DEVELOPING A FLIGHT DELAY PREDICTION MODEL USING MACHINE LEARNING

SNS COLLEGE OF TECHNOLOGY, COIMBATORE.

PROJECT REPORT

TEAM MEMBERS:

K. TAMARAISELVI

T. PAVITHIRAVALAVAN

S. SANDEEP

M.R. VYSHNAV

TEAM ID: PNT2022TMID17753

MENTOR: KARTHIKEYAN.A

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Over the last twenty years, air travel has been increasingly preferred among travelers, mainly because of its speed and in some cases comfort. This has led to phenomenal growth in air traffic and on the ground. An increase in air traffic growth has also resulted in massive levels of aircraft delays on the ground and in the air. These delays are responsible for large economic and environmental losses. The main objective of the model is to predict flight delays accurately in order to optimize flight operations and minimize delays.
Using a machine learning model, we can predict flight arrival delays.

1.2 PURPOSE:

- To predict if the flight arrival will be delayed or not.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

A flight is considered to be delayed when the difference between scheduled and actual arrival times is greater than 15 minutes. Moreover, the economic impact of flight delays for domestic flights in the US is estimated to be more than $19 Billion per year to the airlines and over $41 Billion per year to the national economy. In response to growing concerns about fuel emissions and their negative impact on health, there is active research in the aviation industry for finding techniques to predict flight delays accurately in order to optimize flight operations and minimize delays.

2.2 REFERENCE

http://cs229.stanford.edu/proj2017/final-reports/5243248.pdf

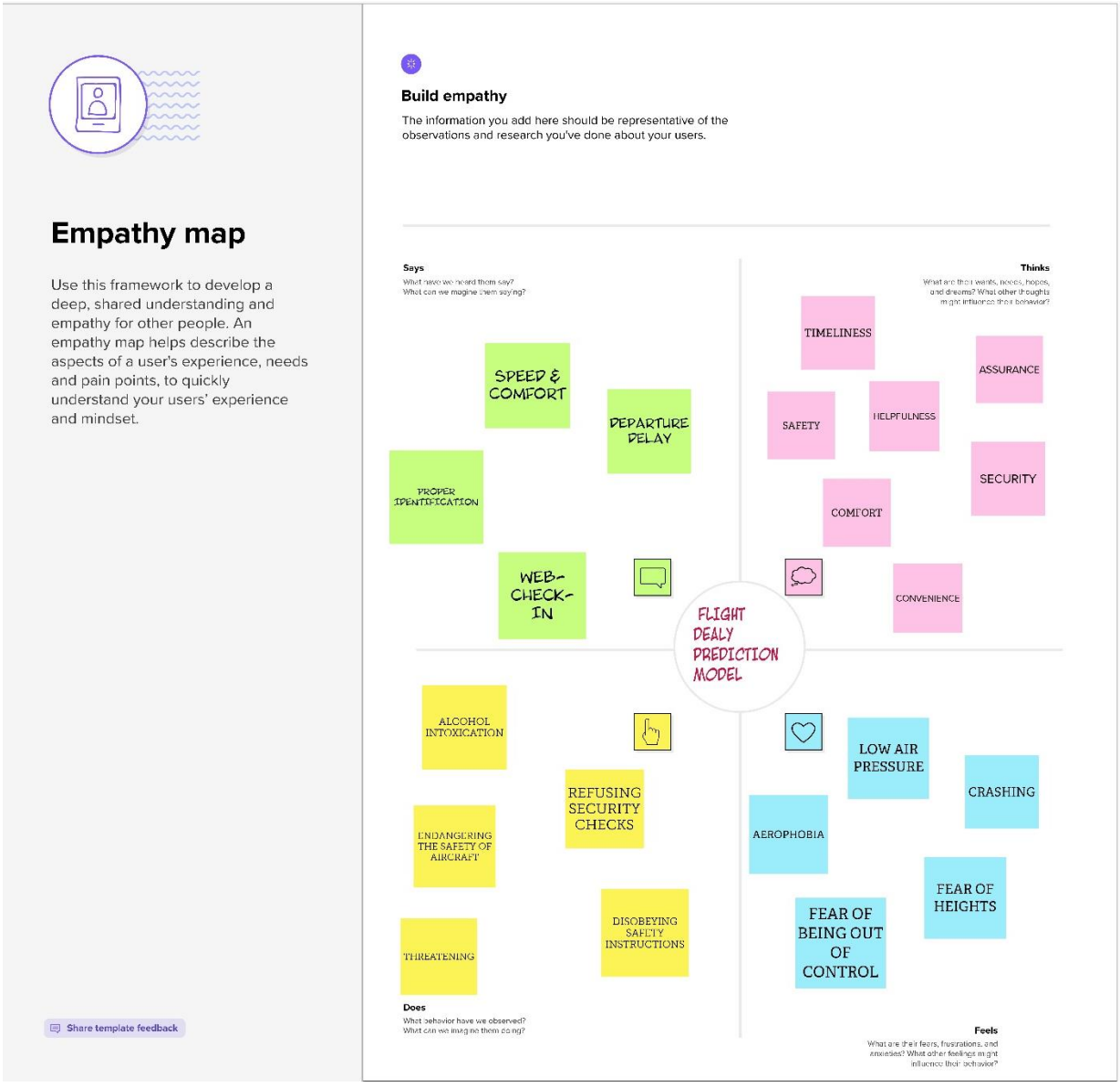
2.3 PROBLEM STATEMENT DEFINITION

Flight delays represent a common problem in everyday air traffic practice. The impact of flight delay can be a risk and this risk represents financial losses, the dissatisfaction of passengers, time losses, loss of reputation and bad business relations. Flight delays not only irritate air passengers and disrupt their schedules but also cause a decrease in efficiency, an increase in capital costs, reallocation of flight crews and aircraft, and additional crew expenses.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

- An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes
- It is a useful tool to help teams better understand 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 participants consider things from the user's perspective along with his or her goals and challenges.



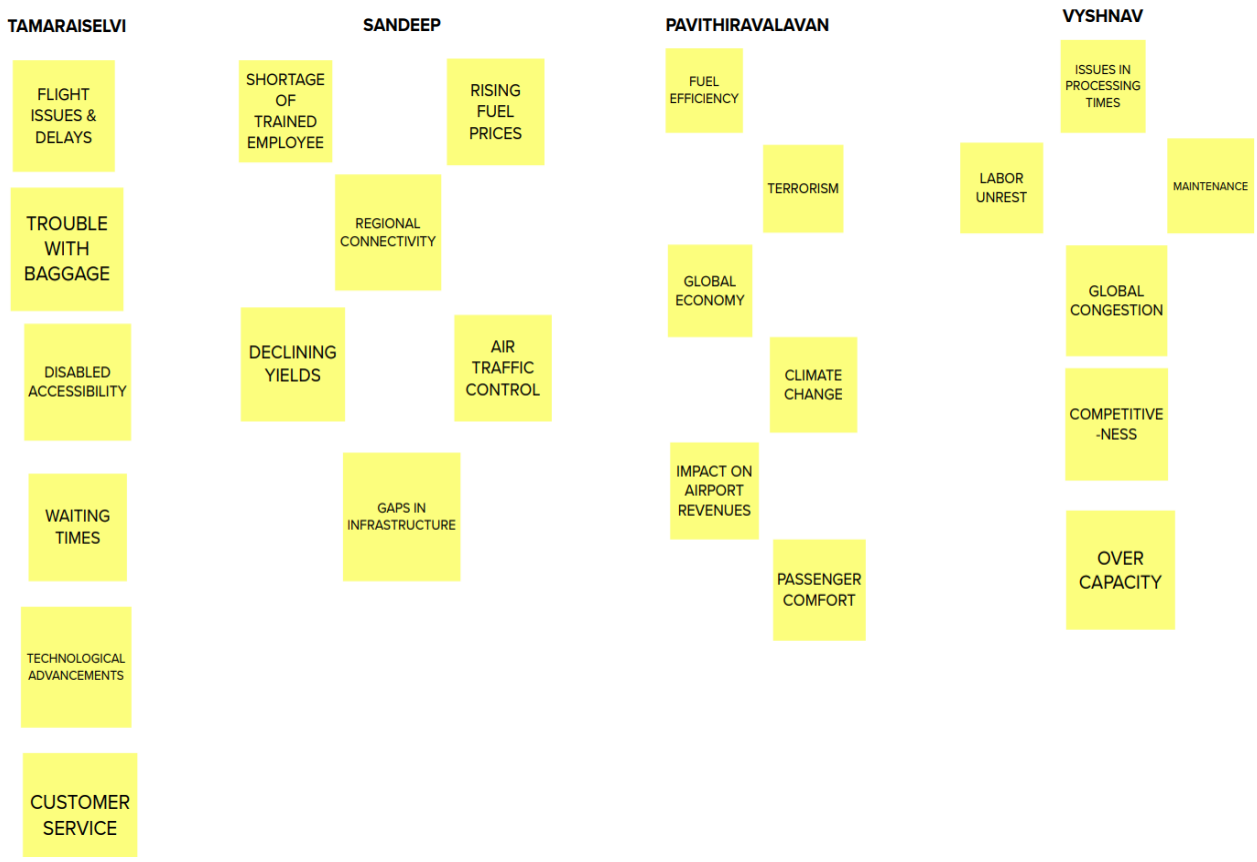
3.2 IDEATION & BRAINSTORMING

Step:1 Team gathering. Collaboration and select the problem statement.

