



Vel Tech

Rangarajan Dr. Sagunthala

R&D Institute of Science and Technology

(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

SCHOOL OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

USECASE SUBMISSION

Programme : B.Tech Computer Science & Engineering

Course Code / Course Name : 10211CS207 / Database Management System

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Faculty Name : Dr. Krishnaveni.N

Slot : S7L1

Task No : 1

Title : AIRLINE RESERVATION SYSTEM

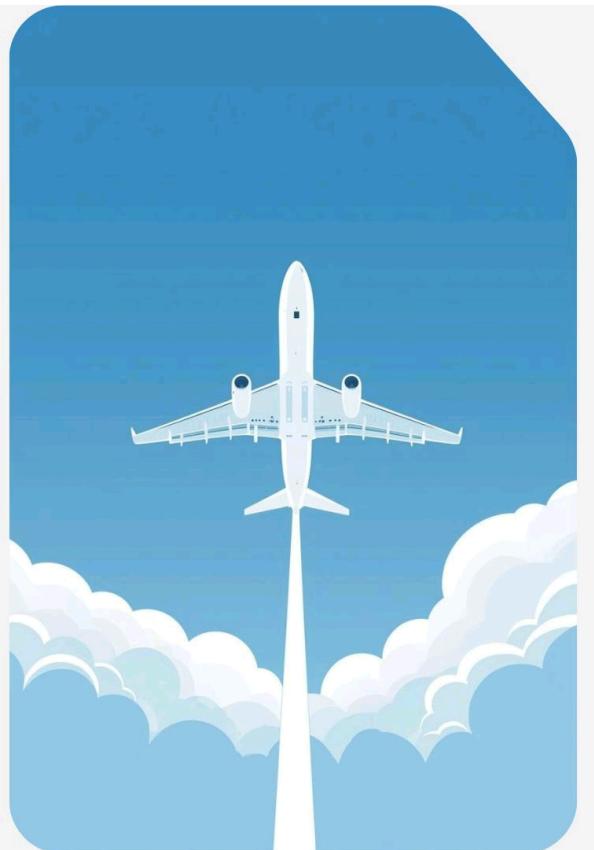
Problem Statement : The current flight booking process is slow, error-prone, and spread across multiple systems, making it hard for

customers to find seats, compare fares, and receive timely updates. Build an airline reservation system that lets users search flights, view real-time availability and pricing, book and pay securely, manage itineraries, and get notifications—while enabling staff to manage inventory, schedules, and reports efficiently.

Name of the Students

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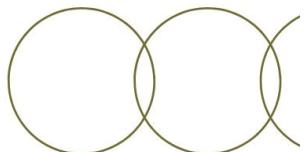
Airline Reservation Systems



Abstract Overview

AI and Machine Learning Insights

This study explores **the necessity** of AI/machine learning in enhancing airline reservation systems, focusing on improving **detection and classification tasks** to address emerging challenges in the industry.



Introduction to Airline Reservation Systems

Importance of Enhancements in Processes

Airline reservation systems face **significant challenges** in accuracy and efficiency. Improving detection and classification is critical for reducing fraud and enhancing overall customer experience within the industry.





