CHAPTER 1

INTRODUCTION

1.1   PURPOSE

The main purpose of our project is to design and develop as an intelligent automation security system as combination of app and web that integrates the passengers devices to the airport or airline authorities which will give real time updates regarding each and every step to the check in procedure, boarding, security scanning, baggage tracking to check out process and reduces the workload, time, capital and making it more efficient & simpler for the user & authorities.

1.2   OBJECTIVE

To maintain a system which guides users from Check In – Check Out process and authorities to maintain authorization and validation and also to maintain security checks at each and every step at airport authorities by designing an intelligent system which can automate process.

1.3   MOTIVATION

Our project idea being chosen by self-experiencing, some issues which could be easily handled by a smart automation technology. The solution we provide will not only help the customers but also help the airlines authorities to save lot of resources in form of resources, capital and time. Our system will manage authorization & validation and will also maintain security standards of airport facility. This automated system will reduce the manual work load and increase security, speed and efficiency.

1.4 DEFINITION AND OVERVIEW

DEFINITION

Drishti "**Intelligent Automation Security System**" [6] is a modern automated airport concept where we are using Google's firebase services to provide cloud-based application authentication, validation, database handling, real-time notifications, real time navigations, tracking & other services. Machine learning and Artificial Intelligence are integrated to our system.

1.4.1 SMART AIRPORTS

The smart airports are not a very modern concept. There have been evidences of research on this context for quite some times and many technology enthusiasts have been working to make this a very good approach. The smarter the airport will be more the people will be choosing to travel by air. One such example is the Dubai International Airport where there are many facilities like smart gardens, Free Wi-Fi and Robot interaction.[4]

1.4.2 DIGITAL INTERACTION

Digital Interaction is the key to todays all smart technologies like smart hubs for face recognition and digital tablets for human-machine interaction.[5]

1.4.3 AUTOMATED SYSTEM

The automated system a combination of software with hardware designed and programmed to work automatically without the need of human interaction and intelligence but rather machine intelligence. [6]

CHAPTER 2

OVERALL DESCRIPTION

2.1 PROJECT PERSPECTIVE

2.1.1 USER VIEW

In terms of user perspective our project can be used by the users from check in to check out process, where they will be connected with the airport facility and get real time updates and notifications services. They will also provide with services such as navigation, virtual guide, security checks and tracking updates.

After being an automated system, it will be helpful for the users access all the services provided by the airport facility. Users can all stay connected with the service providers and can access services or facilities in need.

2.1.2 DEVELOPER VIEW

In terms of developer's perspective our project will help the airport authorities to manage and maintain all the process on an automated system, from where they will be connected with each customer and can track them and provide them services in a simple manner and also to security protocols in an ease.

After being an automated system developers or authorities can use this to maintain security standards of airports facility and can keep a live track on the records of each users. It will reduce manpower and chance of failing to maintain protocols.

2.2 PROJECT FUNCTIONALITY

2.2.1 REAL TIME NOTIFICATIONS

Our system provides real time updates to your device, to stay connected and get access & follow our services in a simple manner. Users gets connected to our system as they reach airport facility and gets to the initial verification process, and stay connected [4] still they depart. They access and follows all the protocols and services required by the airlines or the authorities, they get timely notified updates and virtual guide [2].

Notification Services includes:

☐ Authentication

☐ Check In – Check Out

☐ Arrival – Departure

☐ Location

☐ Navigation

☐ Updates

☐ Baggage Tracking

☐ Announcements

Fig. 1 Real Time Notifications

2.2.2 BAGGAGE TRACKING

Our project will use RFID chips to enable baggage tracking for advanced bag location detection. The tags[5] contain electronically stored information. The baggage tracking facility will help the user to be guided about his valuable luggage items at his comfort and convenience and save a lot of hassle for authorities. It's not like a barcode which will use another feature but it will use the efficient line of sight functionality. [4]

By using RFID chips, it will be simple to keep a track records or the luggage and users also can get updates to their luggage time to time.
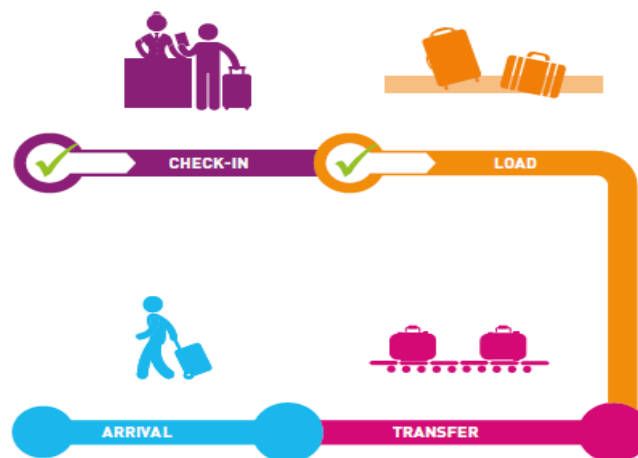

