Airlines Data Analytics for Aviation Industry

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Problem Statement:

To build a user interface application to analyze the delays so airports organization can adjust and allocate the resources(airports) nearby quickly.

Abstract:

Flight delays in air transportation are a major concern that has adverse effects on the economy, the passengers, and the aviation industry. This matter critically requires an accurate estimation for future flight delays that can be implemented to improve airport operations and customer satisfaction. Thus, we propose an interactive dashboard in which user can register his/her details to book the airplane tickets and predict the delays, if occurs.

Literature survey :

1. Life Data Analysis with Applications for the Airline Industry

(Julio Pulido, NortekDana Moore, William Hill -2020)

- In this study **, Julio Pulido, NortekDana Moore, William Hill** proposed the analysis of non-repairable systems.
- The three techniques, namely the time to failure, stress-strength or condition-based approach, is generally adopted.
- The mixed Weibull distribution (also known as a multimodal Weibull) is used to model data that do not fall on a straight line on a Weibull probability plot.
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2. Exploratory Data Analysis on Aviation Dataset

(Saba Firdous, Haseeba Fathiya, Lipsa Sadath -2021)

- In this work , **Saba Firdous, Haseeba Fathiya, Lipsa Sadath** performed Aviation informational collection and performed analytics.
- The first step was to organize all the events into categories depending on their risk level.
- The next step was to use an SVM to learn the relationships between the events.
- The third step was to combine the results from both the models to improve the accuracy of the predictions made.

3. Applying Machine Learning to Aviation Big Data for Flight Delay Predictio

(Yushan Jiang,Yushan Jiang -2020) :

- In this study**, Yushan Jiang,Yushan Jiang** developed several machine learning models to predict flight arrival delays.
- Firstly data pre-processing is needed including the data merging and cleansing.
- Next, data visualization can be performed to extract and visualize the graphic representation of data clearly and efficiently.
- Lastly, prediction models are built and trained using different machine learning methods, then evaluated.

4.Transportation Research Part E IN AVIATION

(Xu et al- 2020) :

- In this work ,**Xu et al** proposed a hybrid model to forecast statistical indicators in the aviation industry, which employs the seasonal autoregressive integrated moving average (SARIMA) and support vector regression (SVR) methods.
- SARIMA is employed to analyze the raw time series. Gaussian White Noise is then used for calculation according to the SARIMA's results.

5.Towards a maturity model for big data analytics in airline network planning

(Iris Hausladen, Maximilian Schosser -2020)

- In this study, **Iris Hausladen, Maximilian Schosser** address this challenge by developing a maturity model for big data readiness for airline network planning.

The transfer steps have been combined with the model evaluation. In the second stage, the maturity levels are conceptualized and formulated, before the complete model is evaluated by the practitioner group.

References :

1. Iris Hausladen, Maximilian **Schosser " Towards a maturity model for big data analytics in airline network planning",** ELSEVIER-Journal of Air Transport Management,Volume 82,(2020).
2. Julio Pulido, NortekDana Moore, William Hill **"Life Data Analysis with Applications for the Airline Industry "**, IEEE XPLORE- **Published in:** 2016 Annual Reliability and Maintainability Symposium (RAMS)
3. Saba Firdous, Haseeba Fathiya, Lipsa Sadath **"Exploratory Data Analysis on Aviation Dataset "**,IEEE XPLORE,Conferences-2021
4. Yushan Jiang,Yushan Jiang **"Applying Machine Learning to Aviation Big Data for Flight Delay Prediction"** IEEE XPLORE, Conferences -2021
5. Xu et al **"Transportation Research Part E IN AVIATION"**, SCIENCE DIRECT Journals and books ,Volume 167,(2022).