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DSC640 T301 Data Presentation & Visualization

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## Project Task 2 – Executive Summary

### A. Introduction

Due to recent unfortunate airline crashes and negative media buzz, the passenger is in state of panic. As a representative of the Singapore Airline, it is our top priority that we ensure safe travel for passenger and as well as for crew members. Also Investigate it properly to understand the reason behind the fatalities and accidents that happened in past also to make sure to introduce any safety measure to improve the performance and reduce the fatalities in Airline travel.

Airline Safety analysis is performed using Aviation Safety Network database along with airplane crashes and Airline Revenue data from Kaggle.

Using the visualization, we gathered the valuable insights for Senior Leaders. This information can help them to represent the facts to shareholders and important decisions can be taken to improve the airline safety and reduce the future risks for betterment of the organization and can guarantee safer air travel to passenger.

### B. Visualizations

I used line, bar, and stacked bar charts to show the total number of fatalities based on many factors. These charts are suitable to show total number by category.

Again, I prefer to use orange color to represent the total number of fatalities in multiple visualization to represent the caution or area in process of improvement, blue color is also used as it symbolizes reliability.

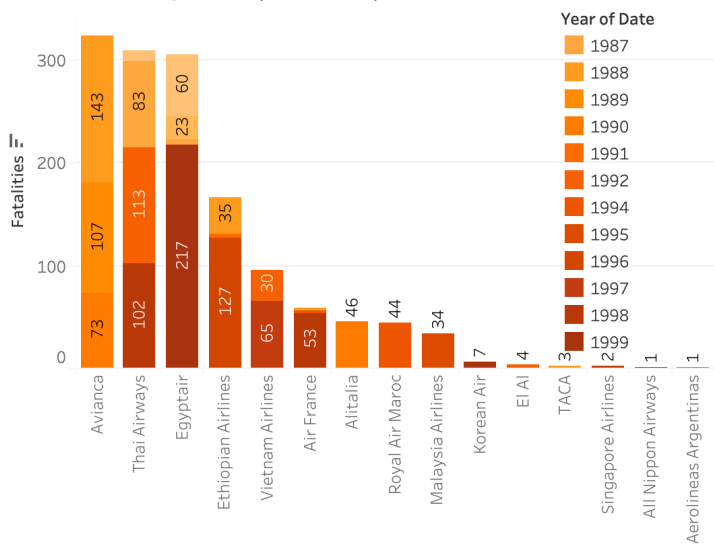
## C. Plan

As part of the presentation my plan is to first show How the Singapore Airline is performing in comparison to others Airline. As next step I intend to show the statistics on airline fatalities to understand if the fatalities rate is improving or not. If it is improving than we are on right track and by adding some safety measure, we can see some good results. Additionally, I am showing some visualization to compare the Engine and their model which can assist management to identify the problem and take crucial steps to improve airline safety. The aim of the presentation is to share useful insights with accuracy so that shareholder can take crucial steps for the beneficial of the organization and share the facts and useful information with media to reduce the negative buzz.

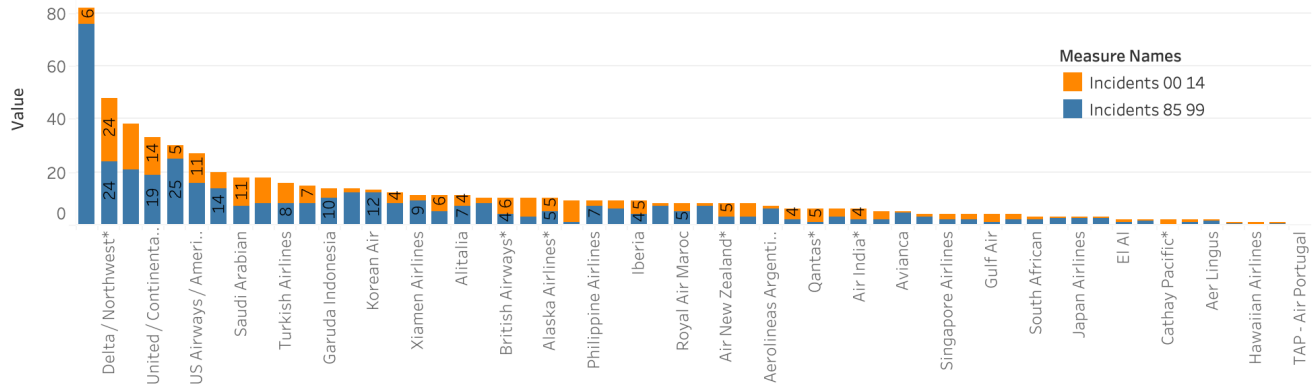
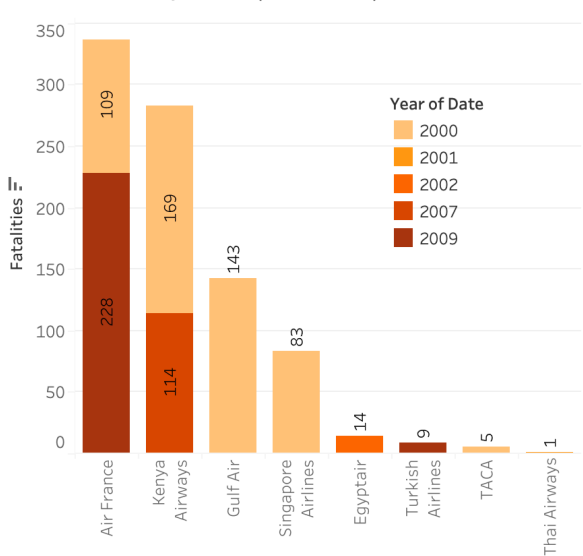
Below dashboards were created as part of the project task 2 executive summary for Senior Leaders.

