Airport Management System

Project report submitted for

IIIrd Semester DBMS – I Project

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1.1 ABSTRACT

Airline Management System is an application of DBMS which is used for booking and schedule information. This project is to help the user book their flights without visiting the booking counter or any other booking vendors. This system provides options for viewing different flights available with different timings for a particular date and provides customers with the facility to book a ticket. It can also manage all the information about customers, booking inquiries, reservations, etc. Users can view the status and schedule of a flight online. It enables us to add any number of records to our database.

The project Airline Management System will be created using PHP and MySQL RDBMS.

1.2 ACKNOWLEDGEMENT

The completion of any project involves the efforts of many people. We have been lucky enough to have received a lot of help and support from all quarters during the making of this project, so with gratitude, we take this opportunity to acknowledge all those whose guidance and encouragement helped us emerge successful.

We are thankful for the resourceful guidance, timely assistance, and graceful gesture of our guide **Dr. Srinivas Naik,** Assistant Professor, Department of Computer Science and Engineering who has helped us in every aspect of our project work.

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We express our sincere thanks to our most respected and beloved Vice-Chancellor and Director Sir**, Dr. Pradeep K Sinha**, for supporting us in our academic endeavors.

And last but not the least, we would be very pleased to express our heart full thanks to all the teaching and non-teaching staff of the DSAI department and our friends who have rendered their help, motivation, and support.

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Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the sources. I also declare that I have adhered to all academic honesty and integrity principles and have not misrepresented, fabricated, or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Chapter 1

Preamble

1.   Introduction

A large-scale airport management system project integrates databases from multiple airports. This airline management system includes information about aircraft types, routes, flights, airfares, passengers, employees, transactions, countries, and airports. This project was developed with distributed architecture and centralized database storage in mind. Distributed client-server computing technology was considered in the development of the entire project. The specification has been normalized to the third normal form to eliminate any potential anomalies that may result from database transactions performed by end users and administrators of the organization. The user interface is tailored to specific browsers to provide decentralized accessibility to the entire system. A database management system helps improve the efficiency and validity of data. This system combines a lot of data into one program and organizes, maintains, and stores it. Flight information, flight schedules, passenger information, flight history, etc. - all of these are included in the project of the airline database system. SQL was used as the language for applying queries. (Requests to add, delete, update, etc.) There is a database administrator with full database access for viewing, updating, and deleting information.

1.1   Motivation

Electronically handling flight records enhances accuracy, flexibility, and reliability and removes human error. To provide an efficient, accurate, reliable, fast, and robust structure that can handle any number of passenger transactions.

The main purpose of this document is to list the requirements of the Airline Management System project. This document also helps us collect and analyze the ideas for the project. This document will be subject to change if more requirements are added to the project. This document is mainly prepared to set the stage for the project's design phase. The document being prepared is the first version of the Airline Management System project.

1.2   Need For Model

Think about an airport. What initial thoughts enter your mind? Arriving aircraft catered for the impending departure, a huge terminal, information displays, long lines, and baggage claim conveyors. The tight flight schedule at airports includes managing workers, screening passengers, paying attention to every last detail, and much more. Airport automation and management expedite such operations and raise service standards. Therefore, there is a need for an excellent DBMS that helps keep track of regions where demand is more so that the supply could be optimized according to it.

1.3 Objectives

Airport management software is very simple and cost-effective. The human purpose of the system is to maintain and retrieve information about passengers, the flight they will board, and the day and time at the airport. The system is easy to design and quite helpful to implement.

The main objectives of this system can be summarized as follows.

- Provides some degree of automation for airline management.
- Helps airline systems make business more efficient.
- Additional appeal for potential customers.
- It also shows management's attitude that it is aware of newly introduced technologies and is ready to implement them.

1.4. Project Overview

1. In today's culture, databases and database systems are a necessary part of daily life. Most of us engage in several tasks each day that entail some sort of database contact. For instance, there's a good likelihood that someone will access a database when we go to the bank to deposit or take money or when we book a hotel or flight.

2. The interactions mentioned above are instances of what we might refer to as classic database applications, in which the majority of the application's data is either textual or numeric and is stored and accessed. We will focus on this aspect

of computer application in our project.

3. Databases can be used in many different ways. Some of these include object-oriented databases, relational databases, and file-handling mechanisms.

4. You get a glimpse into the airline management system's reservation management procedure using this program. With the aid of this project, the entire Airline Management System procedure is illustrated. It offers the option to add, change, delete, and search airline management information.

Chapter 2
Literature Overview

An extensive overview of the operational factors that influence airport management is provided by the project Airport Management System utilizing DBMS. The main problem with the existing system is that it is time-consuming and unstructured, which increases the likelihood of mistakes. This project assists in the management of the passengers' data, including name, city, mobile number, email, etc. When registering, passengers receive an ID, and only those passengers are permitted to make reservations. Each flight's arrival and departure can also be monitored through the system. Additionally, we can offer users a simple way to cancel their tickets. This project grants all authorized system users secure access to the database to ensure sufficient security.

