Vel Tech
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R&D Institute of Science and Technology
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**SCHOOL OF COMPUTING**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**USE CASE SUBMISSION**

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|---|---|---|
| **Programme** | : | B. Tech Computer Science & Engineering |
| **Course Code / Course Name** | : | 10211CS223 / Machine Learning Techniques |
| **Year / Semester** | : | 2024-25 / Winter |
| **Faculty Name** | : | Dr N. Krishnaveni |
| **Slot** | : | S9L3 |
| **Task No** | : | 13 |
| **Title** | : | AIRLINE RESERVATION SYSTEM |

**Problem Statement**

Booking the Ticket at some particular registered ticket counters in online. Even above approaches make a ticket booking online, it was not completely done on online. Passenger may not have much freedom over this approach. Hence the Passenger may or may not be satisfied with this approach as it includes manual intervention like travelling to Airport for booking his ticket. Cannot Upload and Download the latest updates. No use of Web Services and Remoting. Risk of mismanagement and of data when the project is under development. Less Security.

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## Abstract

The Airline Reservation System is a comprehensive software solution designed to streamline and automate the process of booking airline tickets. It enables users to search for flights, check seat availability, compare fares, and make reservations efficiently. The system integrates key functionalities such as passenger management, ticketing, payment processing, and real-time updates, ensuring a seamless experience for both customers and airline operators. Built with a user-friendly interface and robust backend, it supports secure transactions and enhances operational efficiency by reducing manual errors. This system is adaptable for both intranet and internet usage, making it accessible globally while maintaining data integrity and reliability.

## Introduction

dification, and management of flight reservations. It allows airlines to tracktime seat availabil ity, fare adjustments, and passenger details, ensuring a smooth experience for customers and operational efficiency for airlines. The system integrates with global distribution systems (G DS) to provide access to a wide ranAn airline reservation system is a comprehensive platform that facilitates the booking, moge of flight options across various booking channels, includin g airline websites and travel agencies.

## Historical Evolution

Historically, airline reservations were managed manually, with clerks using paper records. As air travel grew, the need for a more efficient system became apparent. The first semiautomate d systems, such as SABRE (developed by IBM for American Airlines in the 1960s), revolutio nized the industry by allowing faster booking processes and better inventory tracking. Today, ARS has evolved into highly automated, cloudbased platforms that integrate seamlessly with other aviation technologies.

## Key Features

Real Time Updates: ARS provides reatime information on flight schedules, seat

availability, and pricing, allowing customers to make informed decisions quickly

## Conclusion

In summary, an airline reservation system is a critical component of modern air travel, enabli ng airlines to manage bookings efficiently while enhancing the customer experience. As tech nology continues to advance, these systems will likely evolve further, incorporating new feat ures and capabilities to meet the growing demands of travelers worldwide. Understanding ho w these systems work is essential for anyone involved in the aviation industry, from airline st aff to travel agents and passengers alike.

## Literature Survey

A comprehensive airline reservation system should have the following features [2] [3]:

- Real-time inventory: Reflects up-to-date flight schedules and availability

- Booking management: Manages reservations, cancellations, and modifications

- Payment processing: Facilitates secure payment transactions

- Revenue management: Optimizes revenue through dynamic pricing and inventory control

- Distribution management: Integrates with global distribution systems (GDS) and online travel agencies (OTAs)

- Loyalty program: Manages frequent flyer programs and rewards

- Departure control system: Streamlines check-in, boarding, and departure processes

**Technologies Used**

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**Technologies Used**

Modern airline reservation systems leverage various technologies, including:

- Cloud computing: Enables scalability, flexibility, and cost savings

- Artificial intelligence (AI): Enhances customer experience through personalized recommendations and predictive analytics

- Blockchain: Provides secure and transparent transaction processing

- Biometric authentication: Strengthens security and reduces identity theft

- Mobile apps: Offers convenient booking and management capabilities

## Benefits

Implementing an advanced airline reservation system can bring numerous benefits, including[4] [2]- Improved customer experience: Faster booking and management processes

- Increased revenue: Optimized pricing, inventory control, and ancillary sales

- Enhanced security: Advanced authentication and fraud detection

- Operational efficiency: Streamlined processes and reduced costs

## Challenges

Despite the benefits, airline reservation systems face challenges, such as:

- Integration with third-party services: Seamless integration with GDS, OTAs, and othertravel services

- Data security: Protecting sensitive customer information

- Scalability: Handling high volumes of bookings and traffic

## Future Directions

The future of airline reservation systems lies in emerging technologies like AI, blockchain, and the Internet of Things (IoT). These advancements will enable airlines to offer more personalized, efficient, and secure services, ultimately enhancing the travel experience [4].