### Singapore Airline Travel Safety

Total Fatalities by Airline(1985-1999)

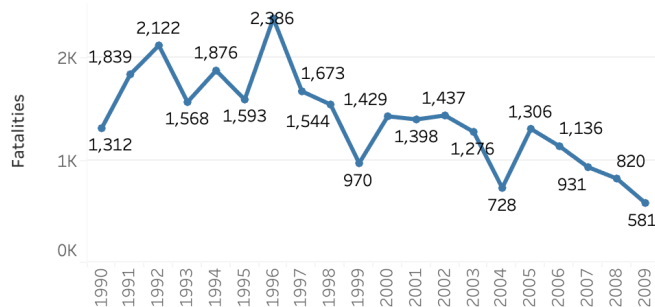


Total Fatalities by Airline(2000-2009)

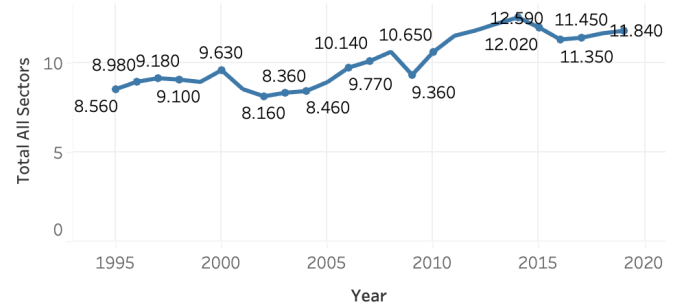


## Singapore Airline - What can change?

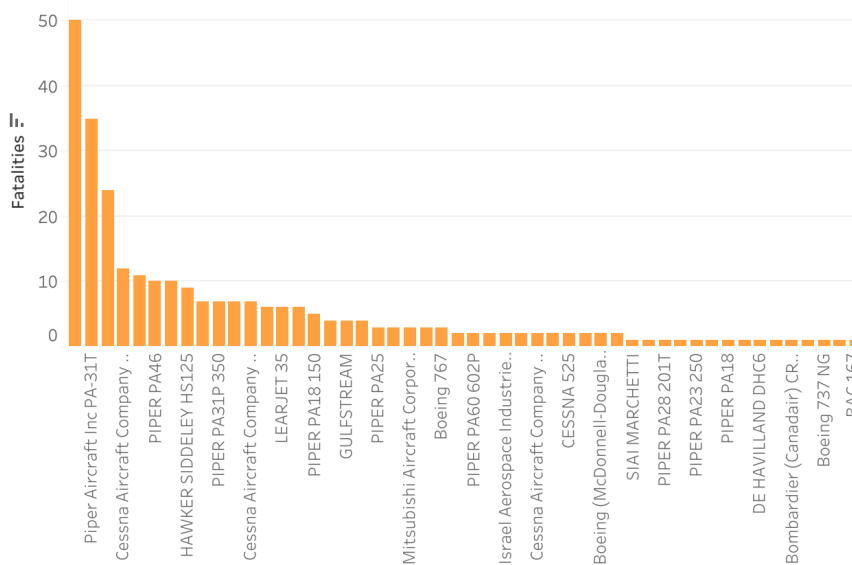
Total Fatalities for last 20 Year



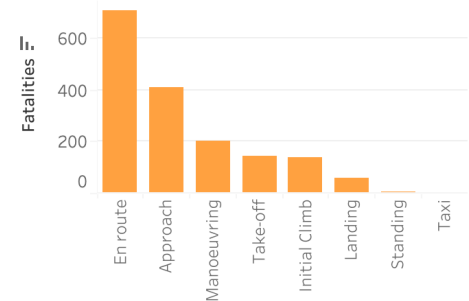
Revenue By Year



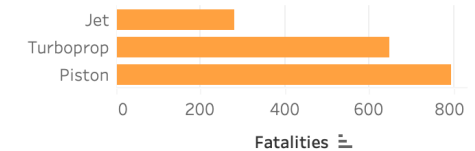
Fatalities by Jet Engine Model



Total Fatalities by Flight Phase



Fatalities by Engine Type



## D. Summary

Sharing the findings below:

### a) Total Incidents 1985 – 2014 by Airline:

Used the bar chart to compare the Singapore Airline total incidents with others Airline. We can clearly see the rate of incidents is lower from others Airline. Aeroflot and Delta/Northwest Airline have most incidents between years 1985 to 2014.

#### b) Total Fatalities 1985 – 2009 by Airline:

This visualization is a combination of two stacked bar charts. For the first one we are showing total fatalities that happened during years of 1985-1999 by Airline. The shades represent the years from 1985-1999. As we can see from above chart that Avianca is the airline with most fatalities over the period, but all the fatalities happened during 1988-1990. The EgyptAir airline had the maximum fatalities of 217 passengers in year 1999.

Whereas the other stacked bar chart is to represent the total fatalities happened during the years 2000-2009. Looking at the above chart we can clearly see Air France airline has most fatalities of 228 passengers in 2009 and 109 passenger fatalities in 2000.

We can clearly state that fatalities rates are lower for Singapore Airline compared to Avianca and Air France Airline. For Singapore Airline, most of the fatalities happened before year 2000. As no Fatalities recorded since 2001 – 2009 for Singapore Airline.

#### c) Total Fatalities by Year

Looking total fatalities for last 20 years, I noticed that the fatalities rate is decreasing, and the Fatalities rate went down to 44% in year 2009. Fatalities rates were higher in year 1996 with 2386 total fatalities.

#### d) Airline Revenue by year

The line graph above shows that despite of negative news by media on fatalities, the Airline revenue is increasing. The positive rate indicate that passengers are increasing every year indicating the trust they have on Airline travel. The revenue increase rate is 38% from 1994 to 2020.