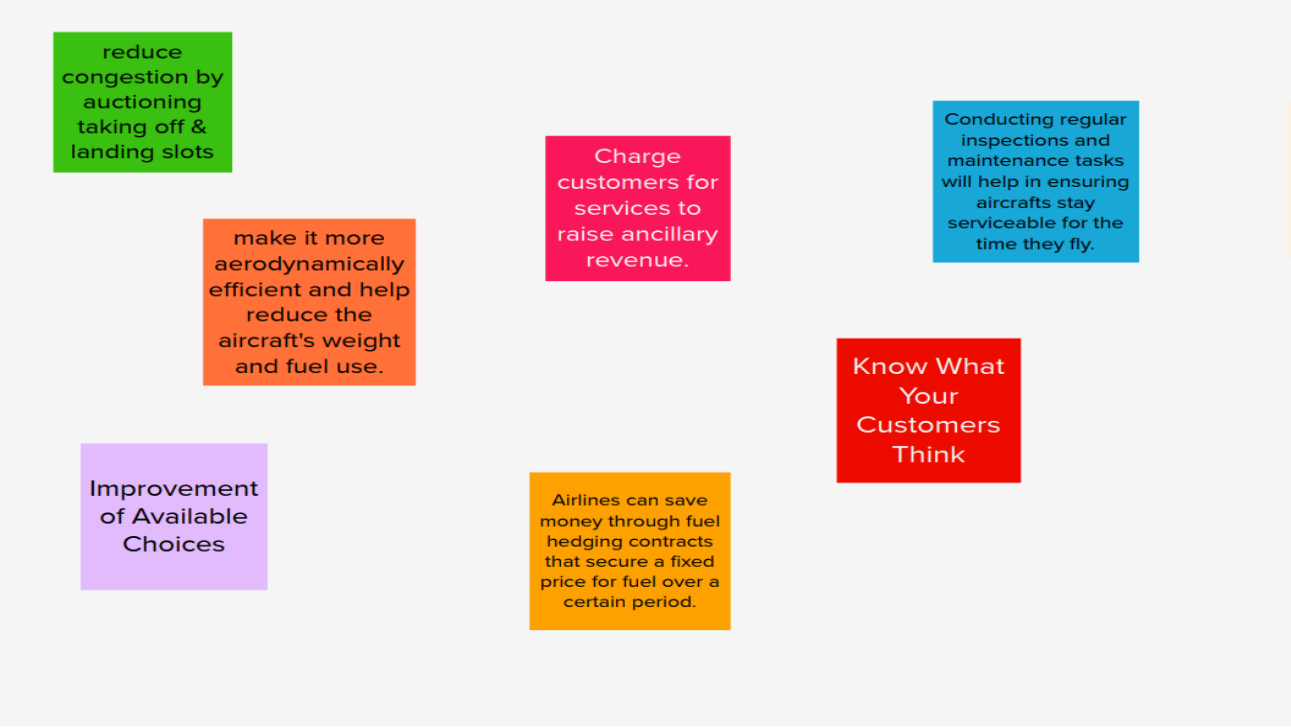
The team was gathered in mural app for collaboration.

The team members are:
K. Tamaraiselvi
T. Pavithiravalavan
S. Sandeep
M.R. Vyshnav