Chapter 3
Functional Requirements

1. Separate interfaces for Airport staff and Passengers.

2. Allow Staff to manage flights in the airport.

3. Allow Passengers to book/view/cancel already booked tickets if necessary.

4. Allow Staff to cancel tickets

5. The system should avoid a clash of departures/arrival of flights.

6. Update the live status of departure/arrivals of flights

Chapter 4
<u>Methodology</u>

4.1 Existing Method

The process takes a lot of time and rewards laziness. This method is more prone to mistakes, and occasionally it takes an ad hoc approach to solve different issues. If any outdated data or information needs to be retrieved, it might be quite difficult for a user to do so quickly because obtaining information from files is not a simple operation. Since everything is done manually, the agency is entirely responsible if a record is lost. Limitations of the existing method include:

1. It takes a lot of time to provide accurate information.

2. Data that is less reliable and maintainable.

3. Because of the obvious facts on paper, information secrecy might not be preserved.

4. Information provided manually cannot be trusted.

4.2 Proposed Solution

The proposed solution is computer-based, approachable for users, and simple to maintain. Records can be easily and for a very long time stored safely thanks to this. The work would be of a far higher caliber at the airport. The time required to perform the requests would be greatly decreased. The suggested solution offers free, simple, and effective administration of the day-to-day operations of the airlines and passengers to minimize manual labor and make even the smallest details accessible.

A menu-driven program is essentially what an airline management system is. This type of format was created with user needs in mind. This will give the user a quick and simple way to operate.

❖ **Relational model:** Relational Model represents how data is stored in a Relational Database. A relational database stores data in the form of relations

(tables). The Airport Management interface website will have different databases that will store the details about every passenger and flight information. The basic operations to be supported by the model include creating, reading, updating, and deleting operations.

- ❖ **Creation:** The model will support the creation of new profiles for a passenger/staff which will be based on authentication.
- ❖ **Updation:** The updation of different flights can be marked as done or not done by the administration admin with special access for the updating operation.
- ❖ **Read:** The status and details can be tracked from the user dashboard after authentication.
- ❖ **Deletion:** Flights can be added and deleted from the database.

We have created a web interface along with the SQL database. A passenger can open our website and can log in with the help of the username and password. After verification, the person can enter the PNR for their flight, and then they can see all the information regarding their booking and the flight. After each login, they can download user data will be stored in the database.

Problem Selection:

1. Before deploying our application, we believed that a carrier that has
newly opened its operation found it quite challenging to manage their customers.
2. Due to their excellent customer service and competent management of everyday
operations where their customer base was expanding, and they began to manage a
several demands from customers. The issue is that manually maintaining airline records
the system, which requires a lot of employees and takes a long time
Customers and staff alike are inconvenienced by the process because it
manager.
3. Slowly but surely, the number of these clients began to increase dramatically.
and the airline staff had to spend most of their time dealing with such
customers.
4. Due to the employees' slow reaction times, the airline gradually began to lose
customers, including those whose requests could not be met.
5. Following this, the management decided to create a system that could handle such
clients' requests effectively and efficiently as well as the accompanying work of its staff,

who were already overworked with such jobs.

6. With this action, an airline employee improved response times and efficiency while serving significant or recent customers with the utmost care.