#### e) Fatalities by Flight Phase

En Route flight phase has most fatalities. Standing and Taxi flight phases have minimum fatalities. We can work on the flight phase with maximum fatalities by arranging proper training and adding some safety measure.

#### f) Fatalities by Engine Type

Jet Engine have less fatalities compared to others Engine type. Piston has most fatalities count.

Singapore Airline can plan to use more jet engine and can avoid using piston.

#### g) Fatalities by Jet Engine Model

Piper Aircraft Jet Engine model has higher fatalities. We have 280 Jet Engine type.

To reduce the fatalities rate we can try avoiding these Jet Engine model which have maximum fatalities rate compared to others.

### E. Recommendation:

- Arrange proper training and guidance for flight phase with maximum fatalities.
- Add more safety procedure to improve Airline performance.
- Prefer using the jet engine as it has minimum fatalities.
- Avoid using jet engine model with maximum fatalities.

### F. Next step:

- Investigate further to understand if Engine is responsible for fatalities.
- What other factors can also increase fatalities rate like location, weather and other.



## G. Ethical Implications

- As part of the project step 1, I noticed the discrepancy between Aviation Safety Network database and data coming from Kaggle like Kaggle data set is for period 1985-2009 and Aviation Safety network show the data for period 1985-2014 we are missing 5 years data for crashes and fatalities.
- The other risk I see is with ensuring data accuracy. Both data set is obtained from public website and none of them is government website, so it is difficult to say if data is accurate.
- All the data used for visualization is decade old and for better decision making it will be beneficial to visualize the recent data which can show the current state of Airlines.
- I also make sure all the ethical analysis guidelines will follow by me while performing data analysis steps.

## H. References:

- Airline Safety dataset - <https://aviation-safety.net/>
- Airplane Crashes Since 1908: <https://www.kaggle.com/datasets/saurograndi/airplane-crashes-since-1908>







