Introduction

Enhancing DAF Truck Data with Traffic Insights

This document presents a comprehensive analysis of truck routes, distances, and travel patterns for a fleet of trucks over a specified period. Utilizing GPS data, trip summaries, and visual mapping techniques, the study aims to provide a detailed understanding of the fleet's operational efficiency.

Introduction

The analysis is based on data collected from GPS-enabled trucks, including latitude and longitude coordinates, timestamps, and other critical metrics such as total distance traveled

The Goal

The main goal of this data enrichment project is to investigate the relationship between traffic jams and the wear and tear experienced by trucks during their journeys. By analyzing this relationship, we aim to achieve the following objectives:

1. **Longevity Assessment:** Determine the extent to which traffic congestion contributes to wear and tear on trucks and its implications for their operational lifespan.

2. **Rerouting Strategies:** Explore the potential benefits of rerouting trucks to avoid high-traffic areas, with the aim of reducing wear and optimizing overall efficiency.

Data Requirements

To accomplish this goal, specific data attributes are required:

- **GPS Coordinates:** To accurately track the routes taken by each individual truck.

- **TimeStamp:** To record the precise time at which each data point is collected.

- **Total Distance:** To calculate the distance covered by trucks during their trips.

- **TripID:** A unique identifier for each trip made by the trucks.

- **VID (Vehicle ID):** Identifiers for individual trucks, allowing us to associate data with specific vehicles.

The following sections provide an overview of how these data attributes were extracted and utilized to route the trucks and visualize their journeys.

Data Extraction and Visualization

In the subsequent sections, we will explore the process of data extraction and visualization to gain insights into truck routes and traffic patterns. This data forms the basis for our comparative analysis with traffic jam data.

Route Mapping

The extraction process involved obtaining start and end times for all trips made by the trucks. This data was then used to create route maps, as shown in the following visualizations:

1. **Route Plot:** A visual representation of the routes taken by the trucks.

2. **Heatmap:** A heatmap highlighting areas of high traffic concentration during trips.

Visualizing the truck routes provides a clear picture of their journeys, which can be compared to traffic jam data to draw meaningful conclusions regarding the impact of traffic on truck health and performance.

Advice:

In this study, my objective was to assess the efficiency of truck routes by correlating them with traffic jam data. By aligning the trucks' timestamps with traffic congestion information, I aimed to determine the impact of traffic delays on trip completion times. The ultimate goal was to uncover strategies for DAF to minimize downtime.

During my initial data preparation, I observed that the trucks typically undertook 50 to 100 trips annually. Additionally, through data visualization techniques, including heatmaps and route mapping, I gained insights into the trucks' most frequented paths.

To enhance my analysis with traffic jam data, I initially considered using the TOMTOM API. However, the cost of accessing historical data was a limiting factor. As an alternative, I found the website https://english.ndw.nu/our-data, which offered the necessary data. Unfortunately, due to time constraints, I couldn't integrate this data into my study.

The proposed approach involves merging traffic jam data with the trucks' routes and examining the vehicles' wear and tear. This comprehensive analysis could provide DAF with valuable information for scheduling maintenance and repairs. Furthermore, it has the potential to predict traffic congestion patterns, enabling proactive route planning to avoid delays.

Next Steps

With the route data in hand, the next step is to collect and integrate traffic jam data corresponding to the times of the truck trips. This will allow us to conduct a comprehensive analysis to address the goals outlined in this proposal.

The insights gained from this data enrichment project have the potential to revolutionize route planning and maintenance strategies for DAF Trucks, leading to improved operational efficiency and cost savings.