Steps/Phases of the project required for completion of the project

- Working on the RDBMS model, we need to create different tables for different purposes like Login/ Register, a table that stores passengers' records. The table will be created with the primary key.
- Storing the Data in the tables of the Database by entering the details.
- Linking these tables with one another as required, using Foreign Key.
- Maintaining the Database and updating/recording entries.
- Creating the Schema of the airport database and ER-Model.
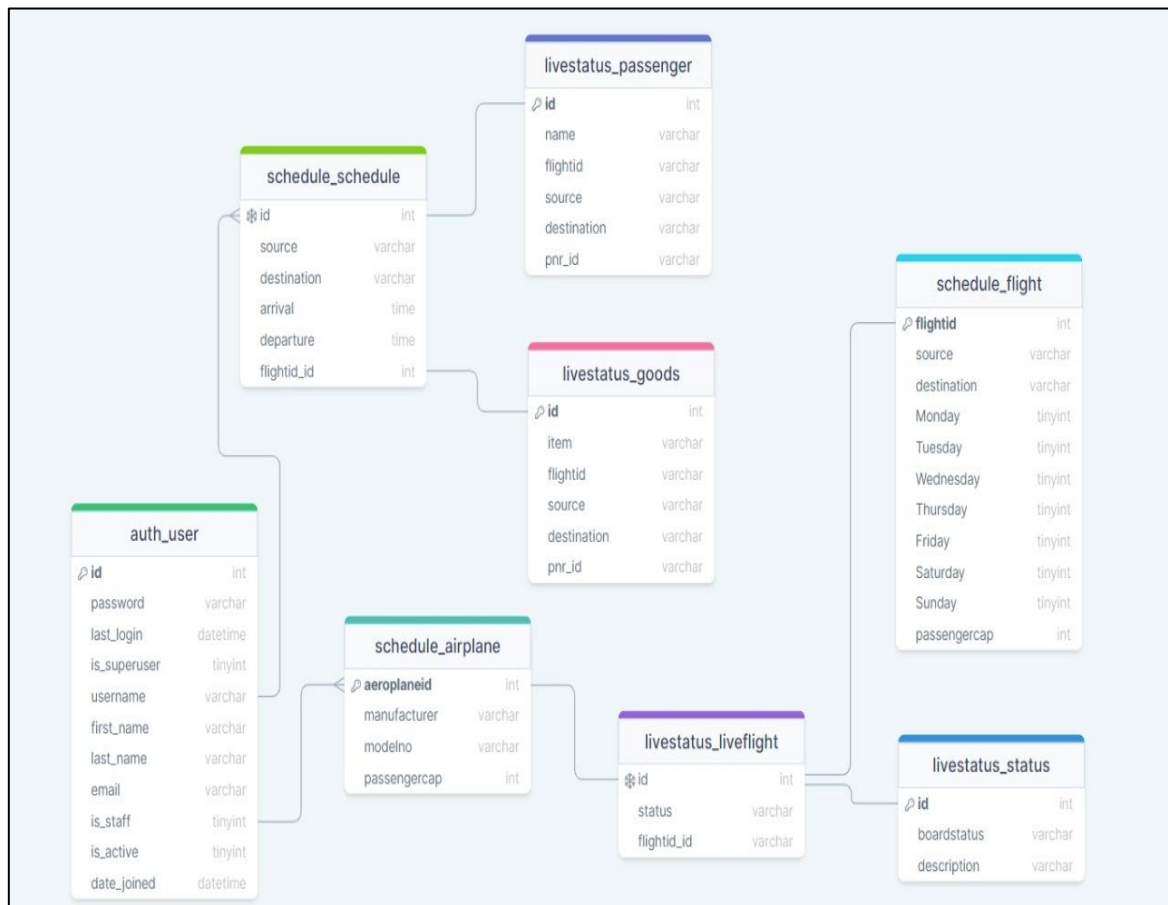
Fig I. Schema Diagram of Management System

➢ The table is in 1NF since all attributes are atomic.
➢ The table is in 2NF since there is no partial dependency.
➢ Table is in 3NF due to the absence of any transitive dependency.

4.4 Implementation

The steps for the development of our project are as follows:

1. **Development of Front-End:** We have developed the design of the website. The implementation part started with the creation of a website using HTML5, CSS3, and JavaScript. Different static and dynamic pages are developed for users as well as the admin. Our focus is on usage, readability, accessibility, ease of use, and clarity.

2. **Development of Back-End:** We have used the Django framework along with MySQL database to perform CRUD operations for insertion, deletion, updating and scanning of data from the database.

3. **Integrating Front-end with Back-end:** Setting up proper paths and displaying the appropriate data on the front-end using POST/GET requests. We have also used Data Visualization tools.

4. **Deployment of the website:** Finally, we have deployed our website onto a local host available for both the staff and passengers.
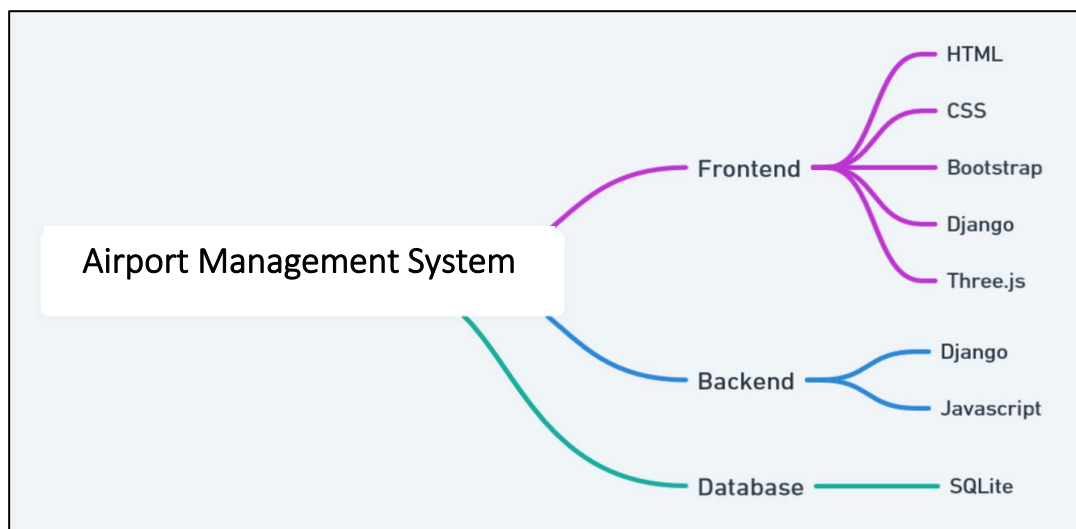

