# CORPORATE EMPLOYEE ATTRITION ANALYTICS

### **TEAM MEMBERS:**

SOFIYA S(TEAM LEAD), SAKTHI SREE V, SANJANA S, SWATHI P, RAMYA P

# 1.INTRODUCTION

### 1.1 PROJECT OVERVIEW

The key to success in any organization is attracting and retaining top talent. As an HR analyst one of the key task is to determine which factors keep employees at the company and which prompt others to leave. Given in the data is a set of data points on the employees who are either currently working within the company or have resigned. The objective is to identify the factor to prevent loss of good people.

#### 1.2 PURPOSE

Every organization wants its valuable employees to be a part of its organization for a long period. Still, when many employees start leaving, it will be a concern for the organization. The key to success for any organization is attracting and retaining top talent. One of the key tasks is to determine which factors keep employees at the company and which prompt others to leave. It's more cost-effective to keep the employees a company already has.

A company needs to maintain a pleasant working atmosphere to make their employees stay in that company for a longer period. To reduce the cost of attrition, organizations need to ensure that employees' aspirations are met.

## 2.LITERATURE SURVEY

### 2.1 EXISTING PROBLEM:

Attrition analysis contributes to the details generated by HR managers on employees leaving the company. The problems in those systems are lack of accuracy and lack of tools for analysis to be performed. The process for the HR to determine the factor of attrition and the factor which makes the employees to stay in the organisation is huge and complicated.

### 2.2 REFERENCES:

- 1. Anjali Chourey, Prof. Sunil Phulre, Dr. Sadhna Mishra "A SURVEY PAPER ON EMPLOYEE ATTRITION PREDICTION USING MACHINE LEARNING TECHNIQUES" in 2019.
- 2. G.Pratibha , Dr. Nagaratna P Hegde, "Analytical Survey on Prediction of Employee Attrition Non parametric tuning Algorithms" in 2022
- 3. V. Krishna Priya, H.H Harasudha, "A study on employee attrition with reference to Lanson, Toyota, chennai" in 2017.
- **4.** Kamalaveni M.S , T Vetrivel , Ramesh S, " A review of literature on employee retention" in 2019.

### 2.3 PROBLEM STATEMENT:

The key to success in any organization is attracting and retaining top talent. As an HR analyst one of the key task is to determine which factors keep employees at the company and which prompt others to leave. Given in the data is a set of data points on the employees who are either currently working within the company or have resigned. The objective is to identify and improve these factors to prevent loss of good people.

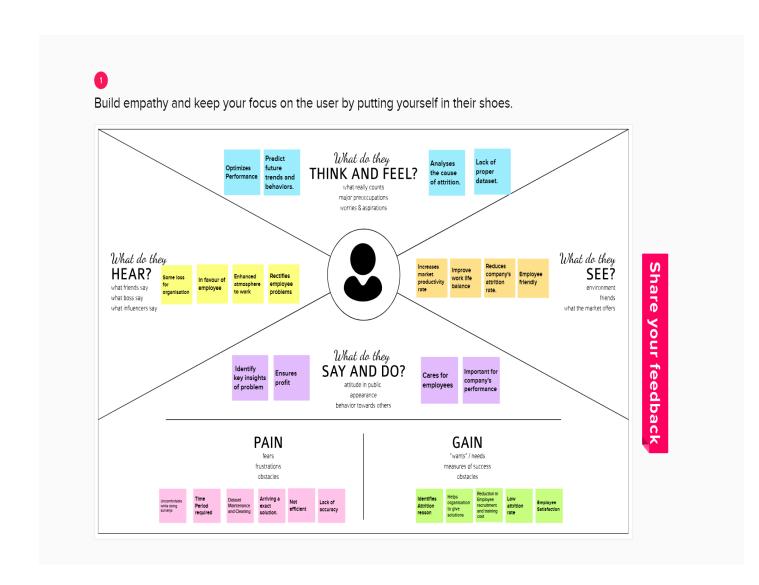
## 3.IDEATION & PROPOSED SOLUTION

### 3.1 EMPATHY MAP CANVAS

The Empathy Map was created with a pretty specific set of ideas and is designed as a framework to complement an exercise in developing empathy.

