# AIRLINE DATA ANALYTICS FOR AVIATION INDUSTRY

**A PROJECT REPORT**

*Submitted by*

| | |
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for the course

## HX8001 – Professional Readiness For Innovation, Employability and Entrepreneurship

**In**

INFORMATION TECHNOLOGY

**DMI COLLEGE OF ENGINEERING**

PALANCHUR, CHENNAI – 600 123

**ANNA UNIVERSITY : CHENNAI 600 025**

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# ANNA UNIVERSITY : CHENNAI 600 025

Certified that this project report **"AIRLINE DATA ANALYTICS FOR AVIATION INDUSTRY"** is the bonafide work of **"KAVIYA.K (210519205022), VENMATHI.R (210519205056), DIVYA.V (210519205013), NUSHRATH FATHIMA.M.J (210519205034), PARIMALA.R (210519205035)"** who carried out the project work under

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# AIRLINE DATA ANALYTICS FOR

# AVIATION INDUSTRY

## TEAM ID:- PNT2022TMID25103

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# 1.INTRODUCTION

## 1.1 Project Overview :-

The use of data and analytics to inform decision-making is causing a revolution that will change everything. With so much data being generated by both the passengers on board and the plane's sensors today, there are more and more chances to utilize this data, which has a significant impact on air travel. It enables numerous businesses to enhance crucial facets of their operations, from utilizing data to increase consumer retention to enhancing the dependability and safety of aeroplane. In this project, we analyse the dataset, visualize the data, define terms, and give further examples for the aviation industry to analyse data from every channel, such as to develop a distinctive customer profile based on a wide variety of demographic information, habits, and preferences. Aviation manufacturers and airlines can optimise the flight of civil aircraft, including risk reduction, operation optimization, and customized services, by studying the aviation dataset of nations, airports, and regions. For civil aviation, developing a framework for storing and processing massive aviation data becomes crucial. The platform gathers information from many data sources, such as aircraft, airlines, and maintenance facilities. The platform offers decision-support tools for civil aviation, such as maintenance plans, real-time alerts, health monitoring, fuel-saving strategies, and flight schedules. The delays are responsible for large economic losses. Its important to provide better airline and airport service and avoid delays in air travel across different locations and promise to get passengers from location A to Location B on time.

## Purpose:-

       We provide a safe and better experience to passengers on civil aircraft by utilizing aviation data. Airport codes can refer to either the IATA airport code, a three-letter code used in passenger reservation, ticketing, and baggage-handling systems, or the ICAO airport code, a four-letter code used by ATC systems and for airports without an IATA airport code. At the municipal level, to provide better airline and airport services and to avoid delays in air travel across different locations. The goal is to provide airports, airlines, and the general public to view the delay of flights to the destination which may occur due to climatic conditions to make the passengers aware of the arrival of flights.

# 2. LITERATURE SURVEY

## 2.1 Existing problem :-

Flight delay is inevitable and it plays an important role in both profits and loss of the airlines. An accurate estimation of flight delay is critical for airlines because the results can be applied to increase customer satisfaction and incomes of airline agencies. There have been many researches on modeling and predicting flight delays, where most of them have been trying to predict the delay through extracting important characteristics and most related features. However, most of the proposed methods are not accurate enough because of massive volume data, dependencies and extreme number of parameters. As the air travels have a significant role in economy of agencies and airports, it is necessary for them to increase quality of their services. One of the important modern life challenges of airports and airline agencies is flight delay. In addition, delay in flight makes passengers concerned and this matter causes extra expenses for the agency and the airport itself. In 2007, U.S government had endured 31–40 billion dollar downsides due to flight delays.

## 2.2 References :-

**Mohamed et al.** have studied the pattern of arrival delay for non-stop

domestic flights at the Orlando International Airport. They focused primarily on the cyclic variations that happen in the air travel demand and the weather at that particular airport.

In **Shervin et al.**'s work , their motive of research is to propose an approach that improves the operational performance without hampering or effecting the planned cost.

**Adrian et al.** have created a data mining model which enables the flight delays by observing the weather conditions. They have used WEKA and R to build their models by selecting different classifiers and choosing the one with the best results. They have used different machine learning techniques like Naïve Bayes and Linear Discriminant Analysis classifier.

**Choi et al.** have focused on overcoming the effects of the data imbalancing caused during data training. They have used techniques like Decision Trees, AdaBoost, and K-Nearest Neighbors for predicting individual flight delays. A binary classification was performed by the model to predict the scheduled flight delay.

**Schaefer et al**. have made Detailed Policy Assessment Tool (DPAT) that is used to stimulate the minor changes in the flight delay caused by the weather changes.

## 2.3 Problem Statement Definition :-

We gathered a dataset on continents, region, different airports located in different geographic regions, and we have worked with the dataset prepared the data module, explored the data and understand the dataset, finally we have performed the data visualization charts. The data which we gathered was very limited, but it gave us a great direction on how weather plays a part in flight delays. In this project, the goal is to use exploratory analysis and to build aware of the flights timings to the airports.
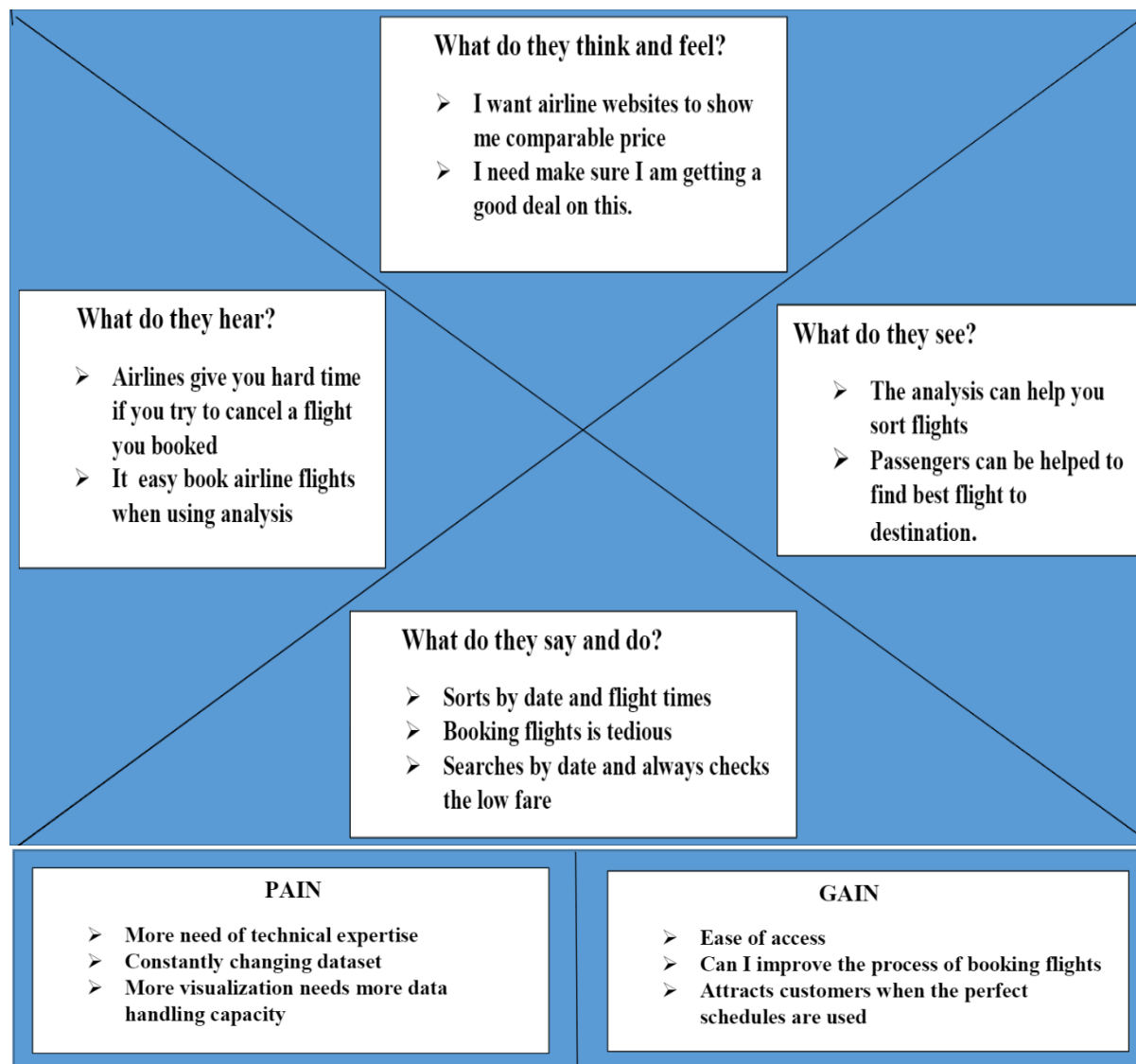
| Problem Statement (PS) | I am (Customer) | I'm trying to | But | Because | Which makes me feel |
|---|---|---|---|---|---|
| PS-1 | Passenger who expects to be comfortable during my airtime travel | Find best solutions and different ways to meet my expectation | Facing issues in searching for some unique resources | Details and information provided in public platform was not confidential | To enjoy my journey in the safest way |

# 3. IDEATION & PROPOSED SOLUTION

## 3.1 Empathy Map Canvas :-

An empathy map is a simple, easy to digit visual that captures knowledge about a user's behaviour and attitudes. It is a useful tool to help teams better understanding their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps the participants consider things from the user's perspective along with his or her goals and challenges.

**What do they think and feel?**

➢ I want airline websites to show me comparable price
➢ I need make sure I am getting a good deal on this.

**What do they hear?**

➢ Airlines give you hard time if you try to cancel a flight you booked
➢ It easy book airline flights when using analysis

**What do they see?**

➢ The analysis can help you sort flights
➢ Passengers can be helped to find best flight to destination.

