VISUALIZATION TOOL FOR ELECTRIC VEHICLE CHARGE AND RANGE ANALYSIS:

1.INTRODUCTION

1.1 OVERVIEW:

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 the new

EV’s are combined Electrical storage and propulsion thread that runs through all these elements is data analytics. Systems with electronic sensors controls, and actuators, integrated closely with software, secure data transfer to form a comprehensive transportation solution.

1.2 PURPOSE:

Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel. Electric vehicles are more efficient, and that combined with the electricity cost means that charging an electric vehicle is cheaper than filling petrol or diesel for your travel requirements.

2.PROBLEM DEFINITION AND DESIGN THINKING:

2.1 EMPATHY MAP:

Template

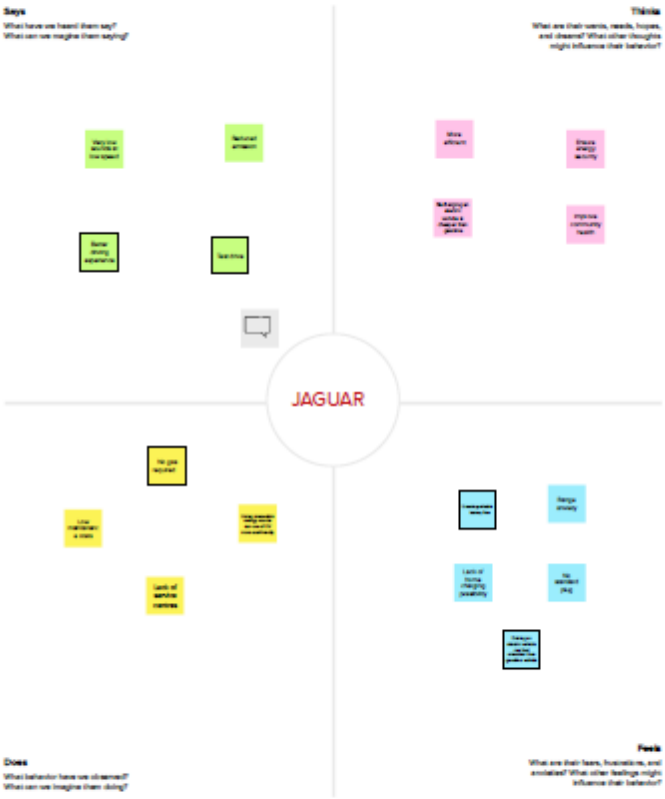
Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

Share template feedback

Build empathy

The information you add here should be representative of the observations and research you've done about your users.

