

PROJECT REPORT

Airlines Data Analytics for Aviation Industry

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I.INTRODUCTION

An Airport has huge amount of data related to number of flights, data and time of arrival and dispatch, flight routes, No. of airports operating in each country, list of active airlines in each country. The problem they faced till now it's, they have ability to analyze limited data from databases. The Proposed model intension is to develop a model for the airline data to provide platform for new analytics based on the following queries. Data analyst can be used to predict future glitches, prevent them from happening, and make the maintenance procedures more accurate and thorough. As a result, it is possible to lower costs related to maintaining an aircraft.

The airport codes may refer to either the IATA airport code, a three-letter code that is used in passenger reservation, ticketing and baggage handling systems, or the ICAO airport code which is a four-letter code used by ATC systems and for airports that do not have an IATA airport code. In this project based on the customer reviews and flight arrival timing and cost the best flight is determined.

PROJECT OVERVIEW

- The main aim is to provide better Airline and AirPort services and to avoid delays in Air Travel across different locations at Municipality level.
- It can be used to predict future glitches, prevent them from happening, and make the maintenance procedures more accurate and thorough.
- data analysis on flight dataset to draw inferences on arrival and departure delays and to identify relationships between flight timings and delays. Using the flight delay data, we identified which flight is mostly prone to delays. The arrived upon conclusions are useful for selecting flights in the future. from the review of the customer and the flight which covers the destination in correct time and in shortest time that airline flight will be selected as a best airline service.

PURPOSE:

- To provide better Airline and AirPort services and to avoid delays in Air Travel across different locations at Municipality level.
- The aim is to provide airports, airlines, and the travelling public with a neutral, third-party view of which airlines are delivering on their promise to get passengers from Point A to Point B on-time.

- Based on the third party review that is customer ,the best flight which covers the destination in short time will be decided.

2. LITERATURE SURVEY

TITLE : On the relevance of data science for flight delay research.

AUTHORS : Leonardo Carvalho, Alice Stenberg, Leandro maia goncalves,
Ana Beatriz cruz, Jorge A,soares.

YEAR : 2018.

DESCRIPTION :

Flight delays are a significant problem for society as they evenly impair airlines, transport companies, facility managers, and passengers. Studying prior flight data is an essential activity for every player involved in the air transportation system. Besides, developing accurate prediction models for flight delays is a crucial component of the decisionmaking process. Prescribing actions to solve on-going delays is an even challenging task due to the air transportation system complexity. In this regard, this paper presents a thorough literature review of data science techniques used for investigating flight delays. This work proposes a taxonomy and compiles the initiatives used to address the flight delay studies.

PROS:

- Accurately predicting these flight delays allows passengers to be well prepared for the deterrent caused to their journey .
- Enables airlines to respond to the potential causes of the flight delays in advance to diminish the negative impact.

CONS:

- Late due to weather predicting this is diificult.
- A few factors responsible for the flight delays like runway construction to excessive traffic are rare, but bad weather seems to be a common cause.

TITLE : Aviation management.

AUTHORS : Shi Qiang Liu, Andrea D'Ariano, Erhan Kozan, Mahmoud Masoud CARRS-Q, SaiHo Chung.

YEAR : 2019.

DESCRIPTION :

Aviation or air transportation refers to the activities surrounding mechanical flights in the airlines and the aircraft industries. In this paper, we present a recent literature survey on aviation management. The literature review is classified into the following main categories: Airline Capacity Analysis; Air Traffic Flow Management; Airline Fleet Assignment;

Tail Assignment with Aircraft Maintenance Routing; Airline Crew Pairing; Airline Recovery and Rescheduling; Airline Revenue Management; Collaborative Decision Making; Aircraft Scheduling. This classification aims to motivate the researchers and practitioners in aviation management to develop more applicable, realistic and wideranging optimization methodologies for meeting the current needs of aviation industry.

PROS:

- Advanced scheduling optimization tools for the better management of the available infrastructure and resources.
- Accurate timing information so that conflicts between aircraft are resolved.

CONS:

- Air traffic control operations and related issues are still scheduled by human controllers.
- Ignore any military/defence use of drones.

TITLE : Predictive Analytics Platform for Airline Industry.

AUTHORS : P. H. K Tissera, A.N.M.R.S.P. Ilwana, K.T. Waduge, M.A.I.

Perera, D.P. Nawinna, D. Kasthurirathna.

YEAR : 2020.

DESCRIPTION :

The research is to develop accurate demand forecasting model to control the availability in Airline industry. The primary outcome of the model is that the Airline organization can maximize the revenue by controlling the availability. The product in airline industry is the seat, which is an expensive, unstock able product. The demand for the seats is almost uncertain, the capacity is constraint and difficult to increase and the variable costs are very high. The revenue is derived by the number of passengers and the fares they pay which vary for each flight. Hence, it is challenging to develop an accurate method to project the revenue for each route.. We have the current ticketed revenue plus we have the current booked passengers. We also have the ticketed passenger details of previous flights. Hence most of the information is available, however changing market conditions is an unknown variable which can have a significant impact on passenger travel patterns.

