Design and Implementation of Airline Reservation and Ticket Booking System Using Multimodal Identification

Adesuwa Enoghomwanse, Okeke O.C, Nwafor Anthony .C

Chukwuemeka Odumegwu Ojukwu University, Department of Computer Science Faculty of Physical Science, Anambra State.   Nigeria.
Chukwuemeka Odumegwu Ojukwu University,Department of Computer Science Faculty of Physical Science, Anambra State.Nigeria
Chukwuemeka Odumegwu Ojukwu University,Department of Computer Science Faculty of Physical Science, Anambra State.Nigeria.

ABSTRACT
Airline reservation and ticket booking system using photo identification and one time password is a research work that will help build aircraft booking portal in Nigeria. It will also help to build an effective information management for customer and air traveler. The problem of the existing system includes: Delay in data processing, errors in documentation, impersonation, ticket forgery, insecurity of data and information, illegal extortion and the following solution were used to solve the existing problem which includes using photo and OTP as a means of identification which will guarantee maximum security, saves a lot of time and ensures accuracy of all valid tickets. Hypertext Preprocessor (PHP) scripting programming language was used for the software design and web development while MySQL was used for the Database, The methodology adopted was Object Oriented Analysis and Design (OOADM). This research work was aimed at developing a system for making checking of flight ticket and document easy among aviation and security agents and detection of fake traveling ticket. The design software served as a more reliable and effective means of detecting and recovering of fake ticket in our airport, remove all forms of delay, stress, insecurity as well as enabling one to understand the procedure involved. This research work met all the objectives intended and it is recommended for use.
KEYWORDS: Airline, Reservation, Multimodal, Ticket, Booking

I.   INTRODUCTION
In science and technology, the desire for improvement is a constant subject which triggers advancements. This is visible in every ramification and the airline industry is not an exemption. Airline reservation systems were first introduced in the late 1950s as relatively simple standalone systems to control flight inventory, maintain flight schedules, seat assignments and aircraft loading. Today modern airline reservation systems are comprehensive suites of products to provide systems that assist with a variety of airline management tasks and serves customer needs from the time of initial reservation through completion of the flight. Airline reservation and ticket booking system is one of the major unit in the airline traveling system. It is a reservation for an itinerary made in the airline system either directly by the passenger or by an agent, the itinerary includes all the details needed for the issuance of an air ticket. An airline ticket is a document or electronic record issued by an airline or a travel agency that confirms that an individual is entitled on a flight or an aircraft (Ajulo, 2017).

Airline ticket is a voucher that indicate that an individual is entitled to admission to an event. Airline ticketing is a kind of user assistance where customers can book tickets for flight online, this is an easy method which saves a lot of time. Customers who wish to travel by air nowadays have a wide variety of airlines, and a range of timings to choose from. Nowadays competition is so fierce between airlines that there are lot of discounts and a lot of luxuries given to customers that will give an edge to a particular airline. The World Wide Web has become tremendously popular over the past years, and currently most of the airlines have made provision for online reservation of their flights. The internet has become

a major resource for people looking for making reservations online without the hassle of meeting travel agents (Desmond, 2020). The timely movement of aircraft and passengers requires even more timely movement of information. This was never truer than today, where information has become not just an operational tool, but a competitive weapon. To capitalize on this information, the technological revolution and the information society have brought us a dazzling set of capabilities. But they have also brought us a bewildering array of options for services, costs, methods and products. In Airline industry, Airlines, airports, and even governments are competing against each other for travel related income. Staying in front means making investments in enhanced customer service tools, improved management awareness, quicker access to operational information, etc, All of the technology and service options, and the need to make rapid, well informed decisions, means that many organizations are finding it increasingly difficult and expensive to find and retain staff to meet the demands(Desmond, 2020).

