Visualization Tool for Electric Vehicle Charge and Range Analysis

Project report

1 Introduction

1.1Overview

A vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source and have an electric motor instead of an internal combustion engine. The Electric Vehicle (EV) is not new, but it has been receiving significantly more attention in recent years. Advances in both EV analytics and battery technologies have led to increased automotive market share. However, this growth is not attributed to hardware alone.

The modern mechatronic vehicle marries electrical storage and propulsion systems with electronic sensors, controls, and actuators, integrated closely with software, secure data transfer, and data analysis, to form a comprehensive transportation solution. Advances in all these areas have contributed to the overall rise of EV's, but the common thread that runs through all these elements is data analytics. The new EV's are combined Electrical storage and propulsion systems with electronic sensors, controls, and actuators, integrated closely with software, secure data transfer to form a comprehensive transportation solution.

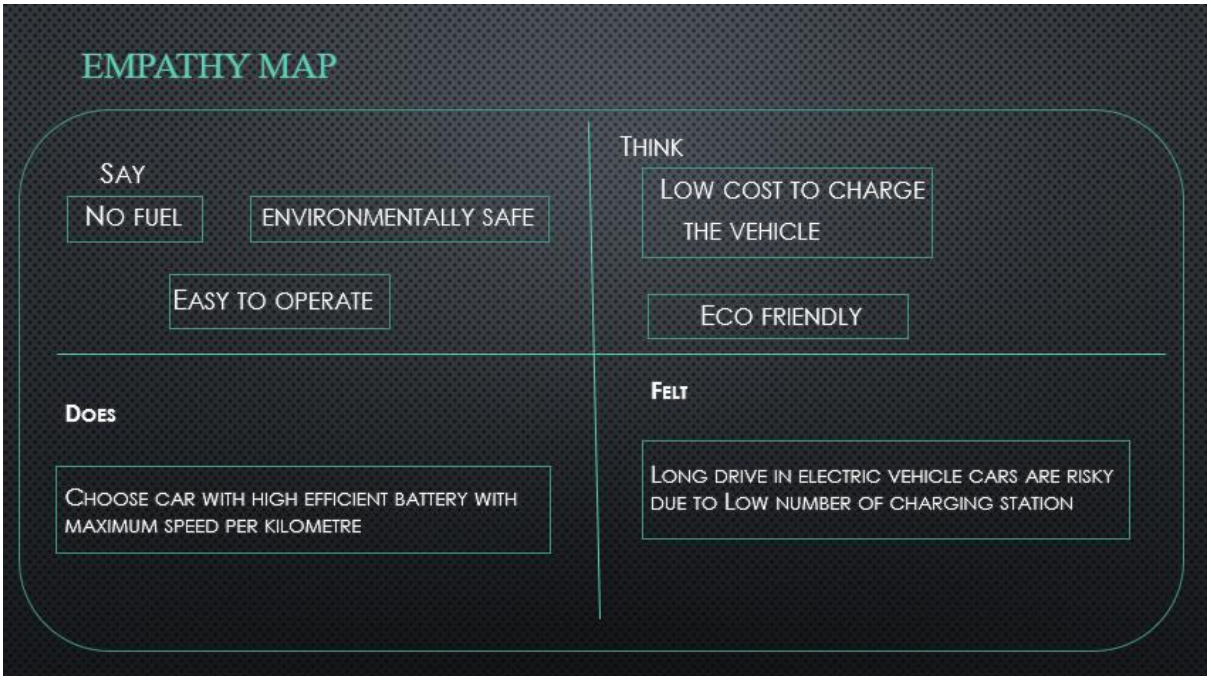
1.2 Purpose

The purpose of the project is help the EV company to grow the techinique and compare themselves with the competitors with the help of insights and performance using With predictive analysis, the EV and its supporting systems can analyze driver and passenger behavior and improve itself to better meet the needs of the humans. Predictive analytics is key to driving **EV infrastructure** growth.