PROS:

- Focus on the passenger demand forecasting, average fare forecasting, no show forecasting and visualizing the passenger demand and annual revenue prediction for od level point of sales.
- Reliability is improved.

CONS:

- With limitation of predictors because of sensitivity of the data and limited access to the data it may have impacted the models and the accuracy.

TITLE : Exploratory data anlysis on aviaton dataset.

AUTHORS : Saba Firdous; Haseeba Fathiya; Lipsa Sadath.

YEAR : 2021.

DESCRIPTION :

The usage of big data analytics is booming today, with its ability to be used to draw useful insights from past data research. Its uses in the aviation industry have a wide array of applications ranging from predicting flight delays to detecting faults in airplane parts. In this paper, we conducted exploratory data analysis on flight dataset to draw inferences on arrival and departure delays and to identify relationships between flight timings and delays. Using the flight delay data, we identified which flight is mostly prone to delays. The arrived upon conclusions are useful for selecting flights in the future.

PROS:

- Data collected from customer profiles, social behavior, etc. can be efficiently used by airlines to provide personalized services to customers.
- They can also be used to analyze passenger flow, cost reduction and to enhance revenue.

CONS:

- When the number of flight arrivals and departures is very high, there can be an disparity between the capacity of the flight to handle the demands and its capacity, leading to many delays.
- Bad weather such as floods, hurricanes could also be the cause

TITLE : Forecast and analysis of aircraft passenger satisfaction.

AUTHORS : Xuchu Jiang , Ying Zhang , Ying Li , Biao Zhang.

YEAR : 2022.

DESCRIPTION : Due to coronavirus epidemic in 2020, the civil aviation industry has encountered severe challenges. Predicting aircraft passenger satisfaction and excavating the main influencing factors can help airlines improve their services and gain advantages in difficult situations and competition. This paper

proposes a RF-RFE-Logistic feature selection model to extract the influencing factors of passenger satisfaction by recursive feature elimination based on random forest (RF-RFE). Second on different classification models, KNN, logistic regression prediction model with the best classification performance is selected. Finally, based on the RF-RFE feature, combined with the logistic model, the factors affecting customer satisfaction are further extracted. The experimental results show that the RF-RFE model selects a feature subset containing 17 variables. In the classification prediction model, the random forest after RF-RFE feature selection shows the best classification performance. Finally, combined with the four important variables extracted by RF-RFE and logistic regression, further discussion is carried out, and suggestions are given for airlines to improve passenger satisfaction.

PRONS:

- Found a positive relationship between customer satisfaction and a range of financial performance indicators by using the American Consumer Satisfaction Index.
- using flight data or text reviews to predict passenger satisfaction.

CONS:

- The evaluation indicators of passenger satisfaction surveys in the data set used in this study are not sufficient.
- Used the default parameters in the prediction model and did not consider the prediction results of different parameters.

2.2 REFERENCE

[1]. Leonardo Carvalho, Alice Stenberg, Leandro maia goncalves, Ana Beatriz cruz, Jorge A,soares, On the relevance of data science for flight delay research, 2018.

[2]. Shi Qiang Liu, Andrea D'Ariano, Erhan Kozan, Mahmoud Masoud
CARRS-Q, SaiHo Chung, Aviation management , 2019.

[3]. P. H. K Tissera, A.N.M.R.S.P. Ilwana, K.T. Waduge, M.A.I. Perera, D.P.

Nawinna, D. Kasthurirathna, Predictive Analytics Platform for Airline Industry , 2020.

[4]. Saba Firdous, Haseeba Fathiya, Lipsa Sadath, Exploratory data analysis on aviation dataset, 2021.

[5]. Xuchu Jiang , Ying Zhang , Ying Li , Biao Zhang, Forecast and analysis of aircraft passenger satisfaction, 2022.

2.3 PROBLEM STATEMENT DEFINITION

The airport codes may refer to either the IATA airport code, a three-letter code that is used in passenger reservation, ticketing and baggage handling systems, or the ICAO airport code which is a four-letter code used by ATC systems and for airports that do not have an IATA airport code. To provide better Airline and Airport services and to avoid delays in Air Travel across different locations at Municipality level. The aim is to provide airports, airlines, and the travelling public with a neutral, third party view of which airlines are delivering on their promise to get passengers from Point A to Point B on-time.

3. IDEATION & PROPOSED SOLUTION

Average aircraft delay is regularly referred to as an indication of airport capacity. Flight delay is a prevailing problem in this world. It's very tough to explain the reason for a delay. A few factors responsible for the flight delays like runway construction to excessive traffic are rare, but bad weather seems to be a common cause. Some flights are delayed because of the reactionary delays, due to the late arrival of the previous flight. It hurts airports, airlines, and affects a

company's marketing strategies as companies rely on customer loyalty to support their frequent flying programs

Nowadays, the aviation industry plays a crucial role in the world's transportation sector, and a lot of businesses rely on various airlines to connect them with other parts of the world. But, extreme weather conditions may directly affect the airline services by means of flight delays. 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. Data mining produces insights around the decisions for adding or subtracting the flights to the routes where more or lesser passenger movement is found. The purpose of this project is to look at the approaches used to build models for predicting flight delays that occur due to bad weather conditions. In this based on the customer review and other datas the delay of the flight is calculated then comparing with other flight the best flight with shortest time delay will be delivered.