**What do they say and do?**

➢ Sorts by date and flight times
➢ Booking flights is tedious
➢ Searches by date and always checks the low fare

**PAIN**

➢ More need of technical expertise
➢ Constantly changing dataset
➢ More visualization needs more data handling capacity

**GAIN**

➢ Ease of access
➢ Can I improve the process of booking flights
➢ Attracts customers when the perfect schedules are used

## 3.2 Ideation & Brainstorming:-

## Step-1: Team Gathering, Collaboration and Select Problem Statement



## Step-2:Brainstorm, Idea listing and grouping

**Group ideas**
Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

⏱ 20 minutes

**TIP**
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

# Step-3: Idea Prioritization

④

**Prioritize**
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⏱ 20 minutes

**♡ Importance**
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

**⚑ Feasibility**
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)
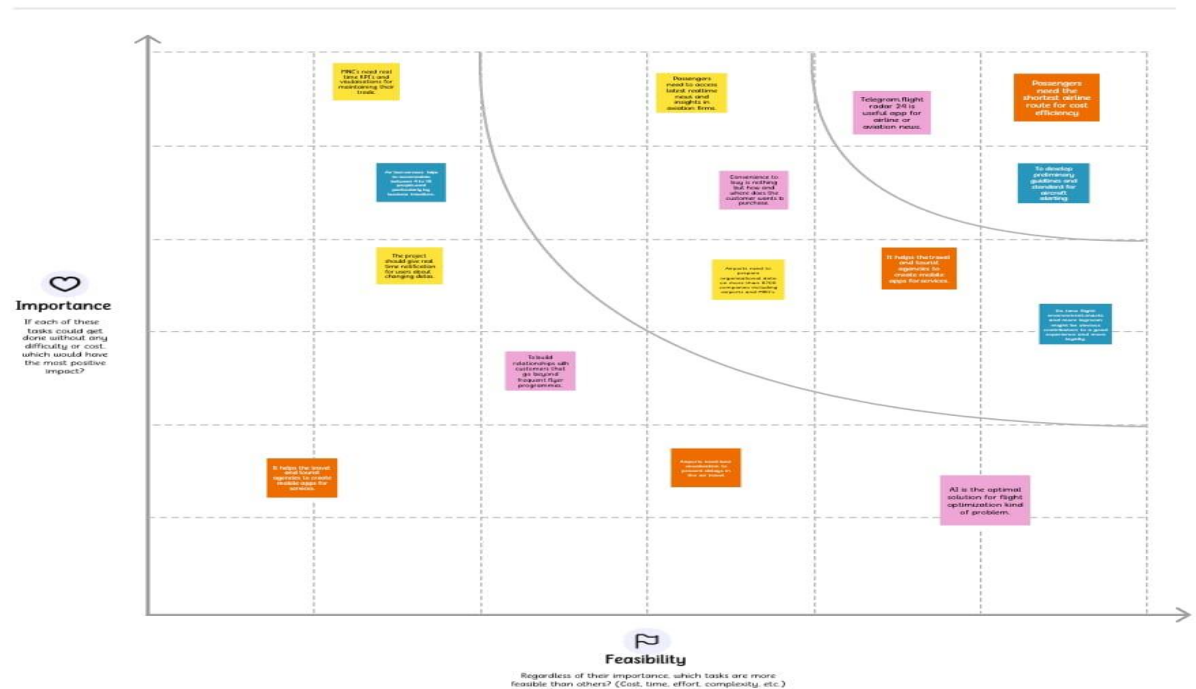
## 3.3 Proposed Solution :-

Understanding traveler demand for specific cities and pricing flights can be done using data analytic. Airlines use this AI system which is collected and analyze flight data with regard to each route distance and altitude,aircraft type and weight,wealth etc. Airlines airports aviation ground handling companies to provide audits workshop,presentation & seminar centered around executive presence corporate image ,team building and exceptional customer service. Due to the use of smart data analytics, passengers will avoid many issues with baggage tracking. While radio-frequency identification prevents mishandling the baggage, predictive analysis assists in improving the predictability of fleet reliability.

| S.No. | Parameter | Description |
|-------|-----------|-------------|
| 1. | Problem Statement (Problem to be solved) | ❖ At airline there is many problem in planning and operation like complexity,detailed and on target modelling is needed to secure useful and well organized solution.<br>❖ At the same time there is continuous change in an airline environment.<br>❖ The industry adapts passenger airlines and air transportation come up with needs to look at how they can reduce health concerns without shrink the customer experience. |
| 2. | Idea / Solution description | ❖ Understanding traveler demand for specific city pairs and pricing flights can be done using data analytic.<br>❖ Airlines use this AI system which is built in machine learning algorithm to collect and analyze flight data with regard to each route distance and altitude,aircraft type and weight,wealth etc. These can be handled with the aforementioned project. |

| 3. | Novelty / Uniqueness | ❖ Airlines airports aviation ground handling companies to provide audits workshop,presentation & seminar centered around executive presence corporate image ,team building and exceptional customer service.<br>❖ Due to the use of smart data analytics, passengers will avoid many issues with baggage tracking. While radio- frequency identification prevents mishandling the baggage, predictive analysis assists in improving the predictability of fleet reliability. |
|---|---|---|
| 4. | Social Impact / Customer Satisfaction | ❖ The industry to understand the customers' convenience,quality,price and other maintenance issues by the Data analytics.<br>❖ The airline industry keeps the detail of customers up-to-date in real time and they also provide their need unique experiences,If there is any issues the customer don't get a proper response for the problem ,next time the customer wont like to choose this Airline.The speed of response is important. |
| 5. | Business Model (Revenue Model) | ❖ Business models is used to describe about the organization design or the company's.<br>❖ It measures and manage the necessary data and it specify the description of company's value generation system.<br>❖ A revenue model is a blueprint that shows how a startup business will earn revenue or gross income from its standard business operations, and how it will pay for operating costs and expenses. |
| 6. | Scalability of the Solution | ❖ The Cloud Cognos Analytics is not only for particular organization/governments.<br>❖ Aviation industry acting under international, domestic or private are also getting satisfied with the aviation data analyzing process provided as per their needs. |

## 3.3 Problem Solution fit:-

### 1. CUSTOMER SEGMENT(S) `CS`

. Customer segmentation is the process by which customer is divided based on common characteristic or behavior

. customers are airport, tourist/travel agencies and other stakeholder to provide the data

.one of the possible aspects for passenger route forecasting model can be the customer segmentation

### 6. CUSTOMER CONSTRAINTS `CC`

What constraints prevent your customers from taking action or limit them choices of solutions?

. customer constraints could be physical movements, time, flight operation, military operations, easing the noise, weather, reduced flows, length, size of aircraft and so on

. customer experience in the airline industry is often defined as what the customer perceives and experience while travelling through the different departure stages and arrival in an airport

### 5. AVAILABLE SOLUTIONS `AS`

Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have?

. Understanding traveler demand for specific city pairs and pricing flights can be done using data analytic

. Airlines use this AI system which is built in machine learning algorithm to collect and analyze flight data with regard to each route distance and altitude, aircraft type and weight, wealth etc. These can be handled with the aforementioned project

**Define CS, fit into CC**

**Explore AS, differentiate**

### 2. JOBS-TO-BE-DONE / PROBLEMS `J&P`

Which jobs-to-be-done (or problem s) do you address for your customers? There could be more than one; explore different sides.

. Average aircraft delay is regularly referred to as an indication of airport capacity. Flight delay is a prevailing problem in this world.

. It hurts airports, airlines, and affects a company's marketing strategies as companies rely on customer loyalty to support their frequent flying program

### 9. PROBLEM ROOT CAUSE `RC`

What is the real reason that this problem exists? What is the back story behind the need to do this job?

. A few factors responsible for the flight delays like runway construction to excessive traffic are rare, but bad weather seems to be a common cause.

. Some flights are delayed because of the reactionary delays, due to the late arrival of the previous flight.

### 7. BEHAVIOUR `BE`

What does your customer do to address the problem and get the job done?

. Have done a sentiment analysis and opinion mining that analyzes people's opinions, sentiments, and studies their behavior.

. The output of the research is a feature-based opinion summary which is also known as sentiment classification

**Focus on J&P, tap into BE, understand RC**

**Focus on J&P, tap into BE, understand RC**

### 3. TRIGGERS `TR`

What triggers customers to act?

. Establish different levels of trigger From customer points are facility/airport Airport incident, security and weather / Natural disaster

### 4. EMOTIONS: BEFORE / AFTER `EM`

How do customers feel when they face a problem or a job and afterwards?

. The customers emotions can be frustrated if the delay in flight and result in loss of customer trust and loyalty

### 10. YOUR SOLUTION `SL`

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behavior.

. The solution is to predict the reasons for flight delay and for that we have put in efforts for collecting data about the flight and weather

. we have created mining model which enables the Flight delay by observing the weather conditions

. The motive is to propose an approach that improve the operational performance

### 8. CHANNELS of BEHAVIOUR `CH`

**8.1 ONLINE**
What kind of actions do customers take online? Extract online channels from #7

. In airline analytics aviation in online should be more secured and authenticated that other third party or any other couldn't able to access the data of customers

**8.2 OFFLINE**
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

. offline is better as you will get better service from travel agents especially when issues like cancellations, refunds arise

**Identify strong TR & EM**

# 4. REQUIREMENT ANALYSIS

## 4.1 Functional requirement :-

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|--------|-------------------------------|-------------------------------------|
| FR-1 | User Registration | Registration can done through Gmail. |
| FR-2 | User Confirmation | Confirmation via Email<br>Confirmation via OTP |
| FR-3 | Visualizing data | Using IBM cognos Analytics user can visualize if any delay of flights. |
| FR-4 | Generating Report | User can view the delay of flights report. |

## 4.2 Non-Functional requirements :-

Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description |
|--------|----------------------------|-------------|
| NFR-1 | **Usability** | Users can easily understand and use the features in an effective manner. The application is very simple to use and it is a user-friendly graphical interface. Actions will be performed in just a few clicks. |
| NFR-2 | **Security** | The proper login mechanism should be used to avoid hacking.This is the main security concern in user account. The organization system should not disclose personal information of users and other organization details to public. |
| NFR-3 | **Reliability** | If the system is disconnected or logout due to over access at the same time, it should save all the process of the users made up to the point of abnormal happenings. |
| NFR-4 | **Performance** | While browsing through the catalogue the system should require a fair amount of speed |

| NFR-5 | **Availability** | User can access at anytime.The system shall be available 24 hours a day 7 days a week. |
| NFR-6 | **Scalability** | Wide range of users can make access of the websites. |

