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Global Airline Reservation and Ticketing System with Centralized Database Management

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Abstract - The online reservation system was originally taken from GDS (Global Distribution System), which is also known as a computer reservation system. The system provides a strong platform for managing airlines by providing details on the airplane, the rent's tariff, passenger reservation and ticket posts. The inventory of an airline includes all flights along with their accessibility status, which ensures real -time updates and accuracy. The system is powered by a centralized database, which accesses through an application programming interface (API), which enables spontaneous connection and interactions. With the arrival of the online reservation system, passengers and airlines have achieved flexibility to book and manage airline tickets to increase the facilities and efficiency at anytime and anywhere, anywhere, anywhere, facilities and efficiency. The system also facilitates flawless reservations and eliminates manual processes exposed to errors.

Key Words: *Global Distribution System,Ticket System,Centralized Database,Ordering Flights*

1.INTRODUCTION

In today's mutual connected world, flights have become an important part of global mobility. Airlines, travel agencies and passengers rely on the reservation systems with comfortable, skilled and real time to book flights, manage tickets and ensure a smooth travel experience. This is where a global flight service and ticket system plays an important role.An airline system (ARS) is a software platform that manages flight bookings, seat tasks and issuing tickets. This allows passengers to book tickets online, check the availability of aircraft and revise the reservation. Integrated with global distribution systems (GDS) such as Amadeus, Saber and Travel Port, these platforms combine airlines with travel agencies and book websites worldwide.

The centralized database management system ensures that all airlines plans, passenger details, ticket information and seat availability are stored and managed in a uniform platform. This happens: Real time updates Accessibility, pricesand instant synchronization of the reservation. Data accuracy and security - reduces errors andfraud, and ensures compliance with global aviation regulations. Operating efficiency airlines streamlining procedures for travel agencies and passengers.

Seamless passenger experience -enables simple ticket modifications , cancellation and reconstruction in many channels. With the growing amount of flights, airlines need to control millions of passengers daily. The centralized database enables a strong airline and ticket system operated by the management: Fast and safer order. Effective resource allocation (seat, crew and aircraft). Customer experience through.

2.OBJECTIVE

The primary goal of the global airline and the ticket system is to take advantage of advanced web technologies and a centralized database frame and bring revolution in the traditional airline's ticket and reservation process. The project aims to provide reliable ,user-friendly platform that simplifies ordering, cancellation and ticket management for both passengers and aircraft operators. An application is trying to offer real-time data access through the programming interface (API), increase the system's operating efficiency, improve customer experience and ensure data placement.

The system is designed to allow passengers to eliminate addiction to physical ticket counters or intermediaries when appropriate, anytime and anywhere. The air inlet section is looks like a rectangular shape in front view. It consists of the honeycomb. By centralizing the airplane, ticket tariffs and accessibility conditions in a strong database, the system ensures that all stakeholders' airlines, travel agencies and passengers reach the same updated information. Another main goal is to reduce the possibility of errors or conflicts in order, which was common in manual processes. For aircraft operators, the goal of the system is to streamline inventory management, adapt resource distribution and reduce operating costs.

This data wants to streng then the airlines with analytical and the reporting equipment, which may enable them to make informed decisions on flying routes, prices, Strategies, and passenger preferences. In addition, the system is designed to handle large transaction versions without compromising speed or security, which ensures scalability to increase the airline.

On the technical front, the goal is to build a strong, scalable and safe system that is able to integrate with the global distribution network and follow international aviation standards. Ultimately, the purpose of this project is to create a platform that not only improves operating efficiency for airlines, but also promotes trust and convenience for passengers, contributing to modernization and digital changes in the aircraft industry.

3.PROPOSED WORK

The new online reservation system maintains the database centrally, giving clients the information they need from anywhere in the world at any time. This system utilizes an API (Application Programming Interface) to extract data from the central database, ensuring seamless and real-time access. The central database monitors all data changes made on the client side and updates itself automatically, eliminating discrepancies and ensuring accurate, up-to-date information.

With the online reservation system, passengers can conveniently book and purchase tickets from their home or office without needing to visit airlines or agents, saving significant time and money. This approach not only benefits customers but also reduces the workload on airlines and agents, allowing them to focus on improving other operational areas. Additionally, because information is stored centrally, passengers no longer face the risk of losing tickets, as all booking details are securely preserved in the system.

The system also facilitates enhanced user experience by offering features such as instant confirmation of bookings, easy cancellations, and modifications. With multi-airline integration, passengers can compare flights, schedules, and prices on a single platform, ensuring they make informed decisions. Furthermore, the system provides robust security measures to protect sensitive passenger information, such as encryption protocols and secure payment gateways. Scalability is another key advantage, enabling the system to handle high transaction volumes during peak seasons without compromising performance.