3.1 EMPATHY MAP CANVAS

An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.



3.2 BRAIN STORM:

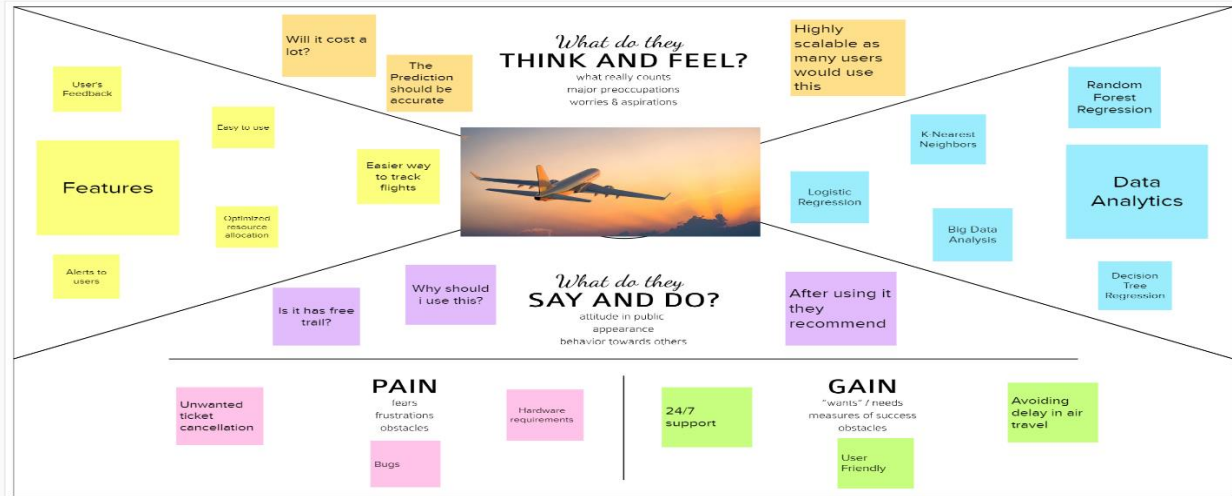
A mind map is a diagram used to visually organize information into a hierarchy, showing relationships among pieces of the whole. It is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those major ideas.

Empathy Map Canvas

Gain insight and understanding on solving customer problems.

1

Build empathy and keep your focus on the user by putting yourself in their shoes.



3.3 PROPOSED SOLUTION

| S.no | Parameter | Description |
|------|-----------|-------------|
|------|-----------|-------------|

| | | |
|----|---|---|
| 1. | Problem Statement(problem to be solved) | The airport codes may refer to either the IATA airport code, a threeletter code that is used in passenger reservation, ticketing and baggagehandling systems, or the ICAO airport code which is a four-letter code used by ATC systems and for airports that do not have an IATA airport code. |
| 2. | Idea/Solution Description | Machine learning and analytics have touched almost all the fields around the globe including the aviation industry. With the growth of data, the use of analytics in the airline industry is the next big wave. The purpose of data analytics in aviation is to examine the vast amount of data generated daily and provide useful information to airlines, |

| | | |
|----|--------------------|---|
| | | <p>airports and other aviation stakeholders so that they can improve their operational planning and execution, as well as any related products and services. Airlines use AI systems with built-in machine learning algorithms to collect and analyze flight data regarding each route distance and altitudes, aircraft type and weight, weather, etc. Based on findings from data, systems estimate the optimal amount of fuel needed for a flight</p> |
| 3. | Novelty/Uniqueness | <p>1.Cost ReductionAirlines are very concerned about baggage handling metrics like lost-bag tally, SLAs. They rely on real-time baggage tracking data to avoid losing damaging or delaying</p> |

| | | |
|--|--|---|
| | | <p>bags and face compliance issues. 2.Fuel Management-</p> <p>Airlines track real-time fuel consumption data on Dashboards from take-off to landing. This monitoring is crucial to be ultraefficient in reducing fuel costs and airline emissions.</p> <p>3.Revenue Maximization-Airlines segment customers, target with personalized offers, optimize pricing in realtime using predictive analytics techniques such as modelling and forecasting.</p> |
|--|--|---|

| | | |
|----|-------------------------------------|---|
| 4. | Social Impact/Customer Satisfaction | <p>Trajectory Optimization</p> <ul style="list-style-type: none"> • Predictive Maintenance • Delay Estimation • Targeted Advertising • Crew Performance Assessment • Sentiment Analysis • Prediction of Customer Behaviour. |
|----|-------------------------------------|---|

| | | |
|----|-------------------------------|---|
| 5. | Business Model(Revenue Model) | <p>The 4 Most Important Business Models for Airlines</p> <ol style="list-style-type: none"> 1. Full-Service Carriers. Full-service carriers are airlines that operate with a business model that includes offering a range of preflight and onboard services with the price of the ticket. 2. Low-Cost Carriers 3. Charter Airlines. 4. Cargo Airlines. |
|----|-------------------------------|---|