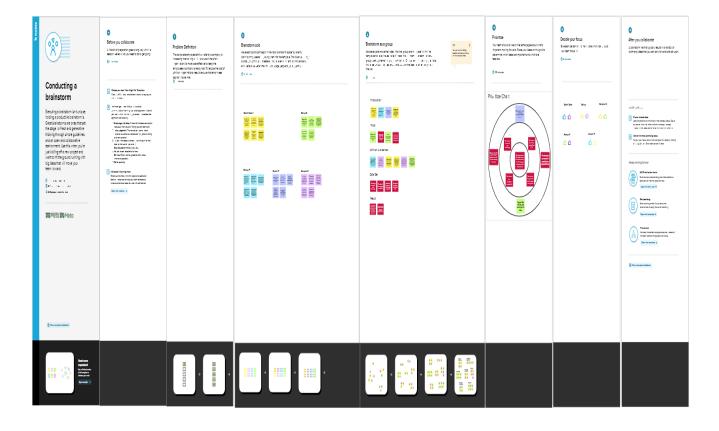
This particular tool helps teams develop deep, shared understanding and empathy for other people. People use it to help them improve customer experience, to navigate organizational politics, to design better work environments, and a host of other things.

The Empathy Map has succeeded beyond our wildest dreams. Place the compass in the center slot of the 3x3 crafting table area, and insert a paper in each of the other nine slots. You now have an empty map, ready to be filled out.



### 3.2 IDEATION & BRAINSTROMING

Ideation is a creative process where designers generate ideas in sessions (e.g., brainstorming, worst possible idea). It is the third stage in the Design Thinking process. Participants gather with open minds to produce as many ideas as they can to address a problem statement in a facilitated, judgment-free environment. Brainstorming is an activity that will help you generate more innovative ideas. It's one of many methods of ideation—the process of coming up with new ideas—and it's core to the design thinking process. As you can see, ideation is not just a one-time idea generation or a brainstorming session. In fact, we can divide ideation in these three stages: generation, selection, and development.



### 3.3 PROPOSED SOLUTION

Organisation require skilled employee to work in their organization, but the employees leave the company. This causes a major concern for the organization as it incur a major loss for them. To find the exact reason analysis is done to overcome it. This analysis is carried using a tool called IBM cognos. This tool helps us to visualize the attrition cause and gives us the solution.

### Project Design Phase-I Proposed Solution Template

| Date          | 19 September 2022                      |  |
|---------------|--|--|
| Team ID       | PNT2022TMID00680                       |  |
| Project Name  | Corporate Employee Attrition Analytics |  |
| Maximum Marks | 2 Marks                                |  |

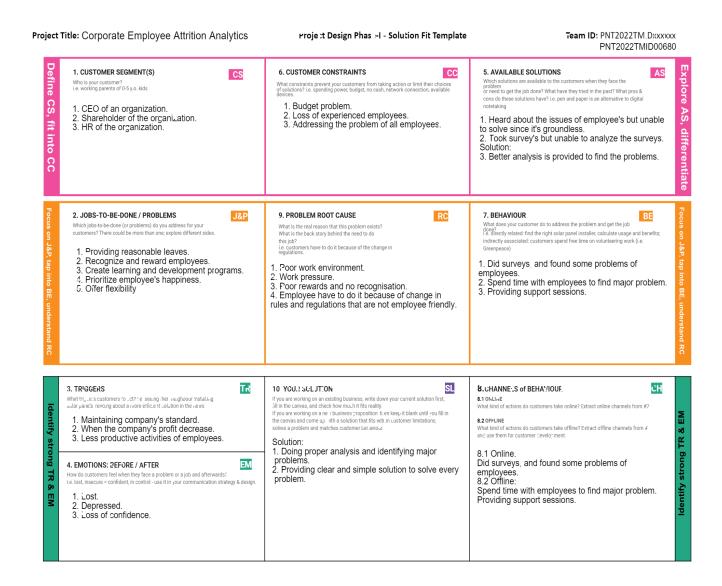
#### **Proposed Solution Template:**

Project team shall fill the following information in proposed solution template.

| S.No. | Parameter                                | Description   |
|-------|--|---|
| 1.    | Problem Statement (Problem to be solved) | In this project we analyse the dataset and find out the reason for the attrition in the organisation.                   |
| 2.    | Idea / Solution description              | To visualize the dataset and identify the major problem for attrition and giving solutions based on problems.           |
| 3.    | Novelty / Uniqueness                     | Difficulty in finding individual personnel problem but with proper collection of data, major problem can be identified. |
| 4.    | Social Impact / Customer Satisfaction    | This project will help the organisation's CEO or HR's to reduce their company's attrition rate.                         |
| 5.    | Business Model (Revenue Model)           | It is a customized model. It can provide different solution according to the organisations.                             |
| 6.    | Scalability of the Solution              | Our solution is scalable for large and small dataset. It provides efficient solution despite the size of dataset.       |

#### 3.4 PROBLEM SOLUTION FIT

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. Problem-solution fit is a term used to describe the point validating that the base problem resulting in a business idea really exists and the proposed solution actually solves that problem. Validate that the problem exists: When you validate your problem hypothesis using real-world data and feedback. The Problem-Solution Fit is an important step towards the Product-Market Fit, but often an underestimated one.