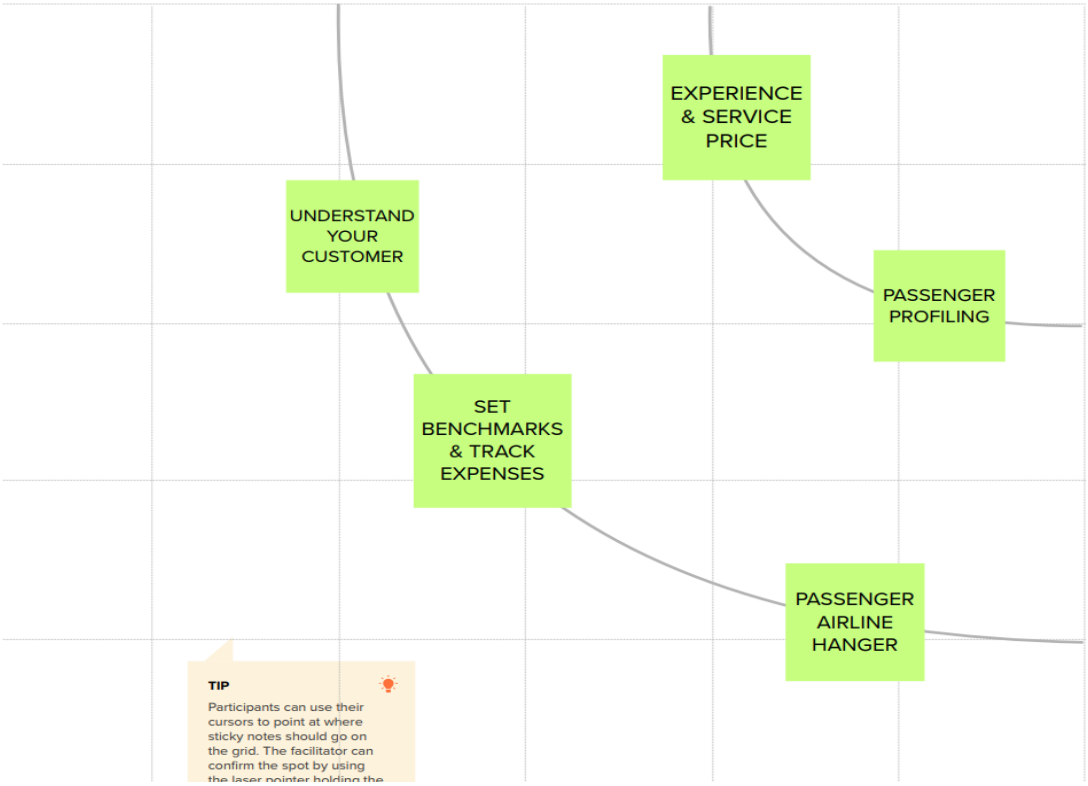
Step 2: Brainstorming



Grouping ideas



Step 3: Idea Prioritization



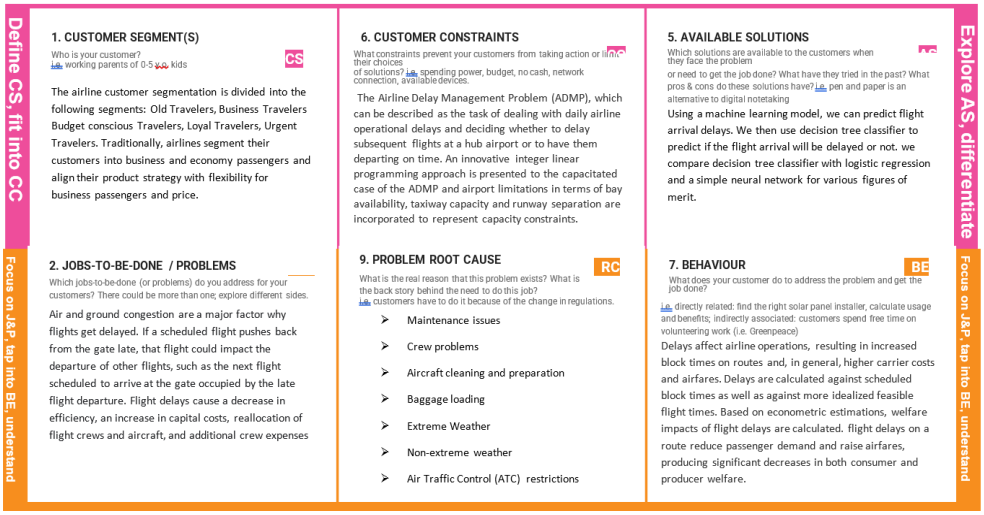
3.3 PROPOSED SOLUTION

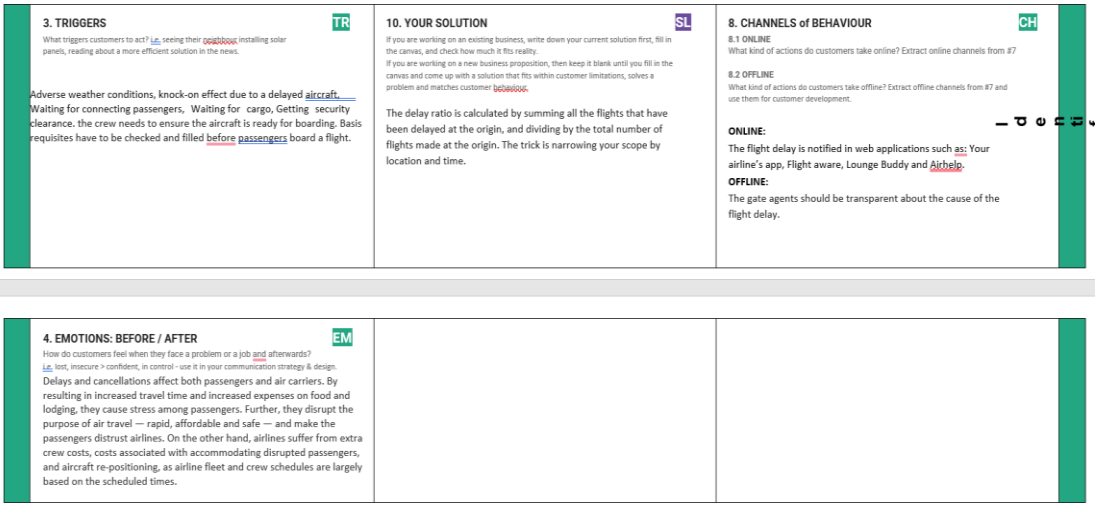
S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The main objective of the model is to predict flight delays accurately in order to optimize flight operations and minimize delays.
2.	Idea / Solution description	Using a machine learning model, we can predict flight arrival delays. The input to our algorithm is rows of feature vector like departure date, departure delay, distance between the two airports, scheduled arrival time etc.
3.	Novelty / Uniqueness	We then use decision tree classifier to predict if the flight arrival will be delayed or not. we compare decision tree classifier with logistic regression and a simple neural network

4.	Social Impact / Customer Satisfaction	It makes the air transportation more efficient and saves more time for the passengers
5.	Business Model (Revenue Model)	Using this model, we can create a revenue by giving appropriate solution about the delay to the people
6.	Scalability of the Solution	This makes the people to take the action according to the delay and it improves time management, business value and more

3.4 PROBLEM SOLUTION FIT

Project Title: **Project Design Phase-I - Solution Fit Template** **Team ID:** PNT2022TMID17753





4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

- A functional requirement defines a function of a system or its component, where a function is described as a specification of behaviour between inputs and outputs.
- It specifies “what should the software system do?”
- Defined at a component level
- Usually easy to define
- Helps you verify the functionality of the software

FR No.	**Functional Requirement (Epic)**	**Sub Requirement (Story / Sub-Task)**
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Registered User -Login	Login through password Login through Gmail Login through LinkedIn
FR-4	Verify the link provided by the user	User inputs the link to be verified
FR-5	Display the result	If the site link is a prediction site, user must be aware and read the precautions displayed If the site link is legit exit the application
FR-6	Share Queries	If any doubts, send query Read FAQs

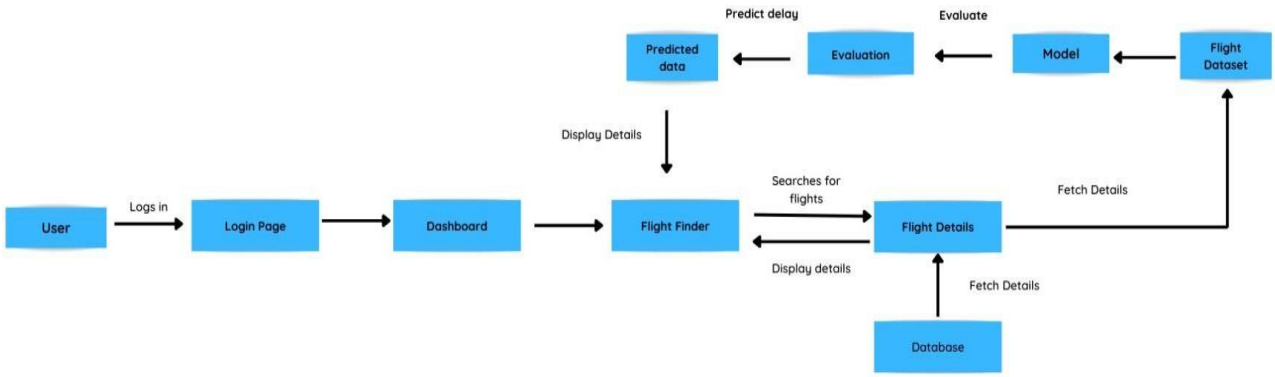
4.2 NON-FUNCTIONAL REQUIREMENTS

- A non-functional requirement defines the quality attribute of a software system
- It places constraint on “How should the software system fulfil the functional requirements?”
- It is not mandatory
- Applied to system as a whole
- Usually more difficult to define
- Helps you verify the performance of the software

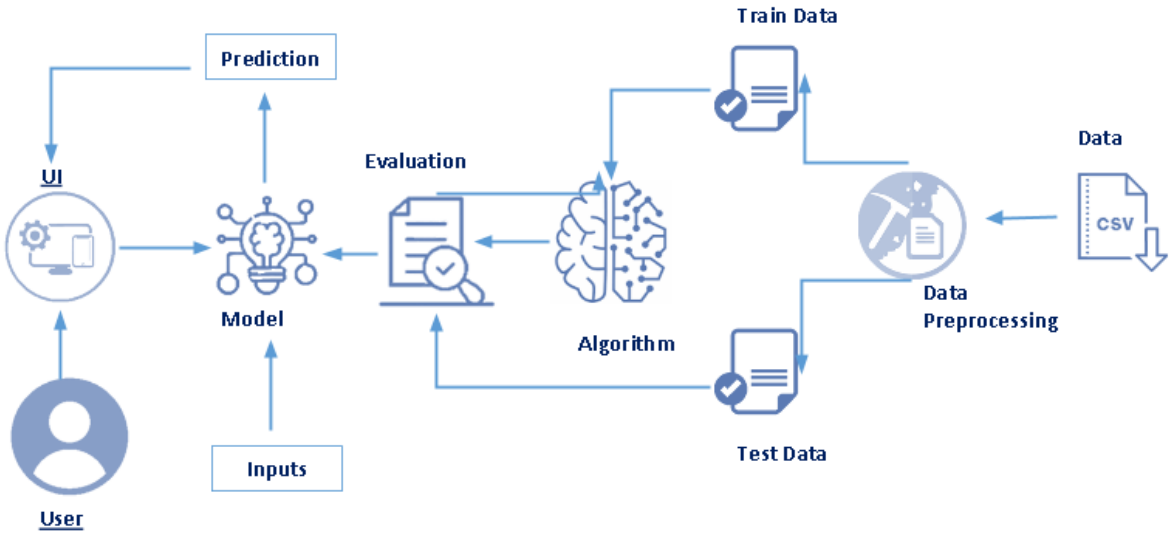
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Describes the ease of use for the customers.
NFR-2	**Security**	Assures all data inside the system or its part will be protected against malware attacks or unauthorized attacks.
NFR-3	**Reliability**	Specifies the probability of the software performing without failure for a specific number of uses or amount of time.
NFR-4	**Performance**	Deals with the measure of the system's response time under different load conditions.
NFR-5	**Availability**	Describes how likely the system is accessible for a given user at a given point of time.
NFR-6	**Scalability**	Assesses the highest workloads under which the system will still meet the performance requirements.