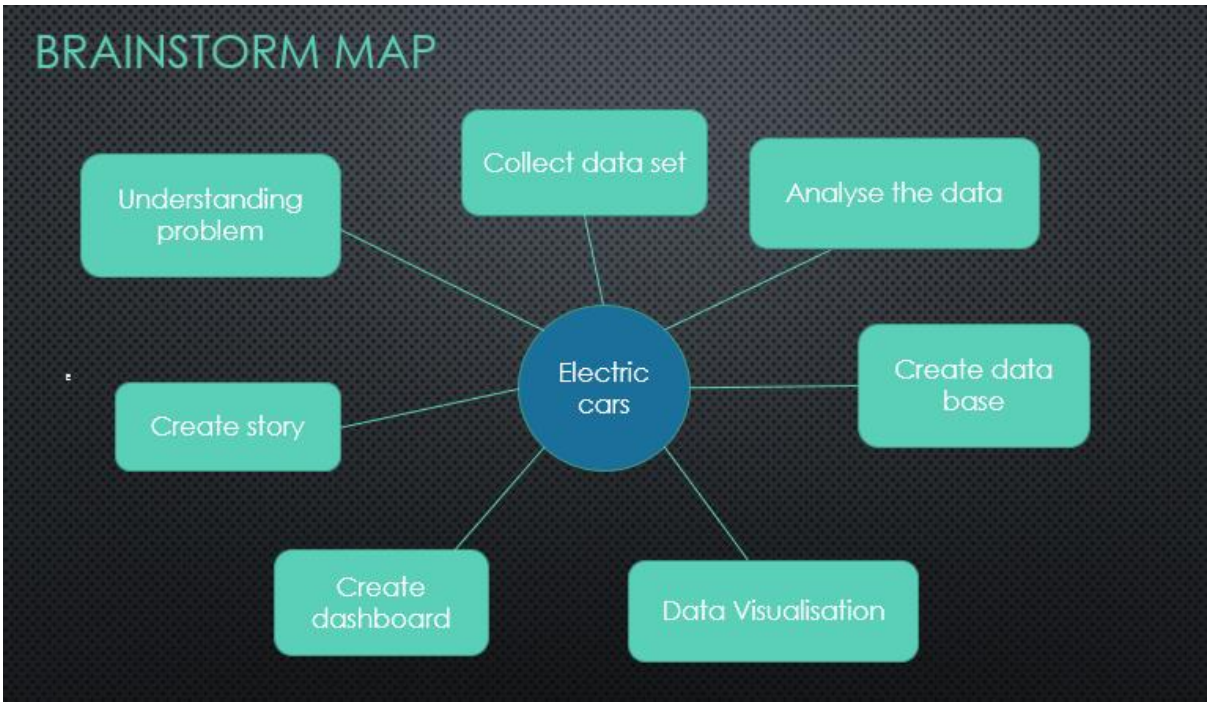
2 .Problem definition &design thinking

To find the needs and requirements of the customer by analysing the EV vechicles

2.1 Empathy map