## Methodology

### Phase 1: Requirements Gathering

1. Identify stakeholders (airlines, customers, travel agents)

2. Conduct surveys, interviews, and focus groups to gather requirements

3. Document functional and non-functional requirements

### Phase 2: System Design

1. Develop a detailed system architecture

2. Design database schema for storing flight schedules, bookings, and customer information

3. Create wireframes and user interface (UI) prototypes

### Phase 3: Development

1. Choose a suitable programming language and framework (e.g., Java, Python, React)

2. Develop the backend API for managing bookings, payments, and flight schedules

## 3. Implement the frontend UI using HTML, CSS, and JavaScript

## 4. Integrate with payment gateways and third-party services (e.g., flight schedule APIs)

**Phase 4: Testing**

1. Unit testing for individual components
2. Integration testing for API and UI interactions
3. System testing for end-to-end functionality
4. User acceptance testing (UAT) with stakeholders

**Phase 5: Deployment**

1. Deploy the application on a cloud platform (e.g., AWS, Azure, Google Cloud)
2. Configure load balancing, scaling, and monitoring
3. Ensure security measures (e.g., SSL/TLS, encryption)

**Phase 6: Maintenance and Updates**

1. Monitor system performance and fix issues
2. Gather user feedback and implement enhancements
3. Update the system to accommodate changing requirements and technologies

## Tools and Technologies

## Some popular tools and technologies for building an airline reservation system include:

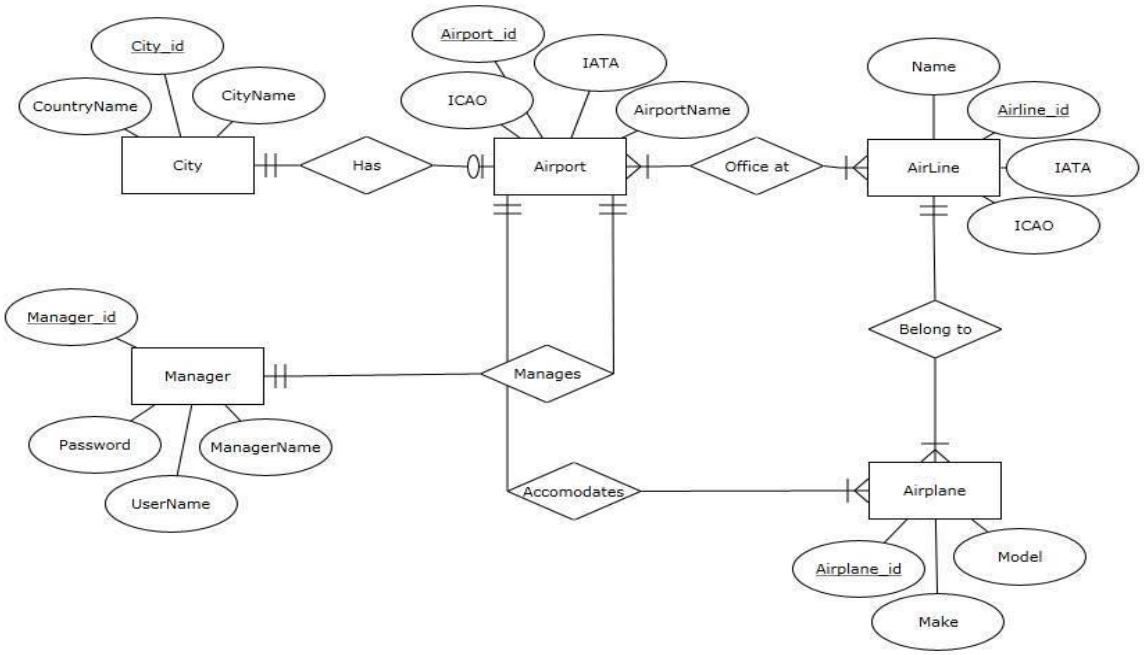
## - Programming languages: Java, Python, JavaScript

