| Date | 18 November 2022 |
|---|---|
| Team ID | PNT2022TMID40091 |
| Project Name | Project – Airlines Data Analytics for Avaition Indsutry |
| Maximum Marks | 8 Marks |

# Project Report Format

1. **INTRODUCTION**

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    1.2 Purpose

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6. **PROJECT PLANNING & SCHEDULING**

    6.1 Sprint Planning & Estimation

    6.2 Sprint Delivery Schedule

    6.3 Reports from JIRA

7. **CODING & SOLUTIONING (Explain the features added in the project along with code)**

    7.1 Feature 1

    7.2 Feature 2

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## 1. INTRODUCTION

### 1.1 Project Overview

when a flight delay or baggage loss occur, travellers get nervous. And if customers don't get a response or explanation of a problem from an airline representative in a timely manner, they likely won't choose this airline for their next trip. The speed of response to customer queries matters as much as actual steps that are taken to solve an issue.

So, travel experience is getting extremely customized and customer-oriented.

## 2. LITERATURE SURVEY

### 2.1 Existing problem

The aviation industry is a world in itself, encompassing a massive workforce and contributing a significant percentage to the global economy. The sector was set for major growth, challenges notwithstanding, until the pandemic hit, post which it plummeted to a considerable extent. Yet, it is fair to state that despite the economic impact of COVID-19 on airline industry, it has been on the road to recovery, and may very well get back to the mainstream in a few years.

### 2.2 References

**$2.7 trillion in world economic activity https://aviationbenefits.org/economic-growth/adding-value-to-the-economy/**

**22.4 per cent of world traffic was from  https://www.icao.int/annual-report-2018/Pages/the-world-of-air-transport-in-2018.aspx**

### 2.3 Problem Statement Definition

**To identify and manage many people traveling this summer, they are noticing first –hand that airlines are facing major challenges, including** numerous flight cancellations and delays. Many people will get frustrated to sit

idle in airport. Passengers who need to handle international meeting and also for some emergency purpose. Adverse weather conditions, low ceilings, and low visibility conditions strongly influence flight delays. Inclement weather such as thunderstorm, hurricane, or blizzard. Late arrival of the aircraft to be used for the flight from a previous flight. Maintenance problems with the aircraft A flight delay is when an airline flight takes off and /or lands later than its scheduled time. A cancellation occurs when the airline does not operate the flight at all for a certain reason. The least punctual airline of all U.S. carriers was Frontier which had an average on-time arrival of 73.14 percent. Coming in just above that was JetBlue with an on-time arrival of 73.5 percent. Passengers are increasingly affected by delays and cancellations. Thus these problems has to be fixed.
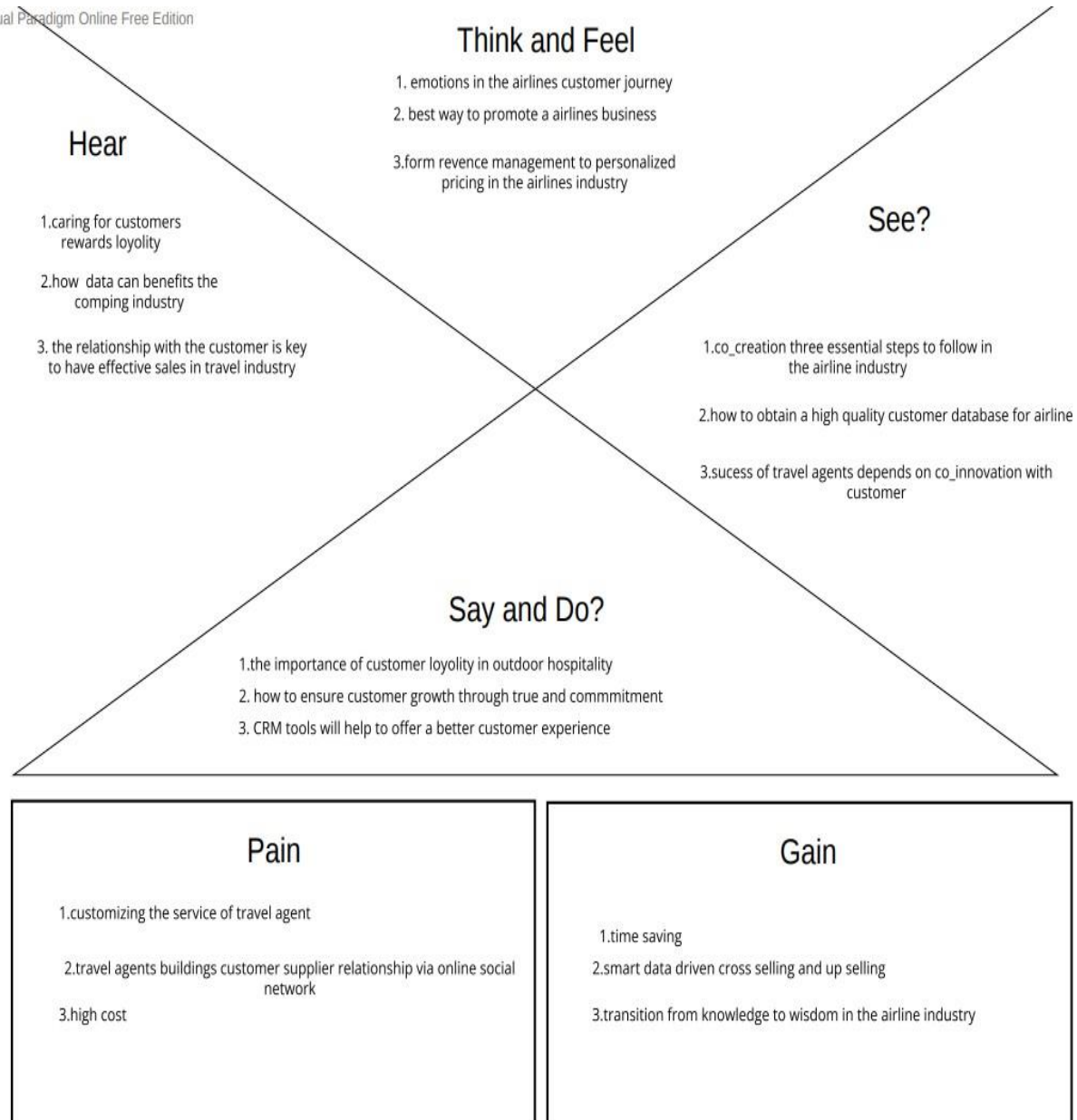
## 3. IDEATION & PROPOSED SOLUTION

### 3.1 Empathy Map Canvas

#### Empathize & Discover

### 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 helps 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.

## Think and Feel

1. emotions in the airlines customer journey

2. best way to promote a airlines business

3. form revence management to personalized pricing in the airlines industry

## Hear

1. caring for customers rewards loyolity

2. how data can benefits the comping industry

3. the relationship with the customer is key to have effective sales in travel industry

## See?

1. co_creation three essential steps to follow in the airline industry

2. how to obtain a high quality customer database for airline

3. sucess of travel agents depends on co_innovation with customer

## Say and Do?

1. the importance of customer loyolity in outdoor hospitality

2. how to ensure customer growth through true and commmitment

3. CRM tools will help to offer a better customer experience

## Pain

1. customizing the service of travel agent

2. travel agents buildings customer supplier relationship via online social network

3. high cost

## Gain

1. time saving

2. smart data driven cross selling and up selling

3. transition from knowledge to wisdom in the airline industry

## 3.2 Ideation & Brainstorming

Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members. On paper, brainstorming seems like a fairly effective method for ideation.