Fig II: Deployment Scheme

4.3 Entity - Relationship Diagram

An entity–relationship model (ER model) describes interrelated things of interest in a specific domain of knowledge. An ER model is composed of entity types and specifies relationships that can exist between instances of those entity types. In engineering, an ER model is formed to represent things that a business needs to remember to perform business processes. Consequently, the ER model is an

abstract data model that defines data implemented in a relational database.
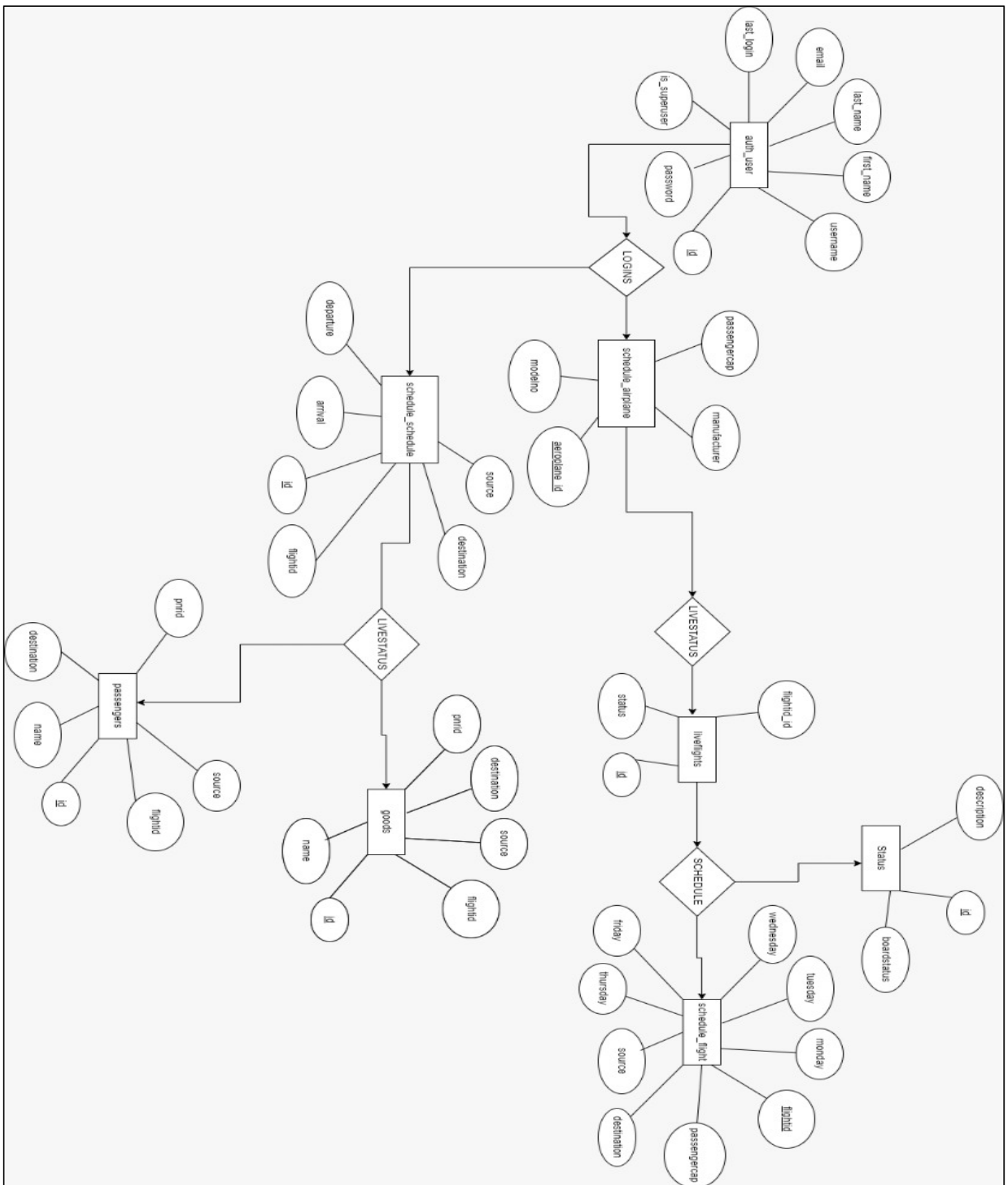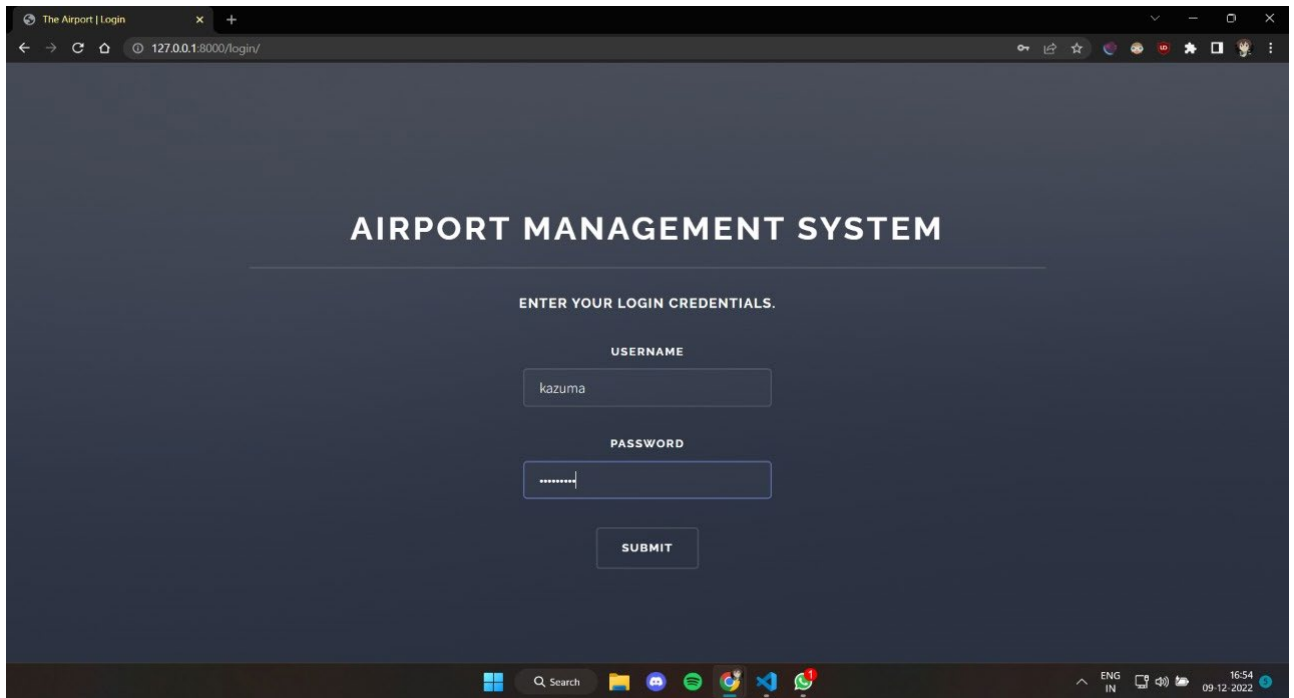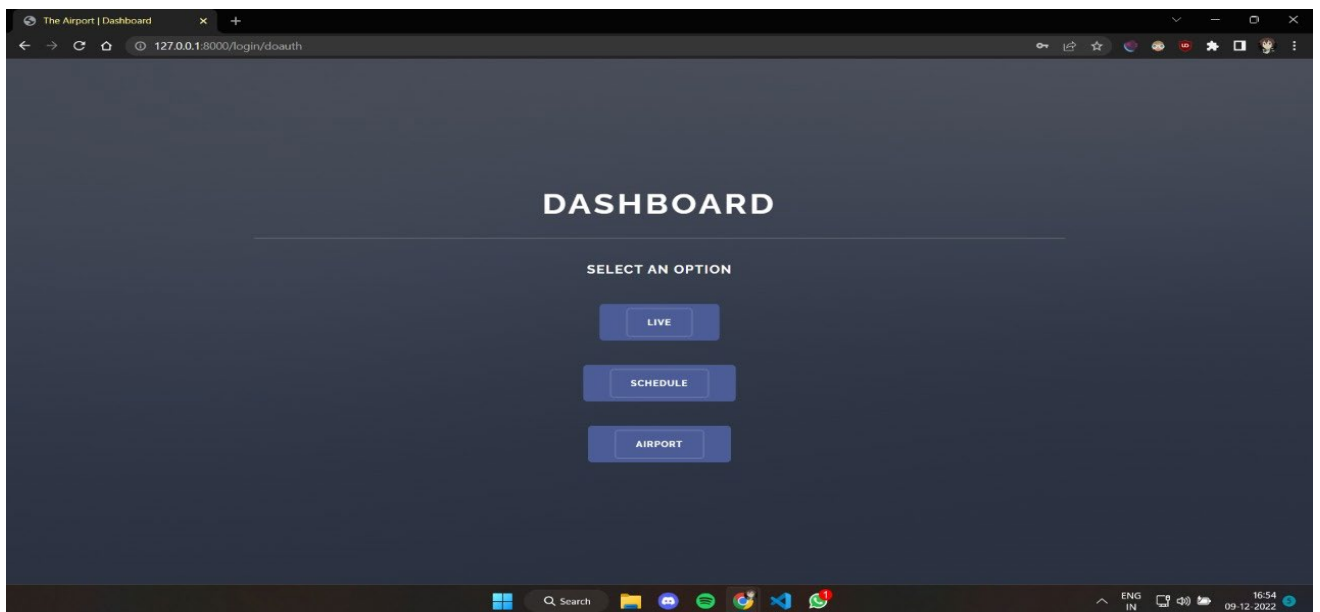

Fig II: ER Diagram

Chapter 5

<u>Results</u>

The project is compiled and executed on a local host on a browser. Some screenshots are present hereto show the working of the application.