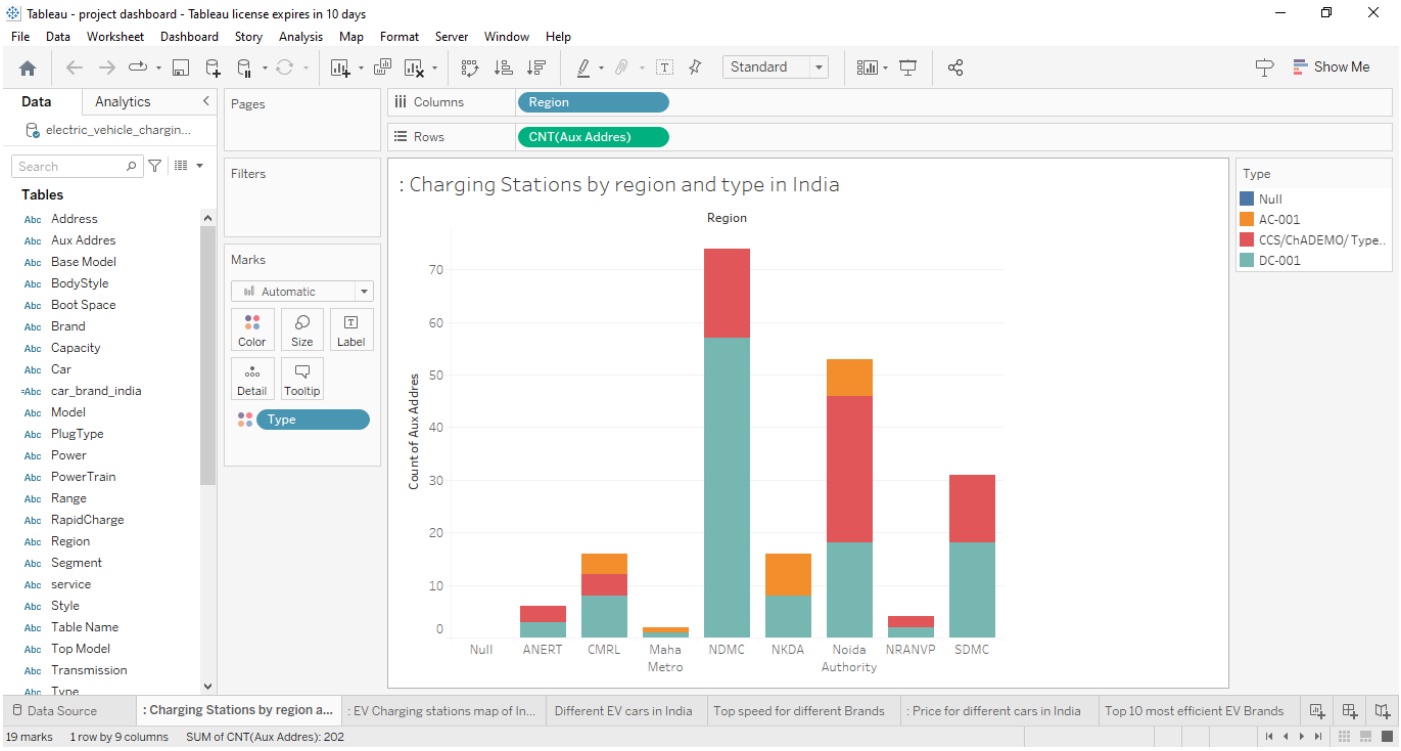


2.2 Ideation &Brainstorm map

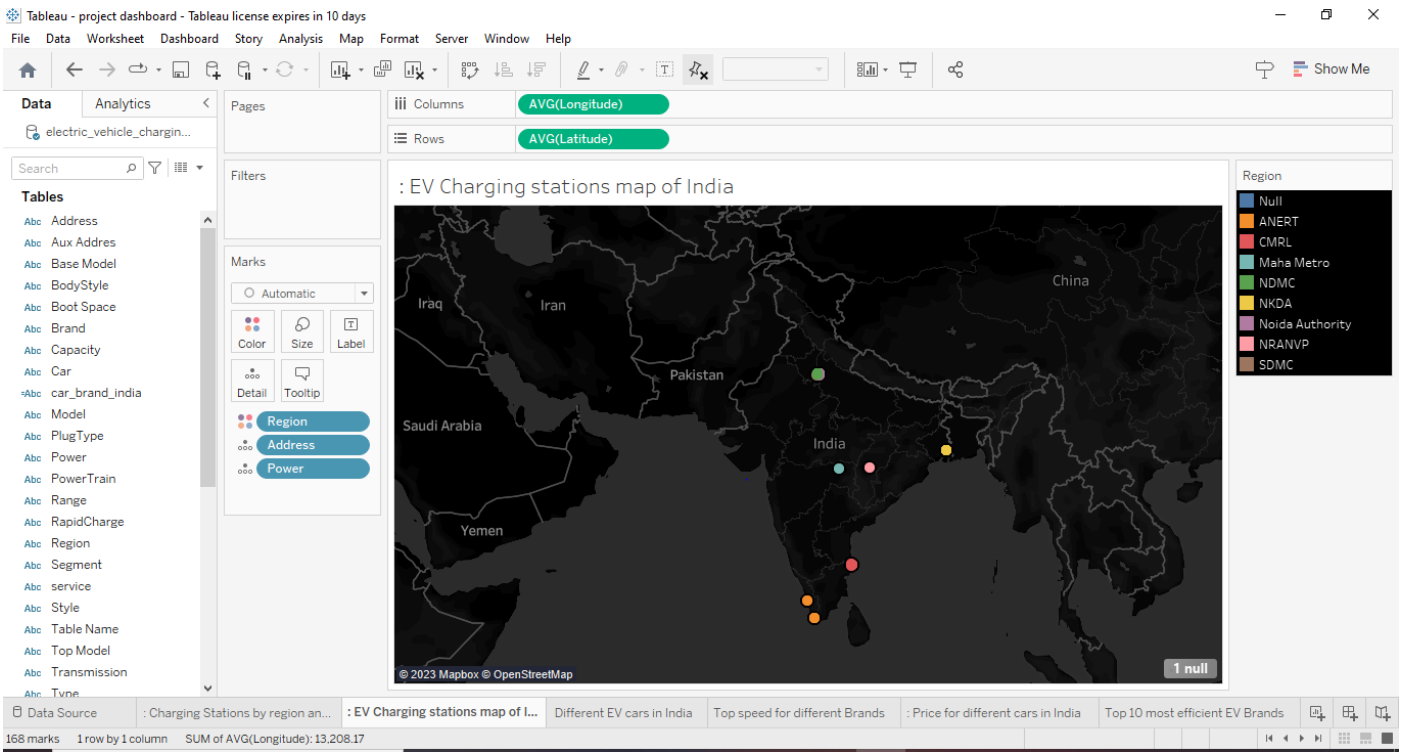


3. Result

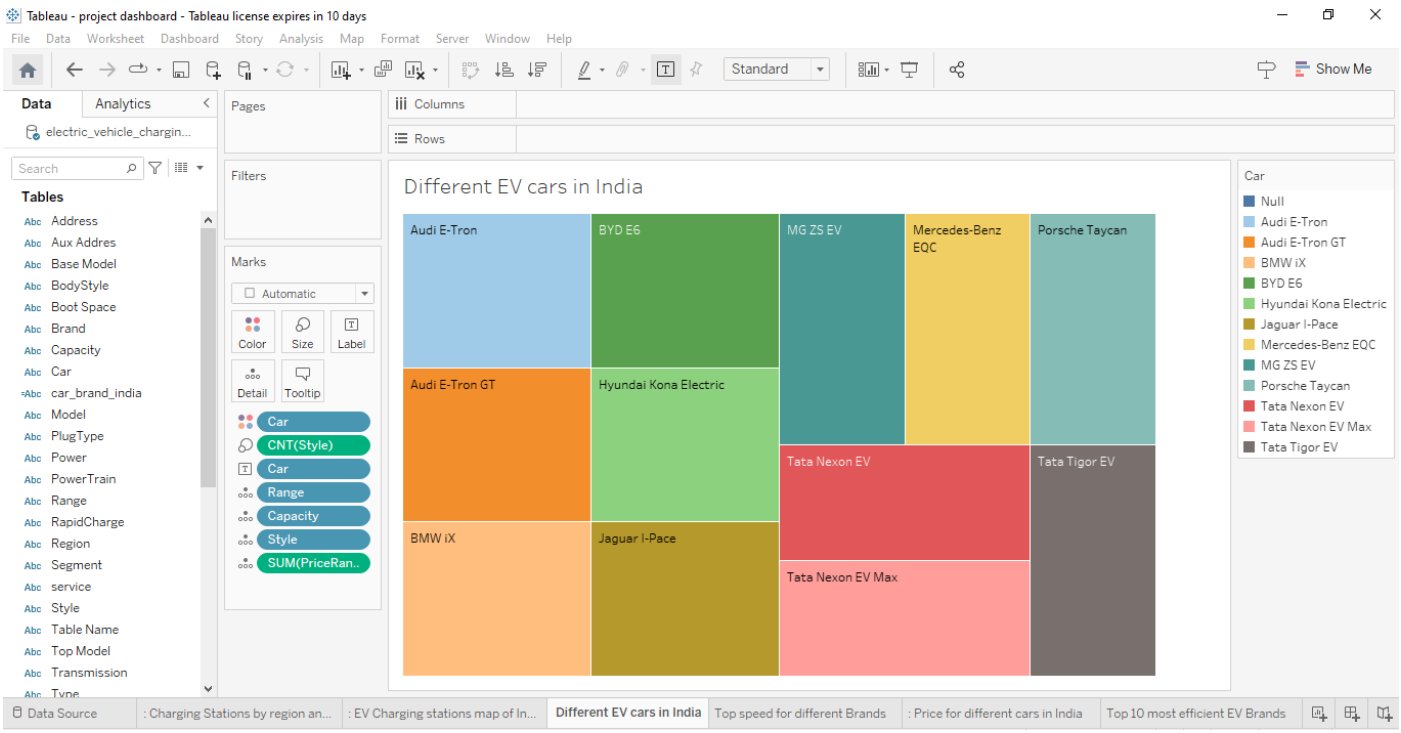
Charging Stations by region and type in India