5. PROJECT DESIGN

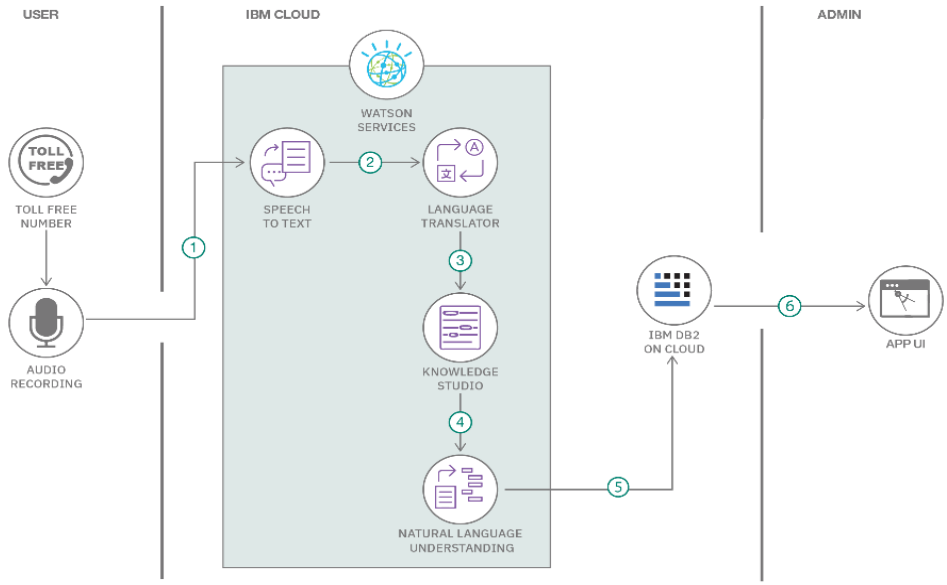
5.1 DATA FLOW DIAGRAM



5.2 SOLUTION ARCHITECTURE



TECHNOLOGY ARCHITECTURE



5.3 USER STORIES

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 Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access the dashboard	High	Sprint-1
	Dashboard	USN-6	As a user, I can navigate through differentpages using the dashboard	I can access various pages	High	Sprint-1
	Search	USN-7	As a user, I can search for flights for different locations	I can receive information on different flights for various locations.	High	Sprint-2
	View	USN-8	As a user, I can view the details of flights.	I will get the information such as flight number, departure and arrival time.	High	Sprint-2
	Receive notifications	USN-9	As a user, I will receive notifications about the flight.	I will get frequent updates of the flight's location	Low	Sprint-3
	Track	USN-10	As a user, I will track the location of my flight.	I can track my flight.	High	Sprint-3,4
Administrator	GPS	USN-11	As an admin, I will need the location of flights	I can track my flight.	High	Sprint-3,4

6. PROJECT DESIGNING AND PLANNING

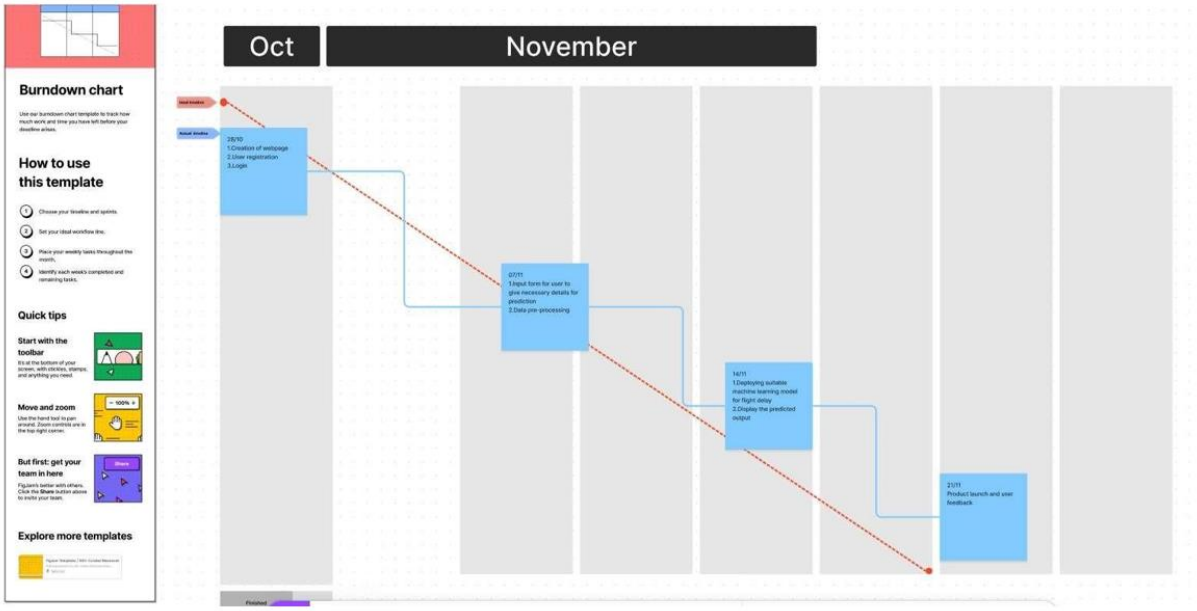
6.1 SPRINT PLANNING AND ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration and login	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	K. Tamaraiselvi
Sprint-2	Confirmation email	USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	T. Pavithiravalavan
Sprint-1	User login	USN-3	As a user, I can register for the application through Facebook	2	Low	S. Sandeep
Sprint-2	Admin Panel	USN-4	As a user, I can register for the application through Gmail	2	Medium	M.R. Vyshnav
Sprint-3	Arrival and Departuretime of flights	USN-5	As a user, I can log into the application by entering email & password	1	High	K.Tamaraiselvi
Sprint-3	Dashboard	USN-6	As a user, I can find exactly how long the flightwill be delayed	2	High	T. Pavithiravalavan
Sprint-4	Helpdesk	USN-7	As a customer care executive, I can provide thecontact details of the airlines	1	Medium	S. Sandeep
Sprint-4		USN-8	As a passenger, I can find alternative flights tothe destination that are available	1	High	M.R. Vyshnav
Sprint-4	Feedback	USN-9	As a user, I can provide my suggestions and feedback for the improvement of the application	2	Medium	T. Pavithiravalavan

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	31Oct 2022	4 Nov 2022	4	4 Nov 2022
Sprint-2	20	6 Days	5 Nov 2022	7 Nov 2022	4	7 Nov 2022
Sprint-3	20	6 Days	8 Nov 2022	9 Nov 2022	4	9 Nov 2022
Sprint-4	20	6 Days	10 Nov 2022	12 Nov 2022	4	12 Nov 2022

6.3 REPORTS FROM JIRA



7.CODING & SOLUTIONING

7.1 FEATURE 1

```
import pandas as pd
import numpy as np
import os, types
import pandas as pd
from botocore.client import Config
import ibm_boto3


def __iter__(self): return 0
data = pd.read_csv(body)
data.head()
type(data)
data.head(10)
data['Gender'],fillna(data['Gender'],mode()[0],inplace = True)
```

```
data['Age'],fillna(data['Age'],mean(),inplace = True)
data['CreditScore'],fillna(data['CreditScore'],median(),inplace = True)
data.isnull().any()
data.head(10)
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
data["Geography"] = le.fit_transform(data["Geography"])
data["Gender"] = le.fit_transform(data["Gender"])
x = data.iloc[:,3:13].values
y = data.iloc[:,13].values
data
x
from sklearn.preprocessing import OneHotEncoder
one = OneHotEncoder()
z = one.fit_transform(x[:,1:2]).toarray()
x = np.delete(x,1,axis = 1)
x = np.concatenate((z,x),axis = 1)
z
x
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size = 0.2,random_state = 42)
x.shape
x_train.shape
x_test.shape
from sklearn.model_selection import train_test_split
x1 = [1,2,3,4,5,6,7,8,9,10]
y1 = [1,0,1,0,1,0,1,0,1,0]
for l in range(5):
    x_train1,x_test1,y_train1,y_test1 = train_test_split(x1,y1,test_size = 0.2,random_state = 2)
```

```
    print(x_train1, "with random state")
for l in range(5):
    x_train1,x_test1,y_train1,y_test1 = train_test_split(x1,y1,test_size = 0.2)
    print(x_train1,"without random state")
from sklearn.ensemble import RandomForestClassifier
forest_reg = RandomForestClassifier(n_estimators=10,criterion='entropy',random_state=42)
forest_reg.fit(x_train,y_train)
x_train[0]
from ibm_watson_machine_learning import APIClient
wml_credentials = {
                    "url":"https://us-south.ml.cloud.ibm.com",
                    "apikey":"Wv3aXu7-agz7OrqIjR-btR10N_5Zncy7TqDdiM55xfyN"
                  }
client = APIClient(wml_credentials)
def guid_from_space_name(client,space_name):
    space = client.spaces.get_details()
    return(next(item for item in space['resources'] if item['entity']["name"] == space_name)['metadata']['id'])
space_uid = guid_from_space_name(client, "models")
print("Space UID = " + space_uid)
client.set.default_space(space_uid)
client.software_specifications.list()
  software_spec_uid = client.software_specifications.get_uid_by_name("default_ py3.7")
software_spec_uid
df_data_1 = pd.read_csv(body)
df_data_1.head()
etaNames.NAME:"Churn_modelling",
client.repository.ModelMetaNames.TYPE:"scikit-learn_0.22",
client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_spec_uid}
                                    )
```

```
    model_id = client.repository.get_model_uid(model_details)
model_id
x_train[0]
forest_reg.predict([[1.0000000e+00, 0.0000000e+00, 0.0000000e+00, 6.8600000e+02,
       1.0000000e+00, 3.2000000e+01, 6.0000000e+00, 0.0000000e+00,
       2.0000000e+00, 1.0000000e+00, 1.0000000e+00, 1.7909326e+05]])
```