Screenshots:

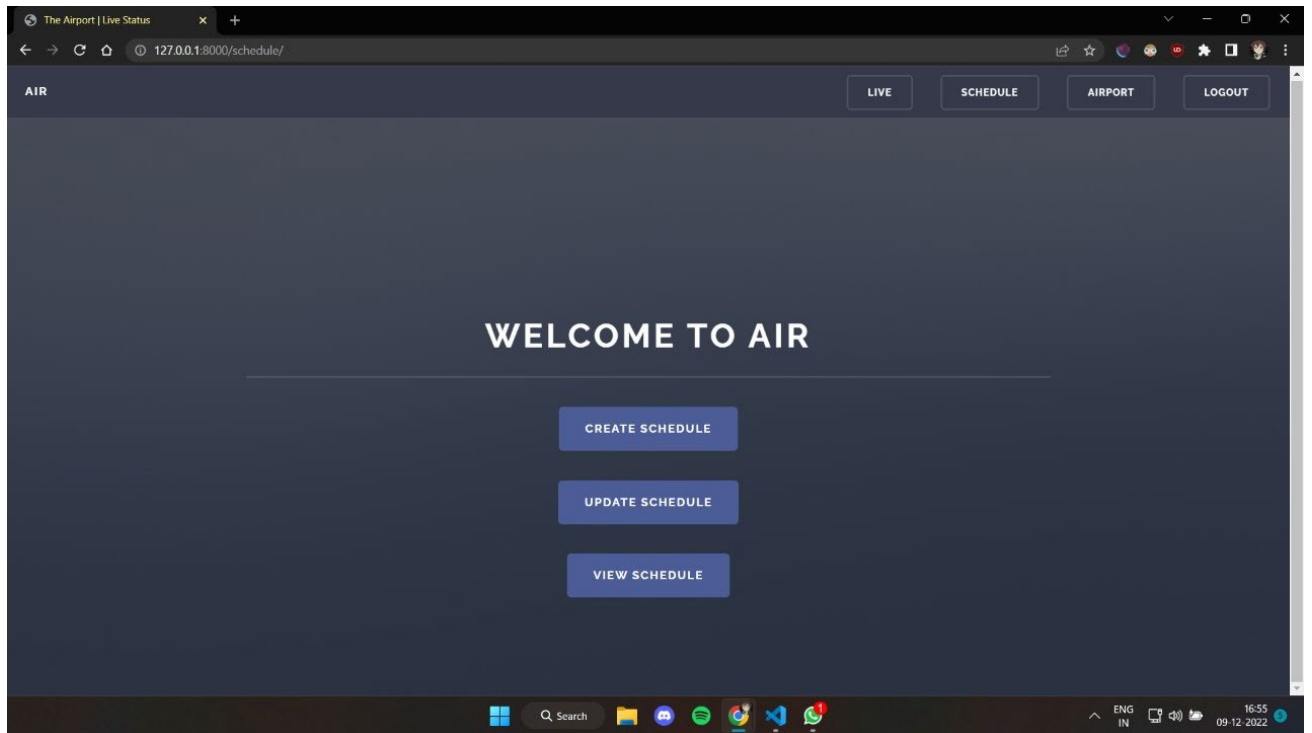The below figure refers to the initial bootup page of the application:
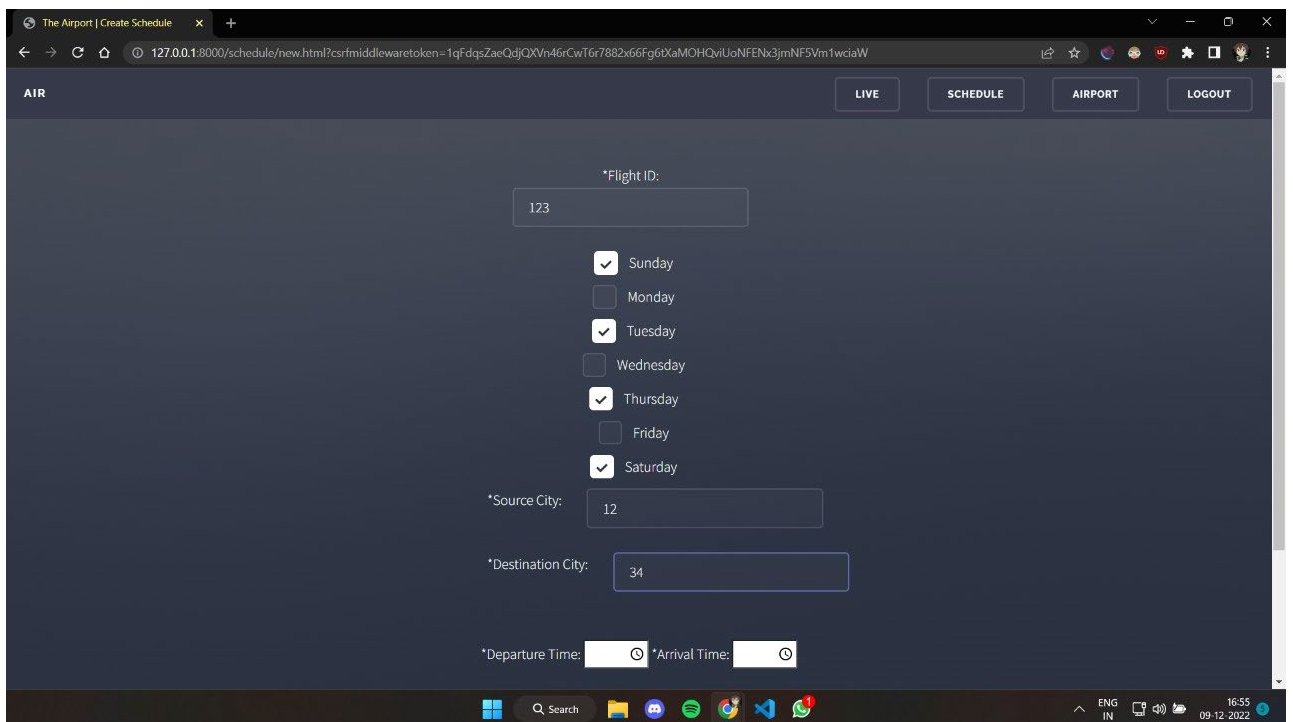

