Power BI End-to-End Project on Road Accident Analysis

Project Overview:

In response to the growing concern regarding road accidents, I undertook a comprehensive Power BI project aimed at analyzing accident data.

This end-to-end initiative involved meticulous steps, from requirement gathering to the implementation of advanced Power BI functionalities, providing valuable insights for stakeholders.

****Requirement Gathering:****

Primary Key Performance Indicators (KPIs):

1. Analyzing Total Casualties and Total Accident values for Current Year (CY) with Year-over-Year (YoY) growth.

2. Evaluating Total Casualties by Accident Severity for CY and YoY growth.

Secondary KPIs:

3. Examining Total Casualties concerning vehicle types for the current year.

4. Presenting a monthly trend comparing casualties for CY and Previous Year (PY).

5. Analyzing casualties based on road types for CY.

6. Understanding CY casualties by Area/Location and Day/Night differentiators.

7. Investigating Total Casualties and Total Accidents by Location.

****Stakeholders:****

Engaging stakeholders such as the Ministry of Transport, Road Transport Department, Police Force, Emergency Service Department, Road Safety Corps, Transport Operators, Traffic Management Agencies, Public, and Media ensures the relevance and impact of the final report or dashboard.

****Power BI Functionalities:****

1. Establishing data connection to raw data/flat file.

2. Conducting data cleaning in Power Query.

3. Implementing data processing techniques.

4. Utilizing Time Intelligence Functions and Calendar Date Table in Power BI.

5. Developing data modeling, including relationships between multiple tables.

6. Calculating Year-to-Date (YTD) to Year-over-Year (YoY) growth using DAX.

7. Generating KPIs and Advanced KPIs.

8. Creating custom columns and measures in the reports.

9. Importing images for enhanced visualization.

10. Crafting diverse charts to extract meaningful insights.

11. Exporting the final report to users for informed decision-making.

****Raw Data Overview:****

The project commenced with an Excel file containing approximately 308,000 rows and 21 columns.

****Connecting Data to Power BI:****

1. Opening a new Power BI file.

2. Selecting 'Get Data' and choosing the Excel Workbook option.

3. Defining the file path and selecting the data file.

4. Loading the desired data with options for Report View, Data View, and Model View.

****Data Cleaning:****

In Power BI, data cleaning involved utilizing the Power Query Editor in the Report View.

A notable correction included replacing the typo "Fetal" with "Fatal" in the Accident Severity column.

The changes were verified in the Data View before finalizing.

Data Processing:

1. Leveraging custom text formulae for modeling.

2. Creating a dynamic Date Table using the "CALENDAR" function for flexible date-based reporting.

3. Enabling time intelligence to facilitate Year-to-Date functions.

Data Modeling:

1. Establishing relationships between data tables in Model View.

2. Creating new measures for CY and PY casualties using DAX functions.

3. Analyzing Casualties by Severity and Vehicle Type for the current year.

4. Presenting Monthly Trends with a focus on custom sorting for better visualization.

5. Exploring casualties in Urban and Rural areas through Doughnut charts.

6. Highlighting light conditions and road types through interactive visualizations.

7. Incorporating Bing Maps for geographical analysis with latitude and longitude columns.

8. Enhancing dashboard interactivity with slicers for weather conditions and road surfaces.