Capstone Project Pitch Deck: Road Traffic Accident Analysis

Comprehensive Analysis of Road Traffic Accidents in the UK (2019–2023)

Presented by: Group 5, Excel Project, !oAlytics

Tools Used: Microsoft Excel, Power Query, Data Visualization

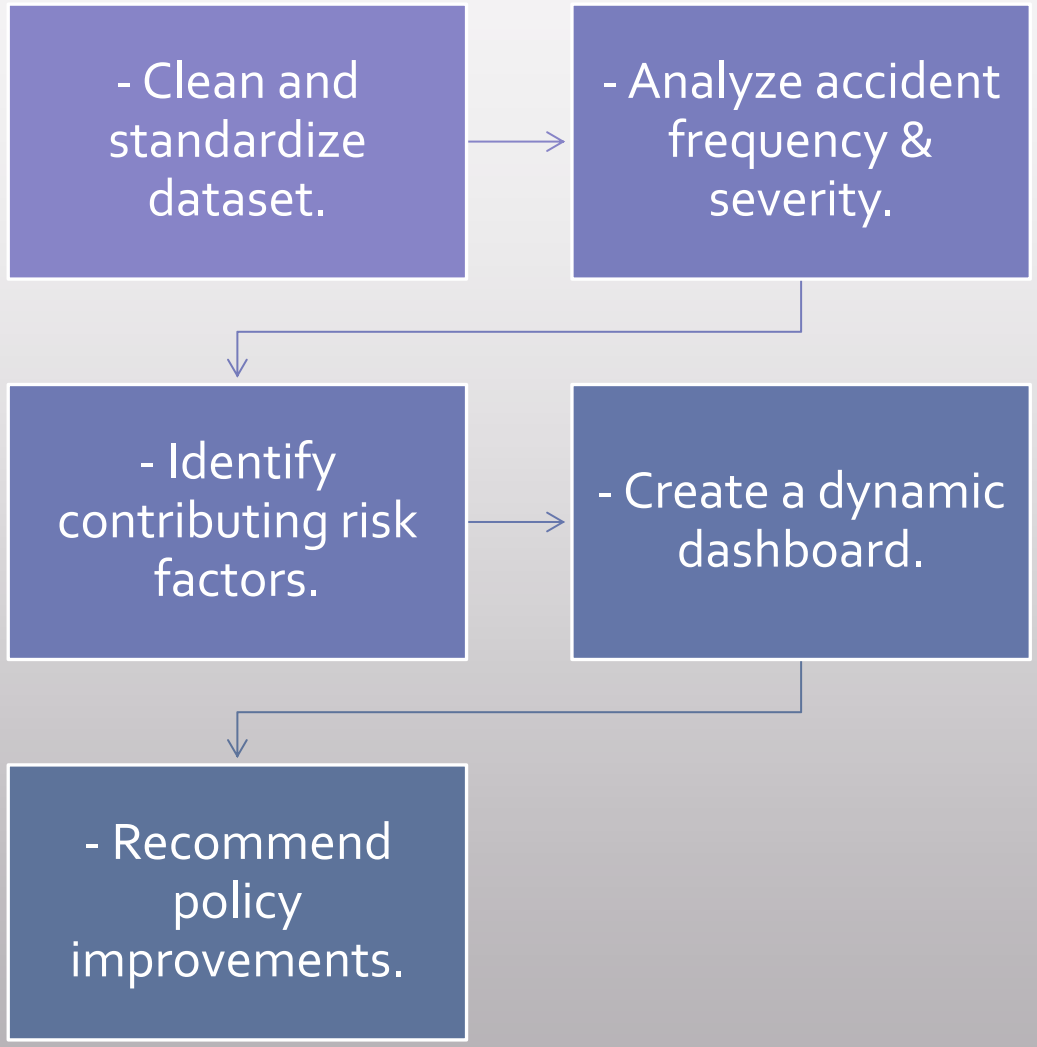
Business Context & Problem Statement

- Road accidents remain a public safety challenge in the UK.

- Raw accident data is often unstructured.

- Goal: Use analytics to uncover trends and inform interventions.

Objectives of the Capstone Project



Data Cleaning & Preprocessing

- Primary Key: Accident Index.

- No missing values found.

- Corrected Day of Week via TEXT + IF.

- Created Light Condition filters: Daylight & Dark.

- Renamed Urban/Rural column to Area.

Dashboard Design & Key Discoveries

- 2-vehicle accidents were most frequent and fatal.	- Westminster: highest local authority accident count.	- No data on carriageway hazards.
- Urban areas had more cases; rural, more fatal.	- Peak time: 5 PM; accidents frequent from 8 AM – 8 PM.	- Speed limit of 30 mph most common.
- Single carriageways: ~75% of all roads.	- Dry roads: ~68%.	- West Midlands Police: highest volume.
- Thames Valley: more fatal cases.	- Most accidents in daylight.	- Common weather: fine with no high winds.
- Junctions with data missing more accident-prone.	- Accidents were fewer where authorized personnel controlled junctions.	- November was the peak month; 2021 slightly higher than 2022.

Forecasting 2023 Accident Totals

- Linear Regression = lower forecast

- Moving Average = higher forecast

- Combined estimate: 124,671 accidents

- Reference data: 2021 = 116,095 | 2022 = 133,246

- Trends show autumn peak season.

Descriptive Statistical Analysis

Speed Limit:

Mean: 36.88 | Median: 35 | SD: 21.87 (Right Skew)

Monthly Accidents:

Mean: 22,208 | Median: 22,578 | SD: 1,875

Daily Accidents:

Mean: 38,070 | Median: 38,772 | SD: 3,766

- No visible outliers found.

Interactive Dashboard Walkthrough

- - Filters: Area, Light Condition, Junction Type, Local Authority
- - KPIs: Fatal, Serious, Slight Casualties
- - Visuals: Donut, Pie chart, Area, Bar, Treemap
- - Time patterns: Hour, Month, Weekday

Policy Recommendations

- - Enhance lighting and signage in rural zones
- - Reinforce infrastructure on single carriageways
- - Schedule campaigns around peak accident hours (4–6 PM)
- - Ensure detailed junction control reporting
- - Increase presence of authorized personnel
- - Encourage vehicle safety upgrades: blind spot detection, auto brakes
- - Introduce AI surveillance for high-risk routes
- - Raise awareness on daylight and fine weather risks
- - Improve commercial driver training and recertification
- - Conduct public workshops on junction navigation and night driving

Summary & Conclusion

- - End-to-end data science process executed: cleaning to forecasting.
- - Dashboard enables dynamic exploration of UK accident data.
- - Data-driven policy suggestions aim to reduce fatalities and improve road safety.

Q&A and Contact

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- Thank you!