Automated processes reduce manual interventions, minimizing errors and increasing operational efficiency. By modernizing airline ticketing and reservation processes, this system promotes customer satisfaction and aligns with the digital transformation goals of the aviation industry. Ultimately, it bridges the gap between passengers and airlines, fostering a seamless, efficient, and user-friendly booking experience.

4.SYSTEM ARCHITECTURE

The Traveler is the primary actor who interacts with the system in multiple ways. They have the option to Book Ticket Online, Book Via Agent, or Book at Counter, depending on their preference or access to services. When a traveler chooses to Book Ticket Online, they first perform an Online Enquiry to check the availability of flights, dates, and fares. Upon verifying the information, the traveler proceeds to Fill Details such as name, travel date, destination, and passenger information.

These details are then used to Book Ticket, which triggers the system to Update Database with the new booking information. After this, the traveler receives a Confirmation, ensuring that the booking process is complete and successful. Alternatively, the traveler can Book Via Agent, where the Travel Agent acts on behalf of the traveler. The travel agent also performs an Online Enquiry and fills in the required details to Book Ticket for the traveler.

In case the traveler prefers to go directly to the airline office, they can Book at Counter, where the Airline Counter In-charge helps them with the booking. This traditional booking method still involves filling out the necessary travel details and follows the same internal system flow, including booking the ticket, updating the database, and issuing a confirmation.

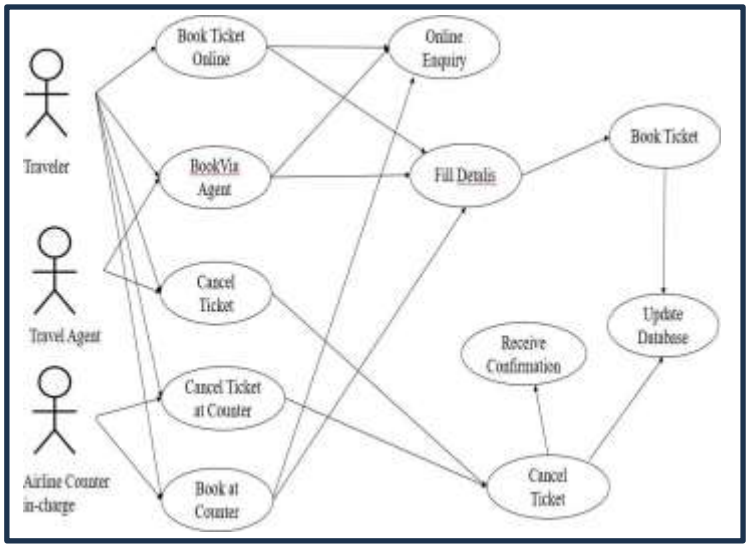


Fig 1 : System Architecture

5.1. Administrator Module

The Administrator Module is responsible for managing and overseeing the entire system's operations. It provides administrators with access to essential functionalities such as user management, vendor oversight, and platform settings. Admin can add, modify, or remove vendors, track customer transactions, and monitor system performance. They also manage flight schedules, seat availability, and oversee booking requests, ensuring all data remains accurate and up-to-date.

Additionally, the module allows for viewing analytic s, handling complaints, and generating reports related to sales, bookings, and system activity, ensuring smooth operation and continuous improvement of the

platform. Enables the airline administrator to perform all administrative functions and manage inventory. The administrator can define or modify routes, fares, schedules and assign or deny access rights for qualified travel agents and other authorized users.

5.2. Passenger Module

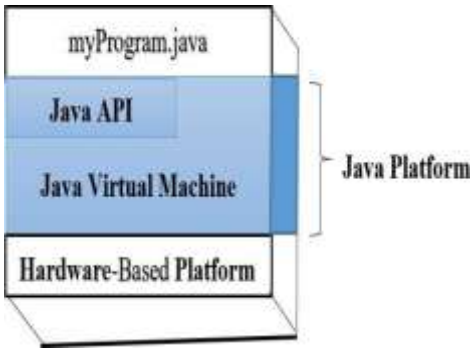
The Passenger Module is designed to offer a seamless and user-friendly experience for customers booking flights. Passengers can register and create personalized profiles, which help the system offer tailored recommendations based on their travel history.

The module enables users to browse available flights, view schedules, select seats, and book tickets easily. It also allows passengers to review their booking details, track the status of their orders, and manage personal information. Furthermore, passengers can rate services, provide feedback communicate directly with customer support through this module.

5.3.Check Flight Module

The Check Flight Module enables passengers to search for available flights based on their desired destination, travel dates, and other preferences. It displays a list of available flights, showing flight numbers, timings, seat availability, and fare details. This module also allows users to filter search results by different criteria such as airlines, departure times, or price range, ensuring they can find the most suitable options.

The module updates in real-time, ensuring that all flight details are accurate, and passengers can quickly identify flights that fit their schedule and budget. The web service will display any matching records based on the search criteria entered. The web service will notify the passenger about the flight availability. If the searched flights are available, then the web service will display flights. Otherwise, the web service will prompt to ask the user to re-enter new searching criteria.