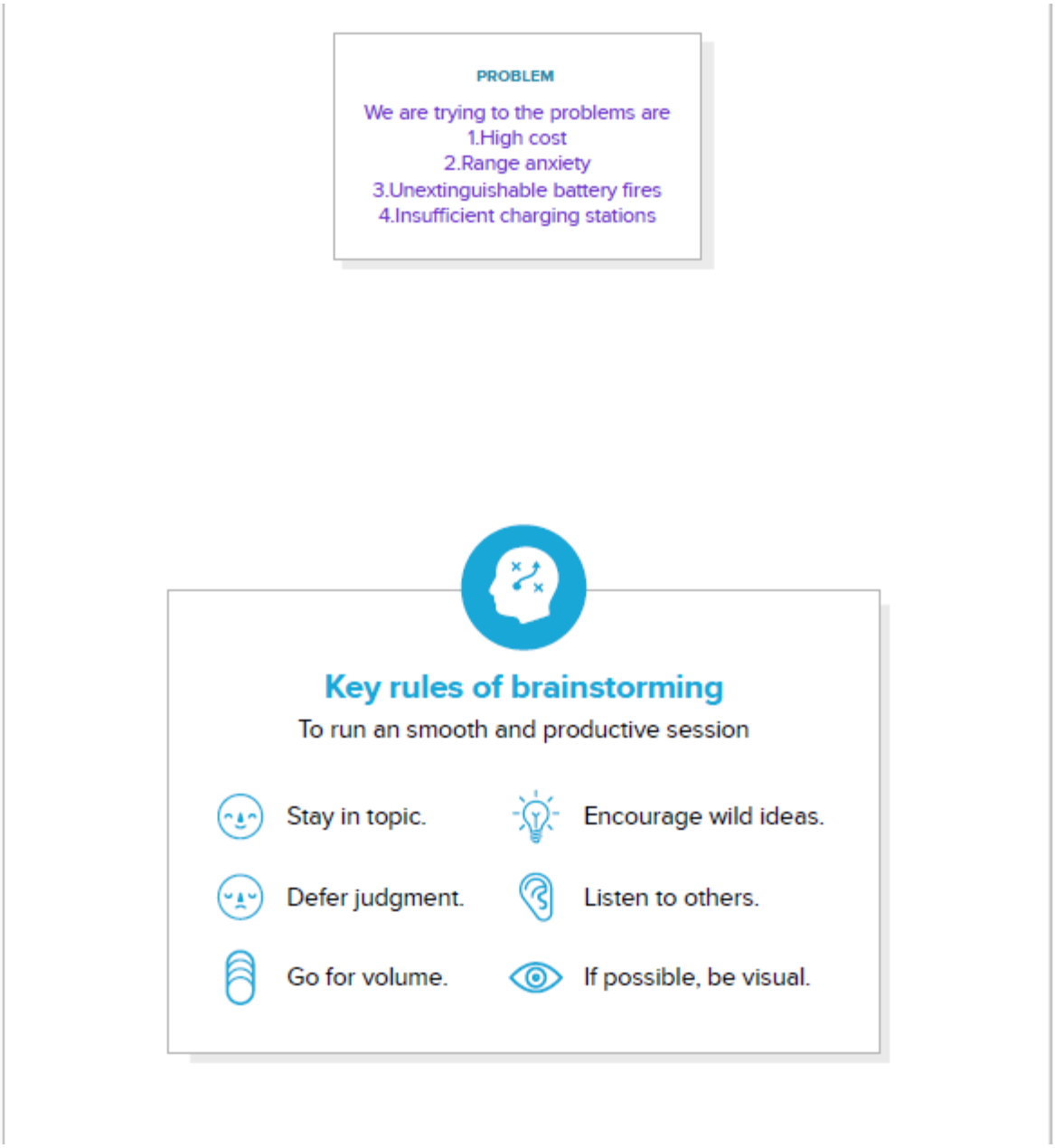


Need some inspiration?

See a finished version of this template to kickstart your work.

Open example →

2.2 IDEATION AND BRAINSTORMING MAP:



Brainstorm

Write down any idea that come to mind that address your problem statement.

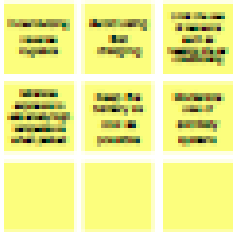
10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