Fig. 2 Baggage tracking

2.2.3 FACIAL RECOGNITION

Our system will have facial recognition technology which will be capable of identifying or verifying a person from a digital image or a video frame from a video source [6]. The modern facial recognition work by identifying recognized faces from a database of images and recognize the face.This method of face detection is although less efficient than the iris recognition technology but it still works fine.

By adding facial recognition our system will automatically start tracking users as soon as they enter the facility, which will have a great impact on the users and the service provides to keep and up to date track records. It will slightly increase security standards and maintain protocols.

Fig. 3 Facial Recognition

2.2.4 REAL TIME NAVIGATION

Our system provide real time navigation and direction to complete our checkin checkout process, And to accees our faclity with virtual tour guidance. It would be very helpful to the users to access the faculity and its services with a greater ease. [2]

Navigation Services Includes:

- Check In - Check Out

- Arrival – Departure

- Virtual Maps

- Locations

- Tracking

Fig. 4 Real Time Navigation

2.2.5 QR CODE SCANNING & VERIFICATION

The QR Code Scanner is the perfect way to scan your QR codes and gets verified anytime and anywhere. Our system provides users and authorities to authenticate the user data from web app and provide validation [2] to mobile app or vice versa.

By adding QR code scanning our system will automatically start validating users as soon as they enter the facility, which will have a great impact on the users and the service provides to keep and up to date validated records. It will slightly increase security standards and maintain protocols. [7]

Fig. 5 QR CODE SCANNING

2.2.6 AUTHENTICATION AND VALIDATION

Authentication and Validation is the process of establishing the identity of a user or system and verifying that the identity is valid. By adding authentication and validation our system will automatically start validating users as soon as they enter the facility, which will have a great impact on the users and the service provides to keep and up to date validated and authenticated records. It will slightly increase security standards and maintain protocols [2].

Our system will provide users a highly secured network, from where they can access our services and use it hassle free. It will also help authorities to manage and control security methods. [5]

Fig. 6 Authentication

2.3 PLATFORMS AND SERVICES

FIREBASE

Firebase [2] is a mobile and web application development platform developed by Firebase, Inc. in 2011 which was then acquired by Google in 2014.Firebase is a very advanced technology that enables its users to implement advanced backend technology in web, iOS and Android applications. It has various features like Authentication, Database, Storage, Hosting, functions and ML kit. It also has features for checking application performance time to time. For the overall growth of the application it has benefits like predictions, Cloud messaging and In-app messaging. [2]

Fig 7 Logo of google firebase

ANDROID STUDIO

Android studio is the official platform of Google for android development based on the Intelli J platform and it is an integrated development environment for app development and linking with database. It has built-in support for Google Cloud Platform, enabling integration with Firebase Cloud Messaging (Earlier 'Google Cloud Messaging') and Google App Engine. [2]

Fig 8 Android Studio

WEB APP

A web application is an application which works through the world wide web. Here the application is stored on a remote server and accessed by a device through internet. Various web applications are there for online shopping, social networking, education etc. Usually a database such as MySQL or MongoDB can be used to store data in web application development. For our web application we have used Firebase database. The web app is hosted on service like on GitHub [4] for access. We can do web searching, messaging, image gallery, notifications etc. A web app is usually coded in web languages like HTML, JavaScript and CSS.