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|----|-----------------------------|--|
| 6. | Scalability of the solution | Data analytics has revolved around every industry, including aviation. Technology has changed how business is conducted and helps to make better decisions. As a result, data analytics plays a vital role in the aviation industry. It assists in collecting data and planning a powerful strategy that helps to grow business overall. According to a report, after adopting |
|----|-----------------------------|--|

| | | |
|--|--|---|
| | | <p>Big Data and Data Analytics in the airline industry, the sector has witnessed 57% more growth. From maintaining flights to unplanned maintenance,</p> <p>Data Analytics in the airline industry unfolds everything. Big Data tailors the flight experience better and uses data to improve performance. There are plenty of advantages, but most of all, it's how Data Analytics transforms the airline industry. It gains insights and enhances operations to make it successful. According to a report, Data Analytics in the airline industry is expected to reach \$7 million by 2023.</p> |
|--|--|---|

3.4 PROBLEM SOLUTION FIT

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.

| | | | | |
|-------------------------|--|--|---|---------------------------|
| Define CS, fit into CC | 1. CUSTOMER SEGMENT(S) CS <ul style="list-style-type: none"> ✓ The customer segmentation based only on dividing the passengers by the purpose of the trip. ✓ Airlines will segment their customers by class of seating, such as economy class, business class and first class. | 6. CUSTOMER CONSTRAINTS CC <ul style="list-style-type: none"> ✓ Instead of smoking onboard, luxurious service, and premium class flights, low-cost travel is king now. ✓ Artificial intelligence will come into play in the way to distribute products and the way to service customers. | 5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none"> ✓ Instead of giving indirect taxes they may give tax with low amount. ✓ The operator shall provide operations staff and flight crew with an aircraft operating manual for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. | Explore AS, differentiate |
| | 2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none"> ✓ The cumulative impact of direct and indirect taxes in aviation is one of the big problem for customers. ✓ Not available airline and airplane safety, emergency exit seating. ✓ Customers with itinerary changes, flight reservations and questions about customer loyalty programs should be done. | 9. PROBLEM ROOT CAUSE RC <ul style="list-style-type: none"> ✓ Customer should know about how to reserve tickets and norms and regulation before entering into it, because regulation will periodically. ✓ Revenue from airport taxes is used for facility maintenance so customers has to pay the taxes. | 7. BEHAVIOUR BE <ul style="list-style-type: none"> ✓ Push and pull factors have a positive and significant effect on switching behavior from both segments low-cost carrier and full-service carrier segment. ✓ Applied technology of behavior change based on these laws and principles. | |
| Identify strong TR & EM | 3. TRIGGERS TR <ul style="list-style-type: none"> ✓ Airlines have trouble-shooters at the airports, usually called Customer Service Representatives, who can take care of many problems on the spot. If they are failed to do that there will be problem. | 10. YOUR SOLUTION SL <ul style="list-style-type: none"> ✓ The study of the processes involved when individuals or groups select, purchase, use, or dispose products, services, ideas, or experiences to satisfy needs and desires ✓ Airlines are stepping up their game with technology and are trying not just to meet customer expectations but exceed them. | 8. CHANNELS of BEHAVIOUR CH <ul style="list-style-type: none"> ✓ Allows customers to easily search in online for flights to and from their chosen destination and will compare prices from different ✓ Offline agency distribution remains an important channel for network airlines, and has been gaining popularity with low cost airlines too | Identify strong TR & EM |
| | 4. EMOTIONS: BEFORE / AFTER EM <ul style="list-style-type: none"> ✓ Before that customer will complaint to customer services in airline industry. ✓ If the customer service of airline industry did not take correct action they have the rights to complaint a file. | | | |

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Functional requirements may involve calculations, technical details, data manipulation and processing, and other specific functionality that define what a system is supposed to accomplish.

Following are the functional requirements of the proposed solution.

| FR No | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|-------|-------------------------------|--|
| FR-1 | User Registration | Registration through Gmail. |
| FR-2 | User Confirmation | Confirmation via Email |
| FR-3 | Search for flights | The registered user can search one way,round trip and multiple destination flights by choosing specific dates and destination. |
| FR-4 | Specify passenger | Customer select the number of passengers and their category either adults,infant or child. |
| FR-5 | Sorting flight | Customer will sort the flight either by price or duration of the flight and will register. |
| FR-6 | Better airline service | Provide better airline service by analysing time consuming,comfort of passenger. |

