

# Visualization Tool for Electric Vehicle Charge and Range Analysis

This document outlines a data-driven approach to analyze Electric Vehicle (EV) charging behavior, battery range, and adoption trends using interactive Tableau dashboards. It details the project objectives, methodology, and key insights derived from a comprehensive analysis of global and Indian EV datasets.

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# Project Overview

The project titled "**Visualization Tool for Electric Vehicle Charge and Range Analysis**" focuses on analyzing key data related to electric vehicles (EVs) using Tableau. It aims to deliver clear and interactive dashboards that visualize EV performance, battery range, charging types, efficiency, and adoption trends in both global and Indian markets.

## Purpose

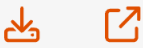
The purpose of this project is to transform raw EV datasets into insightful visualizations that support data-driven decisions for consumers, policymakers, and researchers. By leveraging Tableau, the project highlights trends in EV model efficiency, price-to-range ratios, and the availability of charging infrastructure across regions.



# IDEATION PHASE

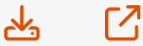
## ✓ Problem Statement

With the growing shift toward electric vehicles (EVs), understanding key aspects such as range, price, charging infrastructure, and adoption trends has become critical. The problem is that raw EV data from various sources is often fragmented and difficult to interpret without a visual tool. This project aims to solve that by transforming complex EV datasets into insightful dashboards.



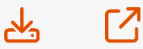
## ✓ Empathy Map Canvas

The empathy map was built with the end-user in mind —typically, EV buyers, researchers, or policy makers. We considered what users **see** (market data, models), **hear** (brand claims), **think** (cost vs range), and **feel** (confused or uncertain about EV decisions). This helped guide our design to make the dashboard easy to navigate, insightful, and reliable.



## ✓ Brainstorming

Our team conducted multiple brainstorming sessions to finalize the scope of the project. We evaluated different datasets, shortlisted key business questions like “Which EV offers best range?”, “Where are charging stations located?”, and “What are the most affordable models?”. These ideas shaped the layout and filters of our Tableau dashboards.



# PROJECT PLANNING & SCHEDULING

Our project followed a meticulously structured approach, as guided by the SmartInternz program. This systematic process began with a thorough understanding of the raw data and culminated in the publication of interactive stories and dashboards. Below is a detailed, step-by-step breakdown of our methodology:

## Week 1:

- Team formation
- Project topic selection
- Dataset research and confirmation

## Week 2:

- Data cleaning and preprocessing
- Initial dashboard planning and brainstorming

## Week 3:

- Dashboard creation in Tableau
- Visual tuning and insights drafting.