## 3.3 Proposed Solution

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

| S.No. | Parameter | Description |
|-------|-----------|-------------|
|       |           |             |

| 1. | Problem Statement (Problem to be solved) | ❖ With the growing demand for air transportation and the limited ability to increase capacity at some key points in the air transportation system, there are concerns that in the future the system will not scale to meet demand.This situation will result in the generation and the propagation of delays throughout the system, impacting passengers' quality of travel and more broadly the economy. |
|---|---|---|
| 2. | Idea / Solution description | ❖ Understanding traveler demand for specific city pairs and pricing flights can be done using data analytics project.<br><br>❖ Airlines use this biometric technology as a boarding option. The equipment scans travelers' faces and matches them with photos stored in border control agency databases. These can be handled with the aforementioned project. |
| 3. | Novelty / Uniqueness | ❖ The ultimate benefits of big data analytics include timely responses to current and future market demands, improved planning and strategically aligned decision making, as well as crystal clear comprehension and monitoring of all main performance drivers relevant to the airline industry.<br><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 | ❖ Data analytics helps the industry to understand customers' preferences andother maintenance issues.<br><br>❖ For instance, analysis of ticket booking helps the industry to target the customers with personalised offers while optimising the price in real-time using predictive analysis techniques. Asa result, by gathering meaningful data, airlines can fetch more bookings in the given timeframe. |
| 5. | Business Model (Revenue Model) | ❖ Business models innovation in airlines can contribute to the creation of value, competitive advantage and profitabilitywith new possibilities of action.<br><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 itwill pay for operating costs and expenses. |
| 6. | Scalability of the Solution | ❖ The Cloud Cognos Analytics is not onlyfor particular organization/governments.<br><br>❖ Aviation industry acting under international, domestic or private are also getting satisfied with the aviation data analysing process provided as pertheir needs. |

### 3.4 Problem Solution fit

The most prevalent trend in aviation recently has been the move from "hub-and-spoke" to "point to point" network configurations. This has been abetted by the introduction of long range, and highly efficient planes like the Boeing 787 Dreamliner and the 737 MAX/ A320 NEO.

But, let's look at the other system. Norwegian (I realize it is a low cost carrier, and offers a drastically different product from Delta, but I think that it helps paint the picture very well) focuses on operating flights with high efficiency aircraft from cities like Barcelona directly to smaller towns in the US, like Austin, Texas (their current route actually will begin to operate from London, but let's keep working with this scenario). Suddenly, the system becomes much more passenger friendly. You only have to board a plane twice, and won't have to worry about connections and the sort. There are increased costs with operating from all different cities with no central connector, but these can be made up for with increased passenger happiness, saved fuel costs, and the sort. Most of the time, passengers *will* choose the more direct flight after all.

## 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 | customer Registration | customer can make registeration through Gmail |
| FR-2 | User Confirmation | After the registeration the customer will getconfirmation through mail. |
| FR-3 | Visualizing data | User can visualize the Regular trends of delay of flightsUsing IBM cognos Analytics |

| FR-4 | Generating Report | User can view the flight delay report |
| --- | --- | --- |

## 4.2 Non-Functional requirement

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

| FR No. | Non-Functional Requirement | Description |
| --- | --- | --- |
| NFR-1 | **Usability** | The application will have a simple and user-friendlygraphical interface. Users will be able to understand and use all the features of the application easily. Anyaction has to be performed with just a few clicks |
| NFR-2 | **Security** | The main security concern is for users account hence proper login mechanism should be used to avoid hacking. The organization system should not disclose personal information of users and otherorganization details to public. |
| NFR-3 | **Reliability** | When the system is disconnected or frozen 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** | The system should require a fair amount of speedespecially while browsing through the catalogue. |
| NFR-5 | **Availability** | The system shall be available 24 hours a day 7 days aweek. User can access at anytime. |
| NFR-6 | **Scalability** | Large Number of users can access the website |