4.2 NON-FUNCTIONAL REQUIREMENT

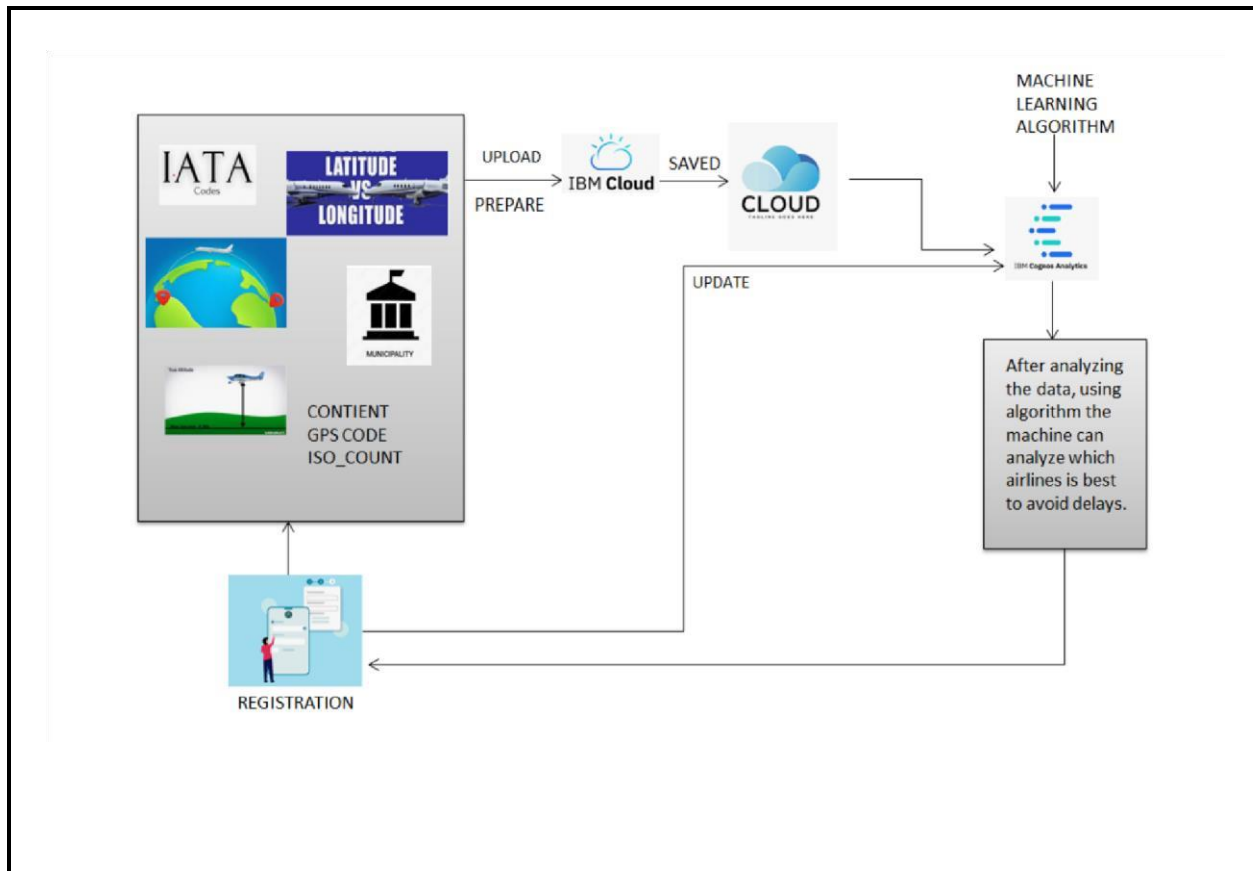
Following are the non-functional requirements of the proposed solution.

| FR No | Non-Functional Requirement | Description |
|-------|----------------------------|---|
| NFR-1 | Usability | It defines how difficult it will be for a user to learn and operate the system and it can be assessed from different points of view. |
| NFR-2 | Security | Software is protected from unauthorized access to the system and its stored data. There will be more security to the passenger. |
| NFR-3 | Reliability | To ensure that the aircraft maintenance program tasks are effective and their periodicity is adequate. |
| NFR-4 | Performance | Revenue is often looked at on a passenger revenue per available seat mile basis. |
| NFR-5 | Availability | Where all required maintenance is accomplished and the aircraft is airworthy, as defined by the regulations and is considered available for flight. |
| NFR-6 | Scalability | The capability of a system, network, or process to handle a growing amount of work. |

5.PROJECT DESIGN

5.1 Data Flow Diagrams

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



5.2 SOLUTION AND TECHNICAL ARCHITECTURE

Technical Architecture (TA) is a form of IT architecture that is used to design computer systems. It involves the development of a technical blueprint with regard to the arrangement, interaction, and interdependence of all elements so that system-relevant requirements are met.

The Deliverable shall include the architectural diagram as below and the information as per the Table1 & Table2.