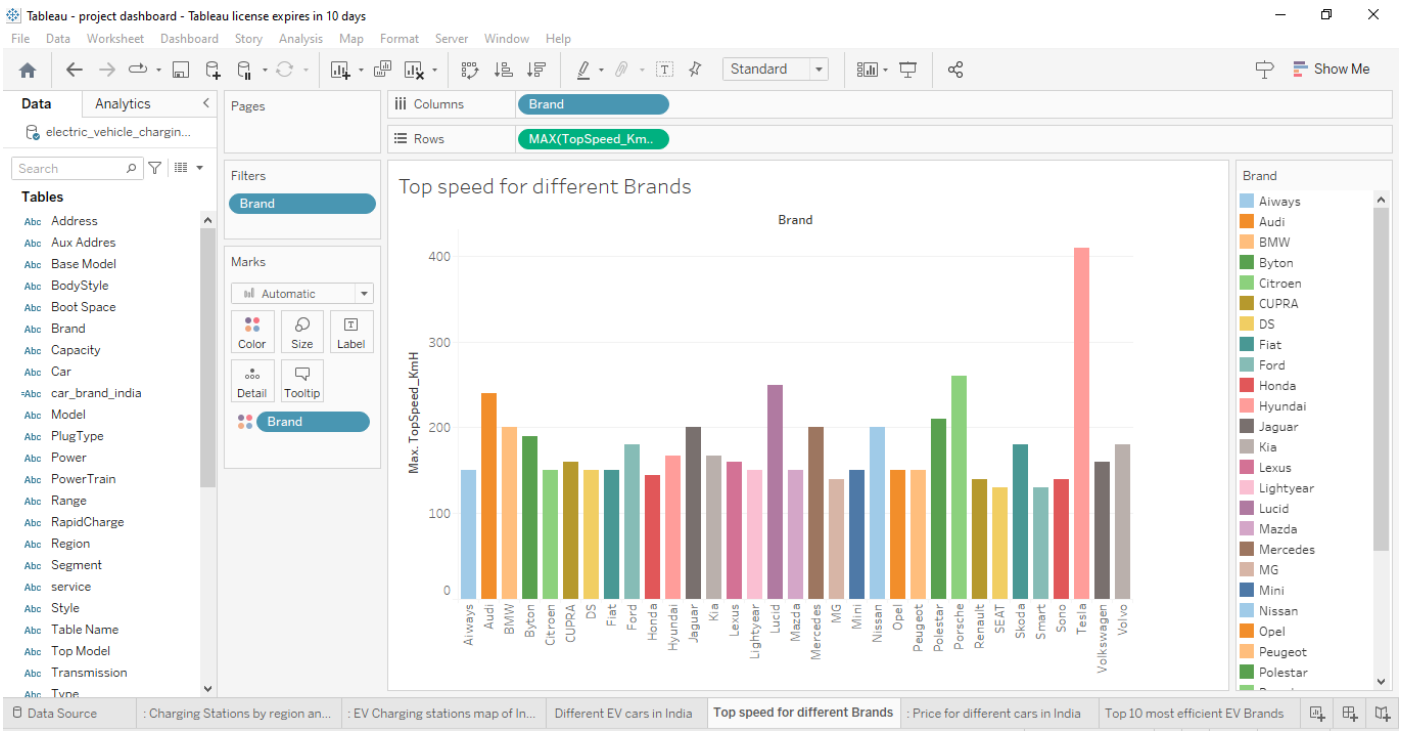
EV Charging stations map of India



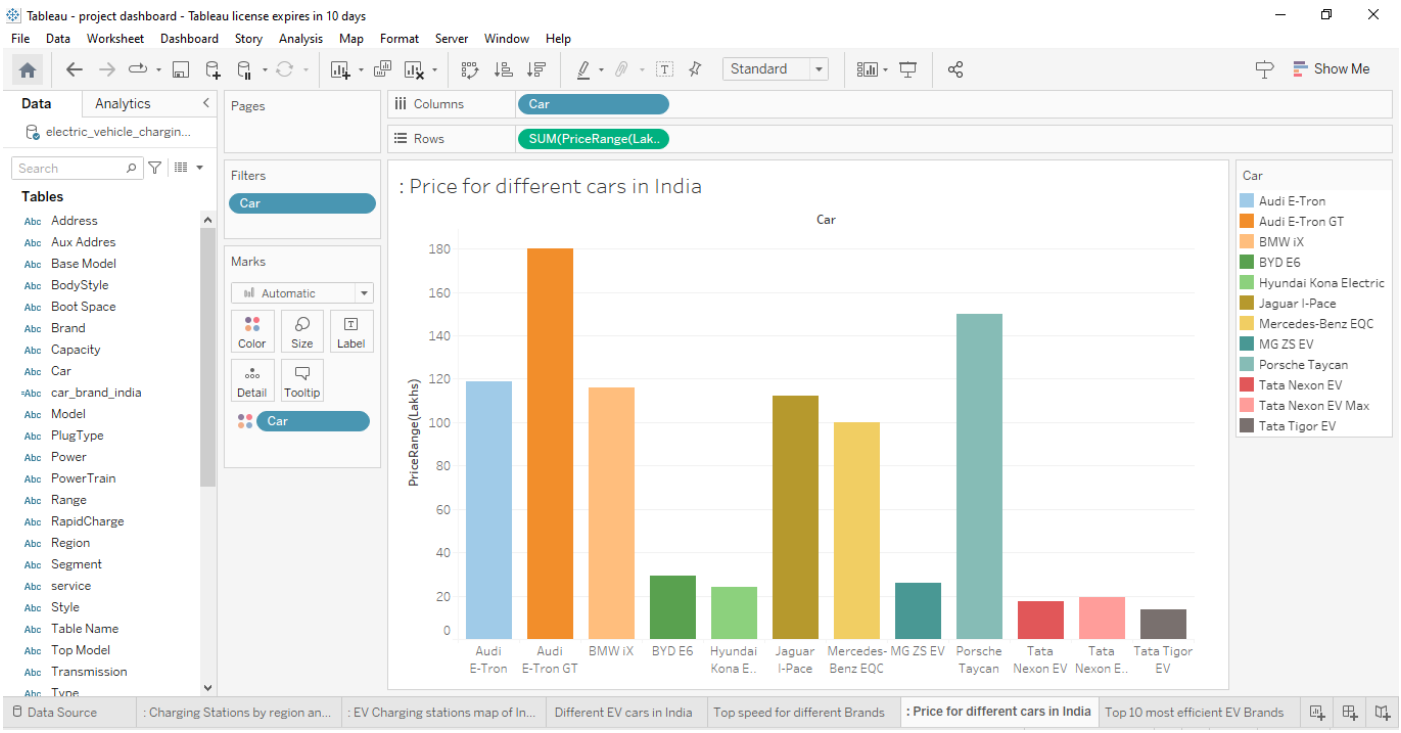
Different EV cars in India



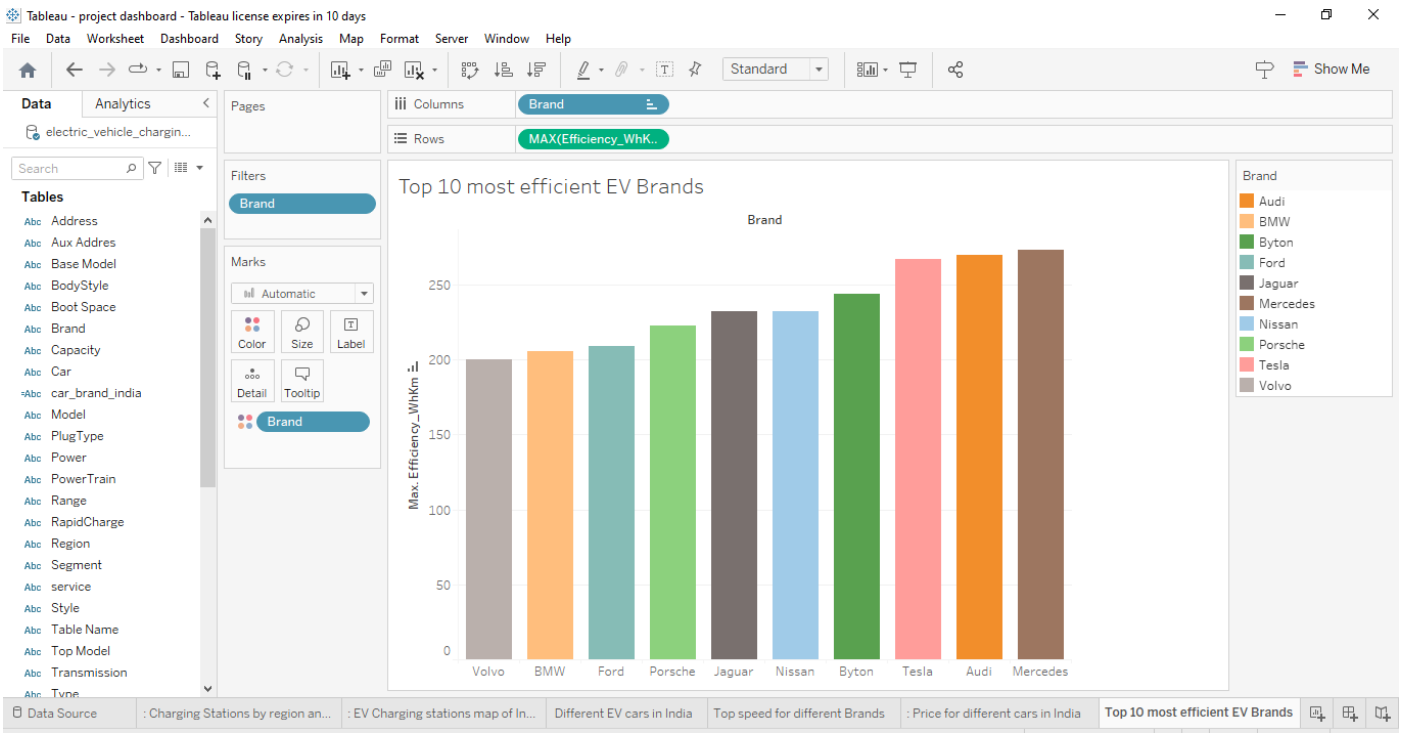
Top speed for different Brands