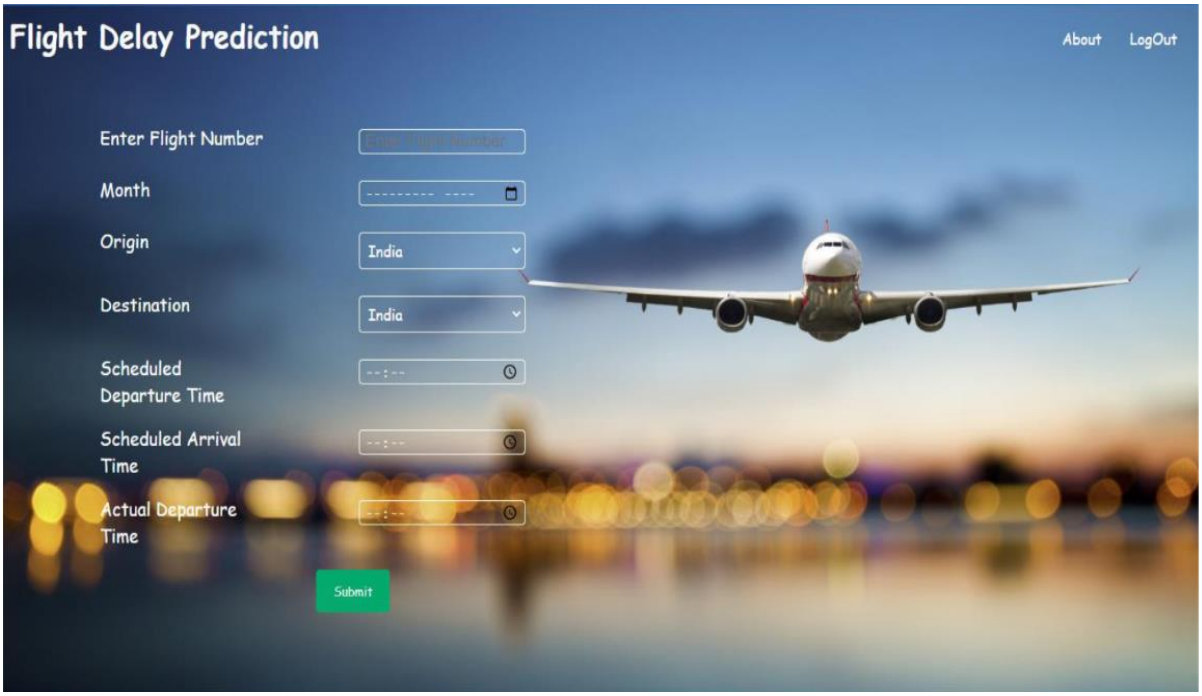
7.2 FEATURE 2

```
def home():
return render_template('index.html')
def y_predict():
geography = request.form("geography")
gender= request.form("gender")
age= request.form("age")
tenure= request.form("tenure")
creditscore= request.form("creditscore")
balance= request.form("balance")
noof = request.form["no of"]
hascreditcard = request.form{"has credit card"]
isactivemember = request.form{"isactivemember"]
estimatedsalary = request.form["estimated salary"]
if(geography == "Spain"):
s1,s2,s3 = 0,0,1
if(geography == "Germany"):
s1,s2,s3 = 0,1,0
if(geography == "Newyork"):
s1,s2,s3 = 0,1,0
if(gender =="female"):
gender = 0
```

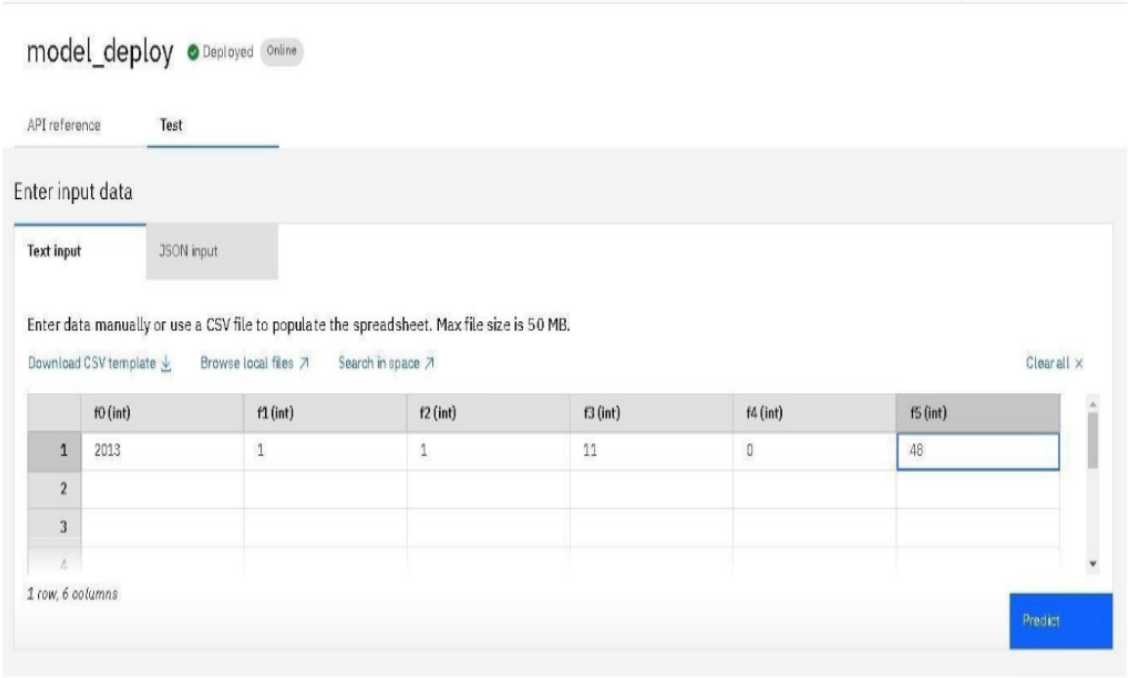
```
if(gender == “male”):

gender = 1

if(isactivemember == “no”):

isactivemember = 0

if(isactivemember == “yes”):

isactivemember = 1

if(hascreditcard == “no”):

hascreditcard = 0

if(hascreditcard == “yes”):

hascreditcard = 1

t=[[int(s1),int(s2),int(s3),int(creditscore),int(gender),int(age),int(tenure),int(balance),int(noof),int(hascreditcard),int(isactivemember),int(estimatedsalary)]]

print(t)

payload_scoring = (“input_data”:[{“field”:[[“G1”,”G2”,”G3”,”CreditScore”,”Gender”,”Age”,”Tenure”,”Balance”,”numofproducts”,”HasCrCard”,”IsActiveMember”)

print(“Scoring response’)

predictions = response_scoring.json()

print(predictions)

pred = predictions[‘predictions’][0][‘values’][0][0]

if(pred == 0):

output = “he will not get excited”

print(“ he will not get excited”)

else:

output = “he gets excited”

print(“he gets excited”)

return render_template(“index.html’,prediction_text=output)

if_name_ == “_main_”:

app.run(debug=True)
```