Objectives and Scope

Understanding the Reservation System

System Complexity

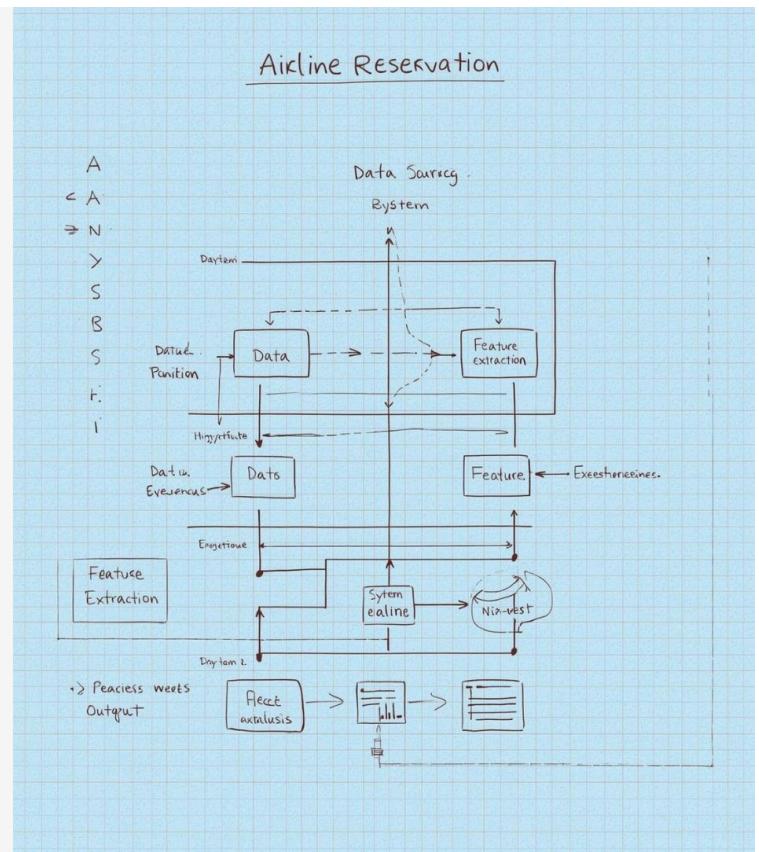
The airline reservation systems are complex due to their **multi-faceted nature**, involving various stakeholders, including passengers, airlines, and third-party vendors. They encompass intricate processes such as ticket booking, cancellations, and modifications, all while ensuring real-time accessibility to data. The challenge lies in managing vast amounts of data securely and efficiently, which is crucial to maintaining customer satisfaction and operational efficiency.

Detection Importance

Effective detection and classification tasks are essential within airline reservation systems to identify fraudulent activities and improve booking accuracy. By leveraging advanced techniques, such as machine learning, these systems can enhance their capabilities to detect anomalies and reduce errors. This ultimately supports **better decision-making**, leading to increased safety and customer trust in the airline industry.

System Architecture

Overview of the machine learning workflow design



Literature Survey



Comparison of Techniques

Conventional Methods

Traditional detection methods rely on **rules-based systems**, which lack flexibility and often fail to adapt to emerging threats in airline reservation systems, limiting their effectiveness in real-world applications.

AI Approaches

Machine learning techniques offer significant **advantages in adaptability** and accuracy, allowing for dynamic responses to evolving patterns in data, thus improving detection capabilities in airline reservation contexts.

Research Gaps

Despite advancements, there remain **critical gaps** in current research, particularly in integrating machine learning models with existing systems, which this study aims to address through innovative methodologies.

Literature Survey

Traditional Methods

Traditional detection methods in airline systems rely on rule-based techniques, often failing to adapt to evolving fraud patterns effectively.

AI Approaches

AI-based techniques leverage data patterns, enhancing detection accuracy while reducing false positives compared to conventional methods significantly.

Previous Studies

Notable studies have demonstrated the success of machine learning in fraud detection, highlighting the need for continuous research in this domain.

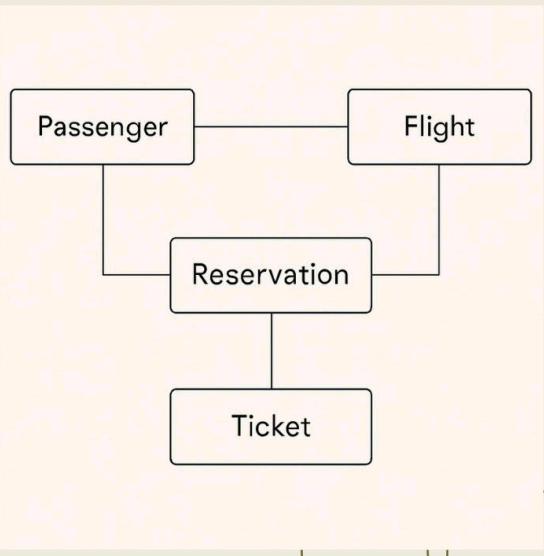
Research Gaps

Existing literature reveals gaps in addressing real-time fraud detection, motivating further exploration of adaptive machine learning solutions.

Methodology Overview

System Approach Explained

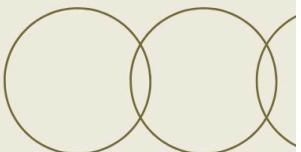
This section elaborates on the **system design** and methodology implemented, highlighting the innovative approaches utilized to enhance the airline reservation system's performance through efficient detection and classification techniques.