NIVETHITHA

SIVARANJANI



BHUVANESHWARI

SUBIKSHA

Person 5

Person 6

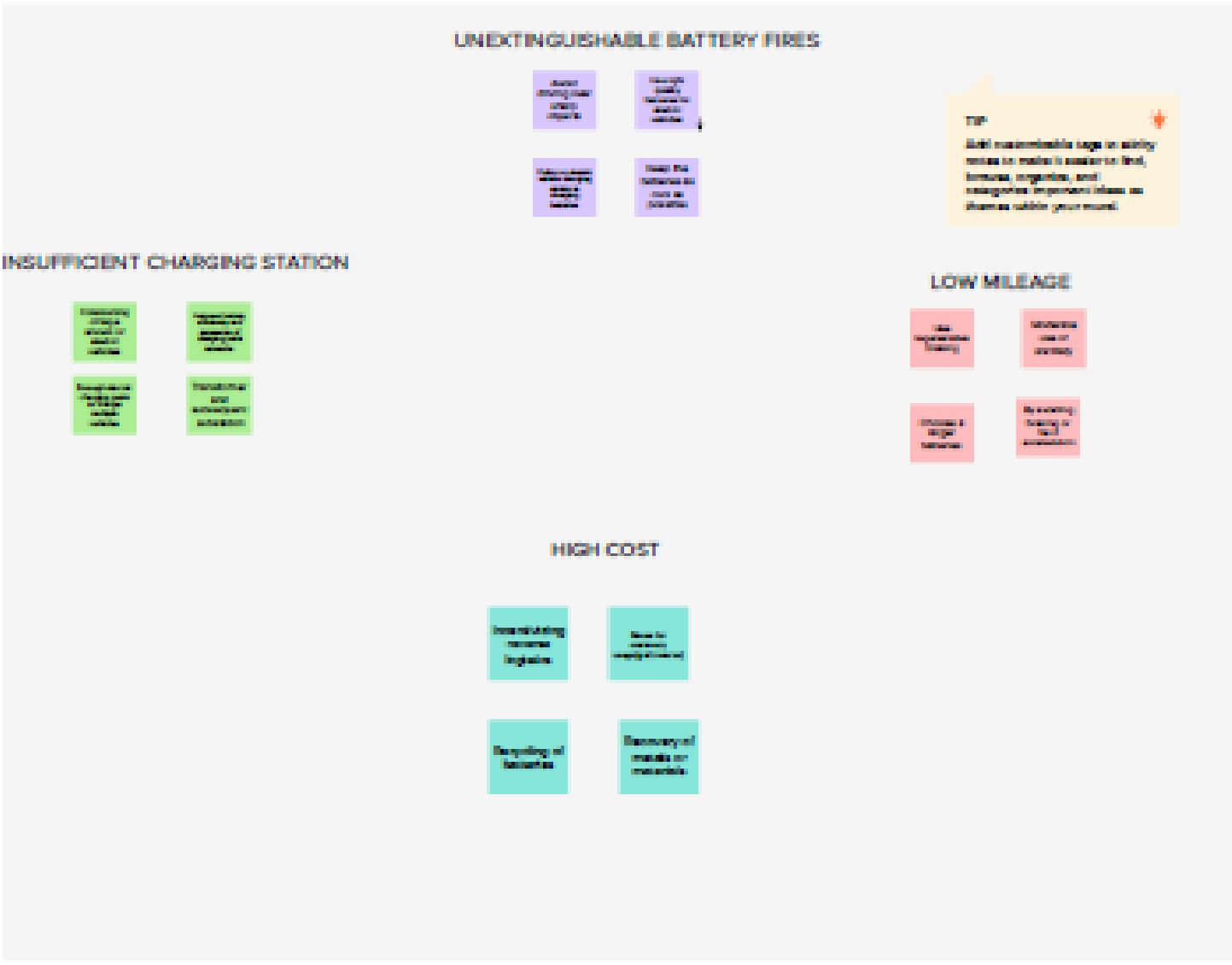
Person 7

Person 8

Group Ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

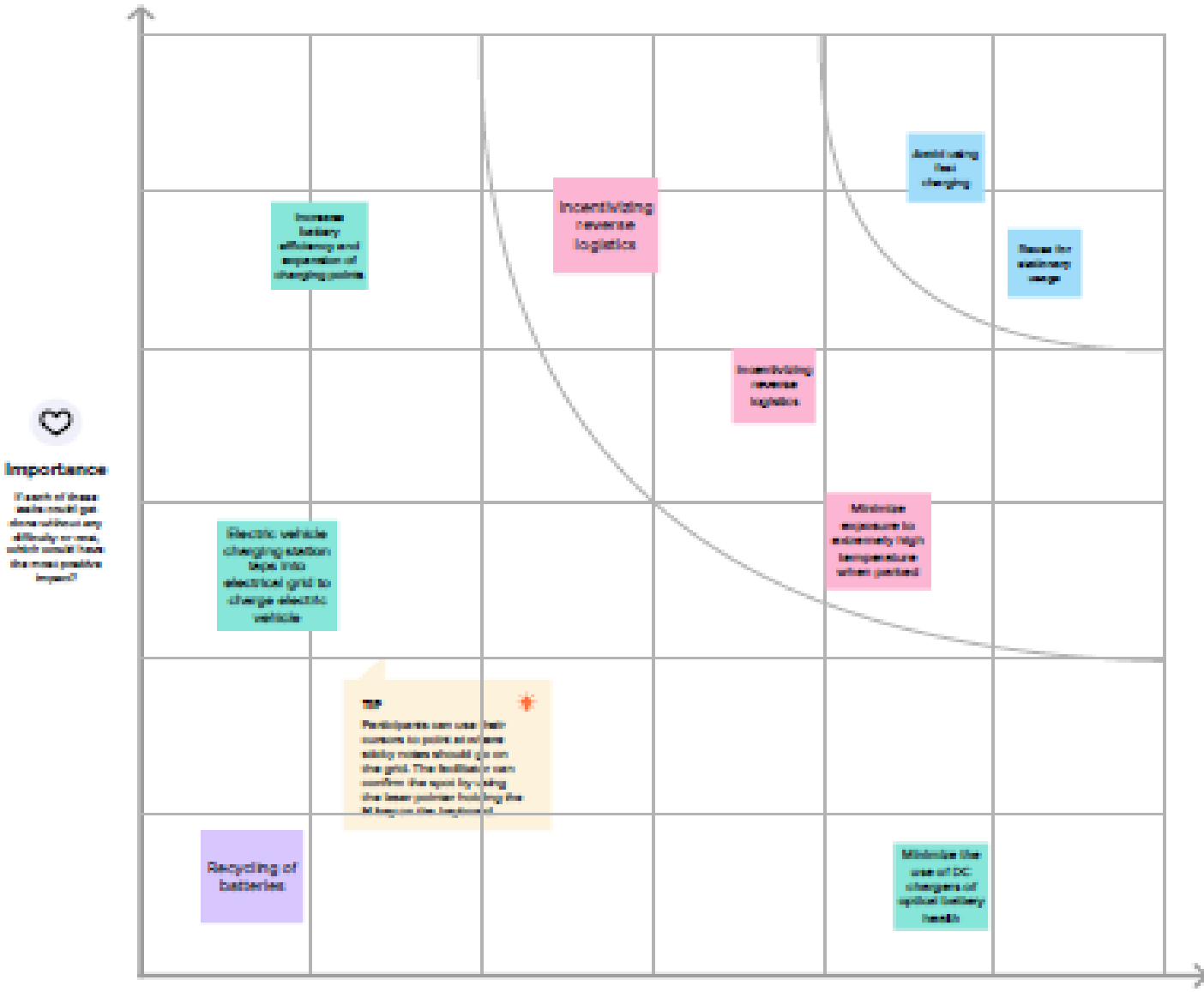


4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



3.RESULT:


ELECTRIC CARS
ANALYTICS
Home
About
Dashboard
story
Team
Drop Down
Contact
Get Started
We offer modern analytics solutions for electric vehicles
We are team of talented designers making websites with Bootstrap
Get Started
Watch Video

DASHBOARD

Brand

Aiways	Lightyear	Sono
Audi	Lucid	Tesla
BMW	Mazda	Volksw...
Byton	Mercedes	Volvo
Citroen	MG	
CUPRA	Mini	
DS	Nissan	
Fiat	Opel	
Ford	Peugeot	
Honda	Polestar	
Hyundai	Porsche	
Jaguar	Renault	
Kia	SEAT	
Lexus	Skoda	