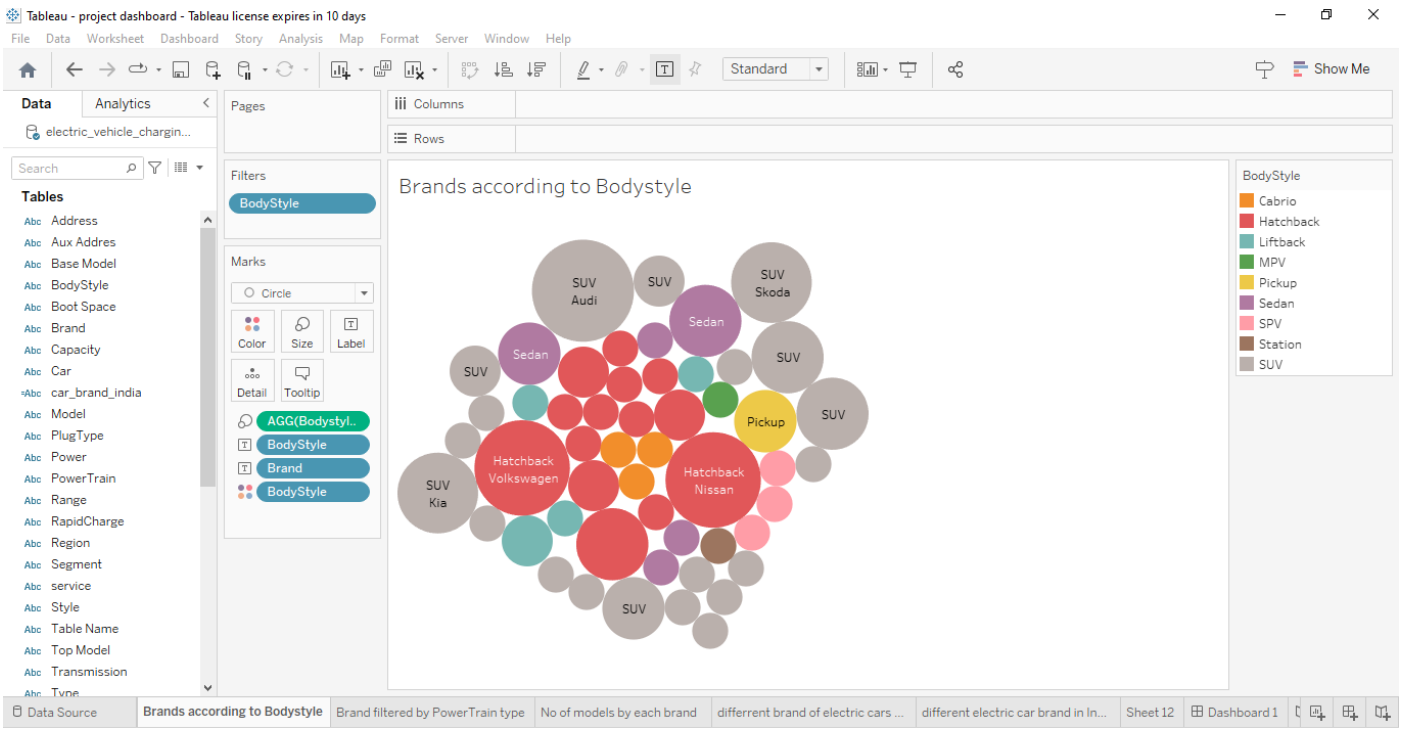
Price for different cars in India



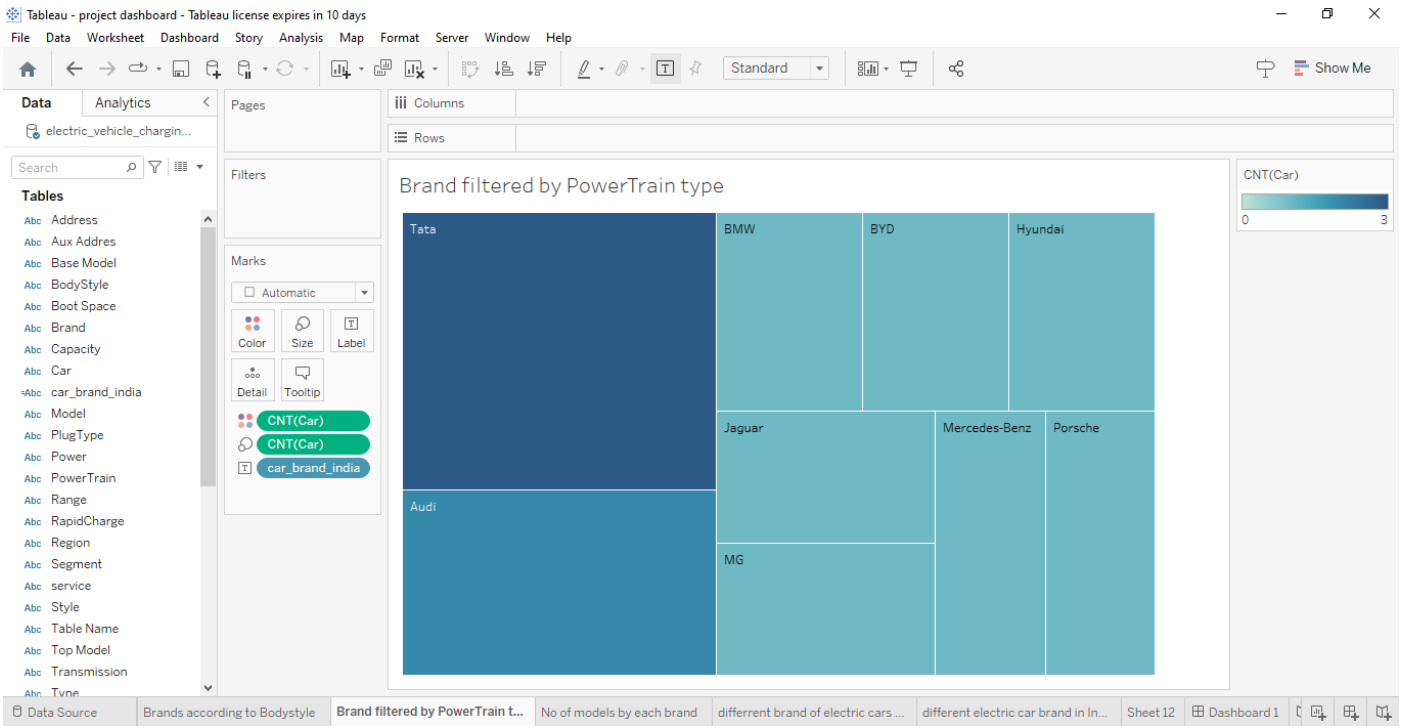
Top 10 most efficient EV Brands



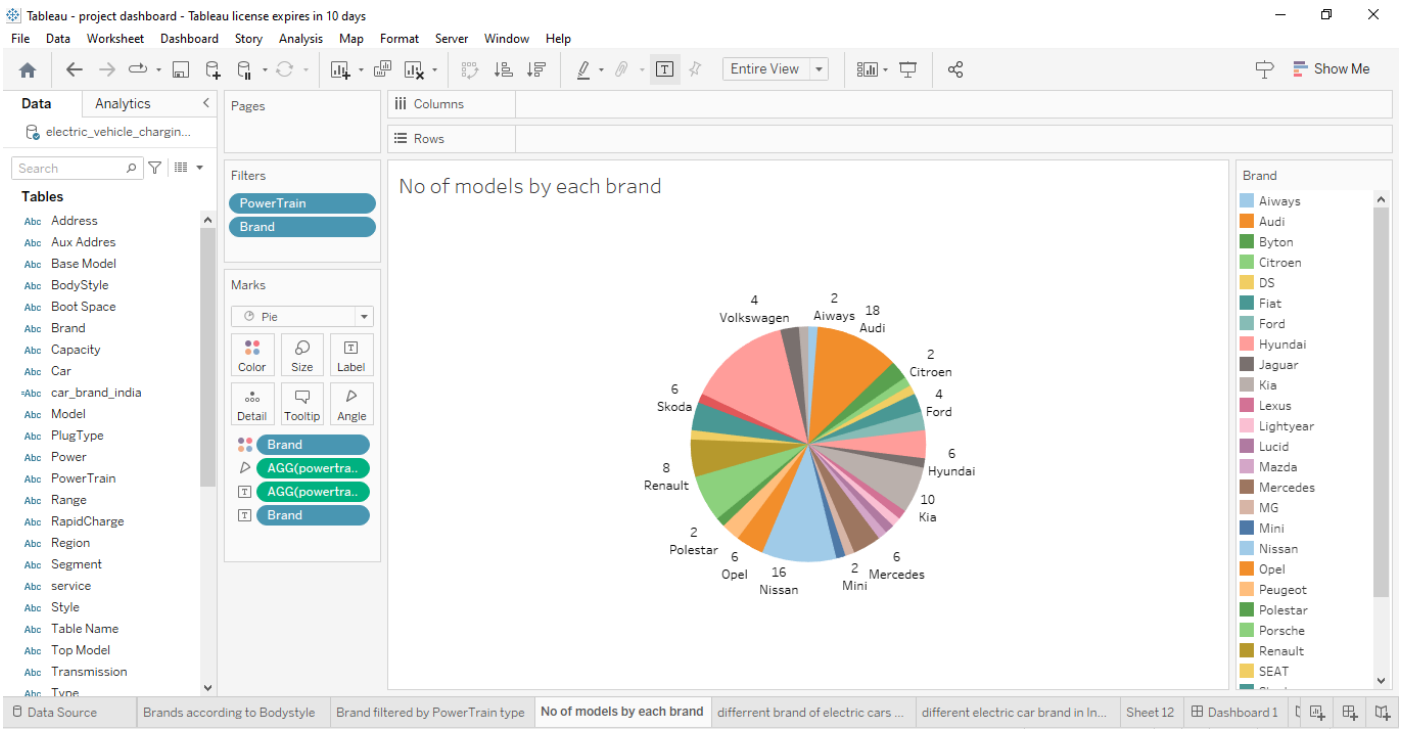
Brands according to Bodystyle