Fig. 9 WebApp

2.4 ER DIAGRAM
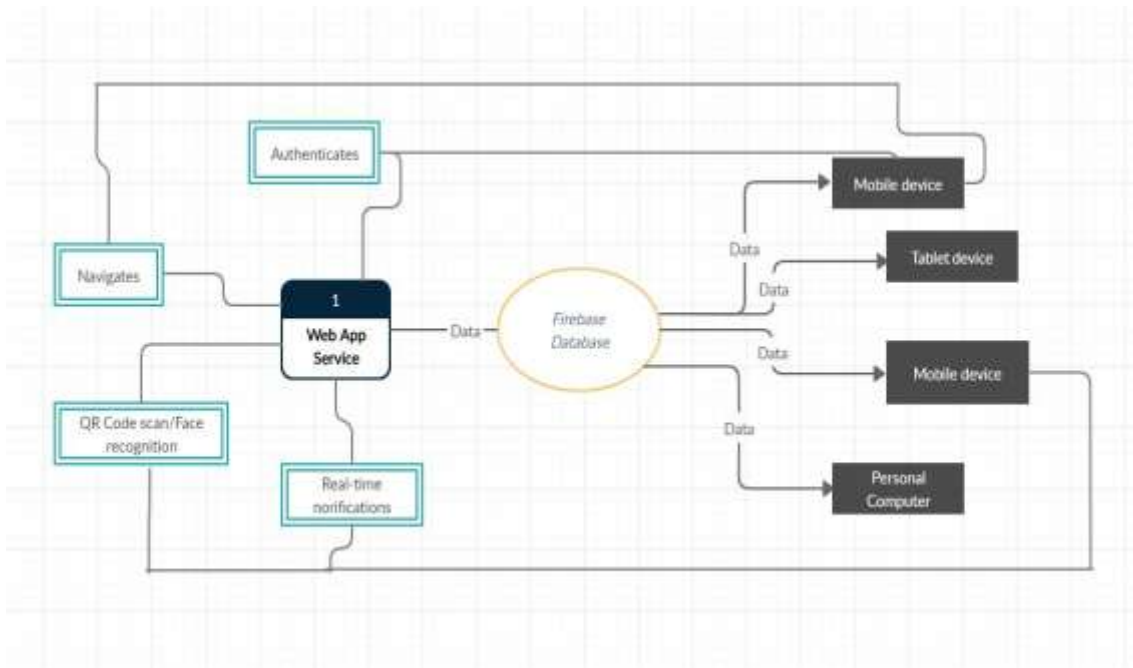

Fig. 10 ER Diagram [6]

In our system we have madea central database which is on firebase console.

The concole works in interaction with the web appand simultaneoulsy with all the devices.

The Entity Relationship diagram drawn above depicts the working scenario of a typical user.