# 5.PROJECT DESIGN

## 5.1 Data Flow Diagrams :-

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.
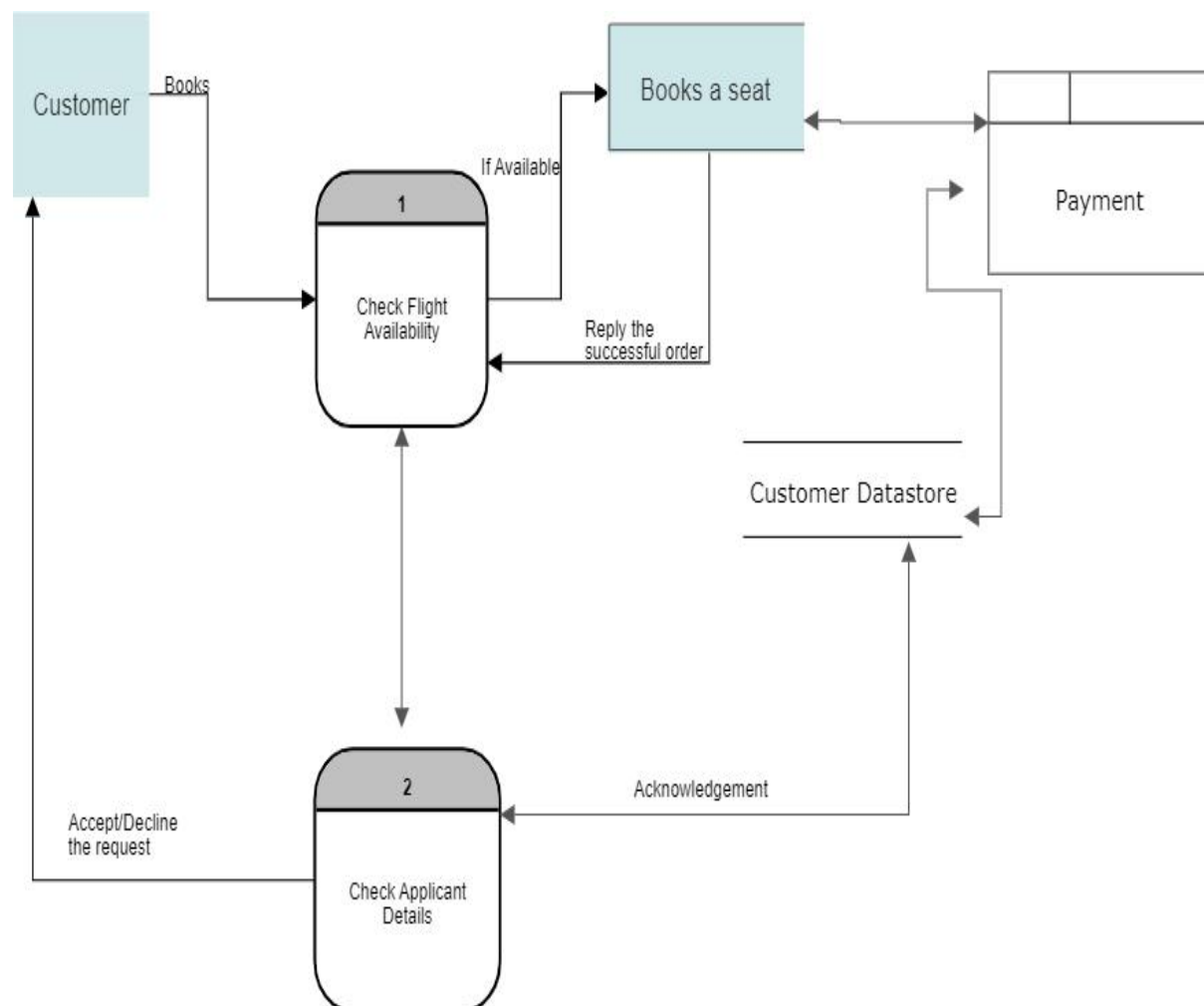
## 5.2 Solution & Technical Architecture :-

## Solution Architecture :

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. its goals are to:

➢ find the best tech solution to solve existing business problems.
➢ describe the structure, characteristics, behaviour, and other aspects of the software to project stakeholders.
➢ define features, development phases, and solution requirements.
➢ provide specifications according to which the solution is defined, managed, and delivered.
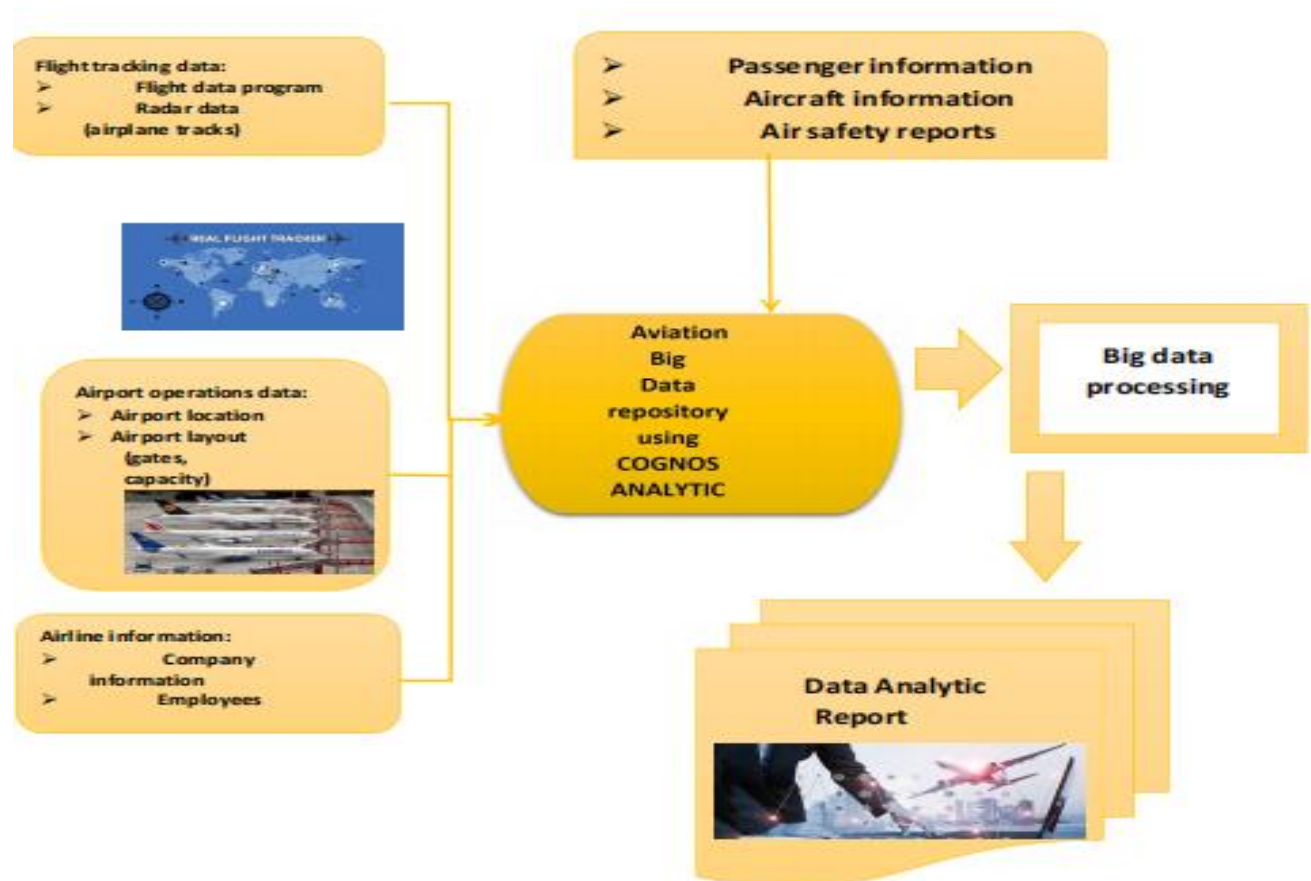
## Technical Architecture :

Airline Data Analytics For Aviation Industry
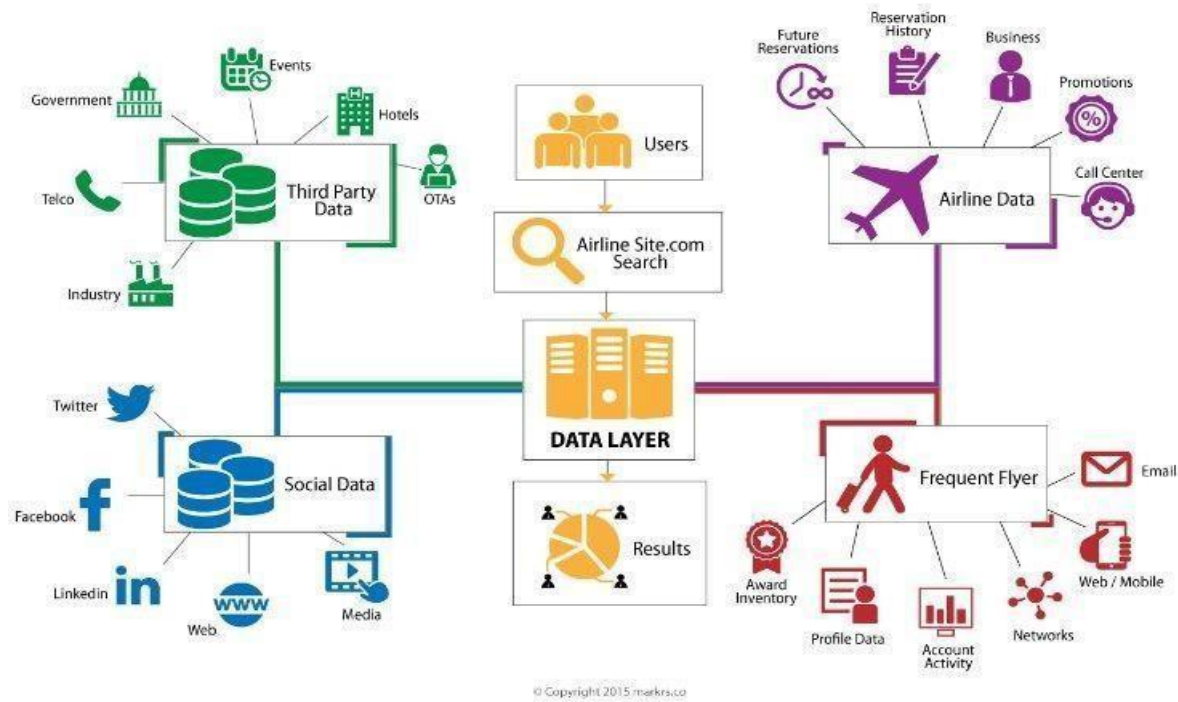