## 5.PROJECT DESIGN

5.1 Data flow diagrams
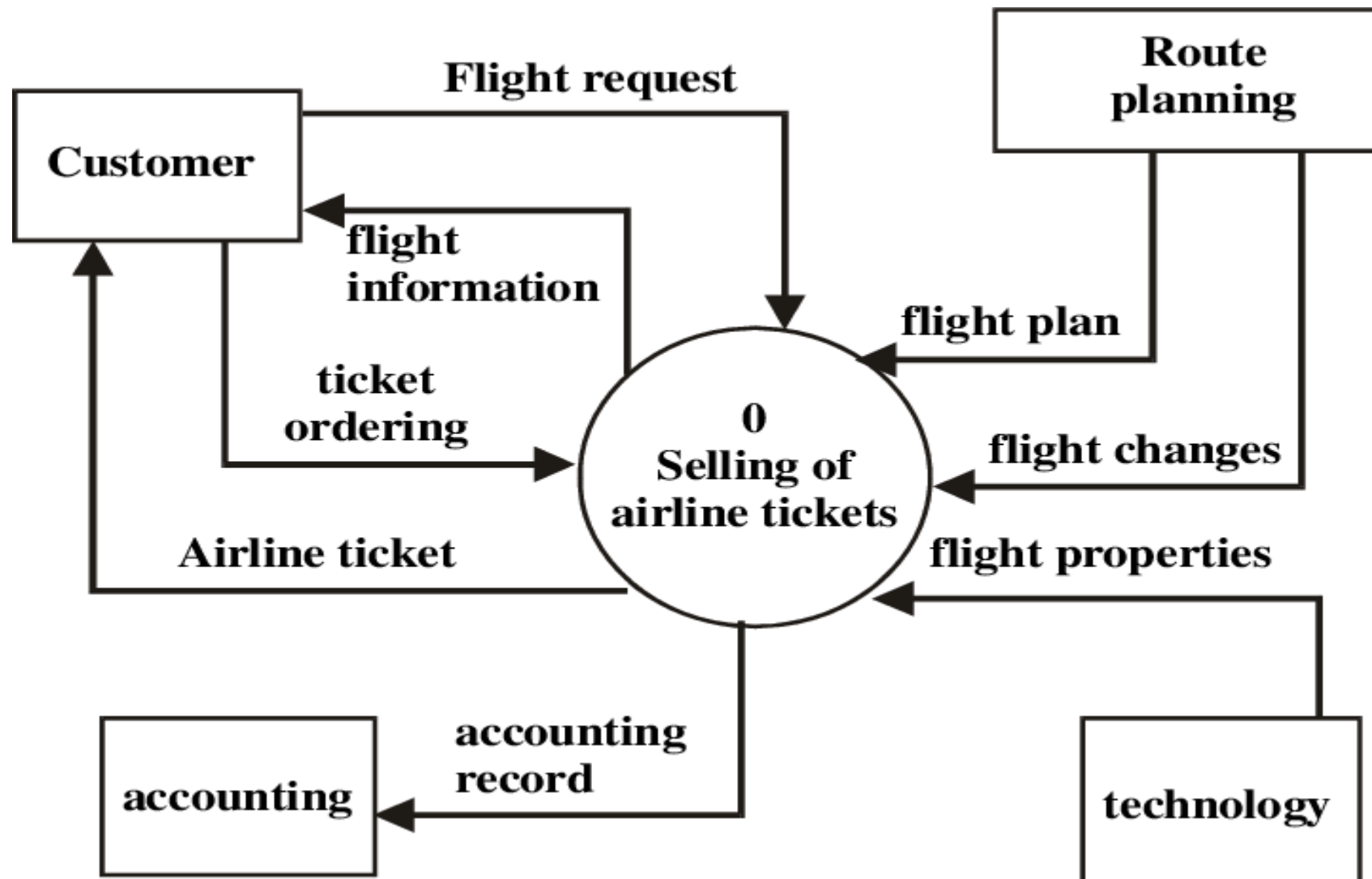
## 5.2 Solution & Technical Architecture

**Technical Architecture:**

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

**Example: Order processing during pandemics for offline mode**

**Reference: https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/**
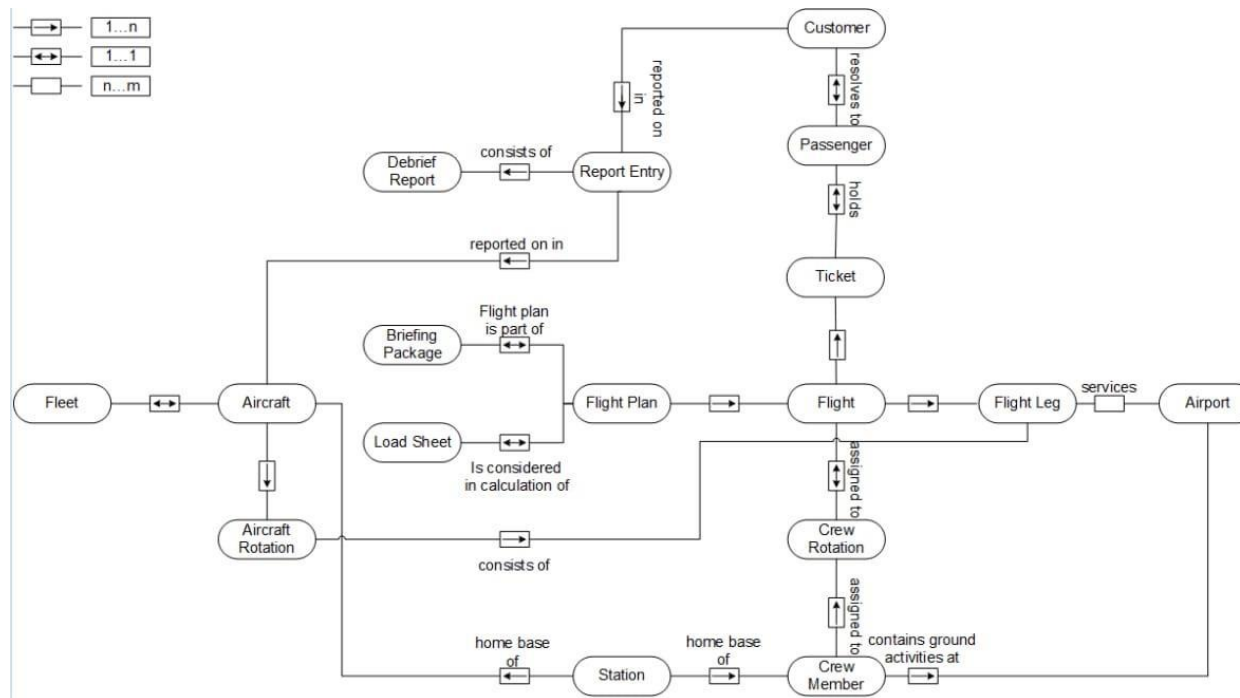
**Table-1 : Components & Technologies:**

| S.No | Component | Description | Technology |
|------|-----------|-------------|------------|
| 1. | User Interface | How user interacts with application e.g. Web UI, Mobile App, Chatbot etc. | HTML, CSS, JavaScript / Angular Js / React Js etc. |
| 2. | Application Logic-1 | Logic for a process in the application | Java / Python |
| 3. | Application Logic-2 | Logic for a process in the application | IBM Watson STT service |
| 4. | Application Logic-3 | Logic for a process in the application | IBM Watson Assistant |
| 5. | Database | Data Type, Configurations etc. | MySQL, NoSQL, etc. |
| 6. | Cloud Database | Database Service on Cloud | IBM DB2, IBM Cloudant etc. |
| 7. | File Storage | File storage requirements | IBM Block Storage or Other Storage Service or Local Filesystem |
| 8. | External API-1 | Purpose of External API used in the application | IBM Weather API, etc. |
| 9. | External API-2 | Purpose of External API used in the application | Aadhar API, etc. |
| 10. | Machine Learning Model | Purpose of Machine Learning Model | Object Recognition Model, etc. |
| 11. | Infrastructure (Server / Cloud) | Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration : | Local, Cloud Foundry, Kubernetes, etc. |

**Table-2: Application Characteristics:**

| S.No | Characteristics | Description | Technology |
|------|-----------------|-------------|------------|
| 1. | Open-Source Frameworks | List the open-source frameworks used | Technology of Opensource framework |

| 2. | Security Implementations | List all the security / access controls implemented, use of firewalls etc. | e.g. SHA-256, Encryptions, IAM Controls, OWASP etc. |
|---|---|---|---|
| 3. | Scalable Architecture | Justify the scalability of architecture (3 – tier, Micro-services) | Technology used |

| S.No | Characteristics | Description | Technology |
|------|----------------|-------------|------------|
| 4. | Availability | Justify the availability of application (e.g. use of load balancers, distributed servers etc.) | Technology used |
| 5. | Performance | Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc. | Technology used |

**References:**
**https://aws.amazon.com/architecture**

**https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d**

## 6. PROJECT PLAN ING & ESTIMATION

## SPRINT PLAN ING & ESTIMATION

### <u>Activity List:</u>

| Activity Name | Activity Number | Activity Description | Tasks Assigned | Status |
|---------------|-----------------|----------------------|----------------|--------|
| Preparation Phase | 1 | a) Access the resources in projectdashboard.<br>b) Explore the dataset provided inworkspace.<br>c) Create GitHub account & collaborate with Project Repository inproject workspace.<br>d) Set-up the prerequisites for the project. | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | Completed |

| Ideation Phase | 2 | a) Literature survey relevant to theselected project.<br>b) Preparation of Empathy Map toidentify the user pros and cons.<br>c) List the ideas by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance. | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | Completed |
|---|---|---|---|---|