Here there are services like navigation, QR code scanning, Real-time notifications and Authentication.
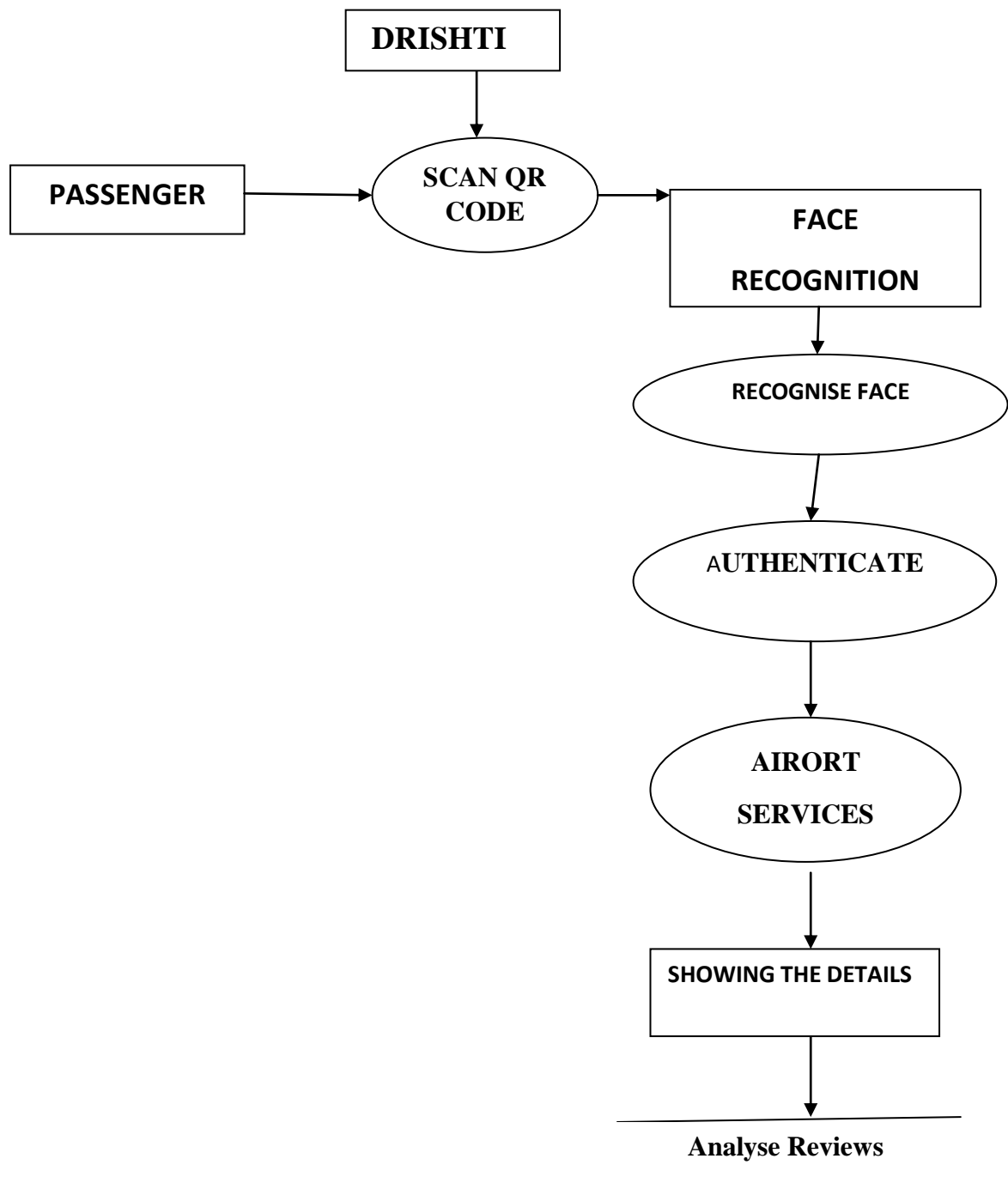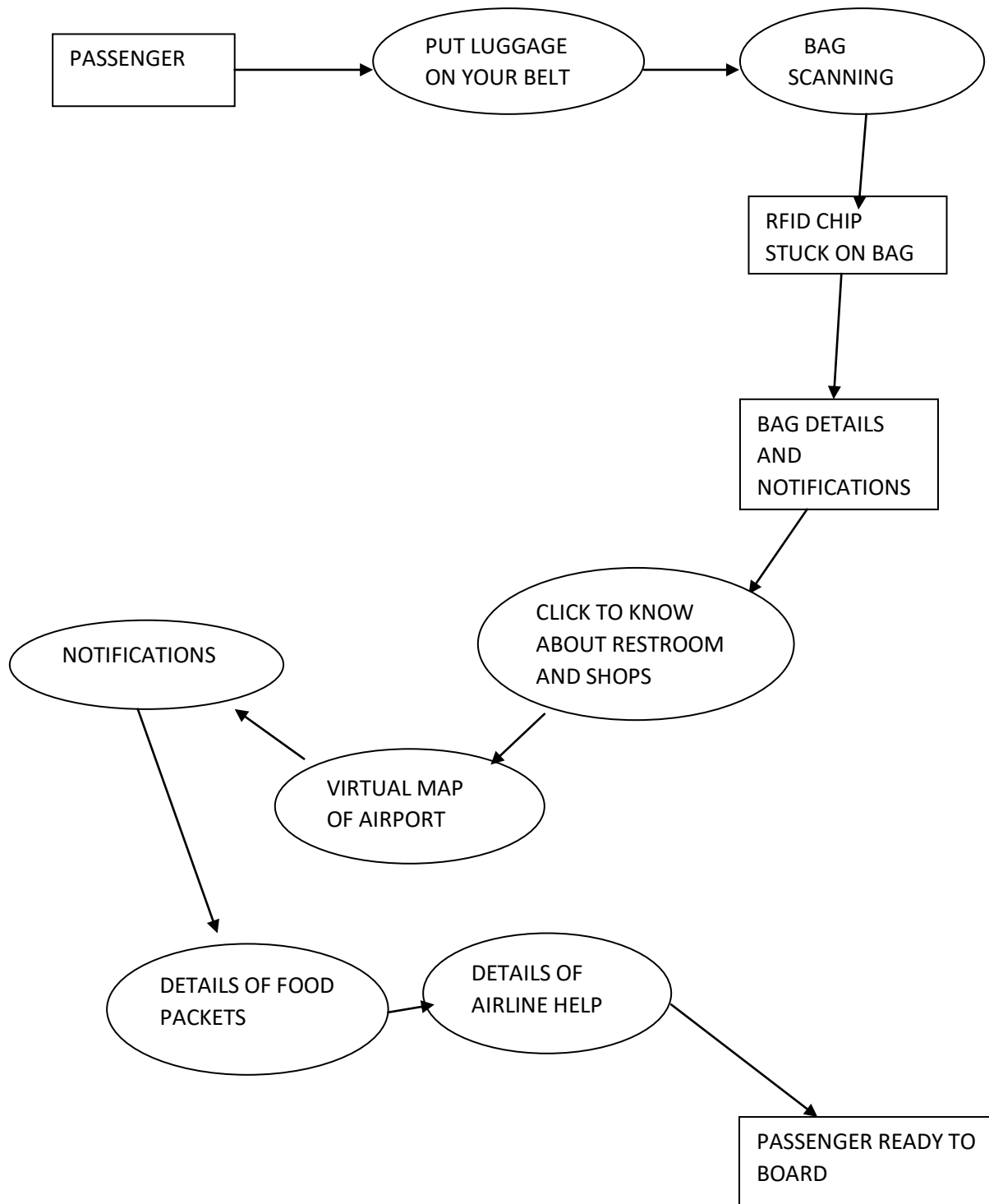
2.5 DFD DIAGRAMS

```
                    ┌─────────────┐
                    │   DRISHTI   │
                    └──────┬──────┘
                           │
                           ▼
┌─────────────┐      ╭───────────╮      ┌───────────────┐
│  PASSENGER  │─────▶│  SCAN QR  │─────▶│     FACE      │
└─────────────┘      │   CODE    │      │  RECOGNITION  │
                     ╰───────────╯      └───────┬───────┘
                                                │
                                                ▼
                                        ╭───────────────╮
                                        │ RECOGNISE FACE│
                                        ╰───────┬───────╯
                                                │
                                                ▼
                                        ╭───────────────╮
                                        │ AUTHENTICATE  │
                                        ╰───────┬───────╯
                                                │
                                                ▼
                                        ╭───────────────╮
                                        │    AIRORT     │
                                        │   SERVICES    │
                                        ╰───────┬───────╯
                                                │
                                                ▼
                                        ┌───────────────────┐
                                        │ SHOWING THE DETAILS│
                                        └─────────┬─────────┘
                                                  │
                                                  ▼
                                          Analyse Reviews
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Fig. 10 Level 1 DFD Diagram

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┌──────────────┐        ╭─────────────────╮        ╭──────────────╮
│  PASSENGER   │───────▶│  PUT LUGGAGE    │───────▶│     BAG      │
│              │        │  ON YOUR BELT   │        │   SCANNING   │
└──────────────┘        ╰─────────────────╯        ╰──────────────╯
                                                          │
                                                          ▼
                                                ┌──────────────────┐
                                                │  RFID CHIP       │
                                                │  STUCK ON BAG    │
                                                └──────────────────┘
                                                          │
                                                          ▼
                                                ┌──────────────────┐
                                                │  BAG DETAILS     │
                                                │  AND             │
                                                │  NOTIFICATIONS   │
                                                └──────────────────┘
```