# **4.REQUIREMENT ANALYSIS**

### 4.1 FUNCTIONAL REQUIREMENT

Functional Requirements of the Proposed Solution.

➤ User Registration - Registration through Email

Registration through Message

Registration through call

➤ User Confirmation - Confirmation through Email

Confirmation through Message

Confirmation through Call

➤ User Feedback - Feedback through Form

Feedback through Gmail

Feedback through Instagram polls

Feedback through LinkedIn

➤ User Rating - Rating via Mail

Rating through Message

- ➤ Employee Management Validating and managing the employee details.
- ➤ Attrition Analysis Analysing and finding out the major reasons for the attrition of emloyees using dataset.

### 4.2 NON-FUNCTIONAL REQUIREMENT

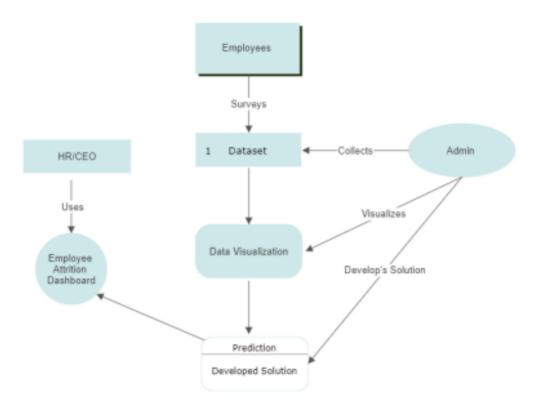
Non-Functional Requirement of the proposed Solution

- ➤ Usability Easy to use for both user and manager. This is user friendly interface.
- ➤ Security The employee data is kept secure and their identity is hidden for the organization.
- ➤ Reliability It is a reliable software as it works efficiently and securely.
- ➤ Performance This software is portable and inter-operable. It works smoothly without generating errors. It also provides faster response.
- Availability This is available for the company organisation to find the major reason for attrition.
- ➤ Scalability Our solution is scalable for large and small dataset . It provides efficient solution despite the size of dataset.

# **5.PROJECT DESIGN**

### 5.1 DATAFLOW DIAGRAM

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 AND TECHNICAL ARCHITECTURE

## 5.2.1 SOLUTION ARCHITECTURE:

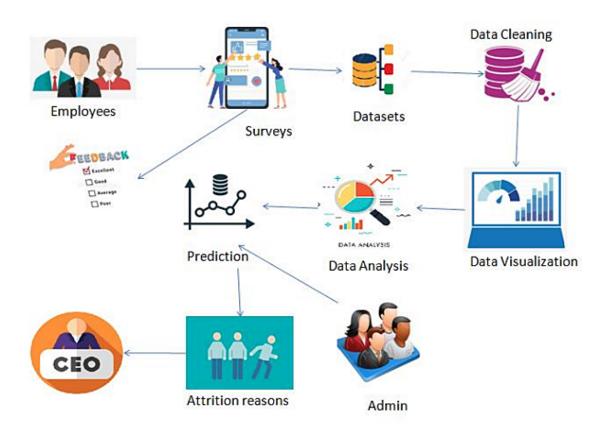
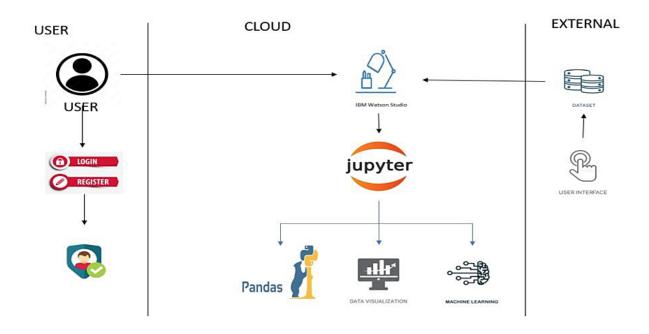


Figure 1: Architecture and data flow of the Corporate Employee Attrition Analytics

# 5.2.2 TECHNICAL ARCHITECTURE:



# 5.3 USER STORIES

| User Type                  | Functional<br>Requireme<br>nt (Epic) | User<br>Story<br>Numb<br>er | User Story / Task  | Acceptance<br>criteria                                   | Priori<br>ty | Relea<br>se |
|----------------------------|--------------------------------------|-----------------------------|--|--|--------------|-------------|
| Custom<br>er<br>(CEO)      | Registration                         | USN-1                       | As a CEO,I can register for the application by entering my email,password, and confirmingmy password.      | I can access my<br>account /<br>dashboard                | High         | Sprint-1    |
| Customer<br>(Employe<br>e) |                                      | USN-2                       | As an employee, I can register for the application by entering my mail, password, and confirming password. | I can access my<br>account/dashboard                     | High         | Sprint-1    |
|                            |                                      | USN-3                       | As a user, I can also register for the application through   | I can register & access thedashboard with Facebook Login | Low          | Sprint-2    |