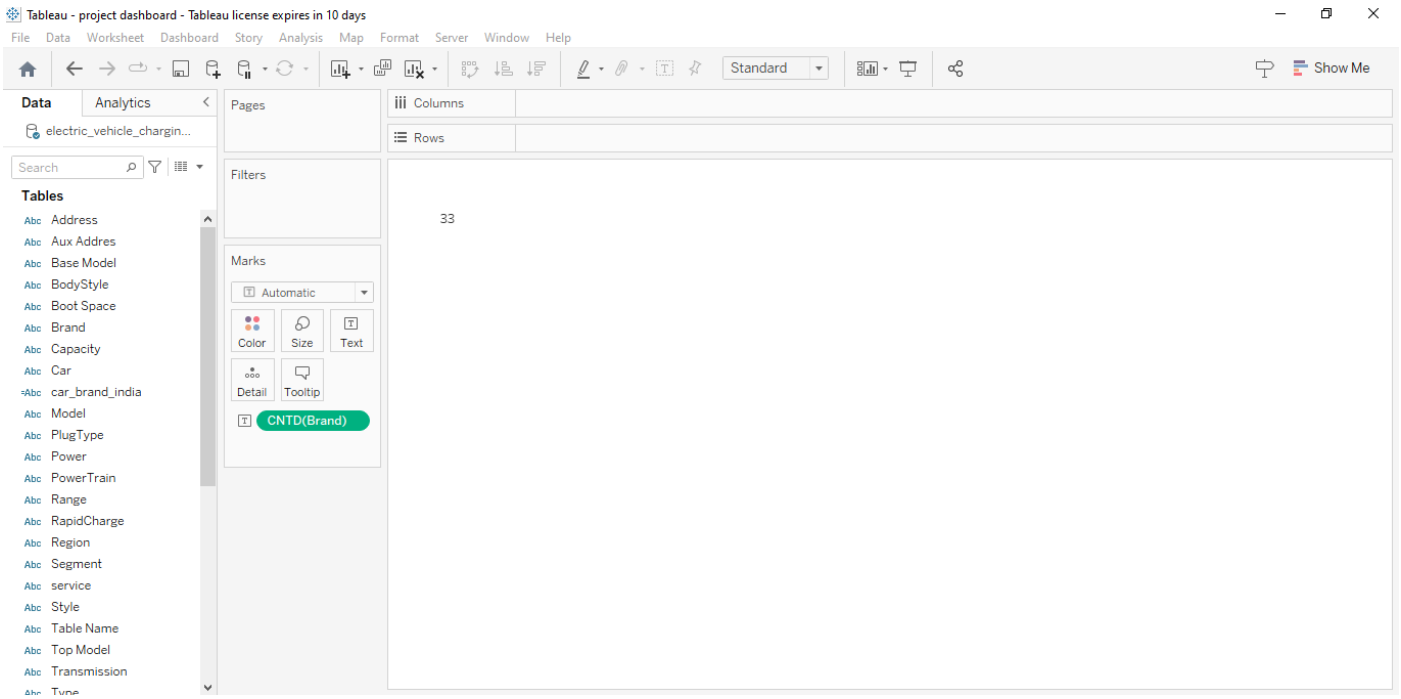
Brand filtered by PowerTrain type



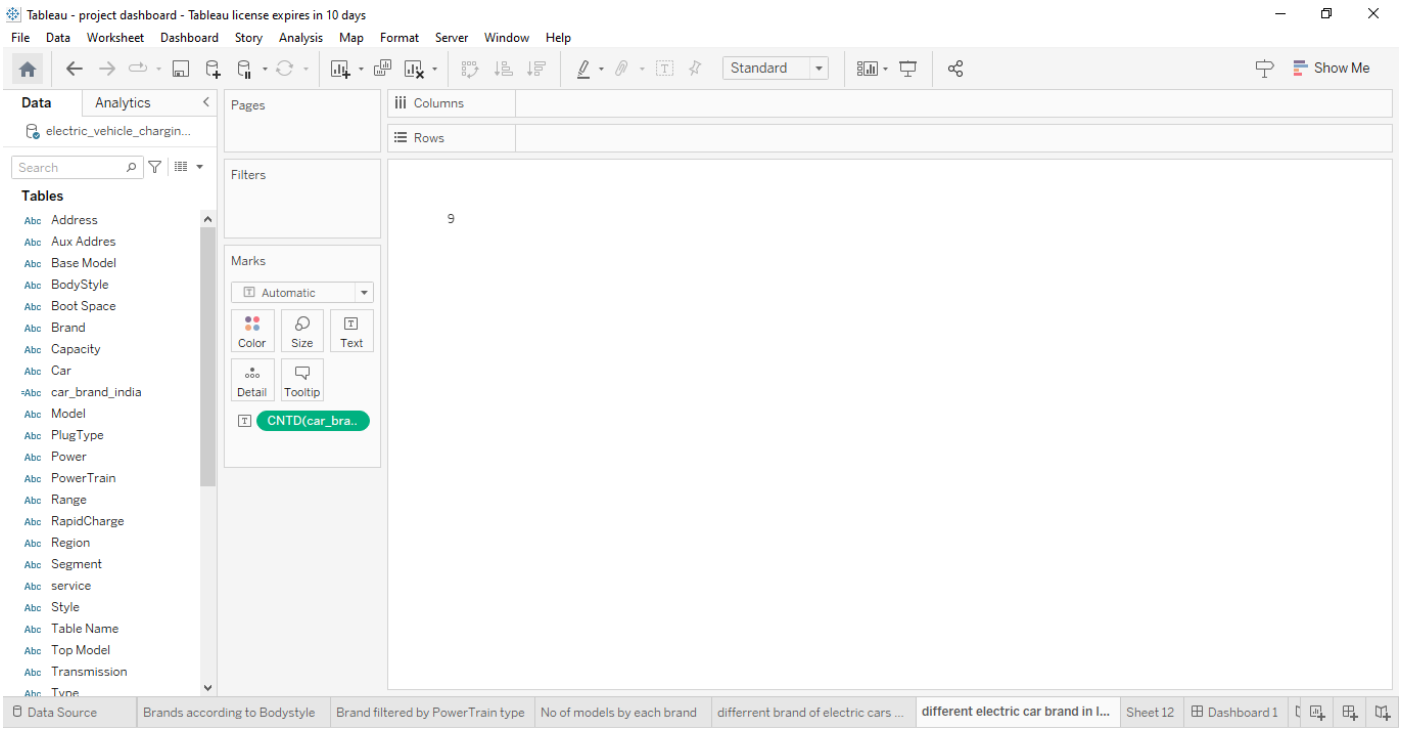
No of models by each brand



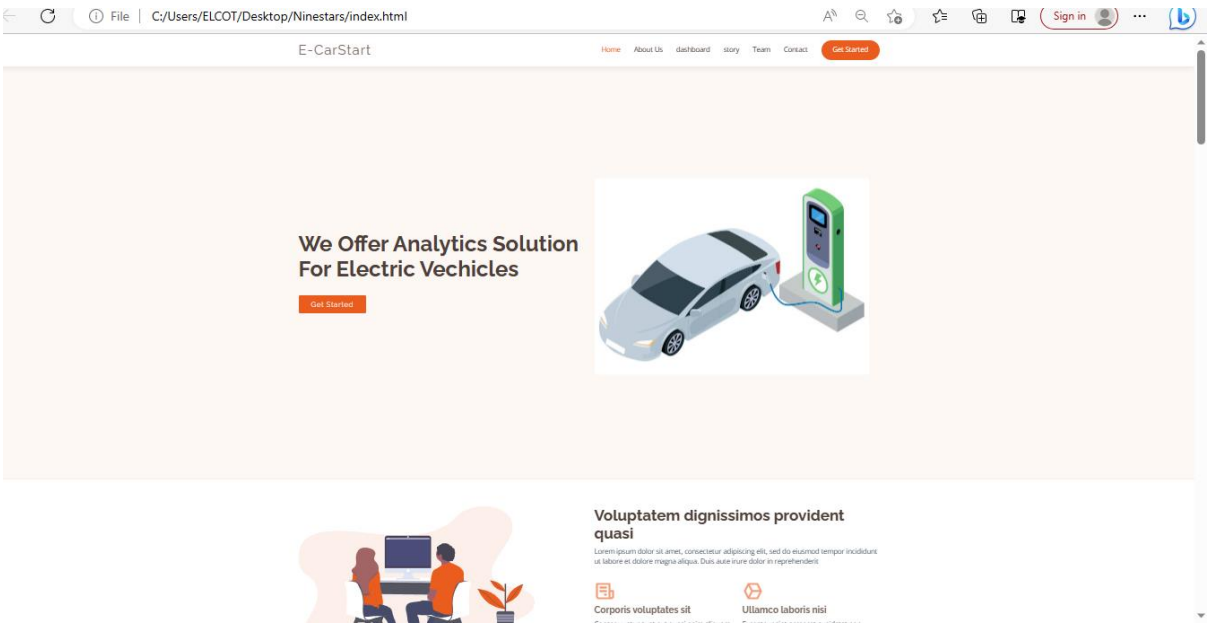
Summary card for Different brands of EV Cars globally