PASSENGER → PUT LUGGAGE ON YOUR BELT → BAG SCANNING → RFID CHIP STUCK ON BAG → BAG DETAILS AND NOTIFICATIONS → CLICK TO KNOW ABOUT RESTROOM AND SHOPS → VIRTUAL MAP OF AIRPORT → NOTIFICATIONS → DETAILS OF FOOD PACKETS → DETAILS OF AIRLINE HELP → PASSENGER READY TO BOARD

Fig. 11 Level 2 DFD Diagram

CHAPTER 3

INTERFACES

3.1 USER INTERFACES
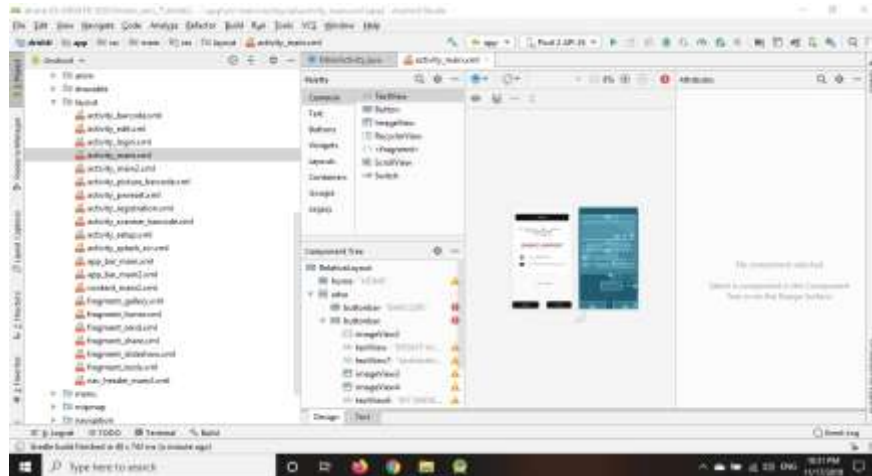
Fig 12 Main activity

This image represents the screenshot of the MainActivity.java file of our Android studio code wherein the first activity of the application is depicted where the registration is done and shown. [2]
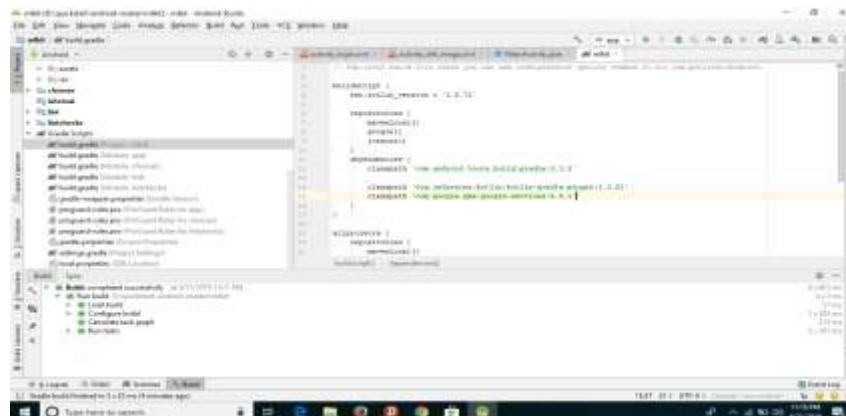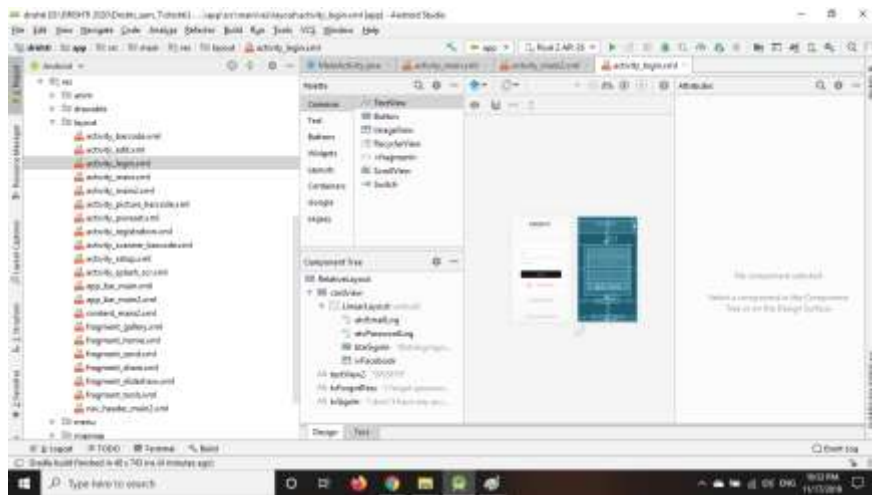

Fig 13 Gradle code

Fig 14 Registration Form

This part shows the screenshot of the registarion.java file in the android studio wherein registration process is done. [2]
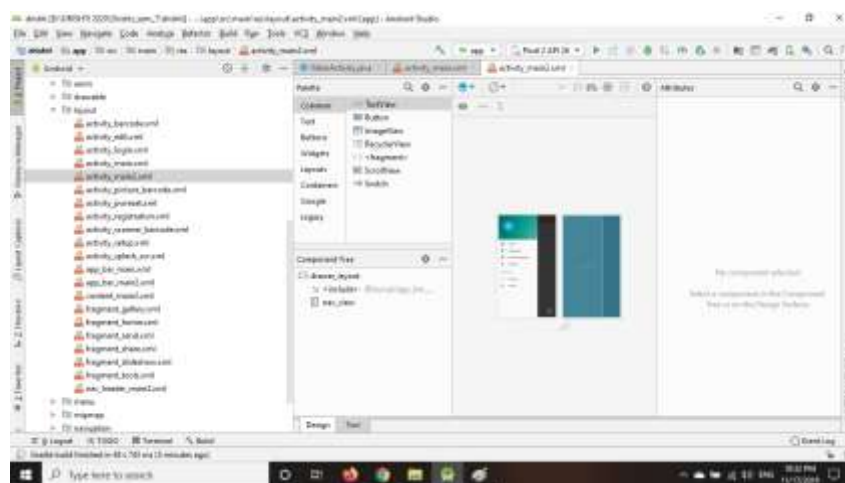

Fig 15 Navigation

This part shows the screenshot of the navigation.java file in the android studio wherein navigation drawer is shown. Modern applications are based on this functionality only. [6]

3.1.1 MOBILE APP SCREENSHOTS

This is the splash screen of the first screen of the android application where it waits for a moment before booting the application. [1]

This is the edit profile activity screen where a user edits his profile details and enters his location.