|                            |           |       | Facebook  |   |            |          |
|----------------------------|-----------|-------|---|---|------------|----------|
|                            |           | USN-4 | As a user, I can also register for theapplicati on through Gmail  | I can register & access thedashboard with Facebook login        | Medi<br>um | Sprint-2 |
| Custom<br>er<br>(CEO)      | Login     | USN-5 | As a user,I can log into the application by entering email & password   | I can access<br>myaccount/dashbo<br>ard                         | High       | Sprint-3 |
| Customer<br>(Employe<br>e) |           | USN-6 | As a user,I can log into the application by entering email and password.  | I can access<br>myaccount/dashbo<br>ard                         | High       | Sprint-3 |
| CEO                        | Dashboard | USN-7 | As a CEO, I can use the predict button to know which factorkeeps the employee at the company and which prompts others to leave. | I can view thevisual chart.                                     | High       | Sprint-4 |
| Employee                   |           | USN-8 | As an employee of the organization, I can view, filland submit the survey formthat is displayed.                                | I can see the acknowledgement message for submitting thesurvey. | High       | Sprint-4 |

# **6.PROJECT PLANNING AND SCHEDULING**

# **6.1 SPRINT PLANNING AND ESTIMATION**

| Sprint   | Total<br>Story<br>Points | Durati<br>on | Sprint Start<br>Date | Sprint End<br>Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release<br>Date (Actual) |
|----------|--------------------------|--------------|----------------------|------------------------------|---|---------------------------------|
| Sprint-1 | 5                        | 6 Days       | 24 Oct 2022          | 29 Oct 2022                  | 5   | 29 Oct 2022                     |
| Sprint-2 | 5                        | 6 Days       | 31 Oct 2022          | 05 Nov 2022                  | 5   | 31 Oct 2022                     |
| Sprint-3 | 5                        | 6 Days       | 07 Nov 2022          | 12 Nov 2022                  | 5   | 12 Nov 2022                     |
| Sprint-4 | 5                        | 6 Days       | 14 Nov 2022          | 19 Nov 2022                  | 5   | 19 Nov 2022                     |

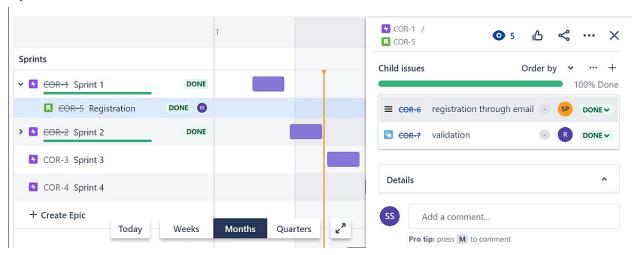
## **6.2 SPRINT DELIVERY SCHEDULE**

| Sprint   | Functional<br>Requirement<br>(Epic) | User<br>StoryNumb<br>er | User Story/ Task   | Story<br>Points | Priority | Team Members                          |
|----------|-------------------------------------|-------------------------|--|-----------------|----------|---------------------------------------|
| Sprint-1 | Registration                        | USN-1                   | As a user,I can register for the application by entering my email, password, and confirming my password. | 5               | Medium   | Sofiya S<br>Ramya P<br>Swathi P       |
| Sprint-2 | Login                               | USN-2                   | As a user, I can log intothe application byentering email & password                                     | 5               | Low      | Ramya P<br>Sanjana S<br>Sakthi Sree V |

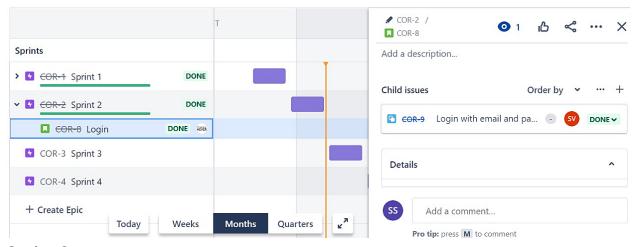
| Sprint-3 | Dashboard | USN-3 | As a CEO, I can     | 5 | High | Sofiya S     |
|----------|-----------|-------|---------------------|---|------|--------------|
|          |           |       | use the predict     |   |      | SakthiSree V |
|          |           |       | button to know      |   |      | Sanjana S    |
|          |           |       | which               |   |      |              |
|          |           |       | factorkeeps the     |   |      |              |
|          |           |       | employee at the     |   |      |              |
|          |           |       | companyand          |   |      |              |
|          |           |       | which prompts       |   |      |              |
|          |           |       | others to leave.    |   |      |              |
| Sprint-4 |           | USN-4 | As an employee      | 5 | High | Sofiya S     |
|          |           |       | of the              |   |      | SakthiSree V |
|          |           |       | organization, I can |   |      | Sanjana S    |
|          |           |       | view,filland        |   |      | Swathi P     |
|          |           |       | submitthe survey    |   |      |              |
|          |           |       | formthat            |   |      |              |
|          |           |       | isdisplayed.        |   |      |              |

