**Capstone Project 1 Proposal**

**Introduction**

The objective of this project is to identify and analyze challenges related to improving the reliability and performance of air transportation service. A reliable and efficient air transportation system provides substantial benefits to society by connecting people all around the world.

**Problem**

The fundamental problem that underlies the often poor reliability and substantial attendant costs of contemporary air transportation systems in the existing relationship between airport capacity and demand at commercial airports. Airport capacity will be considered a number of flights an airport offers to the passengers in a specific time range. At the busiest airports, scheduled demand, even in good weather during some hours of the day, may exceed airport runway capacity and causes unexpected delays. Approaches to managing capacity and demand can be categorized on the basis of time scale relative to flight operations.

**Data**

The flight delay and cancellation data were collected and published by the DOT's Bureau of Transportation Statistics. Summary information on the number of on-time, delayed, canceled, and diverted flights are published in DOT's monthly Air Travel Consumer Report and in this dataset of 2015 flight delays and cancellations. Dataset is an open source and publicly available for use at the link below.

Kaggle

<https://www.kaggle.com/usdot/flight-delays#flights.csv>

The weather data was collected from the website below by using the latitude and longitude of the 10 busiest airports in the USA.

<https://darksky.net/dev/docs#time-machine-request>

**Solution**

This project seeks a solution to the area of managing air transportation demand which is a challenge faced by airline companies and airports. Transportation demanding constraints and the resulting congestion and low schedule reliability currently impose large costs on airlines and their passengers.

This project outlines the solutions for better management of demand and availability of the airports. It then describes strategic initiatives and developments like poor weather or schedule disruptions as exogenous variables.

**Deliverables**

According to flights that have occurred during the year of 2015 in the United States. Determining the optimal control of capacity of flights of an airport will be presented by PyCharm, Jupyter files as deliverables.

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Schedule design and performance is a complex dynamic. In order to improve day-to-day consistency between planned schedules and actual performance, researches have, in recent years, expanded fight schedule optimization models to consider the costs of recovery associated with different flight schedules.