This is the main screen where the details of the logged in user are shown like email and location.

This is the barcode screen where we can choose a picture or directly scan a barcode or QR Code for authentication and recognition.

This is the information page where details of all the airports is displayed for the user.
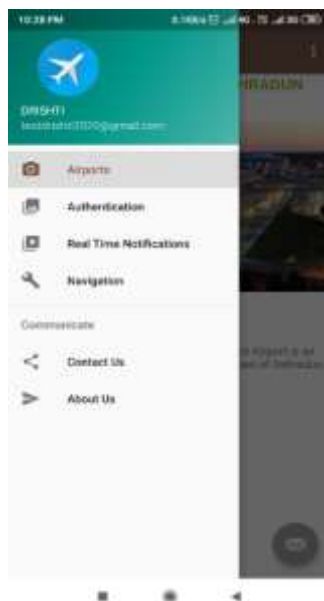
This is the navigation slider where all the services of the application are shown for use.

This is the part where user Real-time authentication is shown where validation takes place.

This is the push notification feature fired by the firebase console where all the updates are visible.
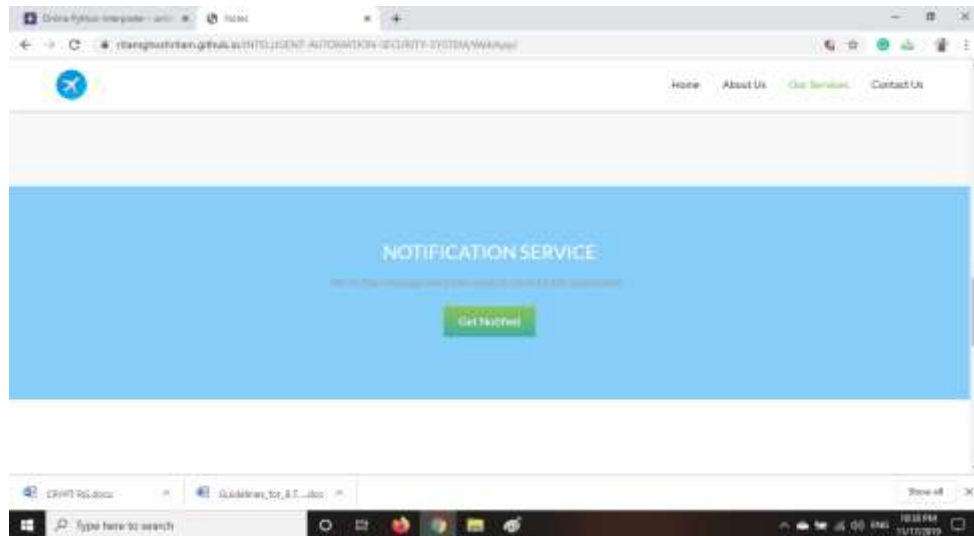
3.1.2 WEB APP SCREENSHOTS
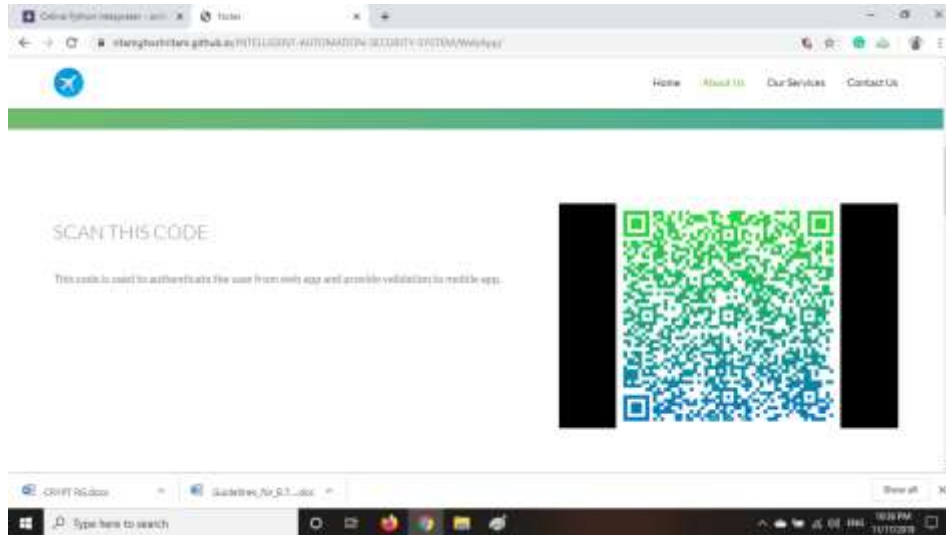
This is the web interface for the airport authorities and here there will be a screen for the user where a barcode will be displayed which the user can scan for authentication [3].
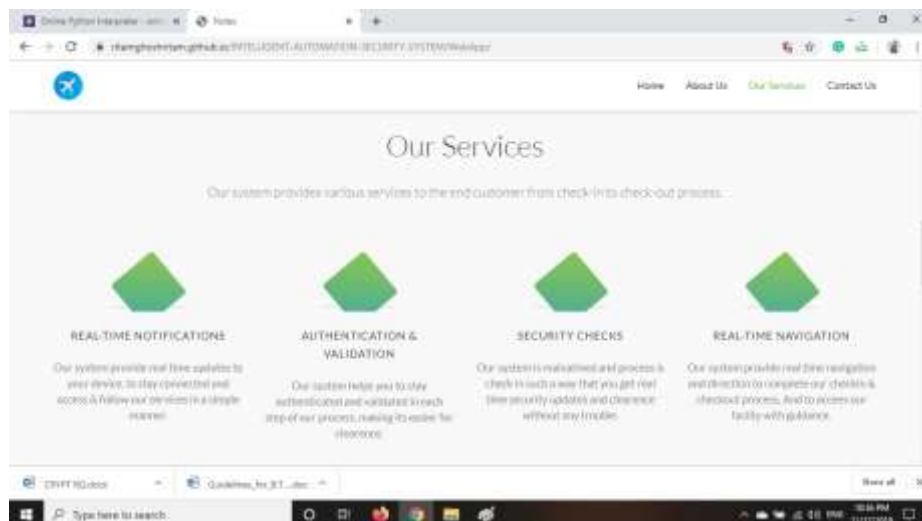
This part shows the various services of this project offered by the airline authorities.