Table-1: Components & Technologies:

| S.No | Components | Description | Technology |
|------|-----------|-------------|------------|
| 1. | User Interface | How user interacts with application. Example: Mobile App | HTML, CSS, Java Script, Excel |
| 2. | Application Logic-1 | Logic for a process in the application | IBM Watson STT service, Python |
| 3. | Application Logic-2 | Logic for a process in the application | IBM Watson Assistant |

| 4. | Database | Data Type, Configurations | MySQL, NSQL |
|----|----------|--------------------------|-------------|
| 5. | Cloud Database | Database service on cloud | IBM DB2, IBM Cloud |
| 6. | File Storage | File Storage requirements | IBM Blocks Storage or other storage service or Local File system |
| 7. | External API-1 | Purpose of External API used in the application | IBM Weather API |
| 8. | External API-1 | Purpose of External API used in the application | Aadhar API |
| 9. | Infrastructure (Server/Cloud) | Application Deployment on Local System/Cloud Local Server Configuration: Cloud Server Configuration | Local, Cloud Foundry |

## 5.3 User Stories :-

Use the below template to list all the user stories for the product.

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|---|---|---|---|---|---|---|
| Customer (Web user) | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my password. | I can access my account / dashboard | High | Sprint-1 |
| | | USN-2 | As a user, I will receive confirmation email once I have registered for the application | I can receive confirmation email & click confirm | High | Sprint-1 |
| | | USN-3 | As a user, I can register for the application through Gmail. | | Medium | Sprint-1 |
| | Login | USN-4 | As a user, I can log into the application by entering email & password. | I can get to access my web portal | High | Sprint-1 |
| | Dashboard | USN-5 | As a user, I can get to know what my dashboard consists of. | I can my details of my registration. | Low | Sprint-2 |
| Customer Care Executive | Organization | USN-6 | The organization which owns this airplane analysis system will enable the option to customers to reach out the organization if | The customer care workers will help out the customers in trouble. | High | Sprint-1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | • they have any problem with the organization's system ofcustomer interaction or<br>• airplane issues- delay, landing ina different location | | | |
| Administrat or | Administratio n | USN-7 | The organization takes in-charge of the administrative policies of different departments like:<br><br>• registration<br>• flight booking<br>• delay visualization<br>• generation of delay report | As an administrator, confirmation of user while registration is done. | High | Sprint-1 |

# 6. PROJECT PLANNING AND SCHEDULING

## 6.1 Sprint Planning and Estimation :-

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|--------|-------------------------------|-------------------|-------------------|--------------|----------|--------------|
| Sprint-1 | Registration | USN-1 | I can sign up for the application as a user by providing my email address, password, and confirming that. | 2 | High | Venmathi R |
| Sprint-1 | Registration | USN-2 | When I register for the application as a user, I will get a confirmation email. | 3 | High | Divya V |
| Sprint-1 | Login | USN-3 | I've grown accustomed to using credentials to access the system as a user. | 2 | Low | Kaviya K |
| Sprint-1 | Collection of dataset | USN-4 | I can collect the dataset and choose the area of interest to be tracked and analysed as a user. | 5 | Medium | Arshiya J |
| Sprint-2 | Dataset Exploration | USN-5 | I can explore the given dataset through IBM cognos | 6 | High | Divya V |
| Sprint-2 | Dataset Visualization | USN-6 | I will use cognos as a developer to visualise the provided dataset into a dashboard. | 6 | High | Venmathi R |
| Sprint-3 | Dashboard Customization | USN-7 | I can personalise the dashboard that is visualised as a user. | 6 | Medium | Arshiya J Nushrath fathima m.j |
| Sprint-3 | Ease of Access | USN-8 | I can simply access and use the dashboard as a user. | 6 | Medium | Parimala R |
| Sprint-4 | Report Generation | USN-9 | I can view the detailed report of my visualization | 6 | High | Nushrath Fathima.M.J |
| Sprint-4 | Dashboard Establishment | USN-10 | Established the dashboard into a website and submit the website. | 6 | High | Kaviya K |

## 6.2 Sprint Delivery Schedule :-

| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|--------|-----|-----|-----|-----|-----|-----|
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 12 | 29 Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 12 | 05 Nov 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 12 | 12 Nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 12 | 19 Nov 2022 |
|  |  |  |  |  |  |  |



Burndown Chart
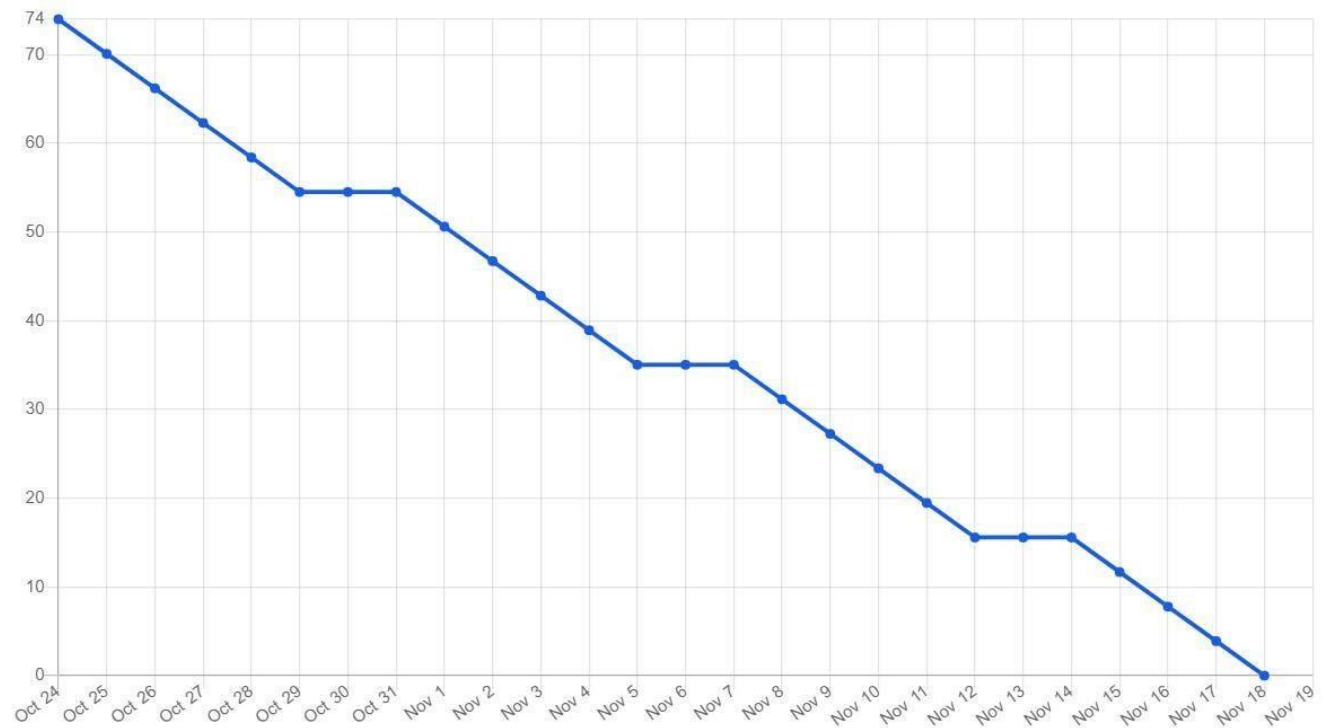
### Velocity:
Imagine we have a 10 day sprint duration and the velocity of the team is 20. Lets calculate the teams average velocity(AV) per iteration unit(story points per day)

Average velocity=Sprint duration/velocity=12/6=2

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus item. It is often used in agile software development methodologies such as scrum. However, burndown charts can be applied to any project containing measurable progress over time.

