**DEVELOPING A FLIGHT DELAY PREDICTION MODEL**

**USING MACHINE LEARNING**

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**INTRODUCTION:**

Passenger airlines, cargo airlines, and air traffic control systems are the main elements of any transportation system in the modern world. Nations all around the world have attempted to develop different methods over time to enhance the aeroplane transportation system. This has significantly altered how airlines operate. Modern travelers may experience inconvenience from flight delays. Around 20% of airline flights are cancelled or delayed annually, costing passengers more than $20 billion in lost time and money

The number of planes that don't take off on time likewise rises as more people prefer to travel by air. This expansion makes airports even more crowded and harms the airline industry's bottom line. The inefficiency of the aviation system is demonstrated by delays in air transportation. Both the airline firms and their customers pay a hefty price for it. The Total Delay Impact Study estimated, The entire cost of delays in air travel to passengers and the airline sector in the US in 2007 was $32.9 billion, which resulted in a $4 billion drop in GDP . Predicting delays can therefore enhance airline operations and passenger pleasure, which will have a positive effect on the economy.

The major objective of this study is to assess how well machine learning classification methods perform when forecasting flight delays. John F. indira gandhi International Airport in delhi served as the study's airport. Analysis was done on flight data departing from Delhi Airport during a one-year period. The study used a number of algorithms, and its predictions were assessed using a variety of metrics. provides an explanation of the theoretical underpinnings of several machine learning models and performance evaluation techniques. discusses relevant works by earlier researchers. Different models' empirical processes and outcomes are displayed and compared in presentthe results of the comparative analysis and suggests future research areas.

**OBJECTIVE**

* To improve airline operations and passenger satisfaction, which will result in a positive impact on the economy.
* To compare the performance of machine learning classification algorithms when predicting flight delays.
* To Develop a business model to predict flight delays

**LITERATURE SURVEY:**

Academic piece for employing machine learning to create a model to forecast flight delays.

in flight The performance of each approach may vary significantly because the data set chosen for this paper has an uneven distribution. By use weighted evaluation methods, this issue was resolved in this work. In future investigations, this imbalance can be better resolved and the prediction can be enhanced by adopting methods like SMOTE. The outcome of the algorithm comparison demonstrates that tree-based ensemble algorithms often have a stronger tendency to anticipate flight delays in this data set. To learn their significance delay prediction, it will be beneficial to conduct similar experimental processes utilising moreThe outcome of comparing algorithms reveals that ensemble algorithms based on trees typically perform better in forecasting flight delays for this data set. Repeating similar experimental methods with more tree-based ensemble algorithms will be beneficial to understand their importance in flight delay prediction.

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