## - Frameworks: Spring Boot, Django, React

## - Databases: MySQL, PostgreSQL, MongoDB

## - APIs: RESTful APIs, GraphQL

## - Cloud platforms: AWS, Azure, Google Cloud Phase 1: Requirements Gathering




**Experimental Results**

**1. Retrieve all flights**

```
SELECT * FROM flights;
```

**2. Find available flights between two cities**

```
SELECT *
FROM flights
WHERE departure_city = 'City A'
  AND arrival_city = 'City B'
  AND departure_time >= CURRENT_DATE;
```

**3. Check seat availability on a specific flight**

```
SELECT seats_available
FROM flights
WHERE flight_id = 'FL123';
```

**4. Book a flight for a passenger**

```
INSERT INTO bookings (passenger_name, flight_id, seat_number)
VALUES ('John Doe', 'FL123', '12A');
```

**5. Retrieve booking details for a passenger**

```
SELECT *
FROM bookings
WHERE passenger_name = 'John Doe';
```

**6. Cancel a booking**

```
DELETE FROM bookings
WHERE booking_id = 'BK123';
```

**7. Update passenger information**

```
UPDATE bookings
SET passenger_name = 'Jane Doe'
WHERE booking_id = 'BK123';
```

**8. Find all flights departing from a specific city**

```
SELECT *
FROM flights
WHERE departure_city = 'City A';
```

**9. Retrieve flight schedule for a specific date**

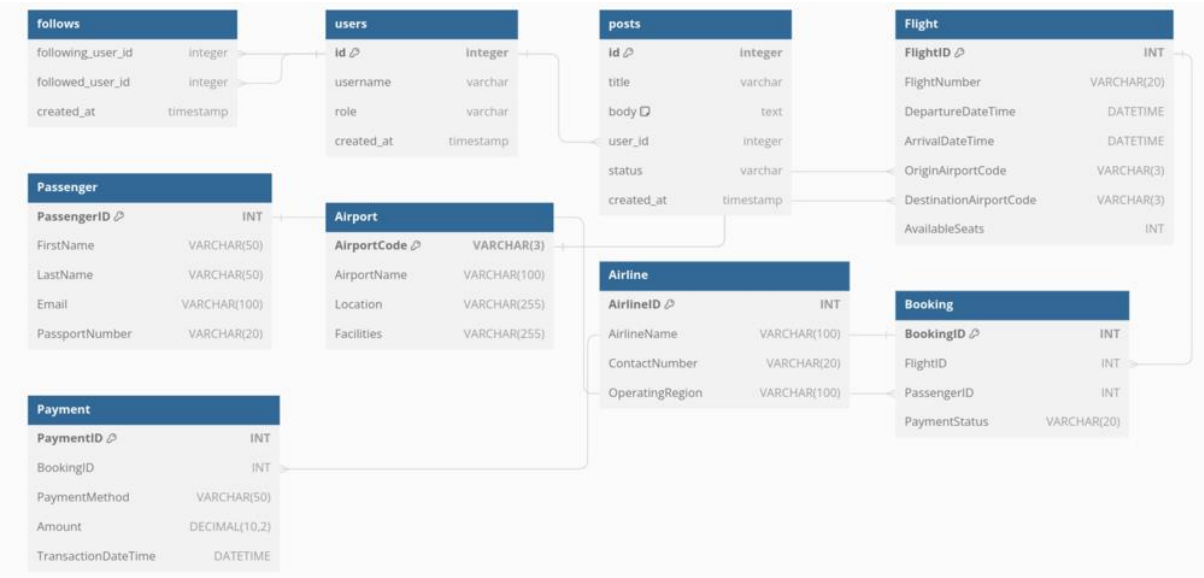
```
SELECT *
FROM flights
WHERE departure_time >= '2024-01-01'
  AND departure_time < '2024-01-02';
```

**10. Find the number of bookings for each flight**

```
SELECT flight_id, COUNT(*) as num_bookings
FROM bookings
GROUP BY flight_id;
```

These queries demonstrate basic CRUD (Create, Read, Update, Delete) operations and can be modified to suit specific requirements.

**Database Model for Flight Reservation System**




## Conclusion

Designing a relational database for a flight booking system involves identifying the entities, defining their attributes, establishing relationships between them, and enforcing data integrity. By following a systematic approach and considering the specific requirements of the system, a well-designed database can facilitate efficient flight booking processes and enhance the overall user experience.