The Real-time notification is the chief feature of our project where the notification will be fired by the Firebase console pushed online by a dashboard.

The user will be informed about each and every part of his airport experience starting from the Terminal gates, Bag dropping [2] site, Flight delay time and various other services through this push notification on his mobile screen.

3.2 HARDWARE INTERFACES

- ❖ Intel core i7 7th Generation
- ❖ 3.1 GHz processor
- ❖ 8 GB Random Access Memory
- ❖ 256 GB SSD
- ❖ 1 TB HDD
- ❖ 2 GB VRAM

3.3 SOFTWARE INTERFACES

- ❖ ANDROID STUDIO
- ❖ GOOGLE FIREBASE
- ❖ WINDOWS 10
- ❖ ANDROID PIE
- ❖ ADOBE CREATIVE SUITE
- ❖ PYTHON
- ❖ HTML, CSS, JS, PHP, Bootstrap.

CHAPTER 4

CONCLUSION AND FUTUREWORK

4.1 CONCLUSION

The entire idea around which our team has worked to find a solution to the advanced airport system is very large and complex. But we have tried to solve some of the major problems through this dream project. The overall Experience of 'DRISHTI" will be good. Talking about domestic market i.e. India, it is the most important airport technology product which will help in the Indian travel market & at the same time shifting the mind-set of the people from going & travelling physically and wasting their precious time to saving a lot of time and energy along with money.

Our application will contribute in the emerging field of airport travel in the world by making aware the travellers of the various limitations of the present systems. Hence, it will help the travellers to choose between the right and the wrong that are there and knowing where to go when and it will save their precious time which they were going to waste by standing in long queues and waiting for their turn to come or sometimes get lost.

4.2 FUTUREWORK

In the future this project can be further modified by using advanced Artificial Intelligence algorithms to enhance its facilities. More and more services can be integrated into our application and the User Experience (UI) can be upgraded as well. Technological research organizations can perform research on our project based on our ideas and codes.

4.3 REFERENCES

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