Different brands of electric car in India

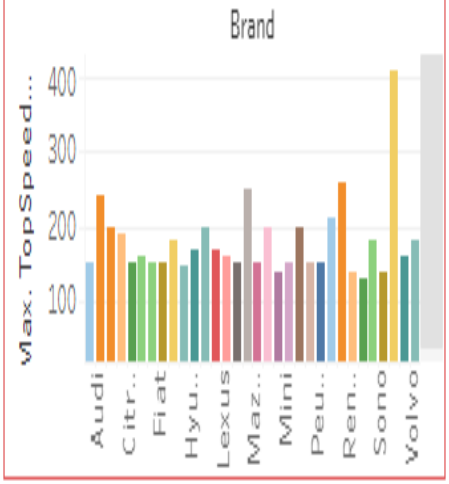
9

Different brands electric car globally

32

Brand according to bodystyle

Top speed for different brands

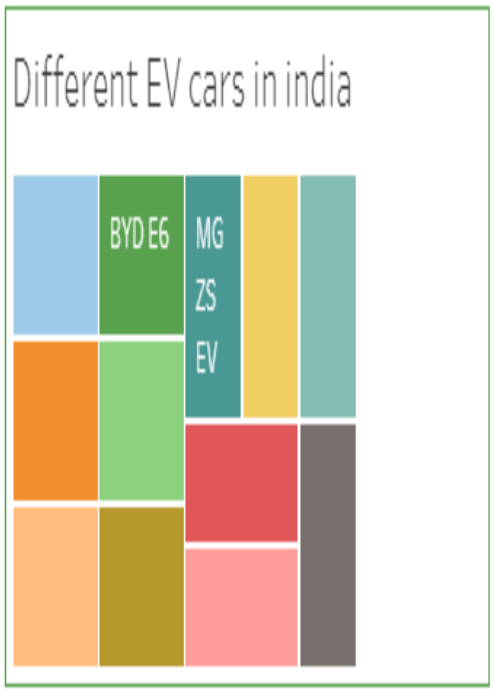


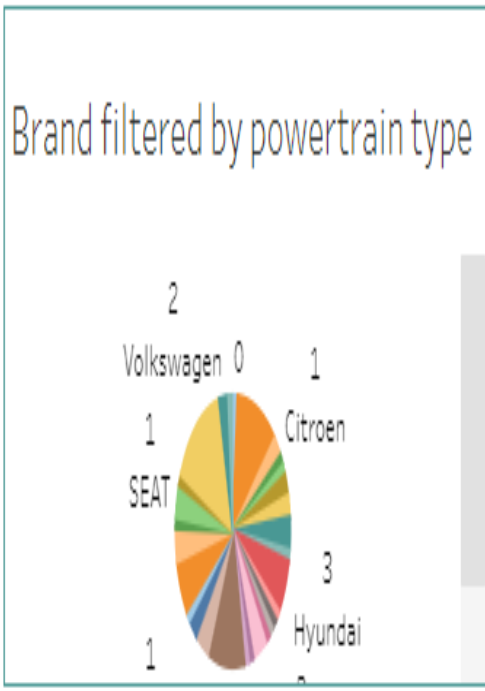
Region

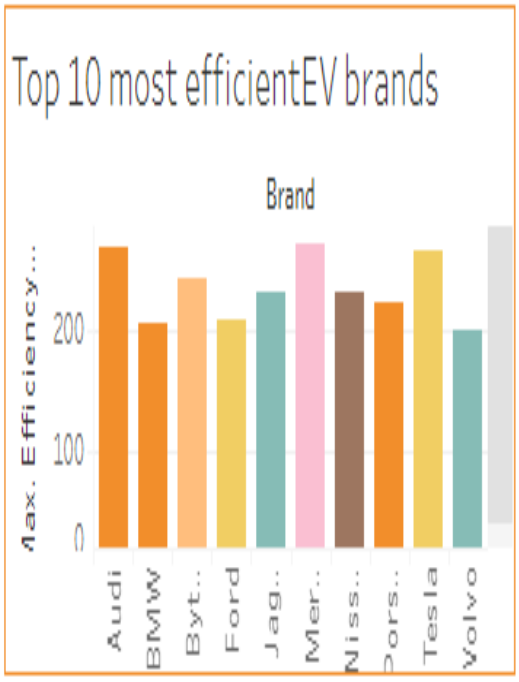
- ANERT
- CMRL
- Maha Metro
- NDMC
- NKDA
- Noida Authority
- NRANVP
- SDMC

