**DEVELOPING A FLIGHT DELAY PREDICTION MODEL BY USING MACHINE LEARNING**

**TEAM LEADER:** K. TAMARAISELVI

**TEAM MEMBERS:** T. PAVITHIRAVALAVAN

S. SANDEEP

M.R. VYSHNAV

**INTRODUCTION**

One of the key business issues that airlines face is that the vital prices that are related to flights being delayed because of natural occurrences and operational shortcomings that is an upscale affair for the airlines, making issues in scheduling and operations for the end users therefore inflicting unhealthy name and client discontent. As we all know that we have a tendency to not get the flight delay before departure as customers of the Airline Company neither the airline company’s ground staff gets the airline delay prediction supported varied conditions. However, we all know that one in all the most reasons for delay in flights is that the weather. This motivates us to use the live weather knowledge in conjunction with different metrics to calculate the delay on the wing before departure. Indian state of affairs, in 2017, in line with the reports by the directorate General of Civil Aviation (DGCA), between January and April, close to 5.12 hundred thousand domestic passengers in India faced issues because of airline corporations denying boarding, moreover as flight cancellations and delays. Airline corporations had to pay the passengers compensations of over Rs. twentyfive crore for varied inconveniences throughout the first four months of this year. Hence, the prediction analysis retrieved from this project can contribute within the form of a prototype in helping to identify operational variables that contribute to delays in any country scenario. The main issues associated with flight delay prediction are known and arranged in taxonomy. It includes the problem that causes the flight delay, the range of institution it affects, and ways that of handling flight delay prediction downside. It considers flight domain options, like problem and scope. Major problem which causes delay in flights can be delay propagation, delay caused on the departure point or the root of the flight, and cancellation of flights. These problems cannot be eliminated forever, but a delay prediction tool will allow the operator and the administrators to take the concerned actions for smooth operation. This problem that is causes delay affects Airline, Airport and the enroute airspace which are independent entities which works in synchronization and hence delay in flight causes issues in all the sectors.

**LITERATURE SURVEY**

Considering the standard taxonomy of the flight delay and its problems, one will contemplate the scope of prediction to be one in every of these factors or combination of those factors. The models developed during this system may be applied to predict the incidence of flight delay at airports. Such prognosticative capabilities would facilitate traffic managers and airline dispatchers to organize mitigation methods for reducing traffic disruptions. This issue can be reduced by developing the flight delay prediction tool which can be developed using following methods.

**STATISTICAL ANALYSIS**

Statistical model requires the use of correlation analysis, parametric and non parametric tests, multivariate analysis and econometric models. Government agencies have invested in these econometric models to understand the relationship between delay and Passenger demand, fare, size of aircraft etc

**PROBABILISTIC MODELS**

Probabilistic model requires analysis tools that estimates the probability of an event based on the historic data. The estimated outcome is given in form of a distribution function of the probability. The factor of randomness always makes an impact on the decision or the outcome produced by the probabilistic model.

**MACHINE LEARNING**

Supervised Machine learning could be a task where the dataset input and also the output are recognized, then many algorithms are used to analyze this data to map new examples. Here in this case is that the prediction of delay in flight. Supervised Learning problems can be further categorized into following problems

**CLASSIFICATION**

It is a type problem in which the output variable is an entire category itself, such as “Win” or “Lose”, the entire input data is classified into the category variables; it is generally used largely for recommendation problems

**REGRESSION**

It is a type of problem is which the output variable is a real value, such as few raw data values related to something.

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