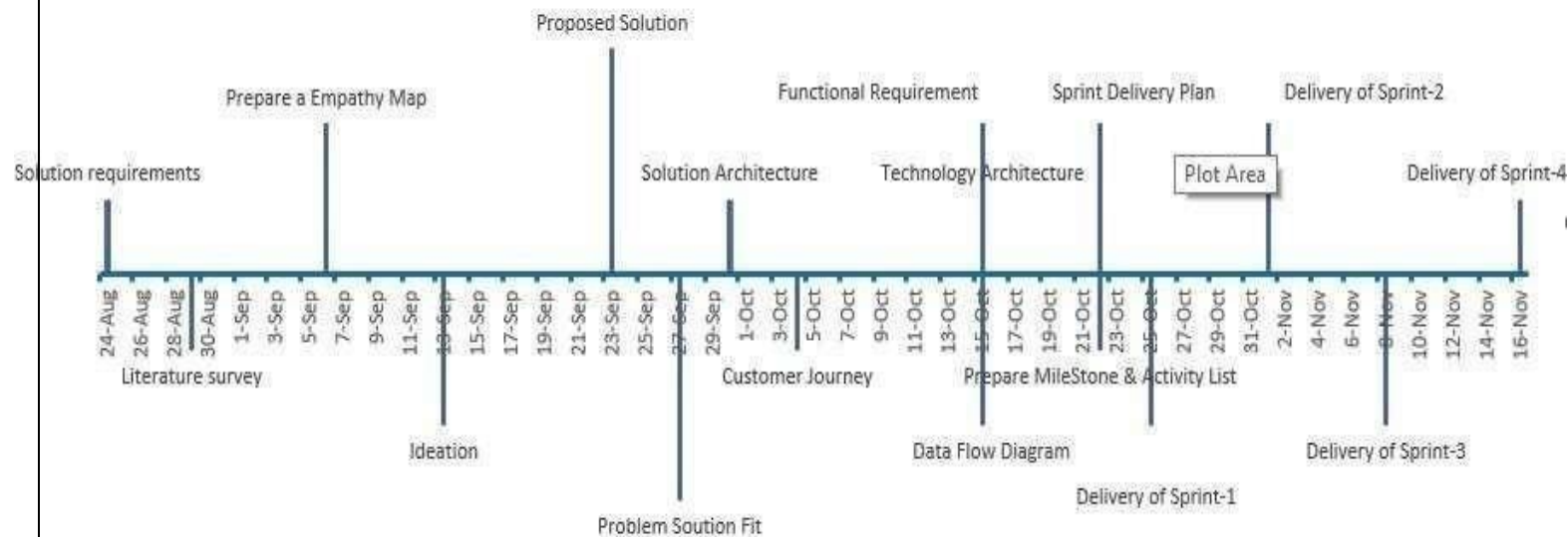| **Project Design Phase-I** | 3 | | | |
|---|---|---|---|---|
| Proposed Solution | 3.1 | Preparation of proposed solution document, which includes the Problem statement , Idea description,novelty,feasibility of idea, business model, social impact and scalability of the solution. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |
| Problem SolutionFit | 3.2 | Prepared problem solution fit documentwhich have designed a value proposition that addresses the customers' job, pros and cons to the particular application. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |
| Solution Architecture | 3.3 | Develop effective architecture for the proposed solution which provides ground for application development projects. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |
| **Project Design Phase-II** | 4 | | | |
| Solution Requirement | 4.1 | Identify the Functional and Non-Functional requirements of the proposed solution. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |
| Customer Journey | 4.2 | Preparation of customer journey mapto understand the user interactions which describes the stages that the customer experiences over time. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |
| Data Flow Diagramand User stories | 4.3 | Generate Data flow diagram for the Project which maps out the flow of information for the application. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |

| Technology Architecture | 4.4 | Develop effective technical architecture for the proposed solution which describes the logical software and hardware capabilities that are required to support the development ofthe application. | JANANI.M SWAPNA.K SWETHA.M SWETHA.B | Completed |
|---|---|---|---|---|

| Project Planning Phase | 5 | | | |
|---|---|---|---|---|
| Milestones & Activity List | 5.1 | Prepare Milestone and Activity list ofthe project. | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | Completed |
| Sprint Plan | 5.2 | Prepare Sprint Delivery plan of the project | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | Completed |
| Project Development | 6 | | | |
| Delivery of Sprint-1 | 6.1 | Implement the working with dataset | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | In Progress |
| Delivery of Sprint-2 | 6.2 | Implement the working with dataset | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | In Progress |
| Delivery of Sprint-3 | 6.3 | Implement the data virtualization | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | In Progress |
| Delivery of Sprint-4 | 6.4 | Implement the data virtualization-final delivery | JANANI.M<br>SWAPNA.K<br>SWETHA.M<br>SWETHA.B | In Progress |

## Milestone Timeline Chart:

A milestone schedule, or milestone chart, is a timeline that uses milestones to divide a project schedule into majorphases. A milestone chart is a way to visualize the most important steps of our project. Each milestone the team achieves brings us closer to completing the project. As a result, milestones provide a sense of accomplishment andshow the team how the work they're doing contributes to the overarching project objective.

### Milestone Timeline Chart

Proposed Solution

Prepare a Empathy Map

Functional Requirement     Sprint Delivery Plan     Delivery of Sprint-2

Solution requirements     Solution Architecture     Technology Architecture     Plot Area     Delivery of Sprint-4

24-Aug, 26-Aug, 28-Aug, 30-Aug, 1-Sep, 3-Sep, 5-Sep, 7-Sep, 9-Sep, 11-Sep, 13-Sep, 15-Sep, 17-Sep, 19-Sep, 21-Sep, 23-Sep, 25-Sep, 27-Sep, 29-Sep, 1-Oct, 3-Oct, 5-Oct, 7-Oct, 9-Oct, 11-Oct, 13-Oct, 15-Oct, 17-Oct, 19-Oct, 21-Oct, 23-Oct, 25-Oct, 27-Oct, 29-Oct, 31-Oct, 2-Nov, 4-Nov, 6-Nov, 8-Nov, 10-Nov, 12-Nov, 14-Nov, 16-Nov