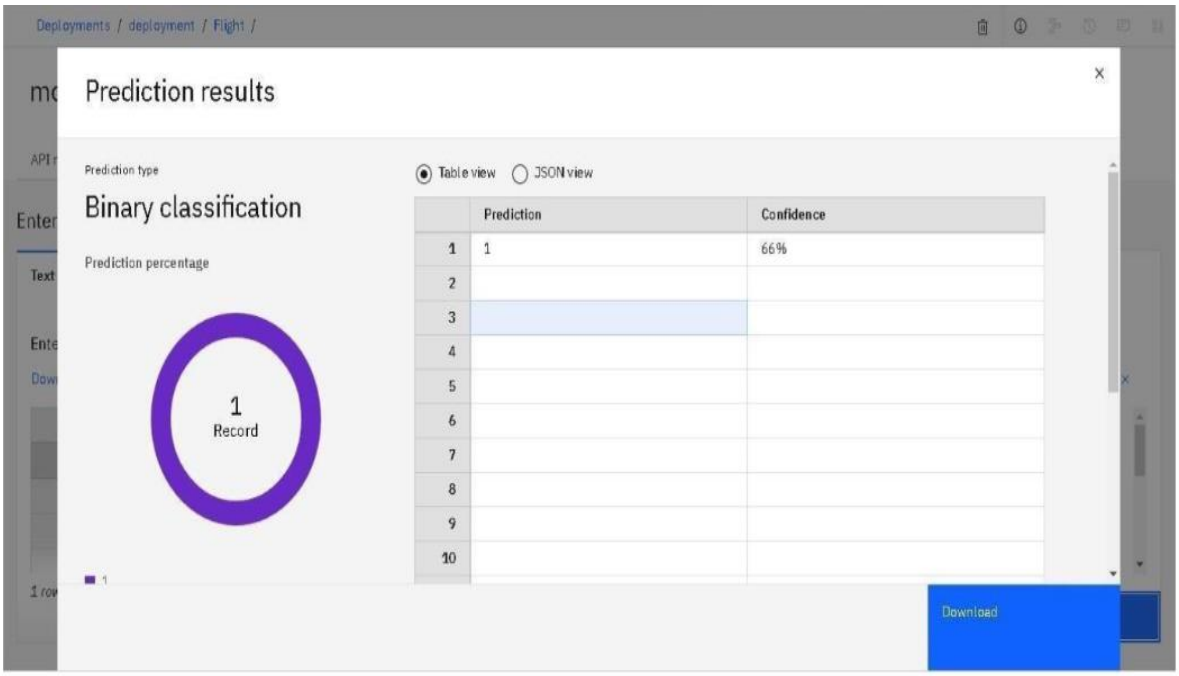
8.TESTING

8.1 TEST CASES

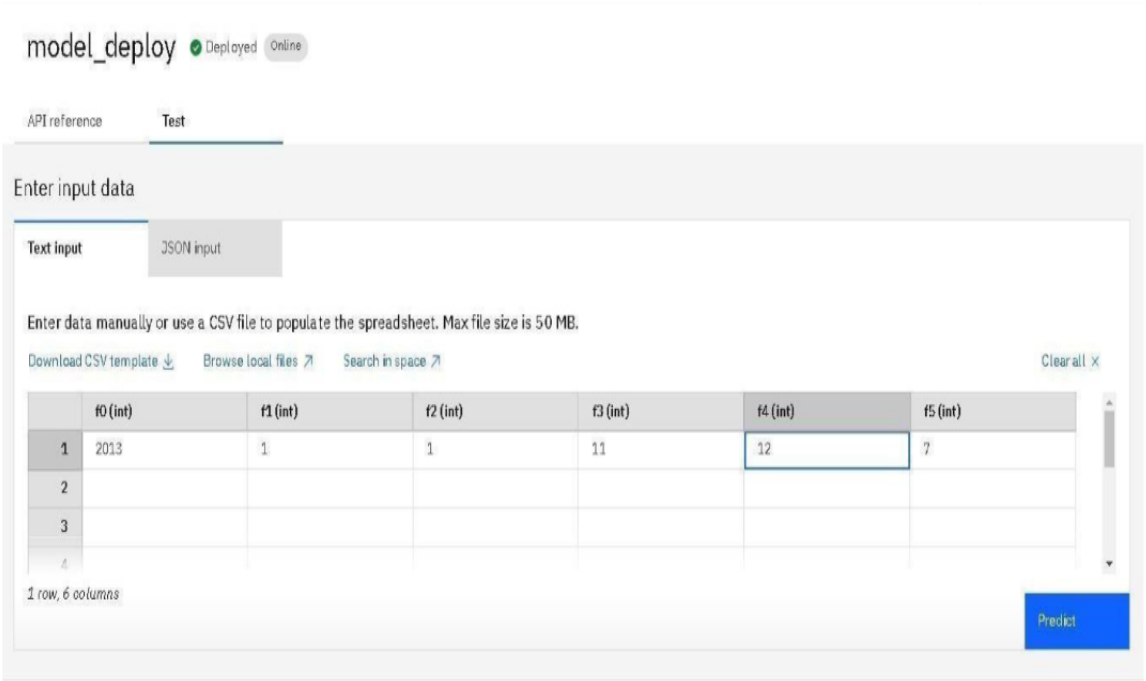


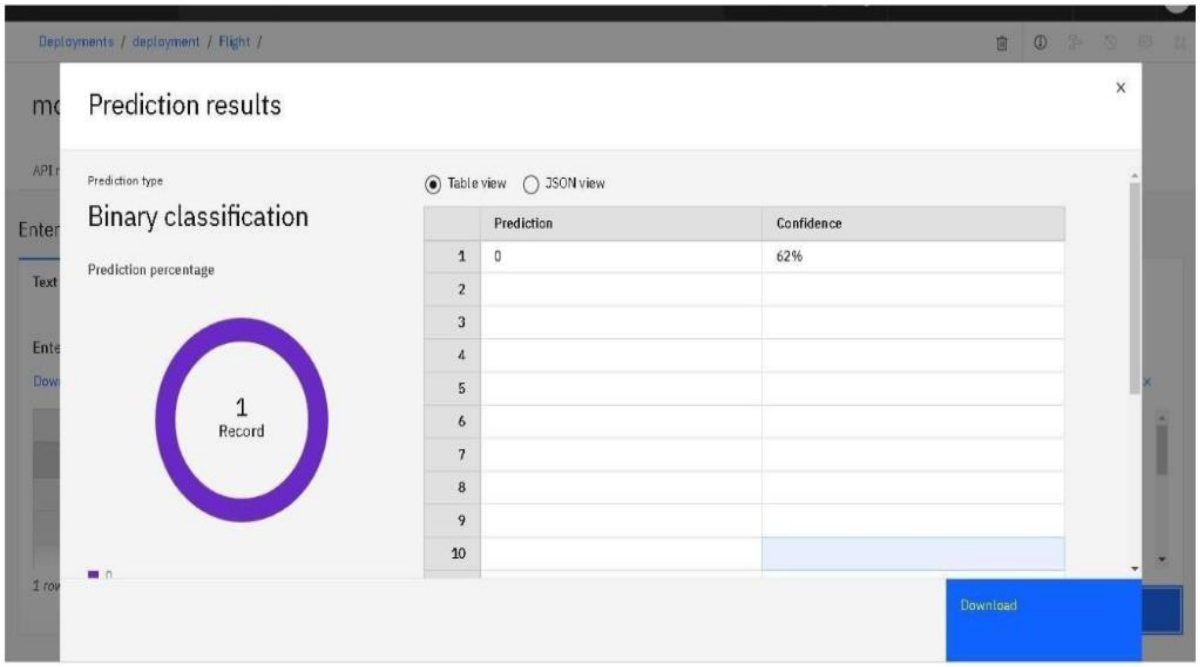
PREDICTION VALUE = 1 (FLIGHT IS DELAYED)





PREDICTION VALUE = 0 (FLIGHT WILL BE ON TIME)