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
- Tata Tigor EV

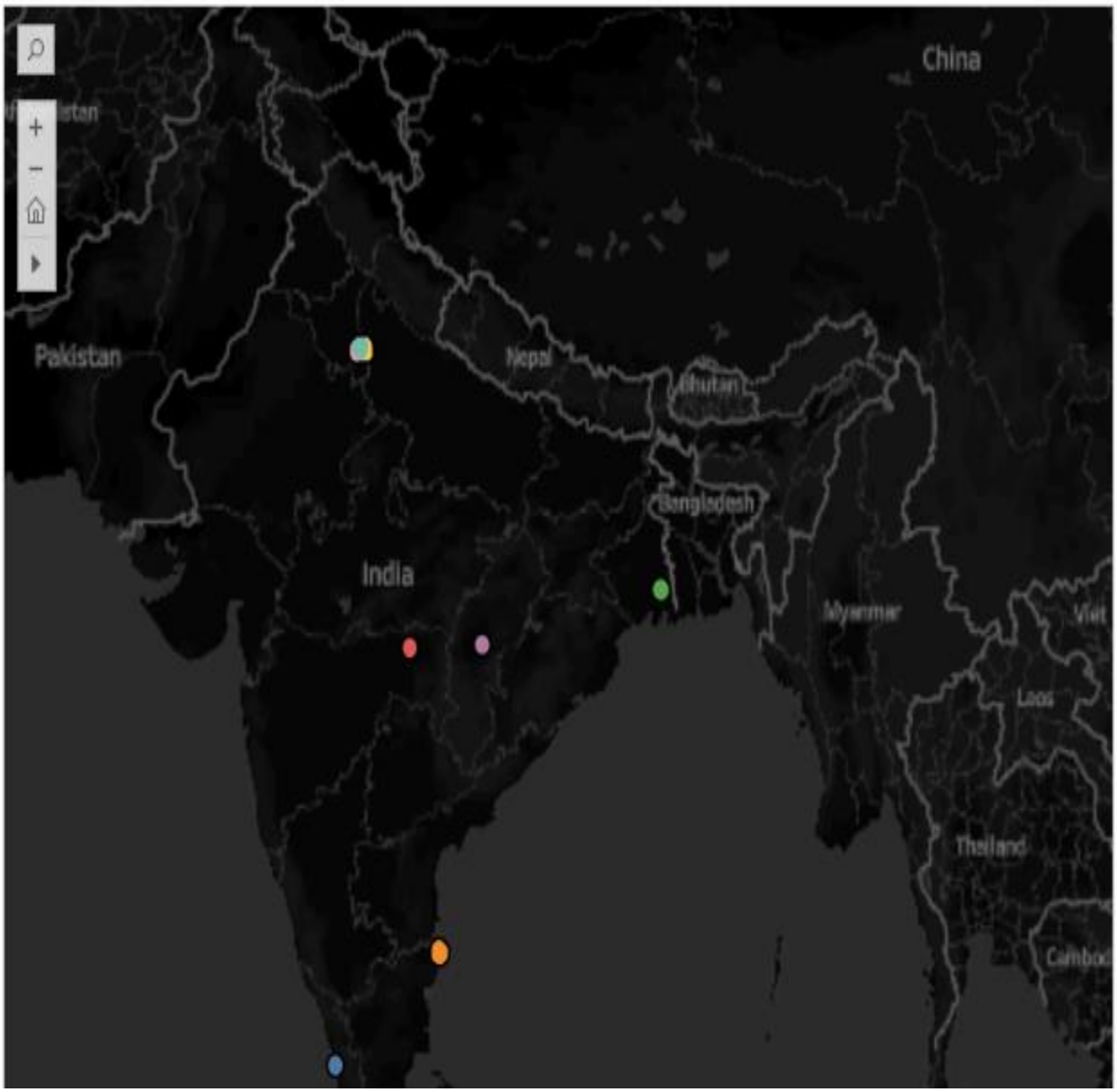






Story of electric cars in India

count of models by each brand | Price for different cars in India | Charging station by region | EV charging station india