Literature survey

Customer Journey     Prepare MileStone & Activity List

Ideation

Data Flow Diagram     Delivery of Sprint-3

Delivery of Sprint-1

Problem Soution Fit

## 6.2 Sprint delivery schedule

**Product Backlog, Sprint Schedule, and Estimation (4 Marks)**

Use the below template to create product backlog and sprint schedule

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story 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 that. | 2 | Low | Janani.M Swetha.B Swapna.K Swetha.m |
| Sprint-1 | Registration | USN-2 | As a user, I will receive confirmation email once I have registered for the application | 3 | High | Janani.M Swetha.B Swapna.K Swetha.m |
| Sprint-1 | Login | USN-3 | As a user, I adapt to logging into the system with credentials. | 2 | Low | Janani.M Swetha.B Swapna.K Swetha.m |
| Sprint-1 | Designation of Region | USN-4 | As a user, I can collect the dataset and select the region of interest to be monitored and analysed | 5 | Medium | Janani.M Swetha.B Swapna.K Swetha.m |
| Sprint-2 | Exploration Of The Data | USN-5 | As a developer,I will explore the given dataset through cognos. | 6 | High | Janani.M Swetha.B Swapna.K Swetha.m |
| Sprint-2 | Visualization Of The Dataset | USN-6 | As a developer,I will visualize the given dataset into a dashboard using cognos. | 6 | High | Janani.M Swetha.B Swapna.K Swetha.m |
| Sprint-3 | Customization Of The Dashboard | USN-7 | As a user,I can customize the visualized dashboard. | 6 | Medium | Janani.M Swetha.B |

| | | | | | | Swapna.K Swetha.m |
|---|---|---|---|---|---|---|
| Sprint-3 | Ease of Access | USN-8 | As a user,I can easily access and manipulate the dashboard. | 6 | Medium | Janani.M Swetha.B Swapna.K Swetha.m |

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|--------|-------------------------------|-------------------|-------------------|--------------|----------|--------------|
| Sprint-4 | Report Generation | USN-9 | As a user,I can view the detailed report of my visualization. | 6 | High | Janani.M Swetha.B Swapna.K Swetha |
| Sprint-4 | Establishment of the Dashboard | USN-10 | As a developer,I established the dashboard into a website and submit the website. | 6 | High | Janani.M Swetha.B Swapna.K Swetha.m |

**Project Tracker, Velocity & Burndown Chart: (4 Marks)**

| 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 |
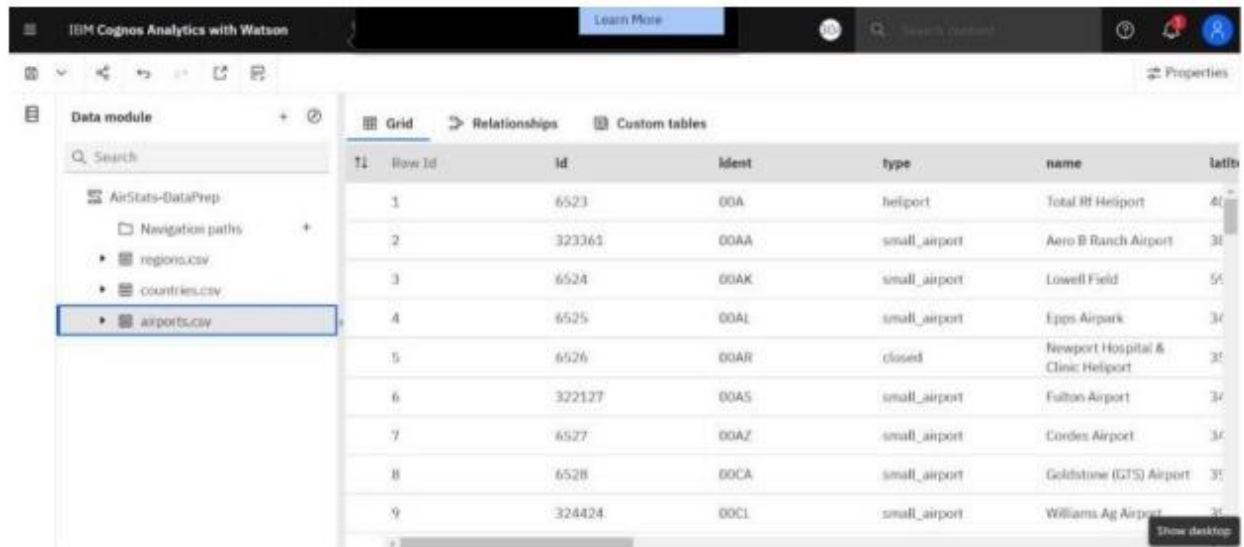
**Velocity:**
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

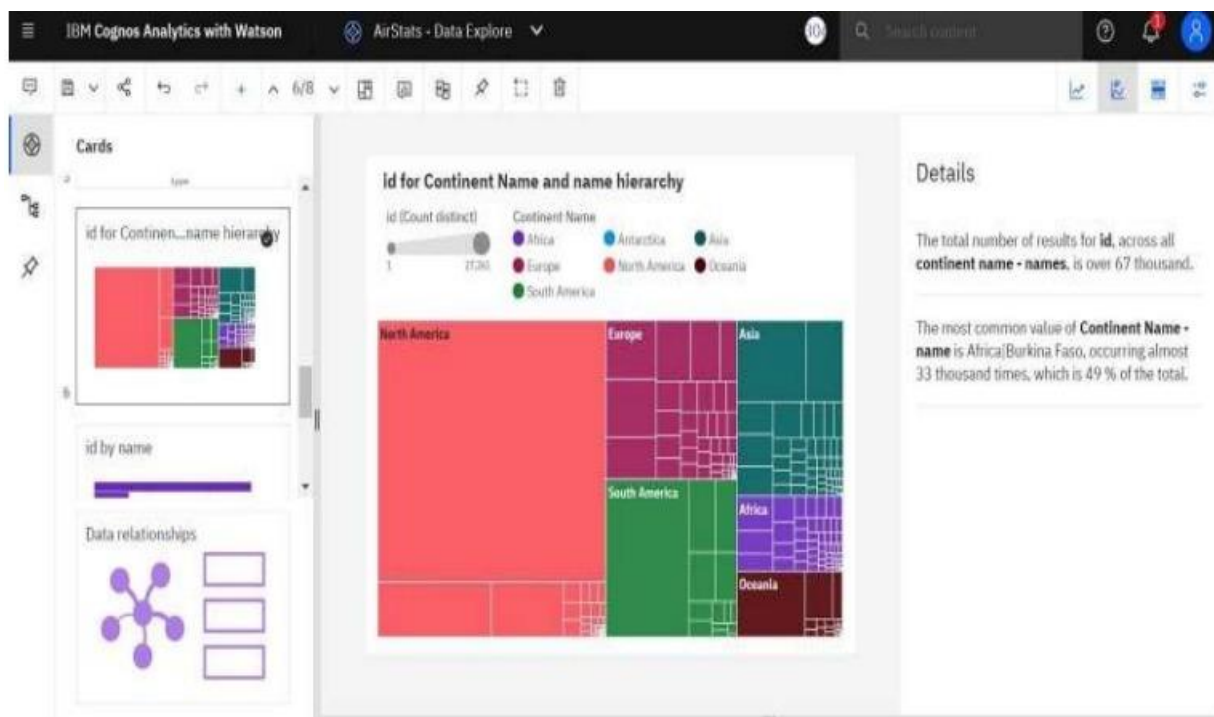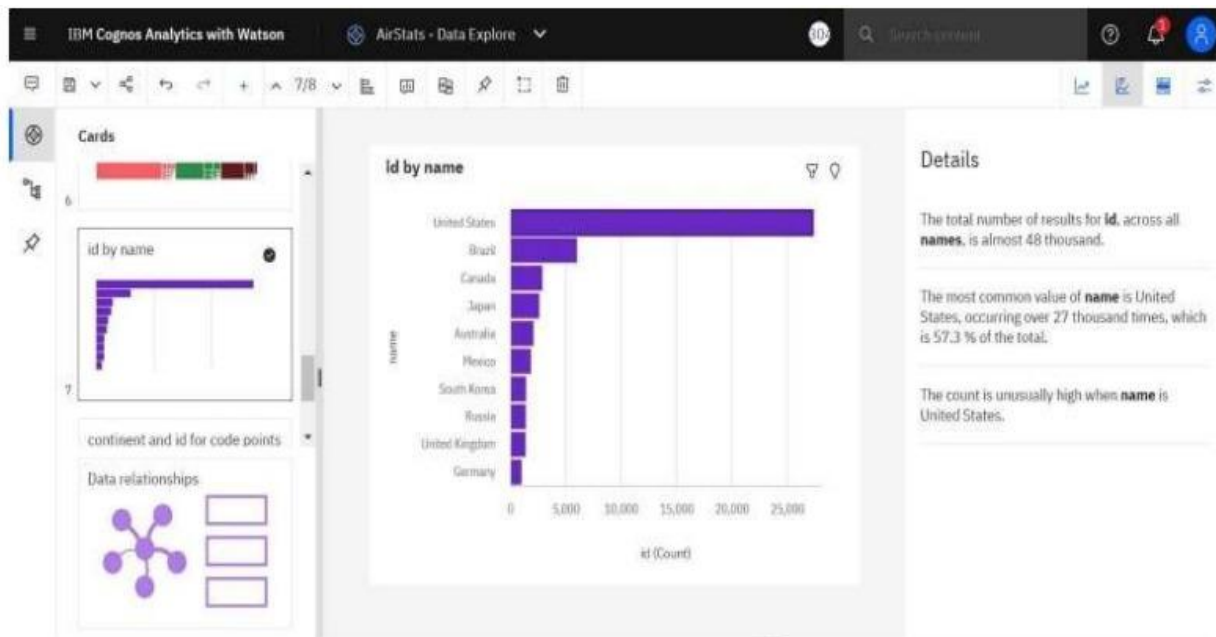**Average velocity=Sprint duration / velocity=12/6=2**