The effective use of Airline Information System can help solve many problems. Booking is the act of making an official record of something or somebody, booking is an act of reserving space and accommodation (oxford dictionary, 2021 edition). A booking by itself is normally not sufficient to gain access, the organization must determine that the costumer or individual has a need to know the information, no one is supposed to be granted access to classified even or information solely because of rank or position, but once booking of ticket is obtained, access to information or gain of freedom to a place will be granted. As many government organizations have choosing to pursue the dynamic documentation options available online, the advantages of online ticket booking are many. As people of all ages and backgrounds become increasingly relying on the internet for information, airline ticket booking system become more convenient and efficient with photo identification and OTP. The skills needed to access and comprehend information online are becoming easy, and the flexibility of wireless computing means that any coffee shop, airport or bedroom can become a booking centre. The changing internet landscape now includes computer-based booking or registration system, manual booking or registration system and other applications. However, documentation is still the most popular thing every sector needs to safeguard information. Airline booking office is one of the government or private

sectors in Nigeria, It was introduced in 1950 located almost in all airports in Nigeria.

The term booking implies to allow by grant of authority. Therefore, a ticket booked is an agreement or contract between two parties namely the issuer and the costumer (Evelyn, 2017). The government of Nigeria reached an understanding with agreement to set up aviation sector that will be in charge of aircraft activities including booking of flight ticket as to reduce fake and faceless costumers and having full identification of all passengers. Before now this sector was using manual or traditional way or method of registering or booking which has been a difficult issue for our aviation sector and security agents and other assigned agents to trace fake ticket. In aviation offices there is need for automated method of keeping data with this World Bank and development report (2019) shows evidence that the new industries and jobs in the technology sector outweigh the economic effects of workers being displaced by automation. This would go a long way in alleviating the various problems and stress involved in the manual method of ticket booking and detecting fake ticket. Moreover, the issue of passenger delay and fake identification of owner of ticket as a result of inability to access data or information within the aviation sector would be curtailed.

Computer-based training and knowledge is one of the most important investments a country should provide to its people and the future as it unlocks a country's potentials for economic growth. In this 21st century people became more literate especially with the use of computers in the new era of advanced technology it helps boost work speed, reduces mistakes and promotes the generation of accurate results , Collins dictionary (2021 edition). Fortunately, the introduction of computers greatly improves the speed and efficiency of ticket booking and registration process especially in aviation industry. Results could be attained even right at every moment, reducing the time to a mere fraction compared to the time it takes if the booking, registration and checking is done manually. It also increases the level of the online experience because of multimedia enhancements. (Emirates, 2019) view multimedia as a field concern with the computer controlled integration of text, graphics and moving of images (video) animation, audio and any other media information stored. Online and computer based airline ticket booking system using OTP and photo identification is a system that facilitates the detection of fake ticket carriers among airline passengers. This system has been developed to simplify the process of

organizing aviation information and make it convenient for security agencies to detect any fake ticket remotely from their checking point and clearance using any device, e.g. computers or cell-phone while taking result into consideration. The concept of this system was somehow adopted from the Direct-recording electronic registration machine. A Direct-recording electronic (DRE) registration machine records information by means of a documents display provided with mechanical or electro-optical components that can be activated by the licensing office such as phone buttons or touchscreen that processes data with computer software, and that records information, data and ticket owner images in the computer memory. After the registration, it produces a tabulation of the registered data stored in a removable memory component. These systems use a precinct count method that tabulates information at any check point. They typically tabulate information as they are registered and print the result in case of fake ticket alert. As for the photo and OTP identification system, it will provide online displaying of picture of the ticket owner and the OTP centralized online tallying of document with one ticket carrier poses in which the data will be stored in a database for results. This research work tries to cover the problems confronting aviation workers and security agencies at check point, booking office and clearance point during registration and suggests a system that would ensure that any passenger bringing fake airline ticket in airport is detected and apprehended.

STATEMENT OF PROBLEM
a. Inability to identify and access fake/original document.
b. Forgery of ticket by passengers/aviation workers.

OBJECTIVES
a. To give an instant and automatic result during checking-in of passengers using a device to check or access original document.
b. It will not give room for aviation staff or individual to forge/manipulate documents

II.   LITERATURE REVIEW
The airline reservations system was one of the earliest changes to improve efficiency in the airline industry. Airline Reservation System eventually evolved into the computer reservations system (CRS). Airline Reservations System (ARS) is a computerized system used to store and retrieve information and conduct transactions related to air travel. The systems were originally designed and operated by airlines, but were later extended for the use of travel agencies (Wikipedia, 2019). The deregulation of commercial aviation rendered computerized reservation systems essential to airlines, and they remain so today. However, a key change in the years that have passed since then has been the privatization of such technology. While airlines previously developed their own reservation systems, this is now typically the domain of private companies. Modern reservation systems allow passengers to directly make their bookings on their chosen airline's website. They store information like schedules, booking class rules, and fares/tariffs. The latter is particularly important today, in the age of dynamic pricing. Meanwhile, global distribution systems are the mid-point between travel agents and service providers.