## 6.3 Report from JIRA :-
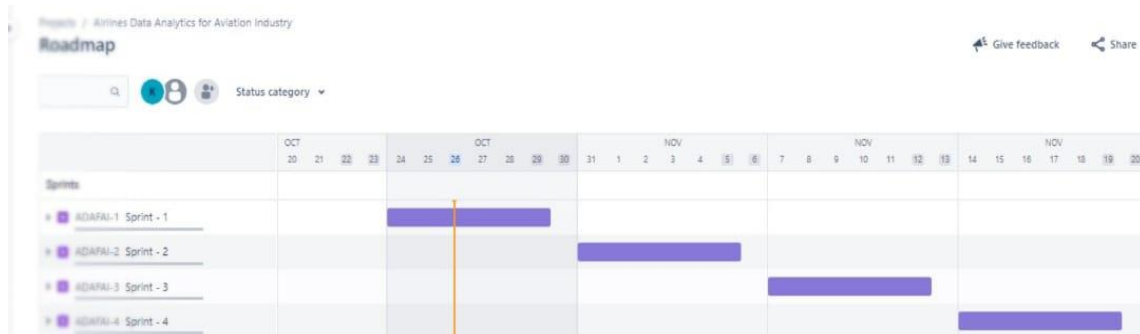


## 7.CODING AND SOLUTIONING

## 7.1 Feature 1 :-Building a login page using html

```html
<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Employee Attrition</title>

    <link rel="stylesheet" href="./style.css">

</head>

<body>

    <nav>

    <div id="lat">

        <div id="logo">

            <img src="./images/logo 2.png" alt="logo" width="50px" height="40px"
style="margin-top: 5px;">

        </div>

        <div id="title">

            <span>Flight</span>

            <span style="color:rgb(209,184,87)">Attrition</span>

        </div>

    </div>

    <div id="menu" style="font-size: large;">

        <span id="home"><b>Home</b></span>

        <span id="admin"><b>Admin</b></span>

        <span id="register" ><b>Register</b></span>

        <span id="about"><b>About us</b></span>

        <span id="contact"><b>Contact us </b></span>

    </div>

</nav>
```

```html
<div class="head">

    <span style="color: rgb(255,194,35);"><b>Log in our Page to get Best Flight Service</b></span>

        <span style="color: white;"><b>IT'S YOUR SKY</b></span>

    </div>

    <div class="body">

        <form action="connection.php" method="post">

            <input class="input" type="email" placeholder="enter the gmail id" name="name">

            <input class="input" type="txt" placeholder="password" name="password">

            <button class="button" name="submit">Login</button>

        </form>

    </div>

</div>div class="container">

<div class="container1">

<div class="container2">

<div class="img">

</div>

</div>

</div>

<script src="./index.js"></script>

</body>

</html>
```
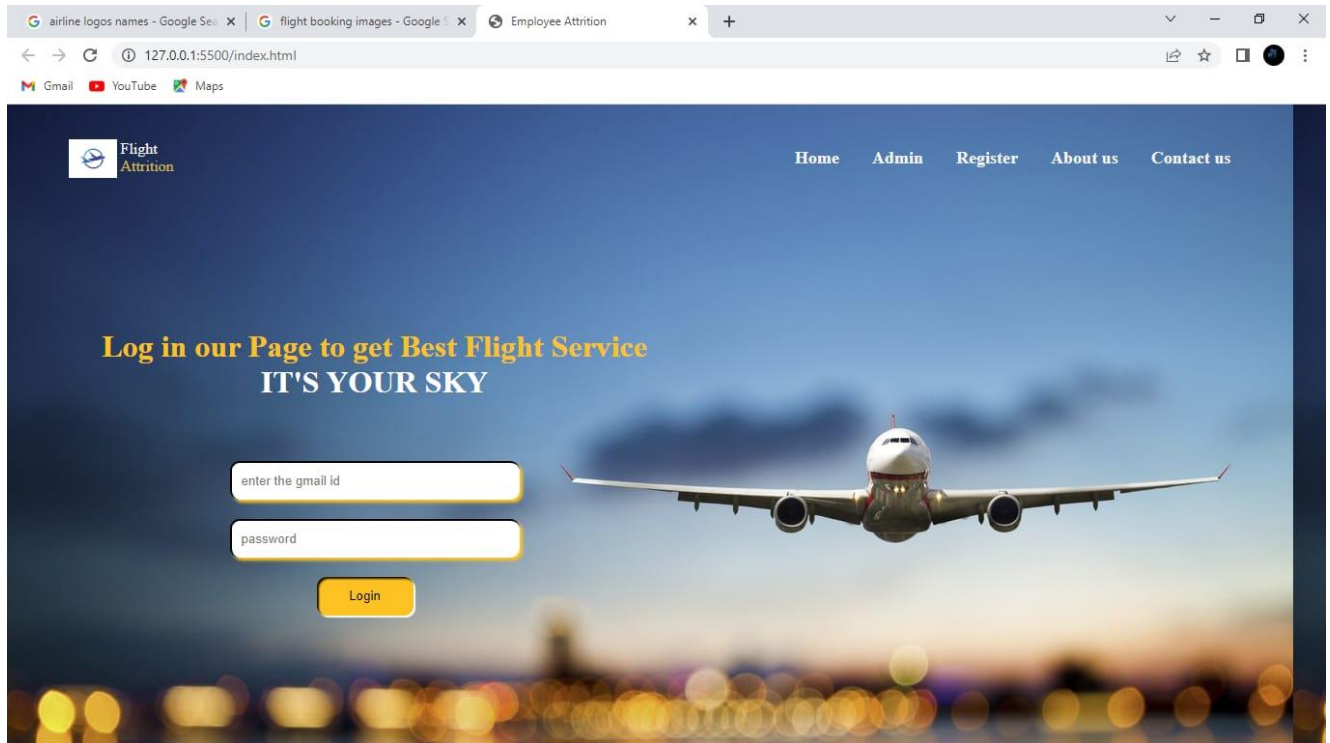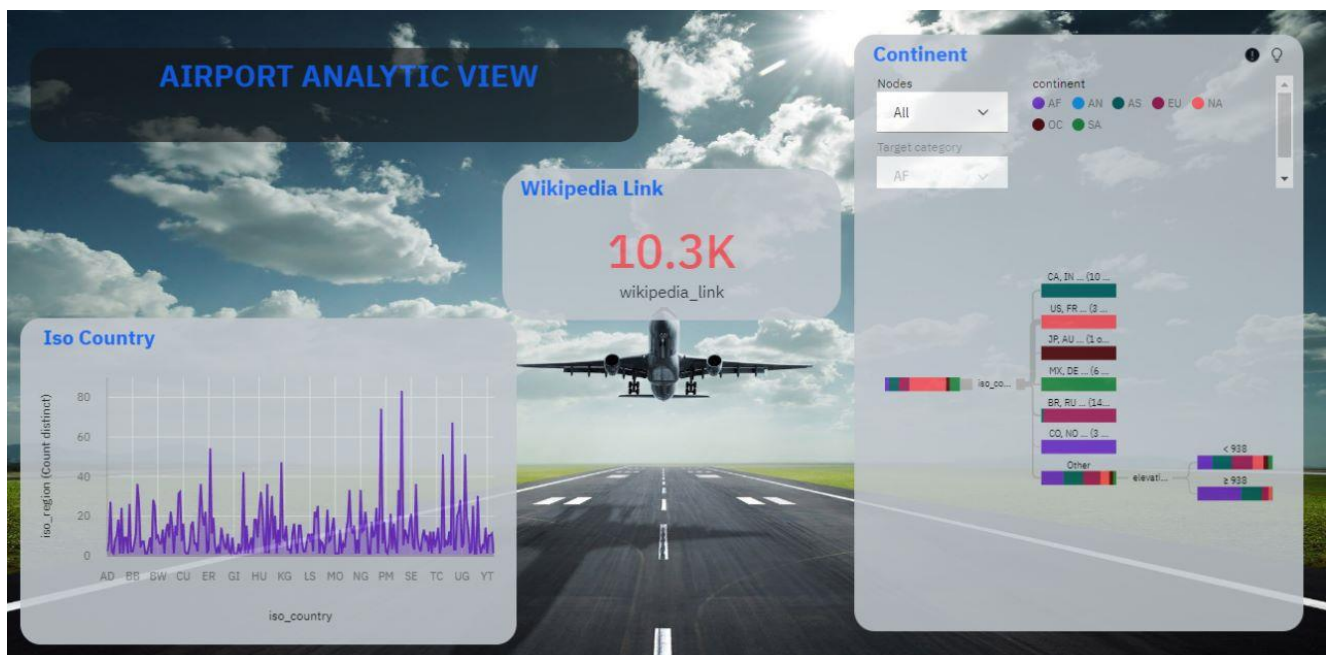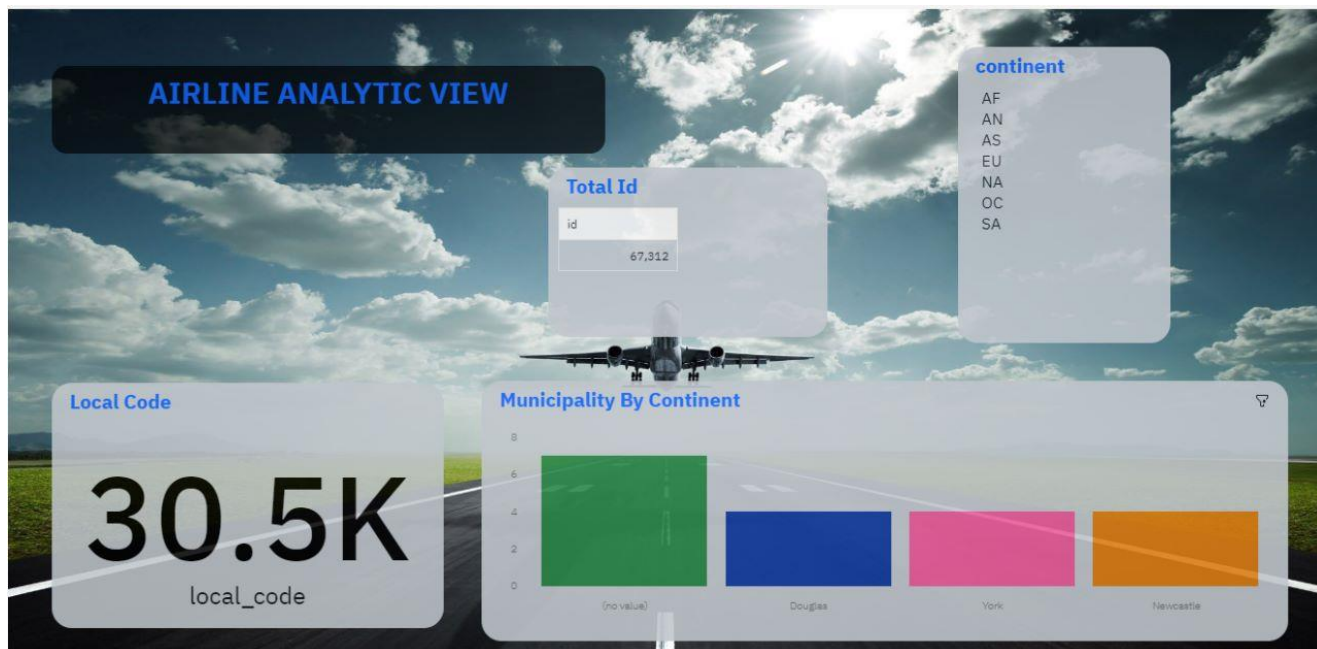
## 7.2 Feature 2 :- Creating dashboard using IBM cognos analytics platform

