**FINAL PROJECT**

**DATA VISUALIZATION FOR ANALYTICS**

**(DSCI 5360)**

TITLE: AIR CRASHES

Presented by:

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**Introduction**

Airline Industry is one of the leading and topmost industries among all the industries in this world. The evolution of Airline Industry has been amazing and a great journey. When Flights are being invented the World was amazed and wondered what could be useful by this implementation. But as years pass by the Demand for Flights are drastically increasing. Now Flights have become most common type of Transportation for both Domestic and International travels. There are lot of drawbacks such as Engine Failures, Pilot’s Fault and much more circumstances which could result in Air crash. Also when flights met with accident it is hardly possible to save the lives of passengers. This report deals with the analysis of Air Crashes all throughout the World over these years. The dataset is retrieved from Kaggle which is an authorized data source site that gives exact historical data. The analysis consists of multiple visuals, several dashboards and several story points. The required calculated fields are created in tableau to finish the task with necessary requirements

**Analysis of Data and Visuals**

The analysis part consists of all the visuals created and purpose in this project. The visuals are being created in Tableau version 2020.4 and the file is saved as twbx file. There are in total 10 different visuals being created. Also two different dashboards are created with these charts and one storyline is being created. The storyline consists of four story points each giving insights for most important visuals out of these 10. All of these visuals are made in an advanced manner with necessary color scheme being used. Visuals are being created in a proper manner with best suitable charts being used for each of the visuals.

**Air Accidents Worldwide**

For this sheet the filled maps are used to present the data. The filled maps are colored using scheme sunset-sunrise diverging which denotes the count of air crashes in each of the country over these years. Those countries where more number of accident occurred are colored in red and those with less air crashes are colored in blue.

**Accidents by Year:**

In this visual a dual-axis area and line chart combined is created. The visuals present the number of air crashes that occurred over these years. Year is added along X-Axis and the number of accidents along Y-Axis. This is a time series data which represents the number of accidents every year.

**Result of crashes:**

This one is an interactive pie chart explaining the result of the air accident to the passengers. There are two possible results one is Fatality and other one is Grounded. Fatality represents that the passenger had lost his life in air crash and grounded represents that the passenger has grounded from plane with serious injuries but they’re alive. The pie chart represents the number of passengers and % among total for each of these category.

**Passenger Deaths and Injuries:**

This one is a line chart that is similar to the sheet 2. In sheet two the visual represents the count of accidents but in this case it represents the number of passengers who have grounded and died over these years. In this graph the Year is added along the X-Axis and the Passenger Count is added along Y-Axis

**Time and Month of these crashes:**

This one is a heat map that is created with Time along Rows and Month along the columns. Also Groups are created for Time which has six values namely Early Morning, Morning, Noon, Evening, Night and Late Night based on the exact hour. Orange-Blue diverging color scheme is used wherein Orange represents high amount of crashes and blue represents less number of crashes. Also the dataset is a bit incomplete for the Time column. Most of the values in Time Column is left as null in the dataset.

**Deaths Map:**

This is again a filled map that is colored based on the number of deaths occurred in each country. Note that in the first sheet the filled maps are colored using the Number of Air Crashes in each country whereas in this filled map those are colored using the Death Count in each country. This map uses color scheme Orange Sequential.

**Operator who has been reason for these crashes:**

This is one of the most important visuals which gives clear understanding for the Users regarding the Airline Operators and number of Air crashes they’ve been part of. This is gives very deep and useful insights and User can easily analyze the Worst Performing Airlines that has been a part in most number of accidents. For this visual Funnel charts are being created and only Top 10 operators who have caused more number of accidents are added to this visual. The top 10 operators are chosen based on Rank Unique method that adds only 10 operators part of many air crashes based on their accident count.

**Death Causing Places:**

This is a bar chart used to analyze the exact place where most of the air crashes had occurred. Again for this visual rank unique method is used to filter the top 10 places based on the total number of air crashes. These places could be regarded as Alarming Zones where Operators need to be careful because they have some difficulty in riding flights in these places.