Fig IV: Login Page for User

Fig IV: Dashboard for User

The below page is used to Create a Schedule, Update e Schedule and View it.

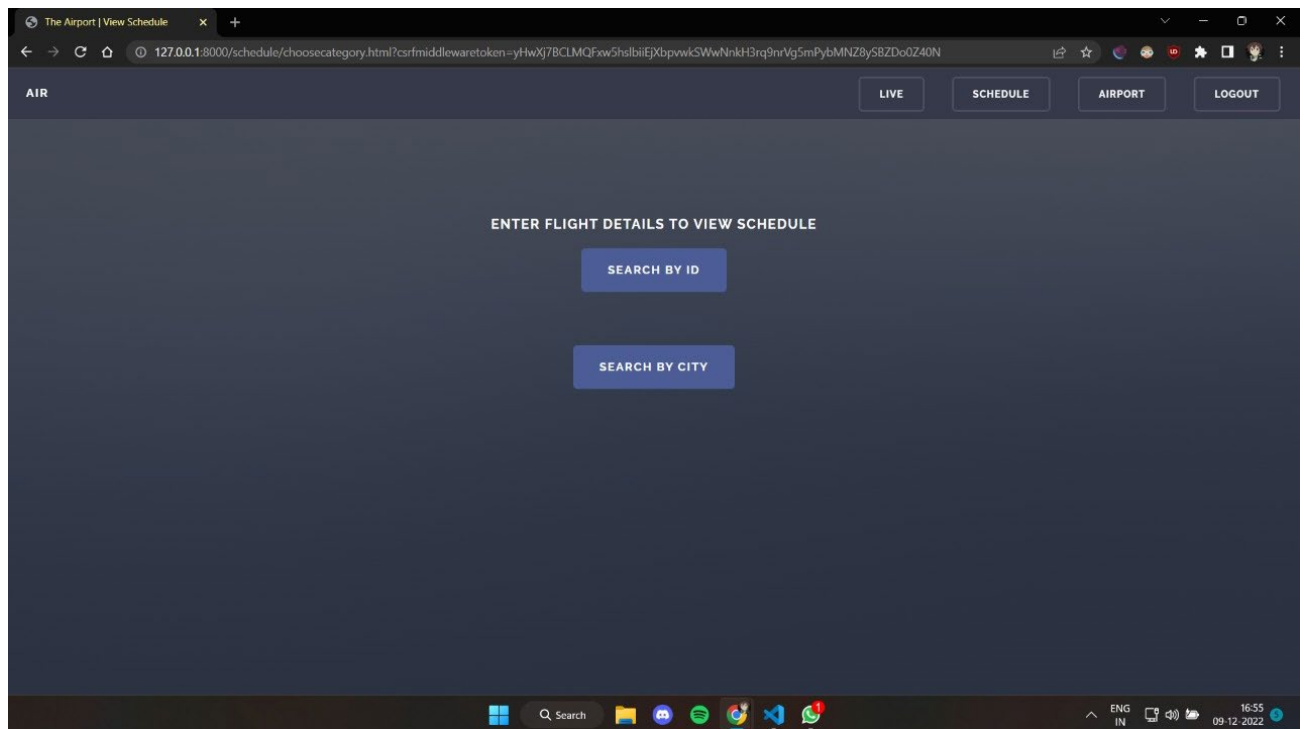*Fig V: Task Applications for User*

The below screenshot shows the Create Schedule task working.