AIRLINE ANALYTIC VIEW

continent

AF
AN
AS
EU
NA
OC
SA

Total Id

id

67,312

Local Code

30.5K

local_code

Municipality By Continent

8
6
4
2
0

(no value)    Douglas    York    Newcastle

# 8. TESTING

## 8.1 Test Cases :-

| Test case ID | Feature Type | Component | Test Scenario | Pre-Requisite | Steps To Execute | Test Data | Expected Result | Actual Result | Status | Commnets | TC for Automation(Y/N) | BUG ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LoginPage_TC_OO1 | Functional | Home Page | Verify user is able to see the Login/Signup popup when user clicked on My account button | Visual Studio Code Using Html,Css,javascript,sql | 1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Singup popup displayed or not | | Login/Signup popup should display | Working as expected | Pass | | | |
| LoginPage_TC_OO2 | UI | Home Page | Verify the UI elements in Login/Signup popup | Visual Studio Code Using Html,Css,javascript,sql | 1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Singup popup with below UI elements: a.email text box b.password text box c.Login button d.New customer? Create account link e.Last password? Recovery | | Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link | Working as expected | Fail | Steps are not clear to follow | | BUG-1234 |
| LoginPage_TC_OO3 | Functional | Home page | Verify user is able to log into application with Valid credentials | Visual Studio Code Using Html,Css,javascript,sql | 1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter valid password in password text box | Username: chalam@gmail.com password: Testing123 | User should navigate to user account homepage | Working as expected | pass | | | |
| LoginPage_TC_OO4 | Functional | Login page | Verify user is able to log into application with InValid credentials | Visual Studio Code Using Html,Css,javascript,sql | 1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter InValid username/email in Email text box 4.Enter valid password in password text box | Username: chalam@gmail.com password: Testing123 | Application should show 'Incorrect email or password ' validation message. | Working as expected | pass | | | |
| LoginPage_TC_OO4 | Functional | Login page | Verify user is able to log into application with InValid credentials | Visual Studio Code Using Html,Css,javascript,sql | 1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter Invalid password in password text box | Username: chalam@gmail.com password: Testing123678686786876 | Application should show 'Incorrect email or password ' validation message. | Working as expected | pass | | | |
| LoginPage_TC_OO5 | Functional | Login page | Verify user is able to log into application with InValid credentials | Visual Studio Code Using Html,Css,javascript,sql | 1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter InValid username/email in Email text box 4.Enter Invalid password in password text box 5.Click on login button | Username: chalam password: Testing123678686786876 | Application should show 'Incorrect email or password ' validation message. | Working as expected | pass | | | |
| ntering to dashboar | Functional | dashboard | can visualize the dashboard | IBM cognos | | | | Working as expe | pass | | | |
| Enter report | Functional | page | can view detailed visualization | IBM cognos | | | | Working as expe | Pass | | | |

## 8.2 User Acceptance Testing :-

### 1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [Product Name] project at the time of the release to User Acceptance Testing (UAT).

### 2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

| Resolution | Severity 1 | Severity 2 | Severity 3 | Severity 4 | Subtotal |
|---|---|---|---|---|---|
| By Design | 10 | 4 | 2 | 3 | 20 |
| Duplicate | 1 | 0 | 3 | 0 | 4 |
| External | 2 | 3 | 0 | 1 | 6 |
| Fixed | 11 | 2 | 4 | 20 | 37 |
| Not Reproduced | 0 | 0 | 1 | 0 | 1 |
| Skipped | 0 | 0 | 1 | 1 | 2 |
| Won't Fix | 0 | 5 | 2 | 1 | 8 |
| Totals | 24 | 14 | 13 | 26 | 77 |

## 3. Test Case Analysis
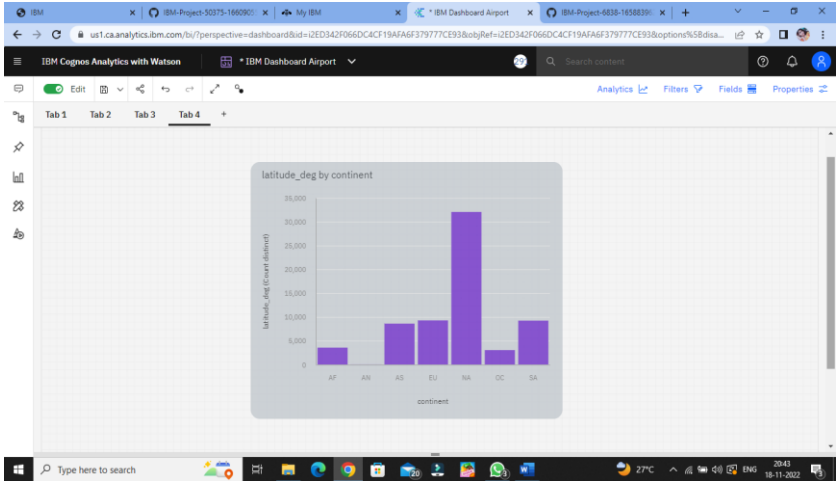
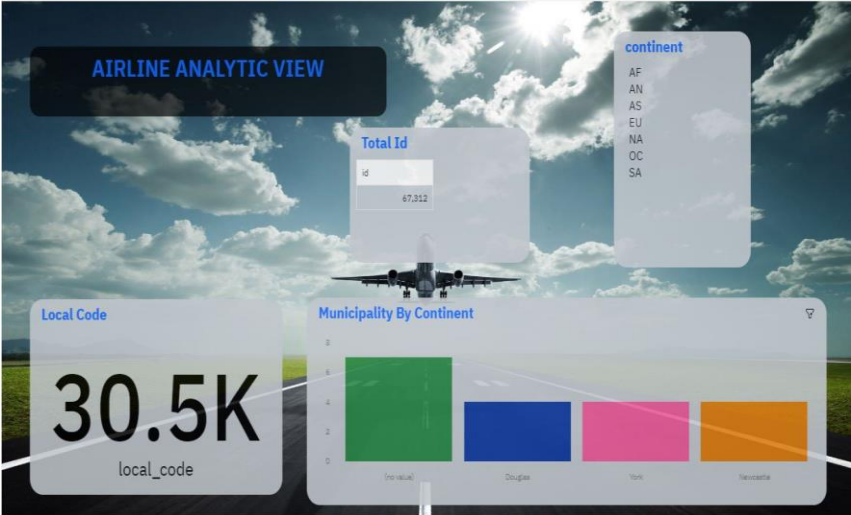This report shows the number of test cases that have passed, failed, and untested

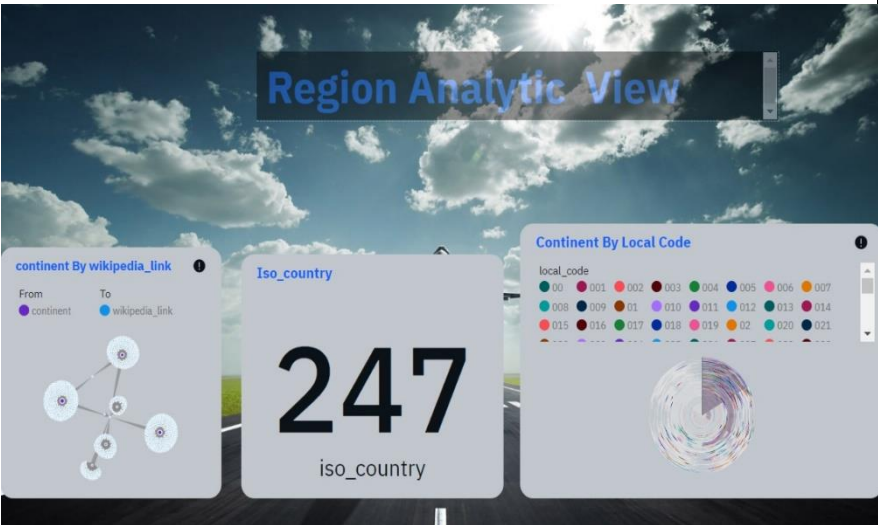| Section | Total Cases | Not Tested | Fail | Pass |
|---|---|---|---|---|
| Print Engine | 7 | 0 | 0 | 7 |
| Client Application | 51 | 0 | 0 | 51 |
| Security | 2 | 0 | 0 | 2 |
| Outsource Shipping | 3 | 0 | 0 | 3 |
| Exception Reporting | 9 | 0 | 0 | 9 |
| Final Report Output | 4 | 0 | 0 | 4 |
| Version Control | 2 | 0 | 0 | 2 |

# 9. RESULTS

## 9.1 Performance Metrics :-

Project team shall fill the following information in model performance testing template.