# 7. Coding and solution

Working with dataset

**Screen 1 — id by name**
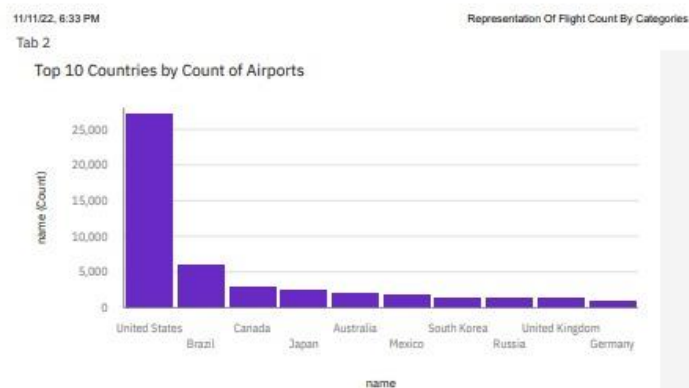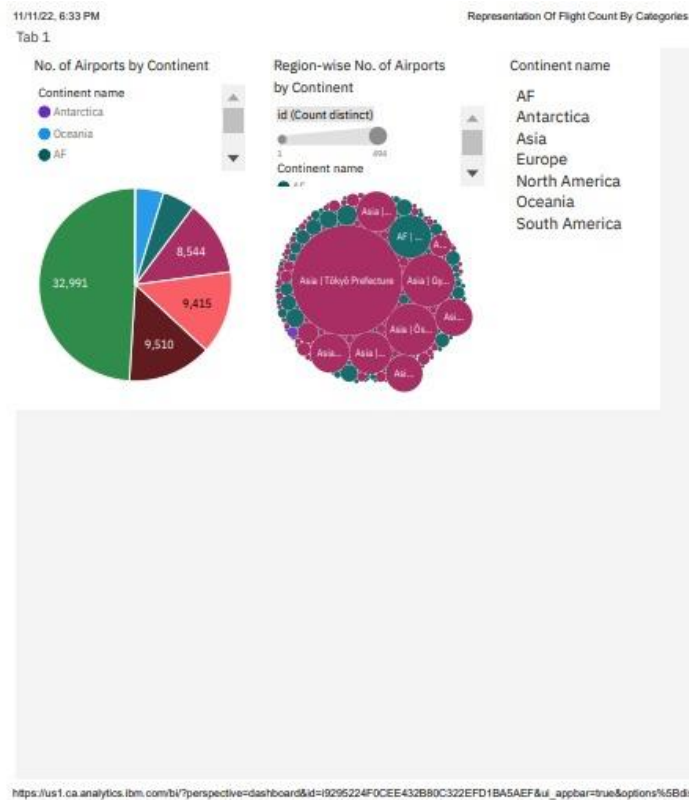
Cards

id by name

continent and id for code points

Data relationships

**id by name**

| name | |
|---|---|
| United States | |
| Brazil | |
| Canada | |
| Japan | |
| Australia | |
| Mexico | |
| South Korea | |
| Russia | |
| United Kingdom | |
| Germany | |

id (Count): 0, 5,000, 10,000, 15,000, 20,000, 25,000

**Details**

The total number of results for **id**, across all **names**, is almost 48 thousand.

The most common value of **name** is United States, occurring over 27 thousand times, which is 57.3 % of the total.

The count is unusually high when **name** is United States.

**Screen 2 — id for Continent Name and name hierarchy**

Cards

id for Continen...name hierarchy

id by name

Data relationships

**id for Continent Name and name hierarchy**

id (Count distinct): 1 — 27,283

Continent Name
- Africa
- Antarctica
- Asia
- Europe
- North America
- Oceania
- South America

North America · Europe · Asia · South America · Africa · Oceania

**Details**

The total number of results for **id**, across all **continent name - names**, is over 67 thousand.

The most common value of **Continent Name - name** is Africa|Burkina Faso, occurring almost 33 thousand times, which is 49 % of the total.

# Data visualization

Tab 1

**No. of Airports by Continent**

Continent name
- Antarctica
- Oceania
- AF

**Region-wise No. of Airports by Continent**

id (Count distinct)

Continent name

**Continent name**

AF
Antarctica
Asia
Europe
North America
Oceania
South America

32,991

8,544

9,415

9,510

Asia | Tōkyō Prefecture    Asia | Os...

AF | ...    A...

Asia | Ōs...

Asi...

Asi...