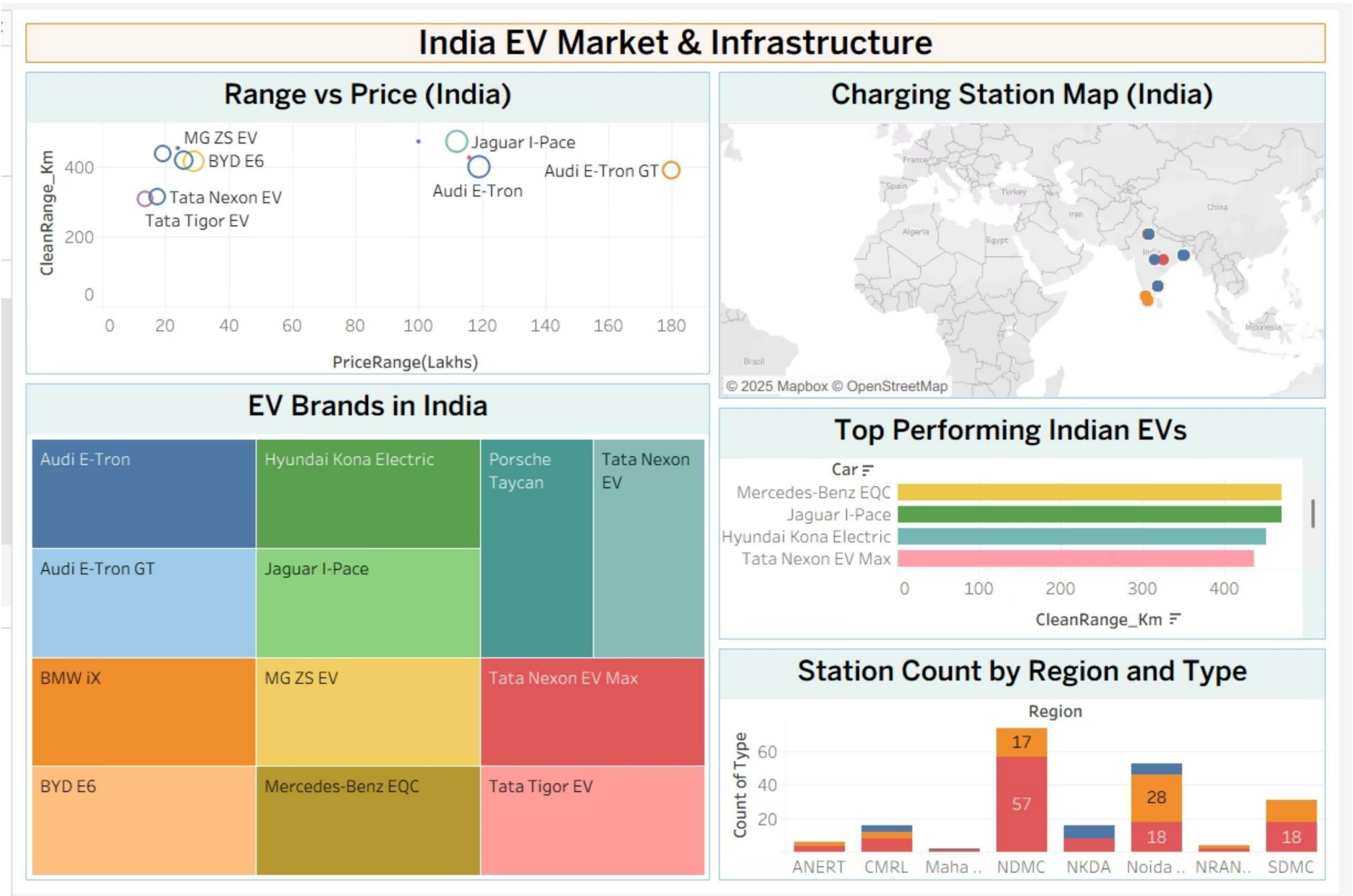