| S.No. | Parameter | Screenshot / Values |
|-------|-----------|---------------------|
| 1. | Dashboard design | No of Visualizations / Graphs – 19<br><br>Number of tabs-6<br><br> |
| 2. | Data Responsiveness | Data will dynamically change if the dataset changes and graphs too changes<br><br> |

| 3. | Amount Data to Rendered (DB2 Metrics) | No.of total local code- 30.5k |
| --- | --- | --- |
| | | Total ID-67,312 |
| | | Total country-7 |
| | |  |
| 4. | Utilization of Data Filters | We have created filters for dashboard which is working perfect |
| | |  |

| 5. | Effective User Story | with help of dataset of airport, country and region |
|---|---|---|
| | | No of Scene Added |
| | |  |
| 6. | Descriptive Reports | No of Visualizations / Graphs – 4 |
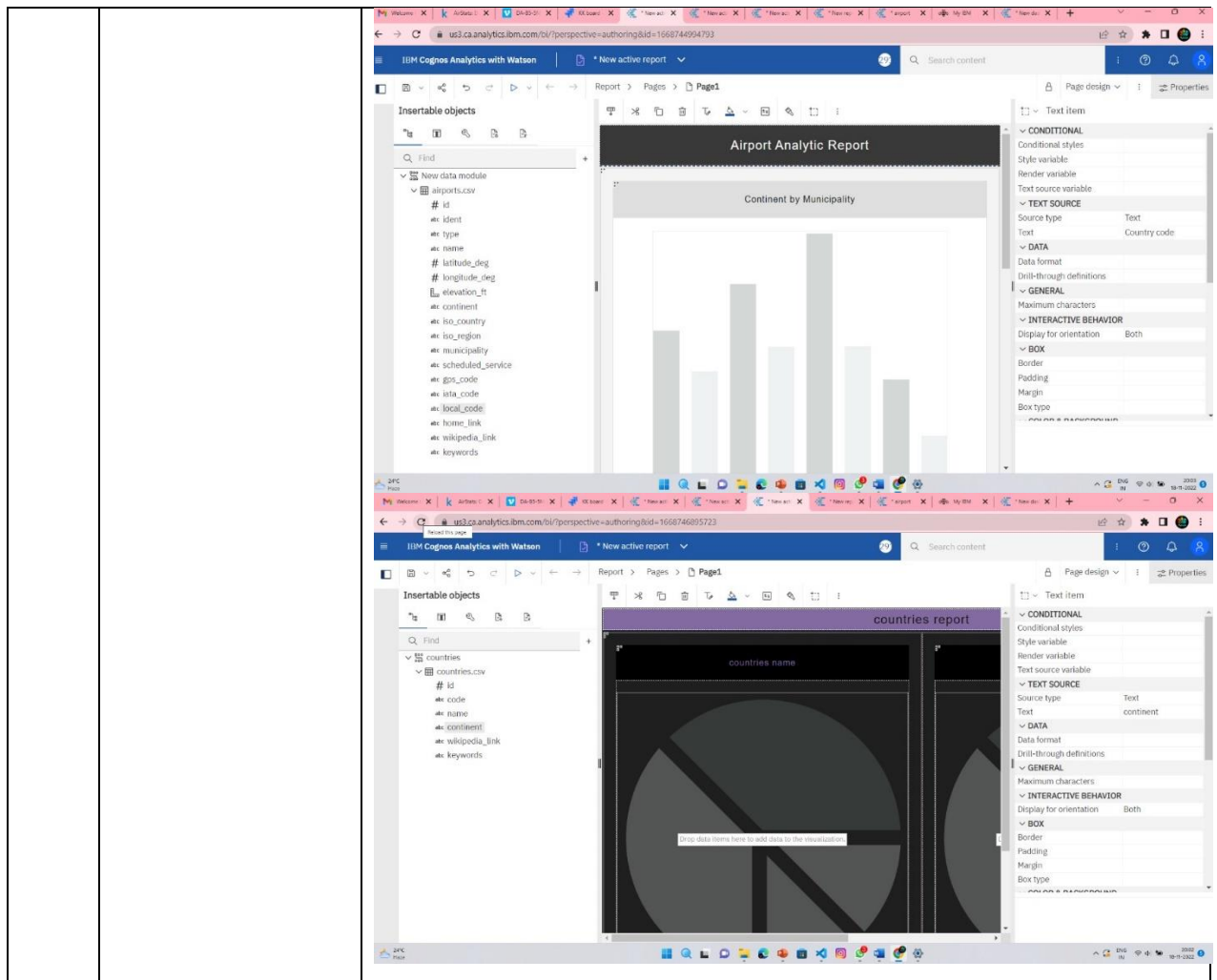
# 10. ADVANTAGE AND DISADVANTAGE

## Advantage

➢ Delay in flights can be visualized.

➢ Cancellation due to climatic change can be visualized.

## Disadvantage

➢ High temperature on the tarmac can lead to hear stress and other illness associated with extreme working conditions.

➢ Heat or flooding can make airports inoperable. When temperature soar toward 100 degree Fahrenheit, tarmacs can get soft and cause the wheels of planes to get stuck.

➢ In addition to extreme heat, climate change triggered by human is contributing to rising sea levels, which are leading to higher storm surges and more floods.

# 11.CONCLUSION

Understanding traveler demand for specific cities and pricing flights can be done using data analytic. Airlines use this AI system which is collected and analyze flight data with regard to each route distance and altitude,aircraft type and weight,wealth etc. It can be used to predict future glitches prevent them from happening and make the maintenance procedure more accurate, after analyzing

the data, a lot of insights have been generated. Most of the delays and cancellations are due to three main reasons which are stated as weather, Airlines carrier issues and the nation air system.

## 12.  FUTURE SCOPE

After analyzing the data we obtain Atlanta is one of the most busiest airport. In the year 2018 there is a maximum cancellations had taken place, most of the delays and cancellations whether in 2018 specifically on time span were due to three major reasons:

➢ Weather

➢ Airlines/carrier issues

➢ National air system

The weather data for each of the major airports could be obtained and combined with the existing dataset. With the new dataset, one could determine the exact weather conditions that resulted in delay/cancellations like rain, fog, etc and there can also book the flight using this web application.

# 13.APPENDIX

## 13.1 Source code :-

**Index.html**

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>flight Attrition</title>
  <link rel="stylesheet" href="./style.css">
</head>
<body>
  <nav>
  <div id="lat">
    <div id="logo">
      <img src="./images/logo 2.png" alt="logo" width="50px" height="40px" style="margin-top: 5px;">
    </div>
    <div id="title">
      <span>Flight</span>
      <span style="color:rgb(209,184,87)">Attrition</span>
    </div>
  </div>
  <div id="menu" style="font-size: large;">
    <span id="home"><b>Home</b></span>
    <span id="admin"><b>Admin</b></span>
    <span id="register" ><b>Register</b></span>
    <span id="about"><b>About us</b></span>
    <span id="contact"><b>Contact us </b></span>
  </div>
```

```html
    </nav>

        <div class="head">
            <span style="color: rgb(255,194,35);"><b>Log in our Page to get Best Flight
Service</b></span>
            <span style="color: white;"><b>IT'S YOUR SKY</b></span>
        </div>
        <div class="body">
            <form action="connection.php" method="post">
                <input class="input" type="email" placeholder="enter the gmail id"
name="name">
                <input class="input" type="txt" placeholder="password"
name="password">
                <button class="button" name="submit">Login</button>
            </form>
        </div>
    </div>div class="container">
    <div class="container1">
    <div class="container2">
    <div class="img">
    </div>
    </div>
  </div>
  <script src="./index.js"></script>
</body>
</html>


Style.css
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Employee Attrition</title>
  <link rel="stylesheet" href="./style.css">
</head>
<body>
  <nav>
  <div id="lat">
    <div id="logo">
        <img src="./images/logo 2.png" alt="logo" width="50px" height="40px"
style="margin-top: 5px;">
    </div>
    <div id="title">
      <span>Flight</span>
      <span style="color:rgb(209,184,87)">Attrition</span>
    </div>
  </div>
  <div id="menu" style="font-size: large;">
```

```html
        <span id="home"><b>Home</b></span>
        <span id="admin"><b>Admin</b></span>
        <span id="register" ><b>Register</b></span>
        <span id="about"><b>About us</b></span>
        <span id="contact"><b>Contact us </b></span>
    </div>
</nav>
    <div class="head">
        <span style="color: rgb(255,194,35);"><b>Log in our Page to get Best Flight
Service</b></span>
        <span style="color: white;"><b>IT'S YOUR SKY</b></span>
    </div>
    <div class="body">
        <form action="connection.php" method="post">
            <input class="input" type="email" placeholder="enter the gmail id"
name="name">
            <input class="input" type="txt" placeholder="password"
name="password">
            <button class="button" name="submit">Login</button>
        </form>
    </div>
    </div>div class="container">
    <div class="container1">

    <div class="container2">
    <div class="img">
    </div>
    </div>
    </div>
    <script src="./index.js"></script>
</body>
</html>
```

**Index.js**

```javascript
const home = document.getElementById('home');
const admin = document.getElementById('admin');
const register = document.getElementById('register');
const about = document.getElementById('about');
const contact = document.getElementById('contact');
admin.addEventListener('click',()=>{
  window.location.href="./admin.php"
});
home.addEventListener('click',()=>{
  window.location.href="./index.html";
  con.classList.add("off");
  console.log("hi")
})
register.addEventListener('click',()=>{
  window.location.href="./registration.php";
```

```
})
contact.addEventListener('click',()=>{
    window.location.href="./contact.html";
})
```

**User.html**

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <h1>success</h1>
</body>
</html>
```

**Registration.html**

```php
<?php

use LDAP\Result;

$con = new mysqli('localhost','root','','project');
if(isset($_POST['submit']))
{
    $name = $_POST['name'];
    $email = $_POST['email'];
    $password = $_POST['pass'];

    $sql="insert into `reg` (name,email,password) values('$name','$email','$password')";
    $result = mysqli_query($con,$sql);
    if(!$result)
    {
        die(mysqli_error($con));
    }
}
?>
```

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Employee Attrition</title>
    <link rel="stylesheet" href="./style.css">
</head>
```