Tab 2

**Top 10 Countries by Count of Airports**

25,000

20,000

15,000

10,000

5,000

0

name (Count)

United States    Canada    Australia    South Korea    United Kingdom
          Brazil    Japan    Mexico    Russia    Germany

name

Tab 1

| 247 | 3.96K | 63.8K | 30.9K |
|-----|-------|-------|-------|
| Countries | Regions | Airports | Municipalities |

### id by Continent Name



### id for Continent Name

Column values
- ● Increase ● Decrease

## Country Wise Airports With Types

id (Count)

Continent name

○ North America ● Europe ● South America ● AF ● Oceania ● Asia
● Antarctica

1    27,261



© Mapbox © OpenStreetMap

Tab 2

Continent name

AF
Antarctica
Asia
Europe
North America
Oceania
South America

type

| type |
| --- |
| balloonport |
| closed |
| heliport |
| large_airport |
| medium_airport |
| seaplane_base |
| small_airport |

## Continent wise No. of Airports

id (Count distinct)

47          32,991

Continent name

● South America   ● Oceania   ● Europe   ● Asia   ● AF   ● Antarctica
● North America

© Mapbox © OpenStreetMap

## id by type



## name and name hierarchy colored by Continent Name and sized by id

id (Count distinct)

Continent Name
● Africa  ● Antarctica  ● Asia  ● Europe  ● North America  ● Oceania  ● South America

### Tab 3

## municipality and Continent Name sized by id

id (Count distinct)



## id by Continent Name
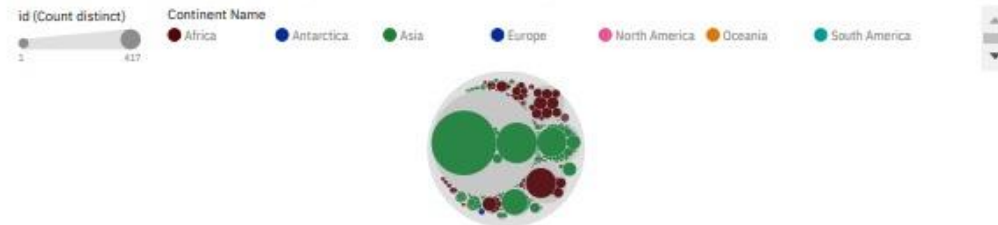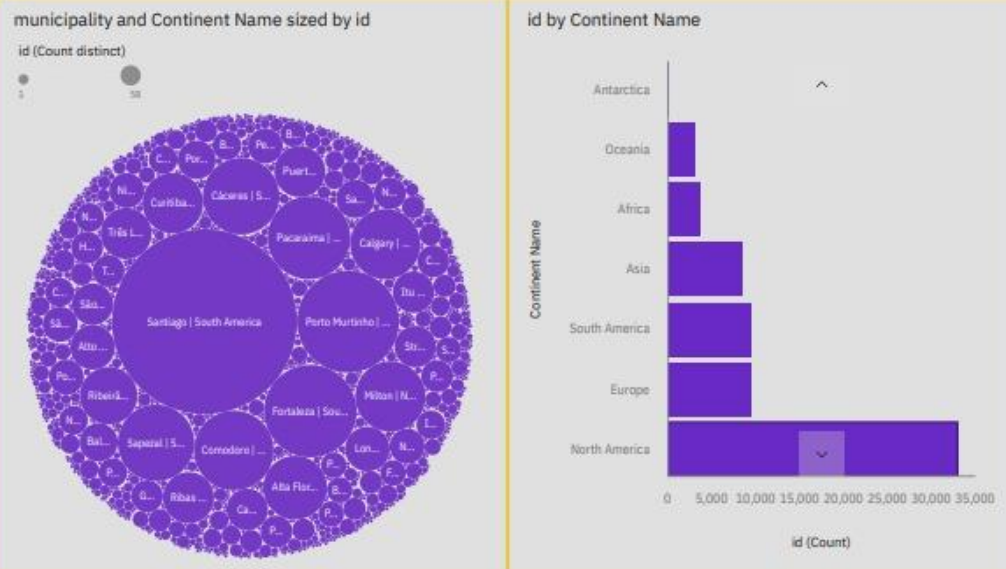
# 8. Testing

## 8.1 Test case

1. Verify that there is a portal to add new flights in the system.
2. Verify that on filling flight details like flight name, code, from and to destinations, capacity, timings, and frequency etc, new filghts get successfully added in the system.
3. Verify that users can search for flights by name, from-to airports or flight code for checking their status and timings.
4. Verify that search results have flight details, timings and availability.
5. Verify that clicking the search results open complete details for flight.
6. Verify that the user should see realtime flight status of availability of seats.
7. Verify that the user is presented with a graphical view of the airline's sitting arrangement along with seat number and availability status.
8. Verify that the pricing of different types of seats is displayed to the users.
9. Verify that users can successfully select single or more than one seat.
10. Verify that the user can not select or is not permitted to select seats that are already booked or not allowed for booking.
11. Verify that after selecting seats, entering passenger details and making payment the selected seats get booked.
12. Verify that on successful booking the ticket should be visible and downloadable.
13. Verify that after successful booking the seat's status is updated to booked.
14. Verify that the user also receives confirmation mail along with tickets on the emailIds provided while filling the details.
15. Verify the maximum limit of seats that a user can book, selecting more seats than permitted results in error message.
16. Verify that all the different types of payment methods work fine.
17. Verify that user is presented with additional options like- luggage, extra legroom, foods/beverages, etc and selecting the same results in additional cost with the booking amount.
18. Verify that the user can also cancel the tickets booked by entering the mandatory details and the amount after deducting the cancellation fee gets refunded back to user.
19. Verify that after cancellation the seat's status is updated to available.

8.2 User Acceptance Testing

User acceptance testing, a testing methodology where the clients/end users involved in testing the product to validate the product against their requirements. It is performed at client location at developer's site.

For industry such as medicine or aviation industry, contract and regulatory compliance testing and operational acceptance testing is also carried out as part of user acceptance testing.

UAT is context dependent and the UAT plans are prepared based on the requirements and NOT mandatory to execute all kinds of user acceptance tests and even coordinated and contributed by testing team.

This report shows the number of test cases that have passed, failed, and untested

| Section | Total Cases | Not Tested | Fail | Pass |
|---------|-------------|------------|------|------|
| Print Engine | 9 | 0 | 0 | |
| Client Application | 55 | 0 | 0 | 55 |
| Security | 3 | 0 | 0 | 3 |