## 6.3 REPORTS FROM JIRA

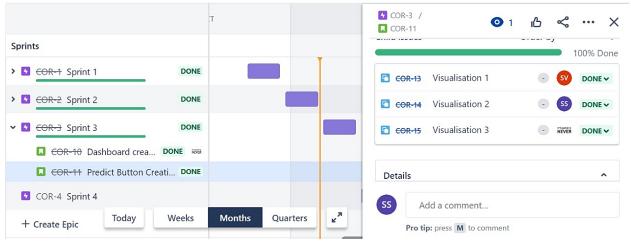
# Sprint 1:



# Sprint 2:



# Sprint 3:



## Sprint 4:



## 7.CODING AND SOLUTIONING

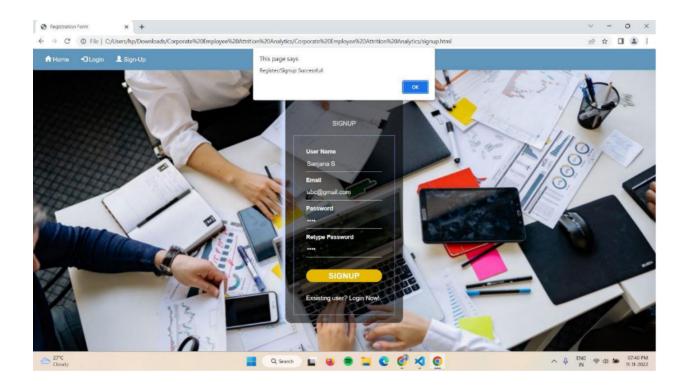
### 7.1 FEATURE 1

```
code:
Registeration:
signup.html
<!DOCTYPE html>
<html>
<head>
     <title>Registration Form</title>
  <meta name="viewport" content="width=device-width, initial-scale=1">
 k rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css" >
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.4/jquery.min.js"></script>
  <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></script>
     k rel="stylesheet" type="text/css" href="style.css">
     <script type="text/javascript" src="javascript.js"></script>
</head>
<body>
     <nav class="navbar navbar-light" style="background-color: #6196bc;">
    <div class="collapse navbar-collapse" id="navbarNavAltMarkup">
      <div class="navbar-nav">
      ul class="nav navbar-nav navbar-right">
                <a class="nav-item nav-link" href="home.html"><span class="glyphicon glyphicon-
home"></span> Home</a>
             <a class="nav-item nav-link" href="index.html"><span class = "glyphicon glyphicon-log-
in"></span> Login</a>
                <a class="nav-item nav-link" href="signup.html"><span class="glyphicon glyphicon-
user"></span> Sign-Up</a>
       </div>
     </div>
   </nav>
<div class="signup_box">
     <h3>SIGNUP</h3>
     <form name="signupform" onsubmit="return form2()" method="post" action="index.html">
     User Name
```

```
<input type="text" name="signup_username" placeholder="Enter Username">
     Email
     <input type="email" name="signup_useremail" placeholder="Enter Email id">
     Password
     <input type="password" name="signup_pwd" placeholder="password">
     Retype Password
     <input type="password" name="repwd" placeholder="Re-Enter pasword"><br>
     <div id="errorbox"></div><br>
     <input type="submit" name="" value="SIGNUP"><br><br>
     <a href="index.html"> Exsisting user? Login Now! </a>
</form>
</div>
</body>
</html>
Login:
login.html
<!DOCTYPE html>
<html>
<head>
     <title>Login Form</title>
   <meta name="viewport" content="width=device-width, initial-scale=1">
 k rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css" >
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.4/jquery.min.js"></script>
  <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></script>
     k rel="stylesheet" type="text/css" href="style.css">
     <script type="text/javascript" src="javascript.js"></script>
</head>
<body>
      <nav class="navbar navbar-light" style="background-color: #6196bc;">
    <div class="collapse navbar-collapse" id="navbarNavAltMarkup">
      <div class="navbar-nav">
      ul class="nav navbar-nav navbar-right">
                 <a class="nav-item nav-link" href="home.html"><span class="glyphicon glyphicon-
home"></span> Home</a>
             <a class="nav-item nav-link" href="index.html"><span class = "glyphicon glyphicon-log-</li>
in"></span> Login</a>
```

```
<a class="nav-item nav-link" href="signup.html"><span class="glyphicon glyphicon-user"></span>
Sign-Up</a>
       </div>
     </div>
   </nav>
<div class="login_box">
     <h3>USER LOGIN</h3>
     <form name="loginform" onsubmit="return form1()" method="post" action="home.html">
     User Name
     <input type="text" name="username" placeholder="Enter Username">
     Password
     <input type="password" name="pwd" placeholder="password"><br>
     <div id="errorbox"></div><br>
     <div><centre>
                                   type="submit"
                                                     name="submit"
                                                                         value="LOGIN">
                        <input
                                                                                             <a
href="home.html"></a></centre></div>
     <br>>dr><br>
     <a href="signup.html">Not registered? <span>Create an account</span></a>
</form>
</div>
</body>
</html>
```