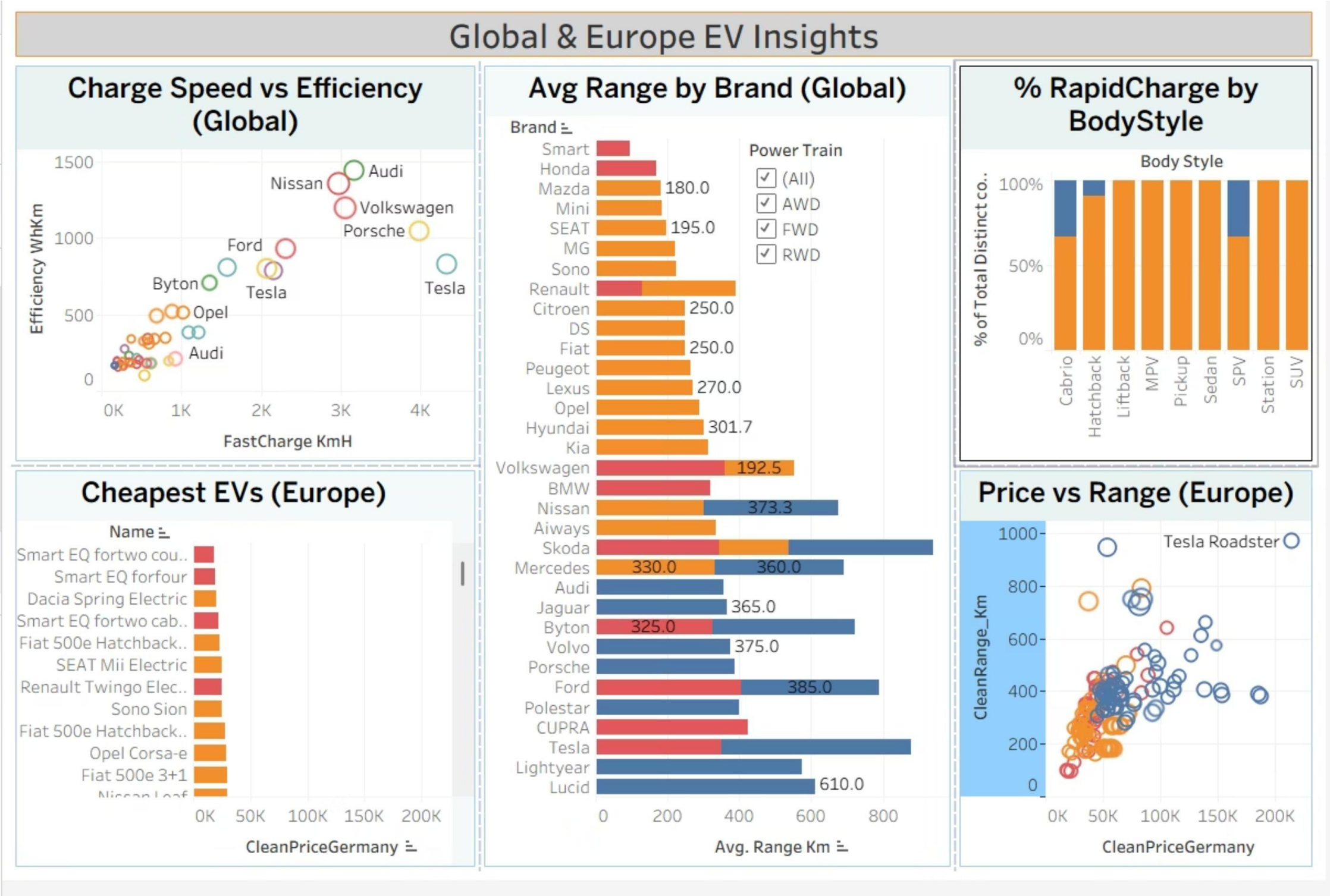
## Week 4:

- Documentation and final demo preparation
- Team review and submission



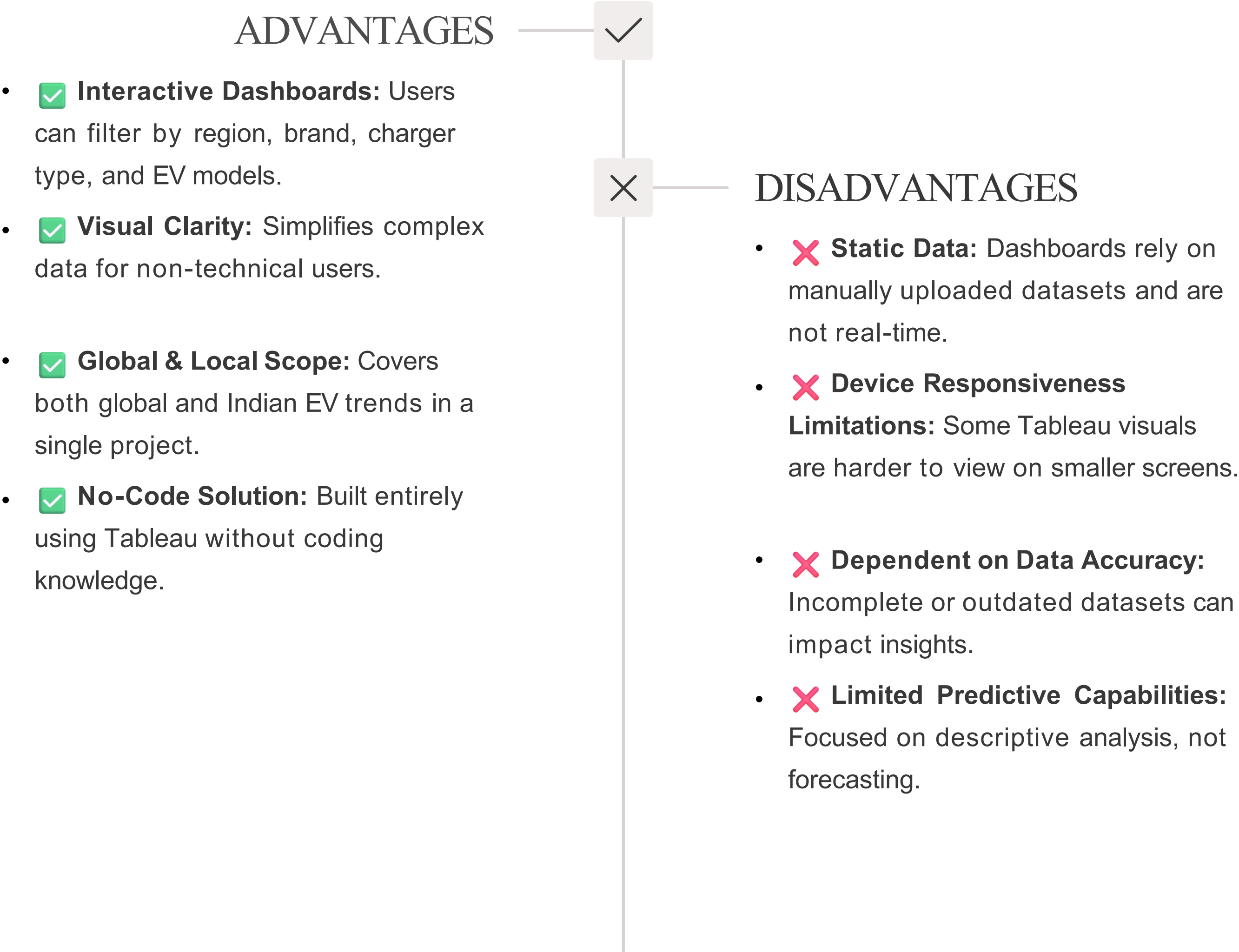
# RESULTS

The project resulted in two fully functional and interactive dashboards built using Tableau. These dashboards visualize key electric vehicle insights across global and Indian markets — helping users explore EV models, performance, pricing, and infrastructure with ease.




# ADVANTAGES & DISADVANTAGES

Every project has strengths and limitations. This section outlines the key advantages of our dashboard-based EV analysis solution, as well as the challenges and limitations we encountered during development and testing.




# Conclusion & Future Scope

The project offered a valuable opportunity to explore Electric Vehicle data through a practical lens. From raw datasets to interactive Tableau dashboards, we built a solution that highlights performance, charging behavior, and adoption trends, proving the feasibility of a robust EV data visualization tool.




### ✓ Successful Analysis

Successfully analyzed multiple EV datasets related to model performance, charging time, and battery range.



### ✓ Dashboard Development

Developed a comprehensive Tableau dashboard to support data-driven decision making.



### ✓ Functional Tool

Delivered a functional visualization tool that simplifies EV data interpretation for stakeholders.

## Future Scope:

### Real-Time Data Integration

Connect live APIs or streaming EV data to update dashboards dynamically, providing the most current insights.

### More KPIs & Filters

Introduce filters for cost, emission reduction, and user reviews to broaden insights and cater to diverse analytical needs.

### Predictive Analytics

Apply forecasting techniques to predict EV market trends or battery lifespan, offering proactive strategic planning.

### User Interface Improvements

Design cleaner, mobile-friendly dashboards for wider accessibility and an enhanced user experience across devices.



# APPENDIX

This section provides all supporting information related to the project, including the datasets used, tools and platforms applied during development, and access links to the final dashboards and demo video. These references validate the analysis and ensure transparency of the solution built.

## **Datasets Used:**

- `ElectricCarData_Clean.csv` – Global EV specifications
- `Cheapestelectriccars-EVDatabase.csv` – Budget EV data (Europe)
- `EVIndia.csv` – Indian EV models and pricing
- `electric_vehicle_charging_station_list.csv` – Charging station locations in India.

## **Tools & Platforms:**

- **Tableau Desktop & Tableau Public** – Dashboard creation & publishing
- **Microsoft Excel** – Data cleaning and preprocessing
- **Gamma** – Project documentation & presentation
- **Google Drive / YouTube** – Hosting demo video

## **Demo & Dashboard Access:**



Tableau Public Dashboard



Project Demo Video



GitHub Link