitment to safety, which positively influences airline performance by reducing prevalence of incidents and accidents, improved reputation for customer satisfaction and enhanced competitiveness.

The study recommends that airlines should implement advanced hazard identification and risk management systems and processes to proactively manage emerging safety concerns. This includes regular safety audits, data-driven risk analysis, real-time monitoring tools and mitigation strategies to prevent hazards and risks from developing into incidents and accidents that can be costly in terms of both injury to personnel and damage to equipment. Effective safety risk management helps in minimizing operational disruptions and occurrence of accidents thereby improving overall airline performance.

The study recommends airlines to institutionalize safety awareness and training programs for continuous training of all airline employees. These programs should include emergency response drills and updated training on new safety protocols, emergency procedures, and the importance of reporting any safety concern. Increasing safety awareness leads to greater employee engagement in safety practices, reducing human error and enhancing operational efficiency. Equally, passenger safety briefings should be informative, engaging and tailored to enhance their awareness and preparedness in case of an eventual safety response requirement. This also improves the passengers' perception of the airline's safety culture that is ideal for customer satisfaction and retention.

The study recommends airlines to expand their safety departments to oversee the implementation and monitoring of safety management system strategies. These units should be well-resourced and report directly to executive leadership for effective performance. This not only reinforces safety as a strategic priority but also underscores the importance of safety management system as a key predictor of airline performance especially in reducing prevalence of accidents and enhancing staff productivity.

The study recommends airlines to deepen their working relationships with regulatory authorities in ensuring compliance with safety regulations and to benefit from shared safety data and insights. Collaboration facilitates timely updates on safety standards and supports the development of industry-wide safety improvements, which contribute to better safety records and improved customer confidence. Airlines are encouraged to participate in safety forums, comply with monthly safety reporting, and support research initiatives by availing relevant operational data that can be instrumental in shaping evidence-based policy and continuous industry improvement.

Lastly, the study recommends airlines to strongly invest in advanced technology such as safety management software, real-time monitoring systems, and automated reporting tools can improve the effectiveness of safety management systems. This technology can enhance data accuracy, enables quicker response to safety issues, and supports decision-making processes that promote safer and more efficient airline operations as time is of essence in acting on advance hazard and risk alerts and warnings to ensure flight safety.

Suggestions for Further Study

The study focused on effects of safety management system on the performance of airlines in Kenya. Findings and conclusions are therefore limited to only those airlines that are registered and operating in Kenya. All airlines operating in the Kenyan airspace, whether registered in Kenya or not, have significant

influence on operations and performance in the industry. Therefore, future research should include all airlines operating in the Kenya airspace in order to validate the findings and conclusions of this particular study.

This study embarked on the use of employee satisfaction aspect of measuring performance. Being a service industry that is also concerned with the perception of customers in terms of service quality and operational efficiency, further research should focus on the hybrid of both customer and employee satisfaction levels than limiting the focus to only employee satisfaction levels of measuring airline performance based on the implementation of safety management system.

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