9.RESULTS

9.1 PERFORMANCE METRICS

CPU usage

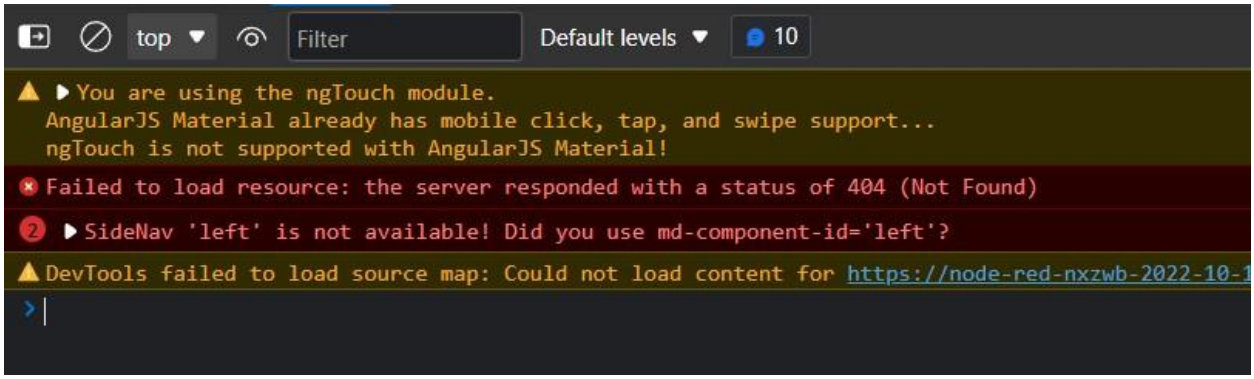
The micro version of c++ is make the best use of the CPU. For every loop the program runs in O(1) time, neglecting the network and communication. The program sleeps for every 1 second for better communication with MQTT. As the program takes O(1) time and the compiler optimizes the program during compilation there is less CPU load for each cycle. The upcoming instructions are on the stack memory, so they can be popped after execution.

Memory usage

The sensor values , networking data are stored in sram of the ESP32 . It’s a lot of data because ESP32 has only limited amount of memory (520 KB) .For each memory cycle the exact addresses are overwritten with new values to save memory and optimal execution of the program

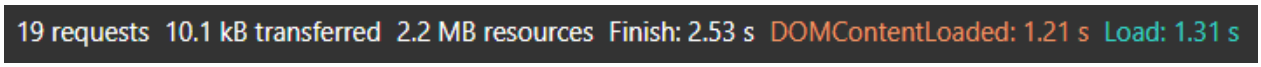
Error rates

The errors rates are very low as the backend and dashboard is handled with node-red.The exceptions are handled in a proper way as it does not affect the usability of the system

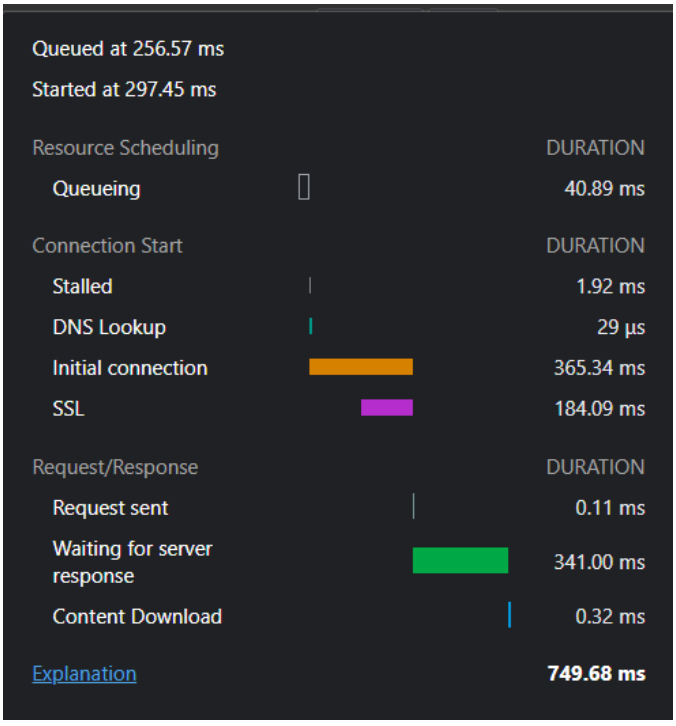


Latency and Response Time

The DOM handling of the received data is optimal and latency is low .After the DOM is loaded the entire site is loaded to the browser



The server also responses quickly . The average time of response is respectable

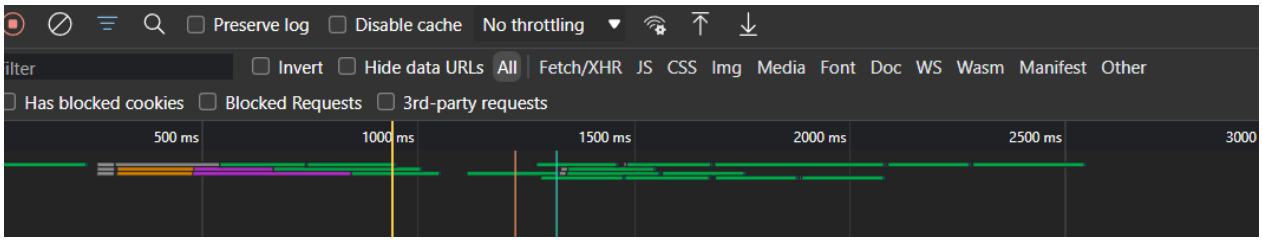


For the data sent from the IoT device (considering the sleep of one second from the IoT),the response is much quicker .We can easily see the delay caused by the sleep function

The average time is well over optimal value

Average time = $(5ms + 2600ms)/2$

= 1302.5



Garbage collection

In the server-side garbage collection is done by the Node framework.In the IoT device , c++ does not have any garbage collection features . But it is not necessary in this scenario as the memory is used again for storing the data . Any dangling pointer or poorly handled address spaceis not allocated.

10. ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

- By watching the ripples that are created when delays in one area occur, we could follow those aircraft and provide passengers with an estimation of what to expect when they arrive at their gate.
- Predicting flight delays can improve airline operations and passenger satisfaction, which will result in a positive impact on the economy.
- Data science technologies like AI and machine learning can help airlines get fuel-burn, weather, navigation, and operations data to deliver actionable insights to optimize fuel utilization and reduce operational costs.

DISADVANTAGES:

- Needs massive amount of data.
- Usage of various analysis such as statistical analysis and probabilistic models.
- Many algorithms are used to analyze the data.

11. CONCLUSION

There is a requirement to develop a system to predict the delay in flights to scale back monetary loss and for the higher and smooth operation. Classification or regression ways are often accustomed determine the delay which includes Feed forward network, Neural Network, Random Forrest, decision tress, Naïve Bayes Classification Tree, Regression Tree etc. Comparison of decision tree classifier with logistic regression and a simple neural network for various figures of merit.

12. APPENDIX

MACHINE LEARNING WITH PYTHON:

Machine learning is a field of computer science that uses statistical techniques to give computer programs the ability to learn from past experiences and improve how they perform specific tasks. Machine Learning is simply recognizing patterns in your data to be able to make improvements and intelligent decisions on its own.

DECISION TREE CLASSIFIER:

A decision tree is a flowchart-like tree structure where an internal node represents feature(or attribute), the branch represents a decision rule, and each leaf node represents the outcome. The topmost node in a decision tree is known as the root node. It learns to partition on the basis of the attribute value.

DATA PREPROCESSING IN MACHINE LEARNING:

Data pre processing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model. A real-world data generally contains noises, missing values, and maybe in an unusable format which cannot be directly used for machine learning models. Data pre processing is required tasks for cleaning the data and making it suitable for a machine learning model which also increases the accuracy and efficiency of a machine learning model.