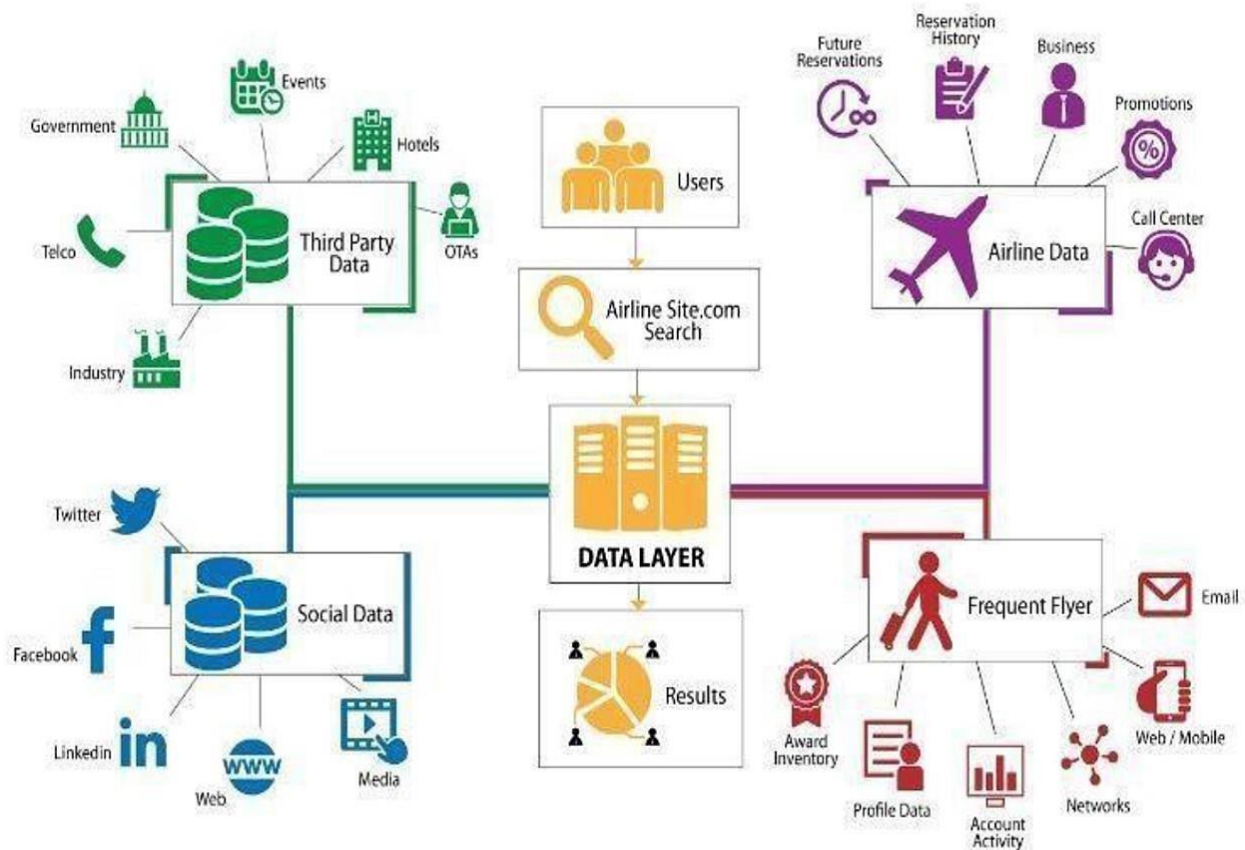


Table-1: Components & Technologies:

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

| | | | |
|----|-------------------------------|---|--|
| 3. | Application Logic-2 | Logic for a process in the application | IBM Watson Assistant |
| 4. | Database | Data Type, Configurations | MySQL, NSQL |
| 5. | Cloud Database | Database service on cloud | IBM DB2, IBM Cloudant |
| 6. | File Storage | File Storage requirements | IBM Blocks Storage or other storage service or Local File system |
| 7. | External API-1 | Purpose of External API used in the application | IBM Weather API |
| 8. | External API-1 | Purpose of External API used in the application | Aadhar API |
| 9. | Infrastructure (Server/Cloud) | Application Deployment on Local System/Cloud Local Server Configuration: Cloud Server Configuration | Local, Cloud Foundry |

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. | Example: SHA256, Encryption, IAM Controls, OWASP. |
| 3. | Scalable Architecture | Justify the scalability of architecture. | Cognos Used. |
| 4. | Availability | Justify the availability of application (e.g: use of load balancers, distributed servers). | AWS Used. |
| 5. | Availability | Design consideration for the performance of the application (number of requests per second, use of Cache, use of CDN's). | Dashboard, Reports, Stories. |