# Output:



### 7.2 FEATURE 2

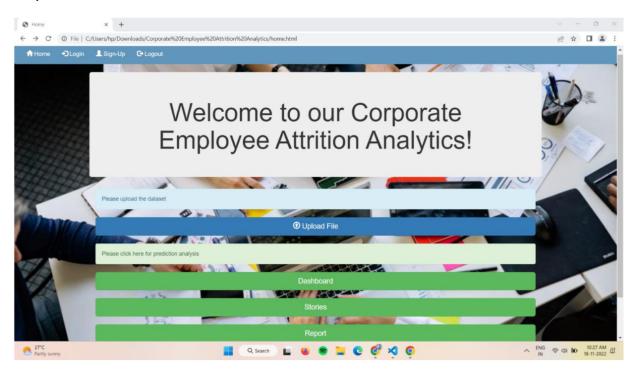
### Dashboard:

- <!DOCTYPE html>
- <html>
- <head>
  - <title>Home</title>
  - <meta name="viewport" content="width=device-width, initial-scale=1">
- <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.4/jquery.min.js"></script>
- <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></script>

```
k rel="stylesheet" type="text/css" href="style.css">
     <script type="text/javascript" src="javascript.js"></script>
</head>
<body>
  <nav class="navbar navbar-light" style="background-color: #6196bc;">
    <div class="collapse navbar-collapse" id="navbarNavAltMarkup">
      <div class="navbar-nav">
      ul class="nav navbar-nav navbar-right">
     <a class="nav-item nav-link" href="home.html"><span class="glyphicon glyphicon-home"></span>
Home</a>
     <a class="nav-item nav-link" href="index.html"><span class = "glyphicon glyphicon-log-in"></span>
Login</a>
     <a class="nav-item nav-link" href="signup.html"><span class="glyphicon glyphicon-user"></span>
Sign-Up</a>
    <a class="nav-item nav-link" href="index.html"><span class="glyphicon glyphicon-log-out"></span>
Logout</a>
       </div>
     </div>
   </nav>
    <div class="container" id="content">
      <div class="jumbotron home-spacer" id="products-jumbotron">
        <h1>Welcome to our Corporate Employee Attrition Analytics!</h1>
      </div>
       <div class="container-fluid">
        <div class="alert alert-info" role="alert">Please upload the dataset</div>
        <input type="file" id="file" style="display:none;" />
 <button type="button" class="btn btn-primary btn-lg btn-block" data-toggle="button" aria-pressed="false"</p>
autocomplete="off" value="upload" onclick="thisFileUpload();">
       <span class="glyphicon glyphicon-upload"></span> Upload File
      </a></button>
       <hr>
       <div class="alert alert-success" role="alert"> Please click here for prediction analysis </div>
             <button type="button" class="btn btn-success btn-lg btn-block" data-toggle="button" aria-
pressed="false"
                                      autocomplete="off"
                                                                                onclick="location.href
='https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FCorporate%2BE
mployee%2BAttrition%2BAnalytics-
%2BIBM&action=view&mode=dashboard&subView=model000001846c977bf6_000000000;">
       Dashboard</button>
       <br>
 <button type="button" class="btn btn-success btn-lg btn-block" data-toggle="button" aria-pressed="false"</p>
autocomplete="off"
                                                                                onclick="location.href
='https://us1.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FCorporate%2BEmploy
ee%2BAttrition%2BAnalytics-
IBM&action=view&sceneId=model000001846f205987_00000000&sceneTime=0';">
```

```
Stories</button>
        <br>
               <button type="button" class="btn btn-success btn-lg btn-block" data-toggle="button" aria-
pressed="false"
                                      autocomplete="off"
                                                                                 onclick="location.href
='https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FCorporate%2BEmployee%2BAttrition%2B
Analytics-%2BIBM%2BReport&action=run&format=HTML&prompt=false';">
         Report</button>
       </div>
      </div>
      <br>
      <div class="alert alert-danger" role="alert">
      <a href="index.html"> Exsisting user? Login Now! </a>
      <a href="signup.html"> Don't have an account? Sign-Up</a>
      </div>
</body>
</html>
```