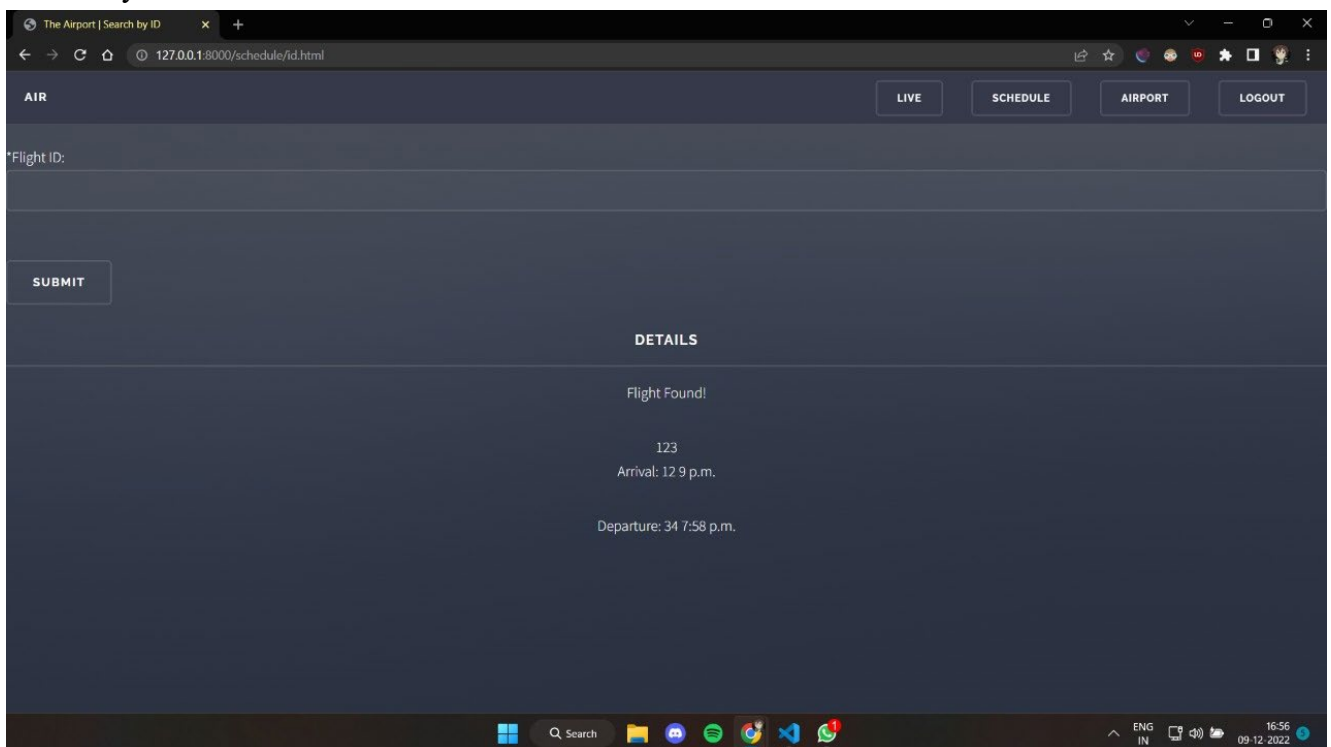*Fig V: Creating Schedule for flights*

The below screenshot shows the use of View Schedule command.

Fig VI: View Schedule for flights

The below screenshot show Flight Info and ID stored in the records of the Management System.

Fig VII: Flight Details stored in database

Chapter 6
<u>Conclusions</u>

Planned approach toward working: The maintenance of Airport management will be well-planned and organized. The data will be stored efficiently with optimal disk space consumption in data stores which will help in the retrieval of information as well as its storage under resource constraints.

Accuracy: The level of accuracy in the proposed system will be higher. All operations would conform to integrity constraints and correctness and it will be ensured that whatever information is received at or sent from the center is accurate.

Reliability: The reliability of the proposed system will be high due to the above-mentioned reasons. This comes from the fact that only the data which conforms accuracy clause would be allowed to commit back to the disk. Other properties like transaction management and rollback during system or power failure etc get automatically taken care of by the SQL systems, which is undoubtedly an excellent choice of the DBMS system. Properties of atomicity, consistency, isolation, and data security are intrinsically maintained.

6.1 Future Enhancement

No redundancy: In the proposed system it will be ensured that no repetitionof information occurs; neither on physical storage nor on a logical implementation level. This economizes on resource utilization in terms of storage space. Also even in the case of concurrent access, no anomalies occur, and consistency is maintained. In addition to all this, principles of normalization have been endeavors to be followed.

Immediate retrieval of information: The main objective of the proposed system isto provide a quick and efficient platform for the retrieval of information, and queries allowed by the database.

References

[1] https://www.youtube.com/watch?v=Perxeabpb-I

[2] Django-Based Airport Management System

[3] GitHub/Airport_Management-Design