5.3 USER STORIES

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|-----------|-------------------------------|-------------------|-------------------|---------------------|----------|---------|
|-----------|-------------------------------|-------------------|-------------------|---------------------|----------|---------|

| | | | | | | |
|----------------------------|------------------|-------|---|--|--------|----------|
| Custom er (Webuse r) | Registrat ion | 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 /dashbo ard | High | Sprint-1 |
| | | USN-2 | As a user, I will receive confirmati on emailonce I have registered for the application | I can receive confirma tionema il & click confirm | High | Sprint-1 |
| | | USN-3 | As a user, I can register for the | | Medium | Sprint-1 |

| | | | | | | |
|--|--|--|-------------------------------|--|--|--|
| | | | applicationt hrough Gmail. | | | |
|--|--|--|-------------------------------|--|--|--|

| | | | | | | |
|---------------------------------|------------------|-------|---|--|------|----------|
| | Login | USN-4 | As a user, I can log into the application by entering email & password. | I can get to access myweb portal | High | Sprint-1 |
| | Dashboa rd | USN-5 | As a user, I can get to know what mydashboa rd consists of. | I can my details of myregist ration. | Low | Sprint-2 |
| Custom er Care Executi ve | Organiza tion | USN-6 | The organizati on which owns this airplaneana lysis system will enable the option to customers to reach out the organizati on if , they have any | The custom er care workers will help out thecusto mers in trouble. | High | Sprint-1 |

| | | | | | | |
|---------------|----------------|---------|---|---|------|----------|
| | | | problem with the organization's system of customer interaction or ,airplane issues- delay, landing in a different location | | | |
| Administrator | Administration | USN - 7 | The organization takes in - charge of the administrative policies of different departments like registration , flight booking , delay visualization, generation of delay report | As an administrator, confirmation of user while registration is done. | High | Sprint-1 |

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Product Backlog, Sprint Schedule, and Estimation

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|----------|---|-------------------|--|--------------|----------|-----------------------------|
| Sprint-1 | Retrieve the Data | USN-1 | Retrieving the data from the passengers those who are traveling in flight and the data of flight | 2 | High | Sanjay Kumar Shyam Kumar |
| Sprint-1 | Visualize the data | USN-2 | After retrieving the data, we have to visualize the data for better understanding | 1 | High | Mohamed Ijas Arun Kumar |
| Sprint-2 | Track the flight timing and airline names | USN-3 | Tracking the delays which are made by the flights and in other situations | 2 | High | Shyam Kumar |

| | | | | | | |
|----------|--------------------------|-------|---|---|------|--------------|
| Sprint-2 | Create interactive graph | USN-4 | At each scenario, we have to create a graph for better visualization | 2 | High | Sanjay Kumar |
| Sprint-3 | Create dashboard | USN-5 | Creating interactive dashboard with the given dataset and information | 1 | High | Arun Kumar |
| Sprint-3 | Creation of story | USN-6 | Creating the story for each respective phase | | High | Mohamed Ijas |
| Sprint-4 | Predict the delays | USN-7 | Finally, this project delivers the airlines which made most of the delays in airport and flight | 1 | High | Sanjay Kumar |

Project Tracker, Velocity & Burndown Chart:

| 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 | 20 | 29 Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 20 | 05 Nov 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 20 | 12 Nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 20 | 19 Nov 2022 |