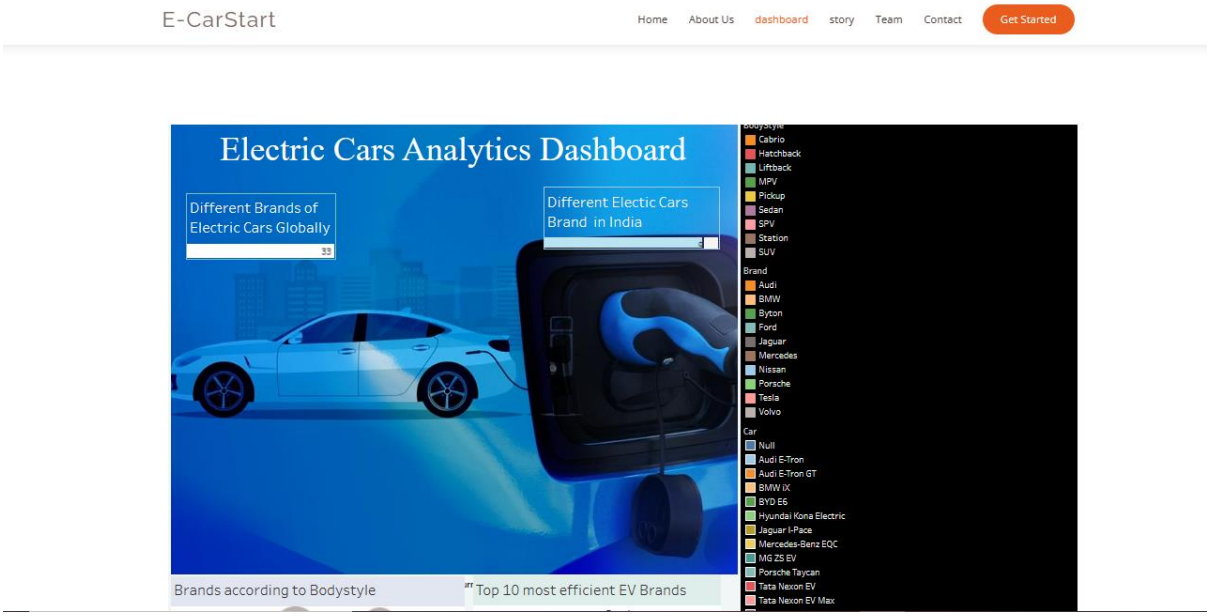


Summary card for Different brands of EV Cars in India



Dashboard

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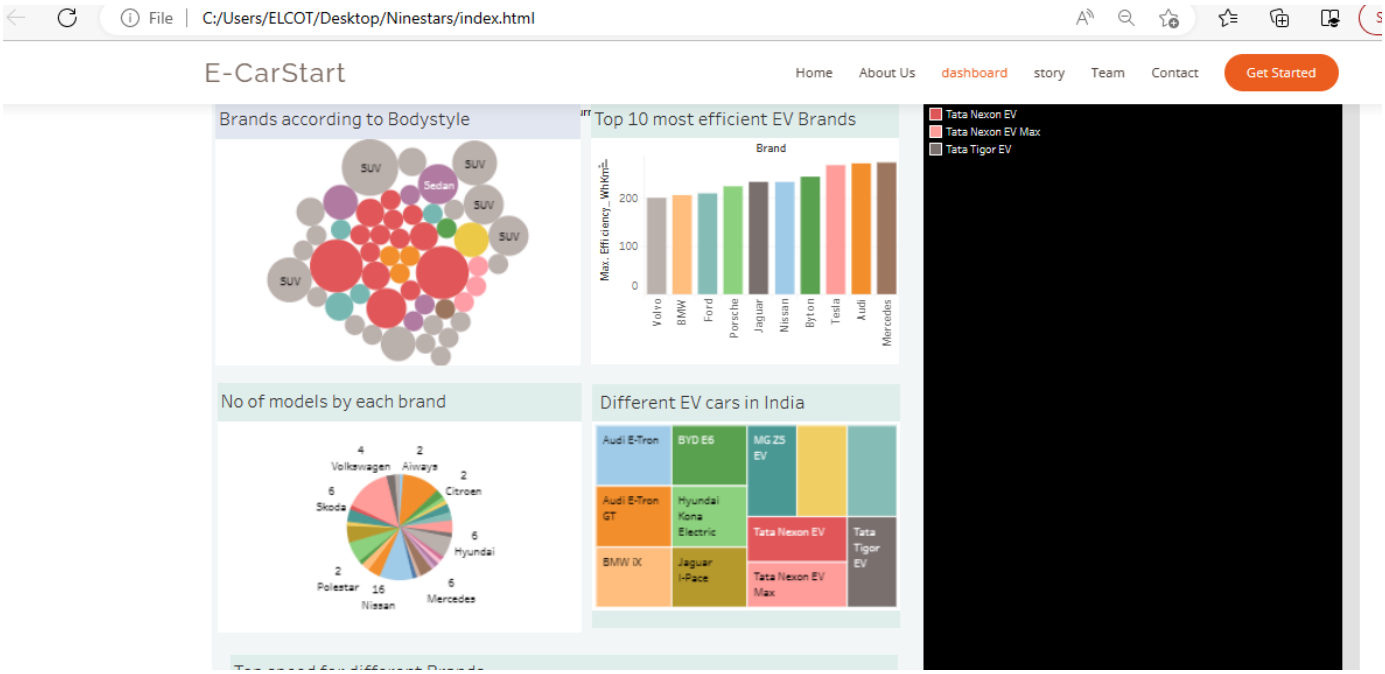
Different Brands of Electric Cars Globally
Different Electic Cars Brand in India
Brands according to Bodystyle
Top 10 most efficient EV Brands
Cabrio
Hatchback
Liftback
MPV
Pickup
Sedan
SPV
Station
SUV
Brand
Audi
BMW
Byton
Ford
Jaguar
Mercedes
Nissan
Porsche
Tesla
Volvo
Car
Null
Audi E-Tron
Audi E-Tron GT
BMW iX
BYD E6
Hyundai Kona Electric
Jaguar I-Pace
Mercedes-Benz EQC
MG ZS EV
Porsche Taycan
Tata Nexon EV
Tata Nexon EV Max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Brands according to Bodystyle
SUV
Sedan
Top 10 most efficient EV Brands
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Volvo
BMW
Ford
Porsche
Jaguar
Nissan
Byton
Tesla
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Tata Nexon EV
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Tata Tigor EV
No of models by each brand
4
Volkswagen
2
Aiways
2
Citroen
6
Skoda
6
Hyundai
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Polestar
16
Nissan
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Mercedes
Different EV cars in India
Audi E-Tron
BYD E6
MG ZS EV
Audi E-Tron GT
Hyundai Kona Electric
Tata Nexon EV
Tata Tigor EV
BMW iX
Jaguar I-Pace
Tata Nexon EV Max


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Tata Nexon EV Max
Top speed for different Brands
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Kia
Lexus
Lightyear
Lucid
Mazda
Mercedes
MG
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Smart
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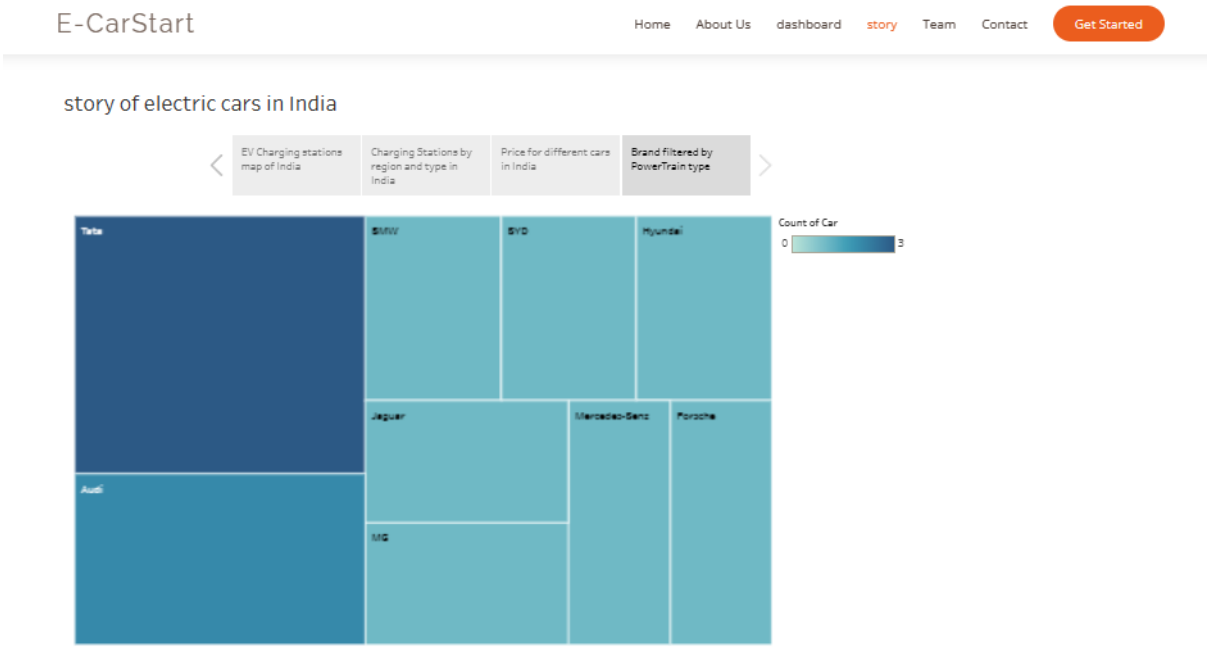
Volvo

Story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EV Charging stations map of India
Charging Stations by region and type in India
Price for different cars in India
Brand filtered by PowerTrain type
Tata
BMW
SVD
Hyundai
Jaguar
Mercedes-Benz
Porsche
Audi
MG
Count of Car
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BYD E6
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Jaguar I-Pace
Mercedes-Benz EQC
MG ZS EV
Porsche Taycan
Tata Nexon EV
Tata Nexon E..
Tata Tigor EV