According to (Jones, 2020) in his view ticket booking is an act of reserving, space or accommodation. This has a wide range of applications since the ticket is the primary key most widely accepted human readable and mandatory identifiers of traveler. Ticket booking is very important because it is an identification mark that distinguishes travelers from others. It shows the aviation staff the airline you belong. Ticket is a piece of paper or card that gives the holder a certain right especially to enter a place or travel (Kenneth, 2019). Ticket code is the only a unique code for customer or air traveler identification in any country database. It is an important resource of accessing the owner It is in this view that Nigeria government made it compulsory to every air travelers must book for ticked in aviation industry. The federal ministry of aviation is charged by law with the responsibility of enforcing adherence to design, produce and maintain aircraft throughout Nigeria using aviation staff, the same law empowers airport authorities and authorized the security agencies to carryout regular supervision or inspection and checking on airline and air travelers to identify fake document/ ticket and identifying of fake passport too.

Airline deregulation occurred in 1978, magnifying the importance of computerized airline reservation systems and their accessibility. During the early 1970s, as travel agents pushed for access to reservation systems, and certain airline executives made investments for the sake of accessing the systems of other airlines, antitrust laws came into focus. The purpose of the 1978 Airline Deregulation Act in the United States was to eliminate government control over commercial aviation, and ensure competitive behavior and fair business practices in the airline industry. Passengers could gain knowledge of market forces

and new market entry in the industry. Information on specific airlines and the industry as a whole became more widely and readily accessible, evolving the airline reservation systems from "standalone" operations toward GDS. Today, airline reservation systems have developed into computerized reservation systems which are of mission critical to the airline industry, about six major airline reservations systems are used by international airlines. Winston (1995)

III.   ANALYSIS OF THE PROPOSED SYSTEM

The proposed system is an enhanced Airline ticket booking system which will be making use of Photo and OTP as a means of identification for passengers at the airport. The proposed system works with virtue of passenger's registration details, ticket number and majorly with passenger's photo and OTP. The passenger is been checked at the counter by the staff of the Airline if the OTP and photo with other information are same with the one on the airline database.

Introducing the new system will help to know the real owner of a particular ticket using photo and OTP identification, the proposed systems will check if the database of a particular ticket is in line with the airline database. When the OTP of the passenger is not as the same on the airline database that means the passenger is not eligible to fly in the aircraft. The system can also check if a particular ticket is a fake one or not. Passengers are been checked at the counter of the airport by the airline staff if the details brought by the passenger is same with the one on the airline database. Introducing the new system will help to know the real owner of a particular ticket using photo and OTP identification, the proposed systems will check if the database of a particular ticket is eligible to apply fly as well. When the system did not accept the ticket number, or the picture and OTP of the passenger is not as the same on the airline database that means the passenger is not eligible to fly in the aircraft. The system can also check if a particular ticket is a fake one or not. If peradventure there is any issue as regards the passenger details, the passenger will not be allowed to fly and thereby will be handed over to the security department.

IV.   METHODOLOGY ADOPTED

The methodology used in this research work is Object Oriented Analysis and Design Methodology(OOADM)

V.   DISCUSSION

Airline Reservation and ticket booking system using photo identification and OTP is a research work that will help build strong and reliable aviation system in Nigeria. It will curb insecurity among passengers, staffs and the aviation industry as a whole and also help to build an effective information management for airline passengers. It is aimed at developing a system for making booking and authentication good. The design software will serve as a more reliable and effective means of conducting checking of passengers, remove all forms of delay, stress, insecurity as well as enable you understand the procedure involved as well as how to travel with ease and system now makes use of photo and OTP as a means of identification. Hence, data can now be processed with great speed and efficiency automatically thereby relieving the aviation staff of work stress, maximum security of data is ensured with proper and accurate identification of passenger.