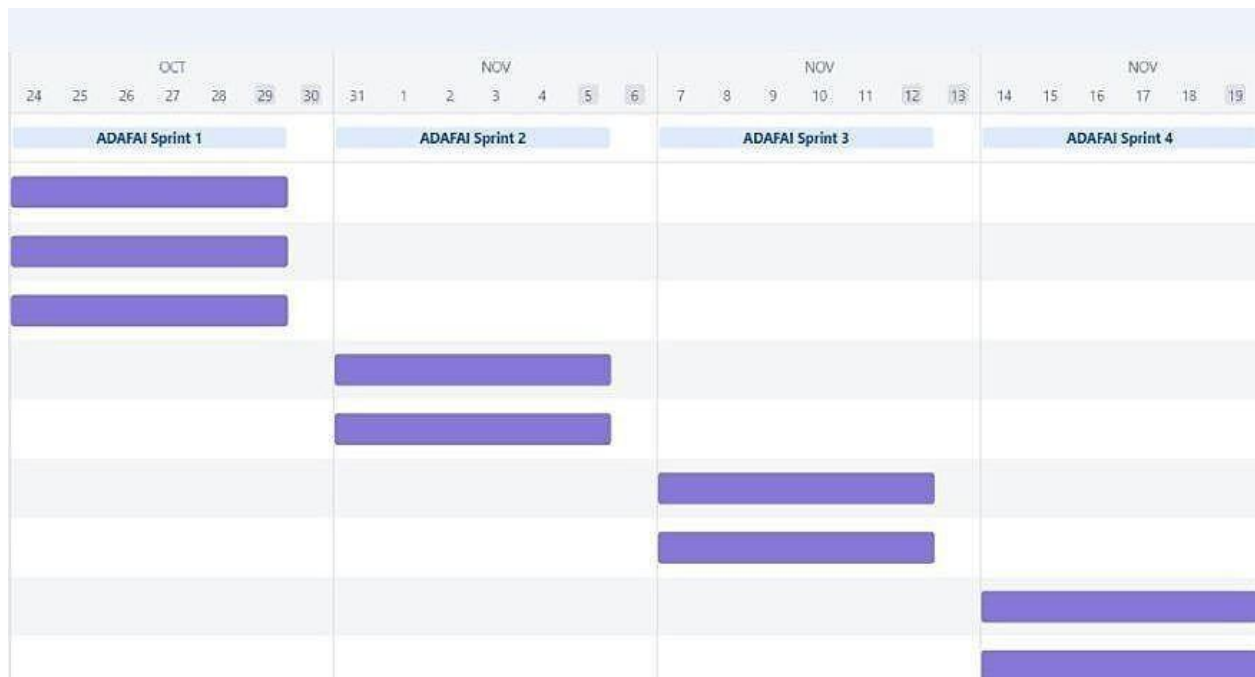
6.2 SPRINT DELIVERY SCHEDULE

MILESTONE&TASKS

| Milestone | Task | Duration |
|------------------|--|------------------|
| Milestone-1 | Collection of Datas | October-24/10/22 |
| Milestone-2 | Uploading the required datas on the platform | October-27/10/22 |
| Milestone-3 | Visualizing of data | October-30/10/22 |

| | | |
|-------------|--|-------------------|
| Milestone-4 | Creating a dashboard | November-2/11/22 |
| Milestone-5 | Display the datas in the dashboard | November-5/11/22 |
| Milestone-6 | Prepare a standardized data set and using the datas required with the help of python program | November-8/11/22 |
| Milestone-7 | Usage of various algorithm to obtain the desired result | November-11/11/22 |
| Milestone-8 | Display them in the required format | November-15/11/22 |
| Milestone-9 | Deployed in the github | November-19/11/22 |

6.3 REPORTS FROM JIRA



7.RESULTS

PERFORMANCE METRICES

There are various metrics to calculate the efficiency of the data models itself. Performance of a data model developed by data scientists is a direct way to measure their efficiency. Methods include confusion matrix, F1 score, PrecisionRecall Curve, Receiver Operating Characteristics, among others. The idea is to see if the performance is better than the baseline models. It is important to consider that a model takes time to improve and that models are not foolproof.

In this project with the help of the data analytics the flight which covers the destination in short time when comparing to the another flight is calculated easily with more accuracy.The accuracy rate is more high by using a data analytics.

8.ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

- The advantages include being able to fly to almost any destination in the world and having a variety of different aircraft for different purposes, and cut down on travel time.
- High Speed - It makes this model an optimum choice if the client has an urgent need to ship a product . It is the quickest transport mode and is therefore ideal for long-distance transport of goods.
- There is less need for heavy packaging - Air exports, in general, entail less hard packaging than ocean shipments. This ensures you save both time and money by not having to provide extra packaging services.
- Fast Service - Air transportation offers convenient, reliable and fast services of transport. It is considered the cheapest way to ship peregrinated goods. It offers a standard, convenient, reliable and fast service.
- Natural Route - An aircraft can fly to any location without seeing any natural obstacles or barriers. Since customs formalities are easily compiled. It eliminates the need for more time to seek clearance. Air travel is used for relief operations during earthquakes, floods, accidents, and famines.

DISADVANTAGE:

- Risky - Air travel is the riskiest mode of transport, since there can be considerable losses to goods, customer and crews as a result of a minor crash. Compared to other means of travel, the risks of collisions are higher.
- Cost - Air travel is considered to be the most expensive means of transportation. The cost of maintaining aircraft is higher and the costs for the building of aerodromes and avions are much higher. That's why air travel is so expensive that it gets beyond ordinary people's grasp.

- Capacity for Small Carriage - The aircraft have no room and therefore are not ideal for carriage of voluminous and cheaper materials. As is seen for rails, the load volume cannot be raised.
- 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.

9. CONCLUSION

Customer experience is always at the top of the priority list for airlines. Customers that are dissatisfied or disengaged inevitably result in fewer passengers and less money. It is critical that clients have a positive experience every time they travel. Looking at the bright prospects of the aviation industry, it makes sense to invest in airline stocks as they are likely to benefit from the government's push to make the aviation industry a bulwark of the transportation industry in India.

From this project we conclude that ,The usage of big data analytics is booming today, with its ability to be used to draw useful insights from past data research. Its uses in the aviation industry have a wide array of applications ranging from predicting flight delays to detecting faults in airplane parts. In this paper, we conducted exploratory data analysis on flight dataset to draw inferences on arrival and departure delays and to identify relationships between flight timings and delays. Using the flight delay data, we identified which flight is mostly prone to delays. The arrived upon conclusions are useful for selecting flights in the future. from the review of the customer and the flight which covers the destination in correct time and in shortest time that airline flight will be selected as a best airline service.

10. FUTURE SCOPE

With the growth of data, the use of analytics in the airline industry is the next big wave. 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.

In future this project has been developed with some extra features. The customer can give query for any dissatisfaction that query will be solved review of the customer will be collected. Then if a customer want to change the destination in a midway they can give one alert message to the service and that nearby destination will be given for the customer.

11.APPENDIX

GITHUB LINK:

<https://github.com/IBM-EPBL/IBM-Project-22865-1659859694>

PROJECT DEMO LINK:

https://drive.google.com/file/d/1w-EMK6fdzMW2IeKGWgnBDd7UOACHSg5o/view?usp=share_link