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Charging Stations by region and type in India
Price for different cars in India
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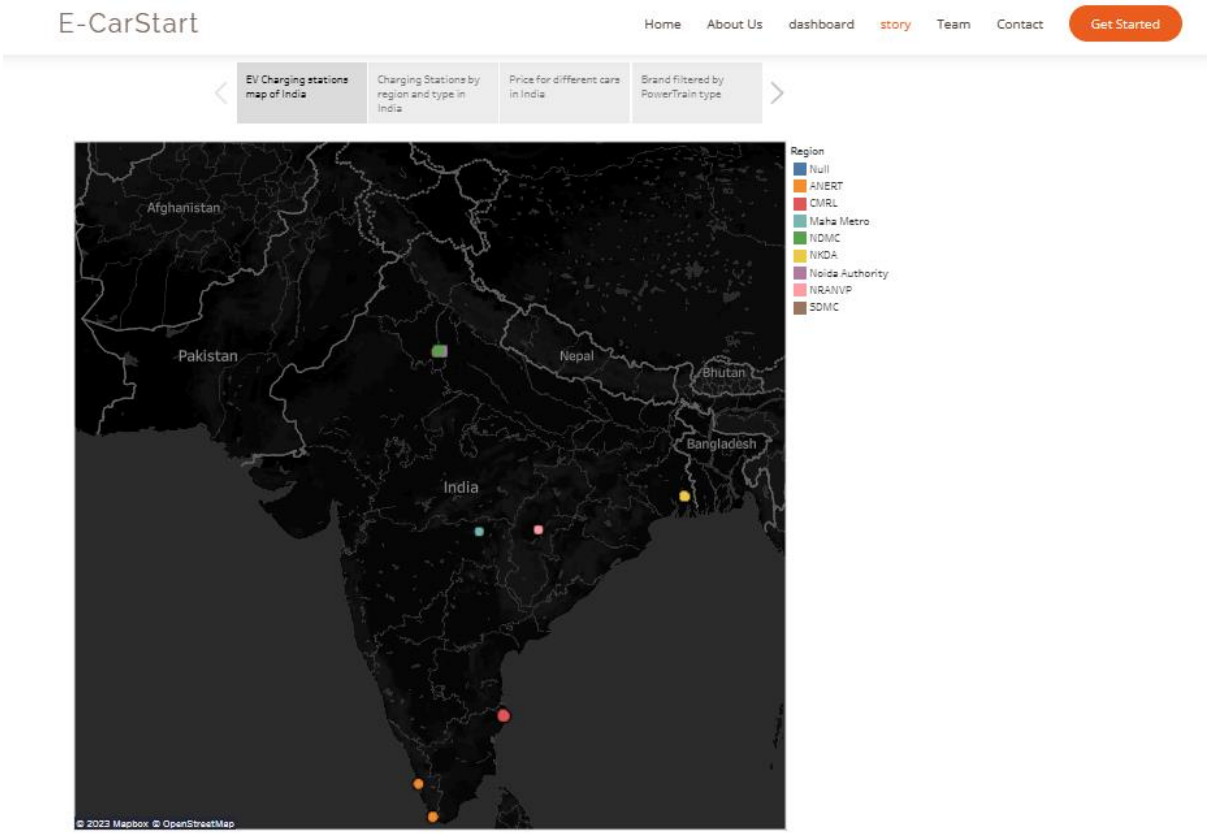
NKDA
Noida Authority
NRANVP
SDMC



4.Advantage and disadvantage

Comparison Table of Pros and Cons of Electric Vehicles

Pros	**Cons**
Electric cars are powered by batteries, thus they emit no emissions, which helps to keep pollution under control in the environment.	Electric vehicles have a high initial purchase cost, and many consumers cannot afford them in their budgets, thus they are hesitant to move from regular vehicles to electric vehicles.
Although electric cars rely on renewable energy, they assist to protect nonrenewable energy supplies, which are fast depleting owing to broad use.	Due to the lack of electric car models accessible to the market, buyers have few alternatives in terms of design, appearance, or customized variants.

The moving components in electric vehicles are less numerous than those in traditional automobiles, which means they last longer. Repairing EVs is also less expensive than regular automobiles.	People who travel long distances are concerned about becoming stuck because there are fewer charging outlets accessible.
Driving an electric car is significantly smoother and quieter since there are no fast-moving pistons.	The charging time of an electric car is around four to six hours.
Governments all across the globe have provided tax breaks to encourage people to buy electric vehicles.	The electric vehicle gets less mileage than gasoline-powered vehicles and is only appropriate for short journeys.

5.Application

AA **hybrid electric vehicle** (**HEV**) is a type of hybrid vehicle that combines a conventional internal combustion engine (ICE) system with an electric propulsion system (hybrid vehicle drivetrain). The presence of the electric powertrain is intended to achieve either better fuel economy than a conventional vehicle or better performance

A hybrid-electric produces lower tailpipe emissions than a comparably sized gasoline car since the hybrid's gasoline engine is usually smaller than that of a gasoline-powered vehicle. If the engine is not used to drive the car directly, it can be geared to run at maximum efficiency, further improving fuel economy.

- **Lower maintenance due to an efficient electric motor**
  Electric motors have less parts that lead to less damage than a traditional non electric vehicle which means you save on operating cost!
- **Better Performance**
  Electric cars are not only lighter but have faster acceleration

6.Conclusion

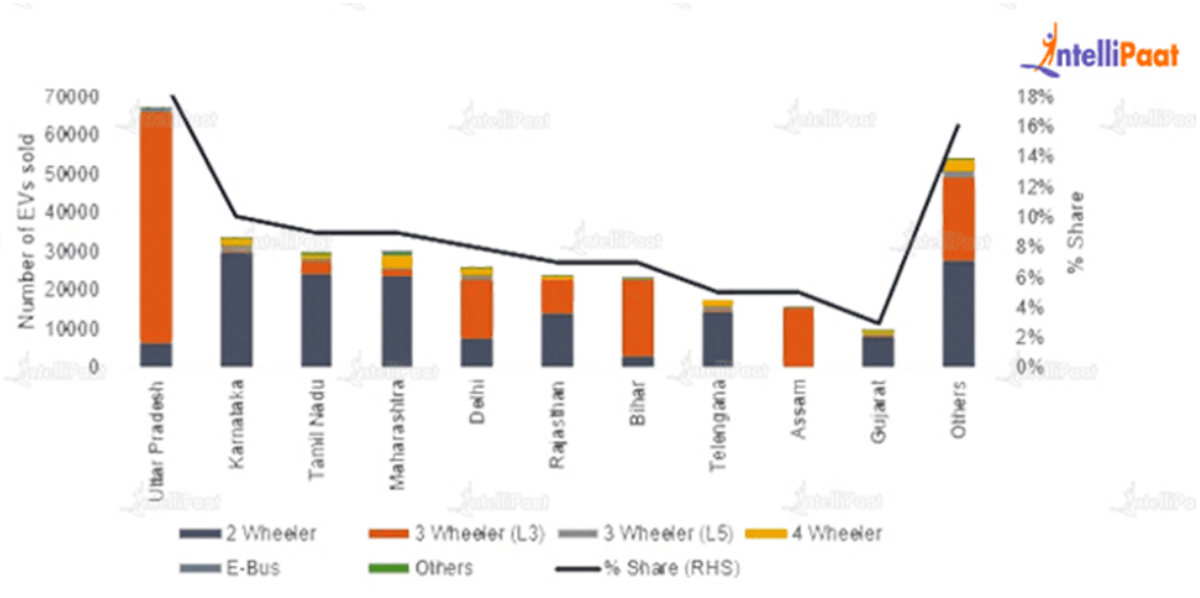
Although electric vehicle manufacturers must solve the hurdles that are currently preventing people from purchasing, the future is clear: EVs will outlast gas-powered automobiles in the long run. Both GM and Nissan declared in January 2021 that they will go all-electric by the 2030s. Other automakers will undoubtedly follow suit.

7.Future scope

Most Indian buyers believe that an electric vehicle will be ready by 2023, but the majority also believe that it would no longer be available until 2025. Consumers in India are looking for a lower price for EVs than those in other countries, with the global average tipping price for EVs being $36,000. (around Rs27 lakh).

The cost of lithium-ion batteries is roughly $250/kWh globally, which translates to approximately Rs5.7 lakh in battery prices alone. Currently, lithium-ion batteries account for half of the cost of an electric vehicle, making them more expensive than conventional vehicles. This is consistent to reach net zero carbon emissions by 2070.

The Indian electric vehicle market was worth USD 1,434.04 million in 2021, and it is predicted to grow to USD 15,397.19 million by 2027, at a CAGR of 47.09% during the forecast period (2022-2027).



Despite the challenges facing us, and the impact these have on the sale of EVs, it is clear that EV remains the immediate future for zero-emissions vehicles. We are simply too far down the line to reverse the ever-increasing reliance on EV, and manufacturers and consumers alike know this.

8.Appendix

A. source Code

https://intellipaat.com/blog/future-of-electric-vehicles-in-india/

https://www.javatpoint.com/advantages-and-disadvantages-of-electric-vehicles

https://www.iea.org/reports/global-ev-outlook-2021/trends-and-developments-in-electric-vehicle-markets

project links

1. web template

   Electric car Analytics

2. Dashboard link

https://public.tableau.com/app/profile/janani.karunakaran/viz/shared/9JWHTS9M3

3. Story link

https://public.tableau.com/views/storyofevcars/storyofelectriccarsinIndia?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link