SOURCE CODE:

login.php

```
<?php
include 'config.php';

use PHPMailer\PHPMailer\PHPMailer;use

PHPMailer\PHPMailer\SMTP;

use PHPMailer\PHPMailer\Exception;

require 'vendor/autoload.php';

session_start();

error_reporting(0);
if (isset($_SESSION["user_id"]))

    {header("Location:

    welcome.php");  }


if (isset($_POST["signup"])) {

    $full_name = mysqli_real_escape_string($conn, $_POST["signup_full_name"]);
    $email = mysqli_real_escape_string($conn, $_POST["signup_email"]);

    $password = mysqli_real_escape_string($conn, md5($_POST["signup_password"]));

    $cpassword = mysqli_real_escape_string($conn, md5($_POST["signup_cpassword"]));
if ($password !== $cpassword) {
      echo "<script>alert('Password did not match.');</script>";
```

```
        } elseif ($check_email > 0) {
          echo "<script>alert('Email already exists in out database.');</script>";
        } else {

    $sql = "INSERT INTO users (full_name, email, password, token, status) VALUES
('$full_name', '$email', '$password', '$token', '0')";

          $result = mysqli_query($conn, $sql);

          if ($result) {

            $_POST["signup_full_name"] = "";
            $_POST["signup_email"] = "";
            $_POST["signup_password"] = "";

            $_POST["signup_cpassword"] = "";
            $to = $email;
            $subject = "Email verification - Find Me";

            $message = "

            <html>

            <head>

            <title>{$subject}</title>

            </head>

            <body>
            <p><strong>Dear {$full_name},</strong></p>

       <p>Thanks for registration! Verify your email to access our website. Click below link toverify
your email.</p>

            <p><a href='{$base_url}verify-email.php?token={$token}'>Verify Email</a></p>
            </body>

            </html>

            ";
```

```
        //Create an instance; passing `true` enables exceptions
        $mail = new PHPMailer(true);

        try {

          //Server settings

          $mail->SMTPDebug = 0;

          $mail->isSMTP();
          $mail->Host       = $smtp['host'];
          $mail->SMTPAuth   = true;
          $mail->Username   = $smtp['user'];
          $mail->Password   = $smtp['pass'];
      $mail->SMTPSecure = PHPMailer::ENCRYPTION_SMTPS;

      $mail->Port             = $smtp['port'];                                    //TCP port to connect to; use 587 if
you have set `SMTPSecure = PHPMailer::ENCRYPTION_STARTTLS`

          //Recipients
          $mail->setFrom($my_email);

          $mail->addAddress($email, $full_name);      //Add a recipient
          //Content
          $mail->isHTML(true);                                  //Set email format to HTML

          $mail->Subject = $subject;

          $mail->Body    = $message;
          $mail->send();
          echo "<script>alert('We have sent a verification link to your email - {$email}.');</script>";

        } catch (Exception $e) {
          echo "<script>alert('Mail not sent. Please try again.');</script>";


        }
       } else {
        echo "<script>alert('User registration failed.');</script>";
```

```
        }
    }

}



if (isset($_POST["signin"])) {

    $email = mysqli_real_escape_string($conn, $_POST["email"]);
    $password = mysqli_real_escape_string($conn, md5($_POST["password"]));


  $check_email = mysqli_query($conn, "SELECT id FROM users WHERE email='$email' AND password='$password' AND status='1'");

    if (mysqli_num_rows($check_email) > 0) {
      $row = mysqli_fetch_assoc($check_email);

      $_SESSION["user_id"] = $row['id'];

      header("Location: welcome.php");

    } else {

      echo "<script>alert('Login details is incorrect. Please try again.');</script>";


    }

}


?>

<!DOCTYPE html>

<html lang="en">
<head>

    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <link rel="stylesheet" href="style.css" />

    <title>Find Me</title>
</head>
<body>
```

```
    <div class="container">
      <div class="forms-container">

        <div class="signin-signup">
          <form action="" method="post" class="sign-in-form">
            <h2 class="title">Sign in</h2>

            <div class="input-field">
              <i class="fas fa-user"></i>

              <input type="text" placeholder="Email Address" name="email" value="<?php echo
$_POST['email']; ?>" required />

            </div>
            <div class="input-field">
              <i class="fas fa-lock"></i>
              <input type="password" placeholder="Password" name="password" value="<?php echo
$_POST['password']; ?>" required />

            </div>
            <input type="submit" value="Login" name="signin" class="btn solid" />

        <p style="display: flex;justify-content: center;align-items: center;margin-top: 20px;"><a
href="forgot-password.php" style="color: #4590ef;">Forgot Password?</a></p>

          </form>

          <form action="" class="sign-up-form" method="post">
            <h2 class="title">Sign up</h2>

            <div class="input-field">
              <i class="fas fa-user"></i>
        <input type="text" placeholder="Full Name" name="signup_full_name" value="<?php
echo $_POST["signup_full_name"]; ?>" required />

            </div>

            <div class="input-field">

              <i class="fas fa-envelope"></i>
```

```
        <input type="email" placeholder="Email Address" name="signup_email" value="<?phpecho
$_POST["signup_email"]; ?>" required />
            </div>
            <div class="input-field">
              <i class="fas fa-lock"></i>
        <input type="password" placeholder="Password" name="signup_password"
value="<?php echo $_POST["signup_password"]; ?>" required />

            </div>
            <div class="input-field">

              <i class="fas fa-lock"></i>
        <input type="password" placeholder="Confirm Password" name="signup_cpassword"
value="<?php echo $_POST["signup_cpassword"]; ?>" required />

            </div>

            <input type="submit" class="btn" name="signup" value="Sign up" />

          </form>
        </div>

      </div>


      <div class="panels-container">
        <div class="panel left-panel">
          <div class="content">

            <h3>New here ?</h3>

            <br>


            <button class="btn transparent" id="sign-up-btn">

              Sign up

            </button>

          </div>
```

```
          <img src="img/download.png" class="image" alt="" />
        </div>

        <div class="panel right-panel">
          <div class="content">
            <h3>One of us ?</h3>

            <br>


                  <button class="btn transparent" id="sign-in-btn">

              Sign in

            </button>

          </div>
          <img src="img/image.png" class="image" alt="" />
        </div>
      </div>
    </div>

<script src="https://kit.fontawesome.com/64d58efce2.js" crossorigin="anonymous"></script>
    <script src="app.js"></script>
</body>
</html>
```

logout.php

```
<?php

session_start();

session_unset();

session_destroy(

);

header("Location: login.php");

?>
```

Verify-email.php

```
<?php

session_start();

if (isset($_GET["token"]))

        {include 'config.php';
        $sql = "UPDATE users SET status='1' WHERE token='{$_GET["token"]}'";

        mysqli_query($conn, $sql);

    $showUserId = mysqli_fetch_assoc(mysqli_query($conn, "SELECT id FROM users WHERE
token='{$_GET["token"]}'"));

        $_SESSION["user_id"] = $showUserId['id'];

        header("Location: welcome.php");

} else {

        header("Location: login.php");


}

?>
```

reset-password.php

```
<?php


include 'config.php';


error_reporting(0);


session_start();


if (isset($_SESSION["user_id"]))

       {header("Location:

       welcome.php");

}
```

```
if (isset($_POST["resetPassword"])) {
        $password = mysqli_real_escape_string($conn, md5($_POST["new_password"]));

        $cpassword = mysqli_real_escape_string($conn, md5($_POST["cnew_password"]));

        if ($password === $cpassword) {

          $sql = "UPDATE users SET password='$password' WHERE token='{$_GET["token"]}'";

          mysqli_query($conn, $sql);

          header("Location: login.php");

        } else {

          echo "<script>alert('Password not matched.');</script>";


        }

}



?>
<!DOCTYPE html>
<html lang="en">

<head>
        <meta charset="UTF-8" />
        <meta name="viewport" content="width=device-width, initial-scale=1.0" />
        <link rel="stylesheet" href="style.css" />
        <title>Find Me</title>
</head>

<body>

        <div class="container">
          <div class="forms-container">

            <div class="signin-signup">
              <form action="" method="post" class="sign-in-form">
                <h2 class="title">Reset Password</h2>
```

```
            <div class="input-field">
              <i class="fas fa-lock"></i>

          <input type="password" placeholder="New Password" name="new_password"
value="<?php echo $_POST['new_password']; ?>" required />

            </div>
            <div class="input-field">

              <i class="fas fa-lock"></i>
          <input type="password" placeholder="Confirm New Password" name="cnew_password"
value="<?php echo $_POST['cnew_password']; ?>" required />

            </div>

            <input type="submit" value="Reset Password" name="resetPassword" class="btn solid" />
          </form>
        </div>

      </div>


      <div class="panels-container">

        <div class="panel left-panel">
          <div class="content">
            <h3>Reset Password ?</h3>
          </div>

          <img src="img/log.svg" class="image" alt="" />
        </div>
      </div>

    </div>
<script src="https://kit.fontawesome.com/64d58efce2.js" crossorigin="anonymous"></script>
    <script src="app.js"></script>

</body>
</html>
```

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-46479-1660747642

DEMO VIDEO:

https://youtu.be/C7bWyI5mCDE