EV Charge & Range Analysis:

Introduction

Electric Vehicles (EVs) are becoming increasingly important in modern transportation due to environmental concerns and technological advancements. Large amounts of EV-related data are generated including performance metrics, pricing, efficiency, and charging infrastructure information. However, raw data alone does not provide meaningful understanding.

This project focuses on converting EV datasets into interactive dashboards and stories using Tableau. The visualization approach helps users easily analyze trends and compare electric vehicles through graphical insights.

Problem Statement

Electric Vehicle datasets are available from multiple sources but are difficult to analyze in raw format. Users face challenges in comparing EV models, understanding charging infrastructure, and analyzing efficiency trends.

The objective of this project is to create a visualization-based analytical system that presents EV data in an understandable and interactive format using dashboards and stories.

Objectives of the Project

- Analyze EV datasets from India and global sources.
- Perform data cleaning and preprocessing.
- Create meaningful visualizations for analysis.
- Develop interactive dashboards using Tableau.
- Build stories to explain insights step-by-step.
- Publish dashboards online through Tableau Public.
- Document and share the project through GitHub.

Dataset Description

The project uses four datasets:

1. EVIndia

Contains electric vehicle details available in India such as vehicle type, price range, capacity, and model information.

2. Electric_vehicle_charging_station_list

Includes data related to EV charging stations such as location, region, type, and power.

3. ElectricCarData_Clean

Contains global EV specifications including range, top speed, efficiency, and price.

4. Cheapestelectriccars-EVDatabase

Contains affordable EV model details including acceleration, top speed, efficiency, and pricing.

Tools and Technologies Used

- Tableau Desktop – Data visualization and dashboard creation
- Tableau Public – Dashboard publishing and deployment
- GitHub – Project documentation and version control
- CSV Files – Data storage format
- Google Docs – Documentation creation

Project Methodology

The project was completed in multiple phases:

Requirement Analysis

Understanding project objectives, identifying system requirements, and defining data flow and technology stack.

Project Design Phase

Designing the solution architecture and planning dashboard structure.

Development Phase

- Data cleaning and preprocessing
- Creating visualizations such as bar charts, scatter plots, and maps
- Developing dashboards and stories

Deployment Phase

Publishing dashboards to Tableau Public for online access.

Performance Testing

Testing dashboard functionality, filter responses, and visualization performance.

Documentation

Preparing final project documentation and organizing files for submission.

Dashboards Developed

The following dashboards were created:

- Main EV Charge & Range Analysis Dashboard
- Global EV Performance Analysis
- Efficiency & Affordability Analysis
- Indian EV Market Analysis
- Charging Infrastructure Dashboard

Each dashboard provides specific analytical insights and allows users to interact with filters for deeper analysis.

Stories Developed

Storyboards were created to guide users through the analysis:

- Story 1 – Project Overview
- Story 2 – Global EV Performance
- Story 3 – Efficiency & Cost Analysis
- Story 4 – Indian EV Market Trends
- Story 5 – Charging Infrastructure Analysis

Stories help explain data insights in a structured and understandable manner.

Tableau Public Deployment

The final dashboards and stories were published on Tableau Public to allow online access and sharing.

Tableau Public Link:
https://public.tableau.com/views/ElectricVehicleChargeandRangeAnalysis_17713481097120/Story1

Key Insights

- Higher priced EVs generally provide greater range and performance.
- Efficiency varies significantly across EV brands.
- Compact SUVs dominate the Indian EV market.
- Charging infrastructure is concentrated in major regions.
- Visualization improves understanding compared to raw data analysis.

Results and Outcome

The project successfully transformed raw EV datasets into interactive dashboards and stories that support data-driven analysis. Users can now explore EV trends, compare models, and understand market insights effectively.

Conclusion

The EV Charge & Range Analysis project demonstrates how data visualization techniques can simplify complex datasets and provide meaningful insights. Tableau dashboards and storytelling effectively present EV analytics in an interactive format, making the analysis accessible and easy to understand.

Future Scope

- Integration of real-time EV data
- Predictive analytics for EV adoption trends
- Mobile-friendly dashboard design
- Advanced analytics using machine learning