Dataset and Preprocessing Techniques

Understanding Data for Modeling

The dataset used comprises **thousands of airline reservation records**, sourced from various industry partners, requiring thorough preprocessing steps like cleaning, normalization, and encoding to ensure accurate model training.

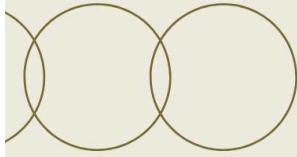
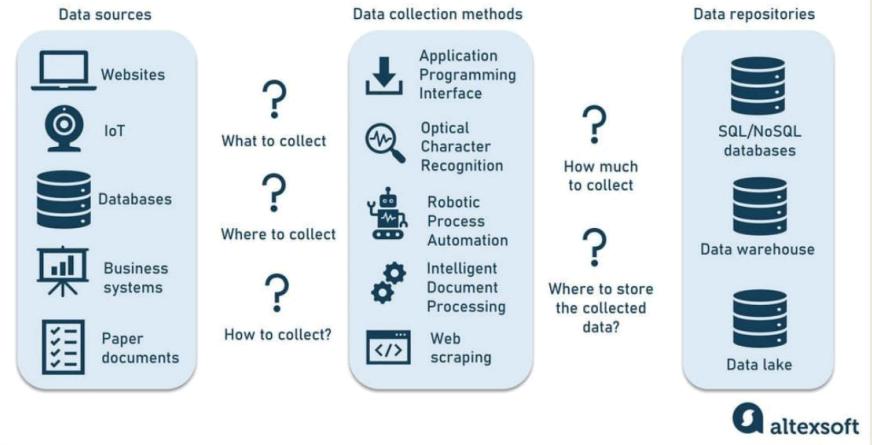


Methodology Overview

Feature Extraction Strategies

The study employs various **feature extraction techniques** to enhance data quality, ensuring the machine learning models are accurately trained on relevant attributes for airline reservations.

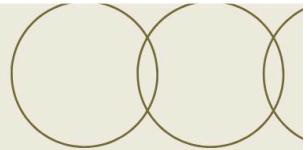
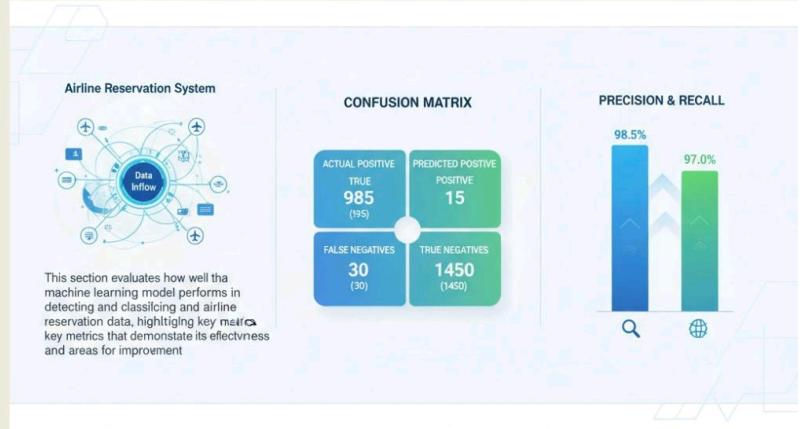
PILLARS OF DATA COLLECTION



Model Performance Evaluation

Analyzing System Effectiveness

This section evaluates how well the machine learning model performs in detecting and classifying airline reservation data, highlighting key metrics that demonstrate its effectiveness and areas for improvement.



Summary and Future Directions

Our analysis demonstrates that the machine learning model effectively detects and classifies airline reservation data with a high degree of accuracy. Key strengths include:

- Robust Classification: The model shows strong performance in accurately categorizing reservation types and identifying critical data points.
- High Precision & Recall: Consistent metrics indicate its ability to minimize both false positives and false negatives, ensuring reliable data processing.
- Efficiency in Data Handling: The system efficiently processes large volumes of real-time reservation data, crucial for operational fluidity.

Summary and Future Directions
Optimizing Airline Reservations Systems

Summary of Current Model Performance

- Robust Classification
- High Precision & Recall
- Efficiency in Data Handling

Future Directions and Enhancements

1. Predictive Analytics for Demand Forecasting
2. Personalized Customer Experience
3. Enhanced Fraud Detection
4. Integration with Emerging Technologies
5. Scalability with Cloud-Native Architecture
6. Continuous Learning and Model Improvement



THANK YOU

Innovating the Future of Air Travel