**Time when these accidents occurred:**

This one gives the exact time when the accidents have occurred. This is a dual axis bar and line chart which represents the number of air crashes occurred in that particular hour of time. Also note that as mentioned before the Time column is left null for lot of records. Hence the visual is created only for data that has value for Time column in the dataset.

**Aircraft Used:**

For any flight there will be an aircraft model used which is basically like an Engine in Car. This visual is a tree map that represents the Aircraft Model and number of air crashes they have caused. Again in this visual the top 5 aircraft model is taken based on the total accidents count. Rank Method is Used in this visual to sort out and choose the top 5 aircraft model.

**Air Crashes Part One: First Dashboard**

In this dashboard five sheets are added (Sheet 1 to Sheet 5). Country is added as a common filter to all these sheets. And also the first sheet which is a filled Map is used as filter for all the other four sheets.

**Air Crashes Part Second: Second Dashboard**

This dashboard consists of five sheets (Sheet 6 to Sheet 10). Similar to the first dashboard even in this dashboard Country is added as a common filter to all the sheets present in dashboard. Also the first sheet in the dashboard which is a filled map is used as filter to all the sheets.

**Story Line:**

**Story Point 1:**

The first story point is made for the Sheet 2 which consists of the Count of Air Crashes over these years. The Insights obtained from this story point is added as caption to this sheet.

**Story Point 2:**

The second story point is added for the Sheet 3 which is a pie chart denoting the result of accident. It represents the Passenger count who have lost their life and who had serious injuries but grounded without ending up in death.

**Story Point 3:**

This story point is made of Sheet 7 which consists of the Operator and the number of crashes they have been part of. Also only the top 10 operators with most number of accidents are added to the sheet. Hence same thing is added to this story point as well.

**Story Point 4:**

This story point is made of Sheet 10 which consists of Aircraft model and number of air crashes it has been part of. The necessary captions are being given to this story point.

**Business Implications:**

1. Airline Industry has been a major contributor to a Country’s GDP and it is one of the industries wherein lot of profit turnover is obtained. The demand for this industry keeps on increasing day by day. Also passengers travelling in flights never bother about the ticket price their utmost concern is safety. Hence it is the first and foremost responsibility for Airlines to provide the best service and safety to their customers.
2. Over these years number of air accidents had increased drastically. This clearly indicates that there is an urgent need for the Industry to be more switch over to new technologies to prevent the air crashes. Lives are so precious and industry may face severe troubles if passengers lose their lives due to the fault of Airlines. They may need to answer the Government and all other bodies regarding these incidents. The Government has rights even to ban airlines if they are found to be inefficient. Hence air crashes must be avoided and reduced in upcoming years.
3. Quality Check is mandatory for all the Airlines. Nowadays some are not following the rules and not going through these processes as a result of which some obstacles happen. The suggestions and findings given to airline industry may be useful to sort out the issues regarding the Air Crashes.
4. Engine failures are more common type of issue regarding the Air crashes. Air crashes also occur due to unavoidable conditions such as Weather conditions, Hitting objects while travelling. Other than this there are particular airports where most crashes occur. Some of airports are not located in a flat surface rather they are in plain region where most number of crashes occur. Hence these airports must be rebuilt and modified.

**Conclusion:**

Altogether the task is carried out in an efficient manner with high accuracy. All the required visuals necessary to support the analysis and arguments are created in an advanced and expressive manner. New kind of charts that are interactive are included in the project. Air Crashes have become major problem nowadays and also this should never continue because it spoils the reputation of whole Airline Industry. Also the air crashes largely depend on factors such as Type of Airliner Used, Operator operating the Airline, Pilot riding the flight and so on. Hence there is an urgent need to reconsider certain things in order to reduce the number of air accidents. Moreover latest technologies have allowed automation in Airline Industry which could prevent the Human errors leading to Air accidents. Machines may be more efficient than Human and their error percentage will be definitely less than that of Human. So the Airline Industry must take all these into consideration and then converse with Aviation Ministry of Government to improve the quality and standards of Flight. The air accidents could be automatically reduced when these things are followed. This task has given great experience in using Tableau and will surely be very useful in future to work with any kind of projects in Tableau.

**THANK YOU**