## Output:



# 8.TESTING

# 8.1 TEST CASES

| Test ID | Test case descripti on | Test Data                                 | Expected<br>Results                      | Actual<br>Results                    | Pass/fail |
|---------|------------------------|---|--|--------------------------------------|-----------|
| T1      | Registrati<br>on form  | Username<br>="sana"<br>Password<br>="788" | Should<br>enter login<br>page            | Enter into<br>the login<br>page      | Pass      |
| T2      | Registrati<br>on form  | Usernam<br>e=<br>Passwor<br>d=            | Should not<br>enter into<br>login page   |                                      | Pass      |
| ТЗ      | Login<br>Page          | Username<br>="sana"<br>Password<br>="788" | Move to<br>Home<br>page                  | Moved to<br>home<br>page             | Pass      |
| T4      | Login<br>Page          | Username<br>="hfdd"<br>Password<br>="435" | Does not<br>move to<br>home<br>page      | Does not<br>moved to<br>home<br>page | Pass      |
| T5      | Home<br>Page           | Upload file<br>button                     | File<br>explorer<br>should be<br>enabled | File<br>explorer is<br>enabled       | Pass      |
| Т6      | Home<br>page           | Dashboard<br>button                       | Should<br>move to<br>dashboard           | Moved to dashboard                   | Pass      |
| T7      | Home<br>page           | Stories<br>snippet<br>button              | Should<br>move to<br>stories             | Moved to stories                     | Pass      |

| Т8 | Home | Report | Should   | Report is | Pass |
|----|------|--------|----------|-----------|------|
|    | Page | button | generate | generated |      |
|    |      |        | report   |           |      |

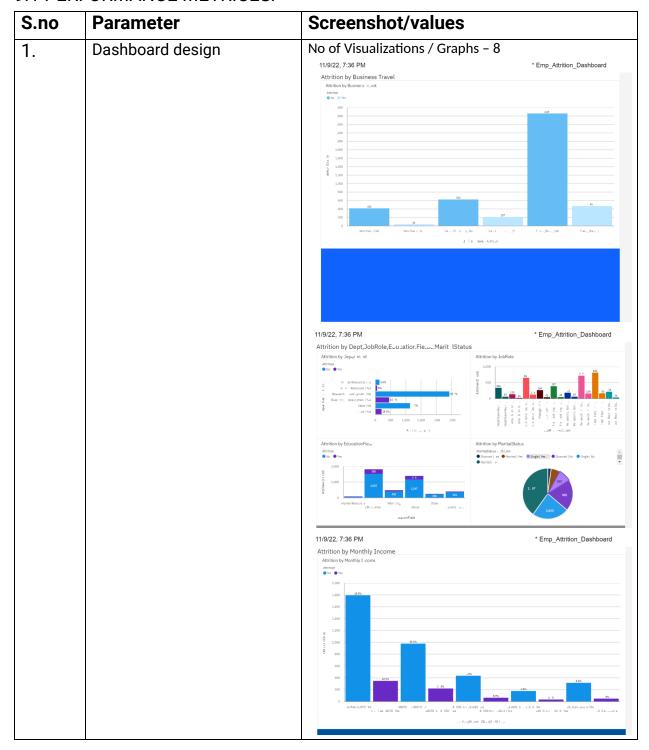
# 8.2 USER ACCEPTANCE TESTING:

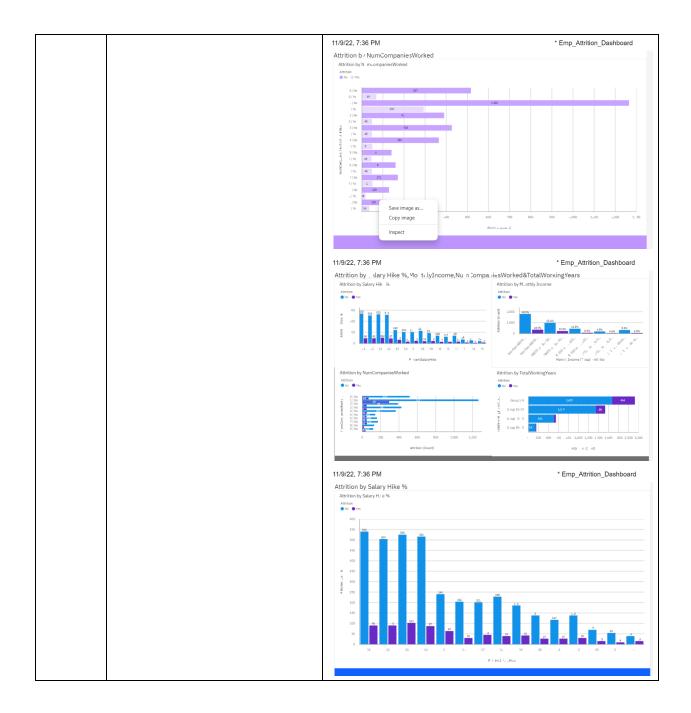
| Test ID | Test<br>case<br>descripti<br>on | Test Data                                 | Expected Results                 | Actual<br>Results                 | Pass/fail |
|---------|---------------------------------|---|----------------------------------|-----------------------------------|-----------|
| T1      | Registrat<br>ion form           | Username="s<br>ana"<br>Password="7<br>88" | Should enter login<br>page       | Enter into<br>the login<br>page   | Pass      |
| T2      | Registrat<br>ion form           | Username=<br>Password=                    | Should not enter into login page | Not enter<br>into login<br>page   | Pass      |
| Т3      | Login<br>Page                   | Username="s<br>ana"<br>Password="7<br>88" | Move to Home<br>page             | Moved to<br>home page             | Pass      |
| T4      | Login<br>Page                   | Username="h<br>fdd"<br>Password="4<br>35" | Does not move to<br>home page    | Does not<br>moved to<br>home page | Pass      |
| T5      | Home<br>Page                    | Upload file<br>button                     | File explorer should be enabled  | File<br>explorer is               | Pass      |