| | | | | |
|---------|-------------|------------|------|------|
| Outsource Shipping | 6 | 0 | 0 | 6 |
| Exception Reporting | 9 | 1 | 0 | 10 |
| Final Report Output | 4 | 2 | 0 | 6 |
| Version Control | 2 | 1 | 1 | 4 |
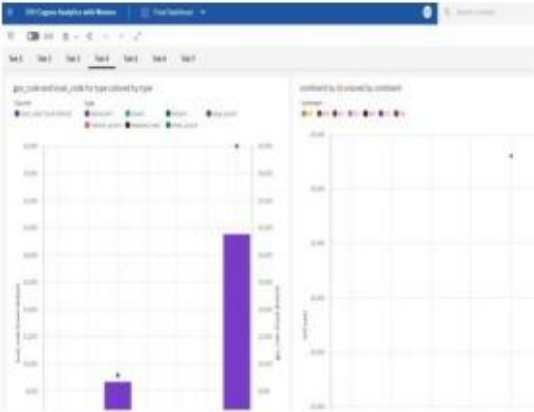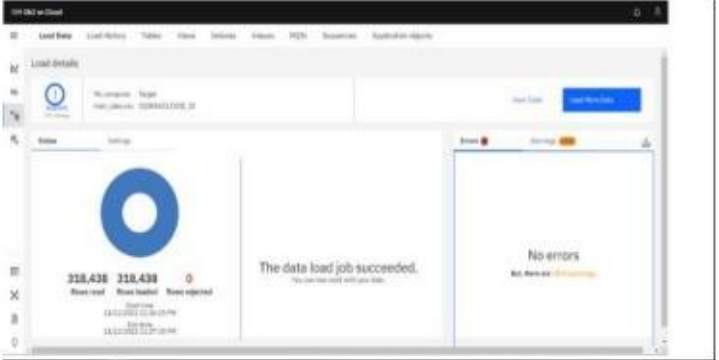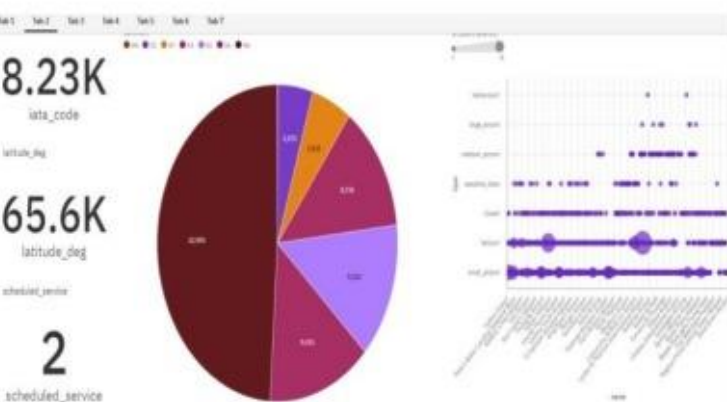
## 9. Result

9.1 Performance Metrics

**Model Performance Testing:**

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

| S.No. | Parameter | Screenshot / Values |
|---|---|---|
| 1. | Dashboard design | Number of Visulizations / Graphs – 22<br>Number of tabs – 8<br><br> |
| 2. | Data Responsiveness | Data's will dynamically changed and graph also changed.<br><br> |

| 3. | Amount Data to Rendered (DB2 Metrics) | Number of rows read – 318438 |
|---|---|---|
| | | Number of rows loaded –318438 |
| | | Number of rows rejected – 0 |
| | |  |
| 4. | Utilization of Data Filters | We created filters for Dashboards which is perfectly working. |
| | |  |
| 5. | Effective User Story | Number of Scene Added – 7 |
| | | Animations are perfectly displayed. |
| | | Images are perfectly rendered. |
| | |  |
| 6. | Descriptive Reports | Number of Visulizations / Graphs – 6 |
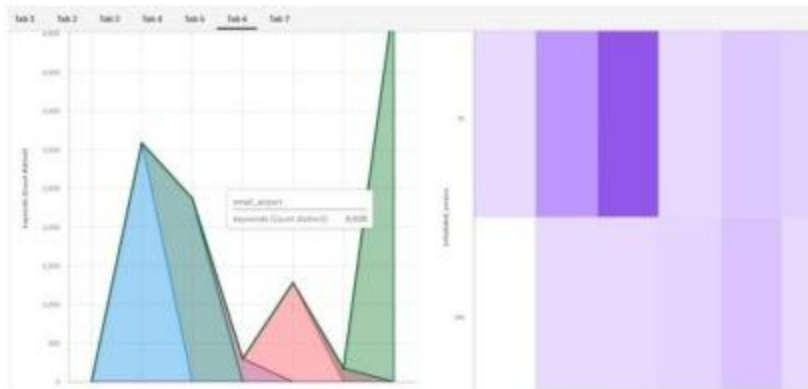
## 10. Advantages and Disadvantages

## Advantages

**Fast speed:** Air transport is capable of moving bulky cargo and hundreds of people very fast in any part of the world. Obviously, it is much faster than any mode of transportation like road transportation, rail transportation or water transportation.it is well used in nation emergencies due to its speed. In India, railways are majorly used by people for moving to any part of the country due to its economic service but nowadays people are moving towards airways for its fastest speed and people want to reach their destination as soon as possible .

**Rapid service:** Air transport is easy,  dependable and definitely the fastest way to transport passengers and goods. It offers rapid and convenient service at a low cost  . Air transport is the best way for the transport of ramble goods due to its fastest service.

**Low infrastructure:** Air transport travels totally on a natural path so it just requires very less investment for its maintenance. Apart from constructing airports from where air traffic is also controlled, there is no other infrastructure needed like making rail paths or several stations like in railways or in any other mode of transportation.

**No physical barriers:** As land routes have so many obstacles or barriers like divided regions need special permission every time which is not applicable while travelling by air.  There are no obstructions like mountains, rivers or any other

element which can affect its speed.it works on a direct route and hence it is faster than other modes of transport.

**Defence service:** Every country is very much reliant on airforce service. Nowadays wars are not only fought on land borders but the air force offers a much easy and fast way to reach the enemy and vanish their evil intentions without much loss. During natural calamities like earthquakes, floods etc. it plays a very vital role in saving the lives of people and providing them special service in bad times.

Disadvantages

**Costly service:** As compared to land transport, rail transport and water transport this is relatively more costly for its services. Passengers cannot travel frequently if they are not financially good. Although Air service offers not only costly business class seats it provides economical class also which is cheaper than business class but still, it is costlier than other modes of transport. It applies the same to cargo. Though it provides faster service than other modes which is great for trading air service goods are costly and need special permission.

**Limited capacity:** Air transport provides fast means of transportation but it has the drawback of the limited capacity of goods which is better in other modes. It is not good for bulky cargo and has limitations on the number of passengers travelling. Also, some kind of goods such as batteries, gases, fired solid and liquids etc.

**Accident-prone:** Compared to other modes air travel is always at high risk of accidents. There are more accidents on count while travelling by air transport. The reason can be bad weather, signal issues or machine parts failure which causes loss of people, crew or goods.

**Requires Skill:** There are trained people required to fly an aircraft and because of it air travel becomes a little costly due to limited crew.

**Unfit for cheap and bulky goods:** Since airways are costly due to numerous conditions, it becomes expensive to move cheap goods and also aircraft are small in size as compared to other modes so it's difficult to load bulky cargo.

**11. Conclusion**

The airline industry is cyclical and sensitive to a number of external economic factors that affect the number of domestic and international travelers, including consumer confidence and corporate profit. Improved economic conditions over the five years to2016 have increased demand for both business and consumer travel. The newer aircrafts are continuing to update to satisfy the request from consumers. There has been a tremendous surge in the percentage of people who are now traveling longer distances and becoming frequently flyers more than ever before. As far as changes in travel preferences millennial are found to be willing to spend more on business travel than other generations when it comes to business travel. Globally the aviation industry is consumers over 200million tons of jet fuel per year (IBIS World, 2016). There is an increasing demand for international flight and airport are beginning to grow and airports now have a system to comply with passengers with connecting flights, it is very important for airport to standardize their processes in order to minimize passenger confusion benefiting the foot traffic of airport and making the airlines more profitable