5.4.Book Ticket Module

The Book Ticket Module facilitates the actual booking process for passengers. After selecting a flight from the "Check Flight" module, passengers can proceed with booking by entering necessary details such as passenger information, preferred seating, and any special requests. This module also supports pre-booking functionality, allowing users to reserve their flights in advance. Upon entering payment details, the system processes the payment, confirms the booking, and generates a ticket.

The module also handles cancellations and modifications, allowing passengers to update or cancel bookings when necessary. From the Check Flight, the passenger is required to log in and the web service will prompt the passenger to confirm the flights. The web service will then ask the passenger whether to update his profile details or not. Subsequently, the passenger will be asked to purchase and confirm the selected flights.

6.SOFTWARE REQUIREMENTS

A platform is the hardware or software environment in which program runs We already mentioned some of the most popular platforms like Windows 2000, Linux, Solaris, and MacOS. Most platforms can be described as a combination of the operating system and hardware. The Java platform differs from most other platforms in that it's a software only platform that runs on top of other hardware-based platforms. The Java platform has two components:

The Java Virtual Machine (Java VM). The Java Application Programming Interface (Java API). You've already been introduced to the Java VM. It's the base for the Java platform and is ported onto various hardware-based platforms.A platform is the hardware or software environment in which program runs We've already mentioned some of the most popular platforms like Windows 2000, Linux, Solaris, and MacOS. Most platforms can be described as a combination of the operating system and hardware.

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Figure 1. Working of java interpreter

The most common types of programs written in the Java programming language are applets and applications. If you've surfed the Web, you're probably already familiar with applets. An applet is a program to certain conventions that allow it to run within a Java-enabled browser. However, the Java programming language is not just for writing cute, entertaining applets for the Web. The general-purpose, high-level Java programming language is also a

powerful software platform. Using the generous API, you can write many types of programs. An application is a standalone program that runs directlyon the Javaplatform. A special kind of application known as a server serves and supports clients on a network. Examples of servers are Web servers, proxy servers, mail servers, and print servers. Another specialized program is a servlet.

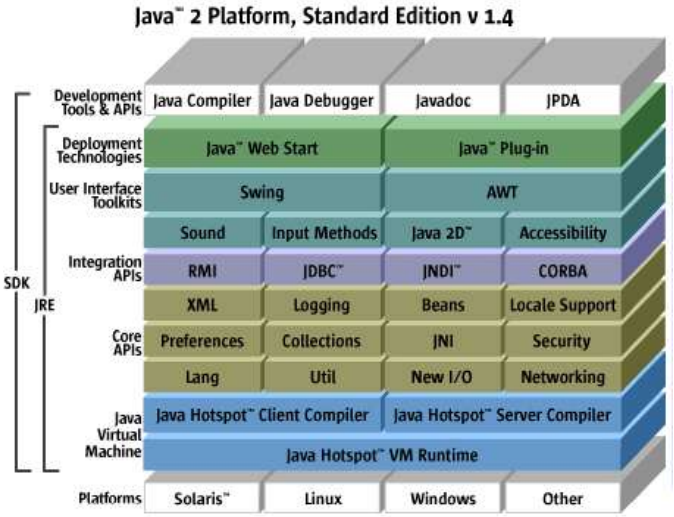

Figure 2.Java software development kit (SDK)

6.CONCLUSION

It is concluded that the application works well and satisfy the end users. The application is tested very well and errors are properly debugged. The application is simultaneously accessed from more than one system.Simultaneous login from more than one place is tested. This system is user friendly so everyone can use easily. Proper documentation is provided.The end user can easily understand how the whole system is implemented by going through the documentation.The system is tested, implemented and the performance is found to be satisfactory. All necessary output is generated. Thus, the project is completed successfully.

7.RESULT

Development and implementation of the airlines control system, administrator module, passenger modules, check flight modules and book ticket modules, led to significant improvement in operational efficiency, user experience and general system functionality. The following results were seen:

Increased Administrator administrative module control: Administrator administrative module control: effectively strengthened the airline by allowing administrators to manage routes, rent, plan and user access. The ability to supervise sellers, monitor transactions and generate display reports led to better decisions.

Better system performance: The system demonstrated increased performance in tracking real-time inventory, managing order requests and updating the availability of flights, ensuring accuracy and reducing deviations.

User-friendly experience: Passenger module provides easy access to seamless flight booking, personal recommendations and order history. This helped to increase customers' satisfaction and storage.

Skilled flight mechanisms: Czech flight modules provided real-time search opportunities, allowing passengers to filter flights based on several criteria, including departure time, airline and price. This made it easier to choose optimal travel options.

Success rate with high order: The book ticket module facilitates a smooth and secure ordering process. Integration of secure payment processing secured reliability, which led to an increase in complete transactions.

Reduction in order errors: Use of automatic verification of passenger details reduces less errors by issuing tickets, reducing the need to improve and interrupt.

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