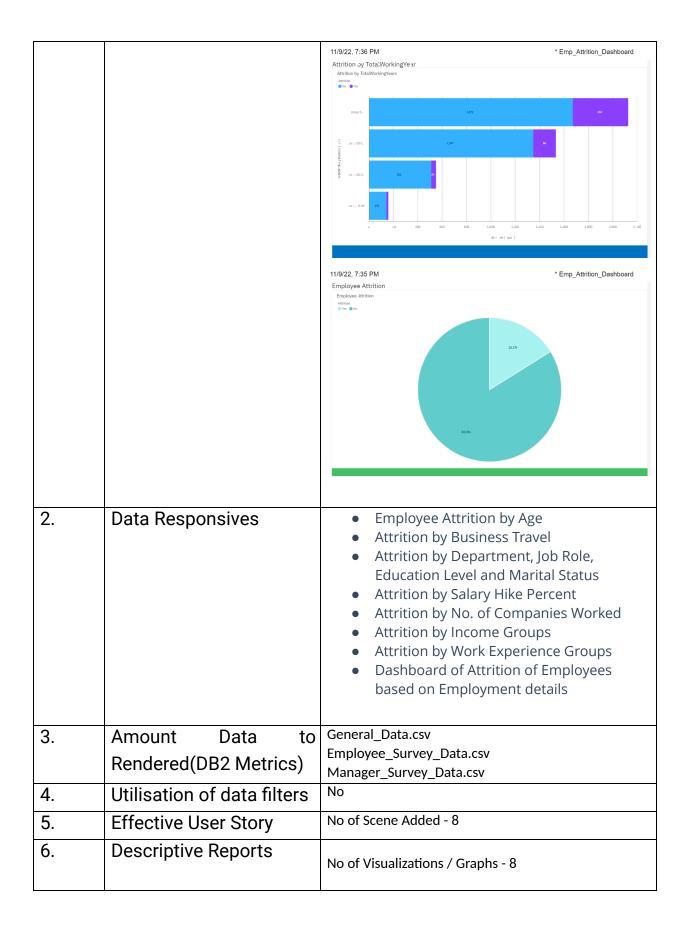
|    |              |                              |                          | enabled                |      |
|----|--------------|------------------------------|--------------------------|------------------------|------|
| T6 | Home<br>page | Dashboard<br>button          | Should move to dashboard | Moved to<br>dashboard  | Pass |
| T7 | Home<br>page | Stories<br>snippet<br>button | Should move to stories   | Moved to stories       | Pass |
| T8 | Home<br>Page | Report<br>button             | Should generate report   | Report is<br>generated | Pass |

# 9.RESULTS

## 9.1 PERFORMANCE METRICES:







# **10.ADVANTAGES AND DISADVANTAGES:**

### 10.1 ADVANTAGES:

- 1. able to predict the reason for attrition
- 2. reduces the time required for analysis
- 3. easy to use

### 10.2 DISADVANTAGES:

- 1. collectiong datas from employees is tedious process
- 2. Employees should give correct reason for attrition

# 11.CONCLUSION

Retention of talent and skilled employee is crucial dilemma for HR Manager. This study has identified those complex factors which are key responsible for employee attrition in selected organization. The education and experience of employee creates opportunity for new job in market and it helps to enhance better career opportunity. The ethical work culture, cordial employee relation and implementation of organizational policies are the most attractive area of making employee to stay back in organization.

# 12.FUTURE SCOPE

To find the right model which has a low false negative rate since classifying an employee at risk of leaving as not at risk is critical.

To develop a model with more accurate result.