VI.   CONCLUSION

Research and development are continuous process, this is same in computer and software development. However, the effectiveness and efficiency of this new system provides room for further improvements. As earlier mentioned, some of the objectives of this project were actualized. So the objectives of this project could be improved upon. Nevertheless, the airline ticket booking system developed will offer greater opportunities in aviation industry

REFERENCES
[1]. Ajulo S.B. (2017). Aviation Handbook (Volume 1 no. 2, pp. 27-35) Vantage Publishers Limited, Ibadan, Nigeria.
[2]. Arik Air. (2019). Viewed on August 4, 2019 from http://www.arikair.com airline Reservation Systems, Retrieved from
[3]. http://en.wikipedia.org/wiki/Airline reservations system.
[4]. Diane (2019) Computer Reservation Systems: "Action Needed to Better Monitor the CRS Industry and Eliminate CRS Biases", DIANE Publishing Company, ISBN1568069774
[5]. Copeland D.G., Mason R.O & McKenney J.L (2019). SABRE: TheDevelopment of Information-Based Competence and Execution of Information-Based Competition, IEEE Annuals of the History of Computing
[6]. (vol. 17, no. 3, pp. 30-57).

[7]. Desmond (2020). Max Hopper knows Sabre's 'softwareguts': American Pushing Limits of Software at 2,000 + TPS - transactions per second. Available at: http://findarticles.com/p/articles/.

[8]. Emirates Airlines (2019). Viewed on August 4, 2019 from http://www.emirates.com.ng.

[9]. Evelyn R. K. (2017). System Integration, Testing of the Systems, Applications and Products.

[10]. French C.S. (2018). Computer science. DP publications limited (3rd ed. pp. 606, 617, and 630). Aldine place, 142/144 Uxbridge road London.

[11]. Inventory Management. In Wikipedia (August, 2017). Retrieved from http://en.wikipedia.org/wiki/Inventory.

[12]. Jones P. (2020). Flight catering: ButterworthHeinemann 2nd Edition.

[13]. Joslin C. (2018). Transport and Transportation in Nigeria.http://www.uni.edu/gai/Nigeria/lessons.

[14]. Kenneth C. L. (2019) . Management Information. Systems: Prentice Hall 12th edition.

[15]. Lang M.W. (2018). Information Systems Development: Challenges in Practice, Theory and Education.

[16]. Milde M. (2018). International Air Law and ICAO: Eleventh International Publishing

[17]. Nnodim, O. (2019). Nigeria‘s Aviation Industry Records Growth in Passenger Figure http;//24.net/csp/ems/sites.

[18]. Olalerin, E.A. (2019). MMIAs Optimism on Traffic Growth, Expansion Aviation and Allied Business Update:Nigeria‘s Journal of Aviation Development September -October, 2019.

[19]. Overland Airways. (2018). ―The Existing Airline Reservation System Explored in Available at: http://www.overlandairways.com.

[20]. Overland Airways. In Wikipedia (July, 2018). Retrieved from http://en.wikipedia.org/wiki/Overland_Airways.

[21]. Raimo, H. (2019). Implementation of Information System as an Organizational Construction: VTT Publications.

[22]. Shelly G.R. (2019). Systems Analysis and Design. (8th Ed.). Shelly Cashman Series.

[23]. Seth P.N & Bhat S.S (2017): "An Introduction to Travel and Tourism", Prentice Hall, London. Protection for Consumers," Sept. 4, 2008 retrieved on June 6, 2012 from http://www.ehow.com/about_5122697_airline-reservation-systems.html

[24]. Smith M.J (2019). "The Airline Encyclopedia, 1909 – 2000". Scarecrow Press, New York.

[25]. Ultimate Technology Company, The Information System of an Airline, viewed on August 4, 2020 fromhttp://www.ultitek.com/information_system.html.

[26]. Vidgen R.D (2020). Developing Web information systems: from strategy to implementation: Butterworth-Heinemann.

[27]. Vikram V. (2019). How to Do Everything with PHP & MySQL: McGraw-Hill Companies

[28]. Winston, C. & Morrison, S.A. (2017). The Evolution of the Airline Industry. Washington: The Brookings Institution.