```html
<body>
  <nav>
  <div id="lat">
    <div id="logo">
      <img src="./images/logo.png" alt="logo" width="50px" height="40px"
style="margin-top: 5px;">
    </div>
    <div id="title">
      <span>Employee</span>
      <span style="color:rgb(209,184,87)">Attririon</span>
    </div>
  </div>
  <div id="menu" style="font-size: large;">
  <span id="home"><b>Home</b></span>
    <span id="admin"><b>Admin</b></span>
    <span id="register" ><b>Register</b></span>
    <span id="about"><b>About us</b></span>
    <span id="contact"><b>Contact us</b></span>
  </div>
</nav>
<div class="container ">
    <div class="con" >
      <div class="reg">
        <form class="regform" action="registration.php" method="post">
          <h1 style="color:rgb(255,283,0); background-color: rgba(255, 255, 255, .3);
width:250px ; text-align: center;
          border-radius: 10px; border: 1px solid white;" >Register Form</h1>
          <div class="inputbox">
            <input type="text" name="name"
required="required"><span>Name</span></div>
            <div class="inputbox"> <input type="email" name="email"
required="required"><span>Email id</span></div>
            <!-- <div class="inputbox"> <input type="text" name="orgname"
required="required"><span>Organization name</span></div> -->
              <div class="inputbox"> <input type="password" name="pass"
required="required"><span>password</span></div>
                <!-- <div class="inputbox"> <input type="password"
required="required"><span>confirm password</span></div> -->
          <button name="submit" >Register </button>
          </div>
        </form>
      </div>
    </div>
  </div>
  <script src="./index.js"></script>
</body>
</html>
```
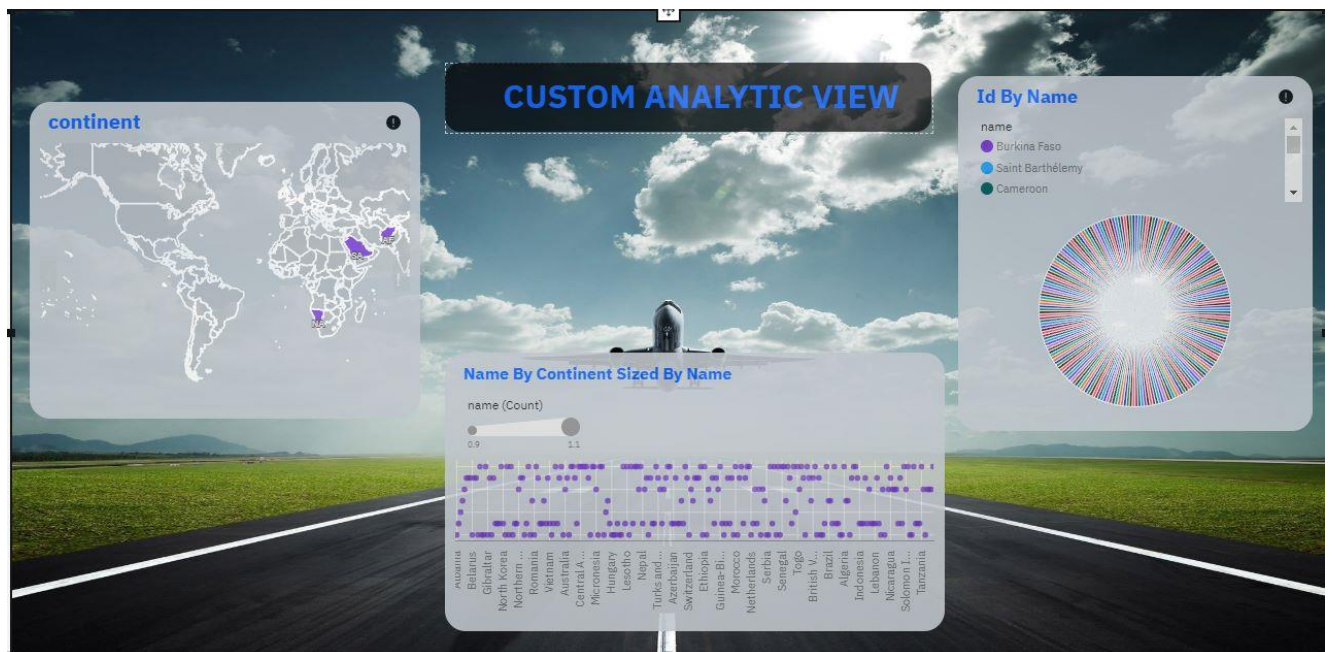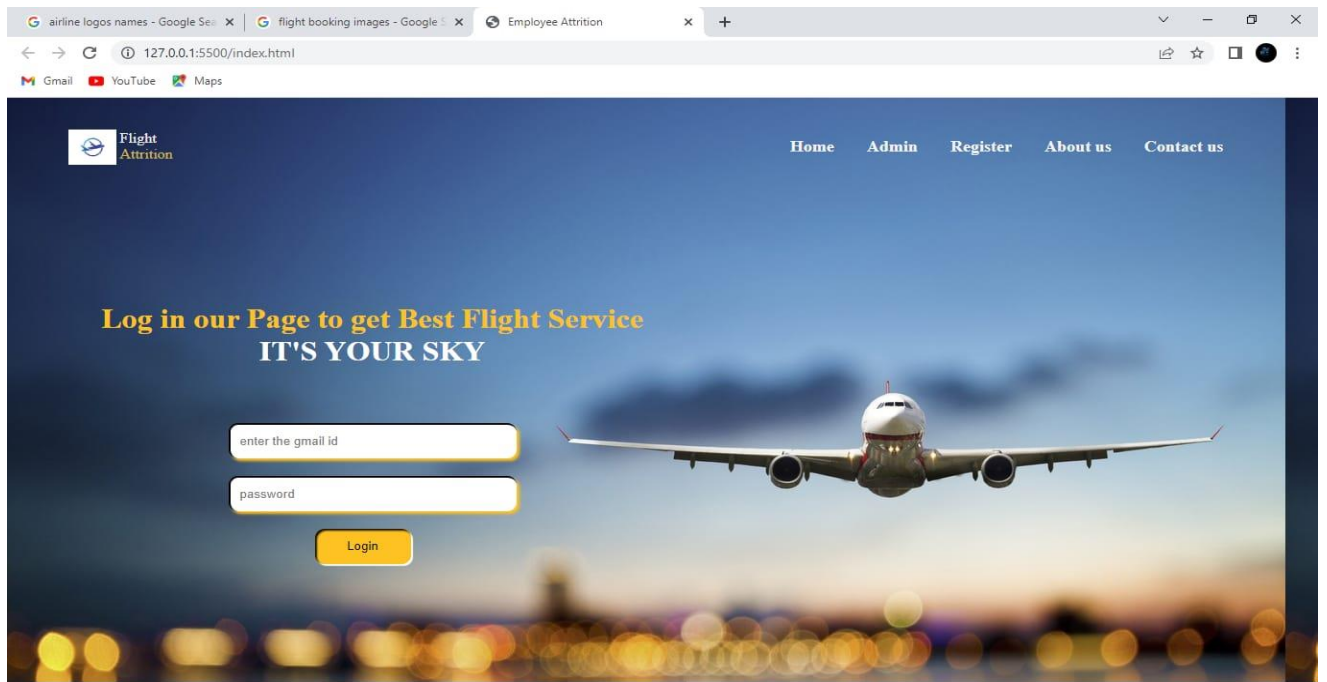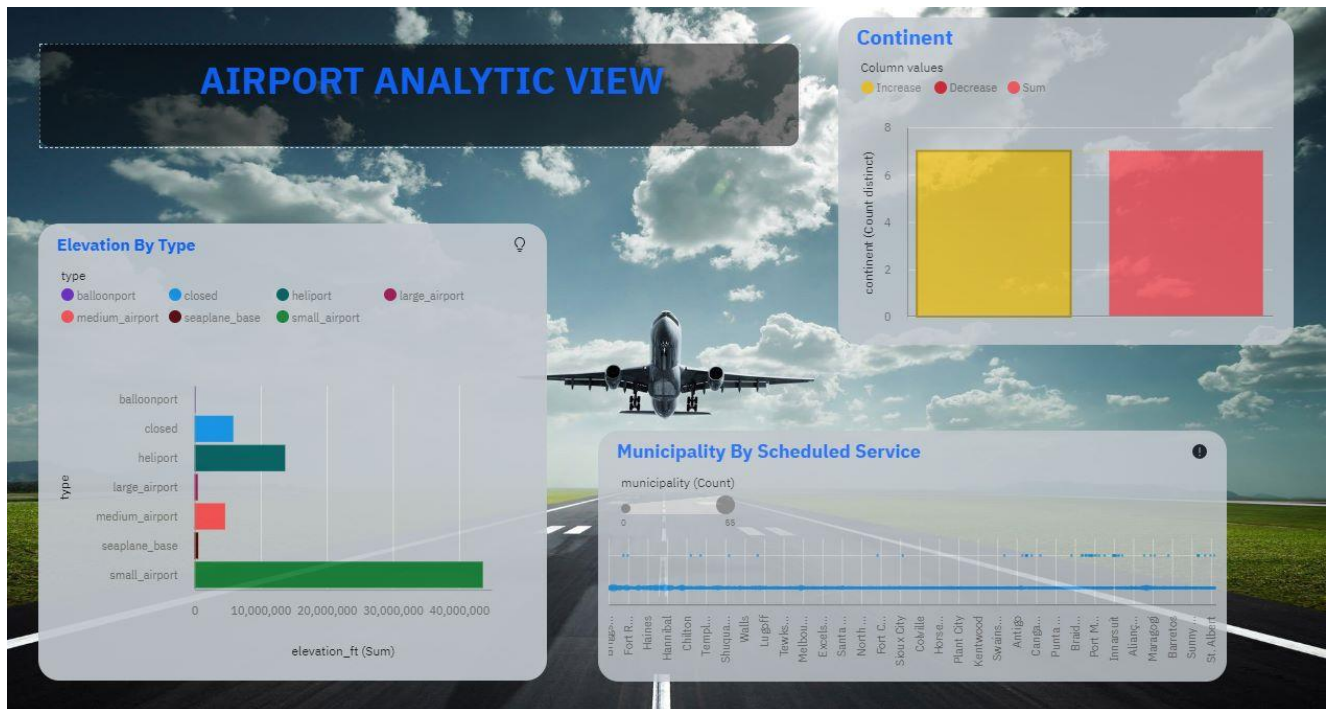
**Final output:**

## 13.2 GitHub :-

**GitHub link: https://github.com/IBM-EPBL/IBM-Project-50375-1660905515**