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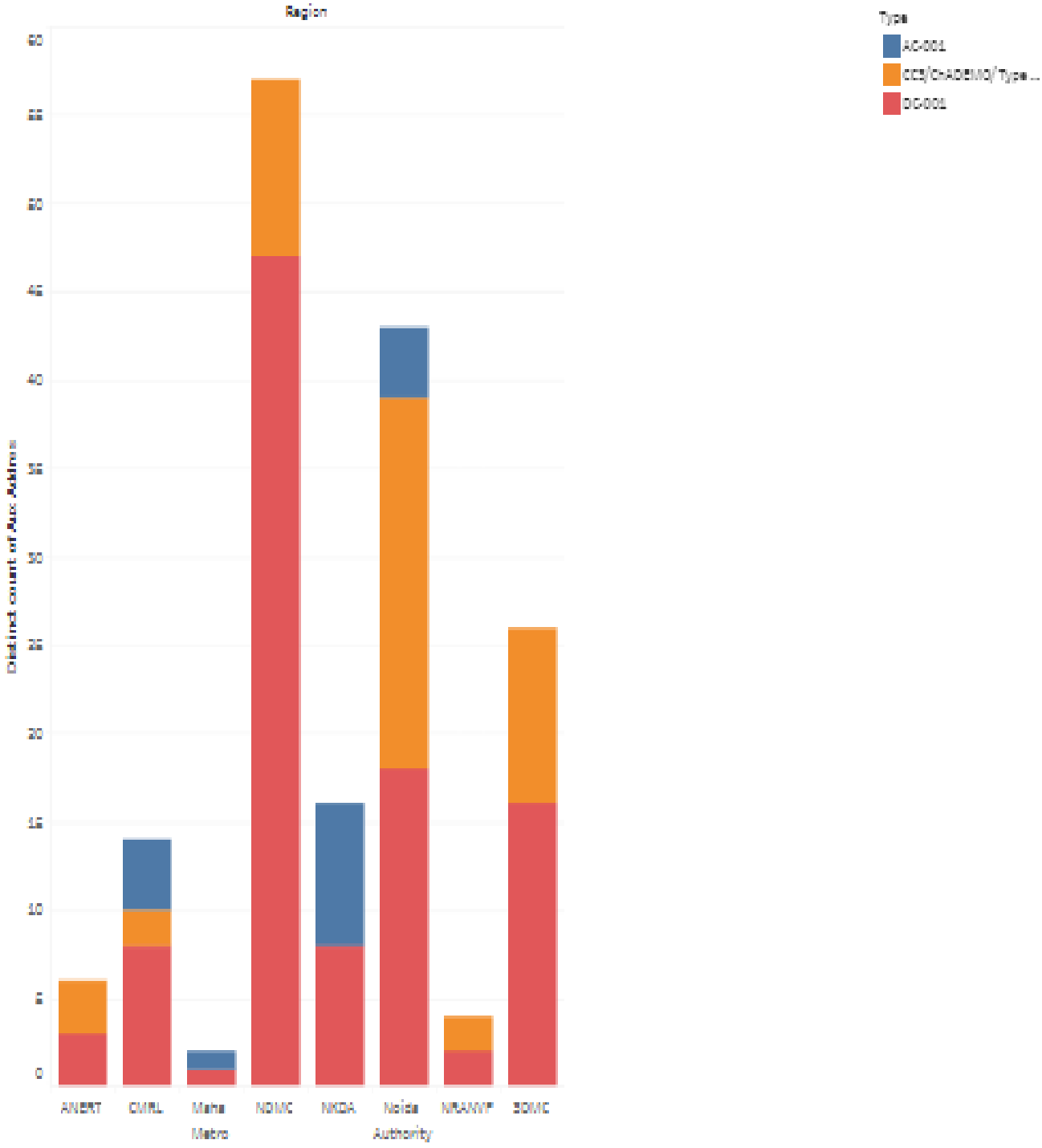

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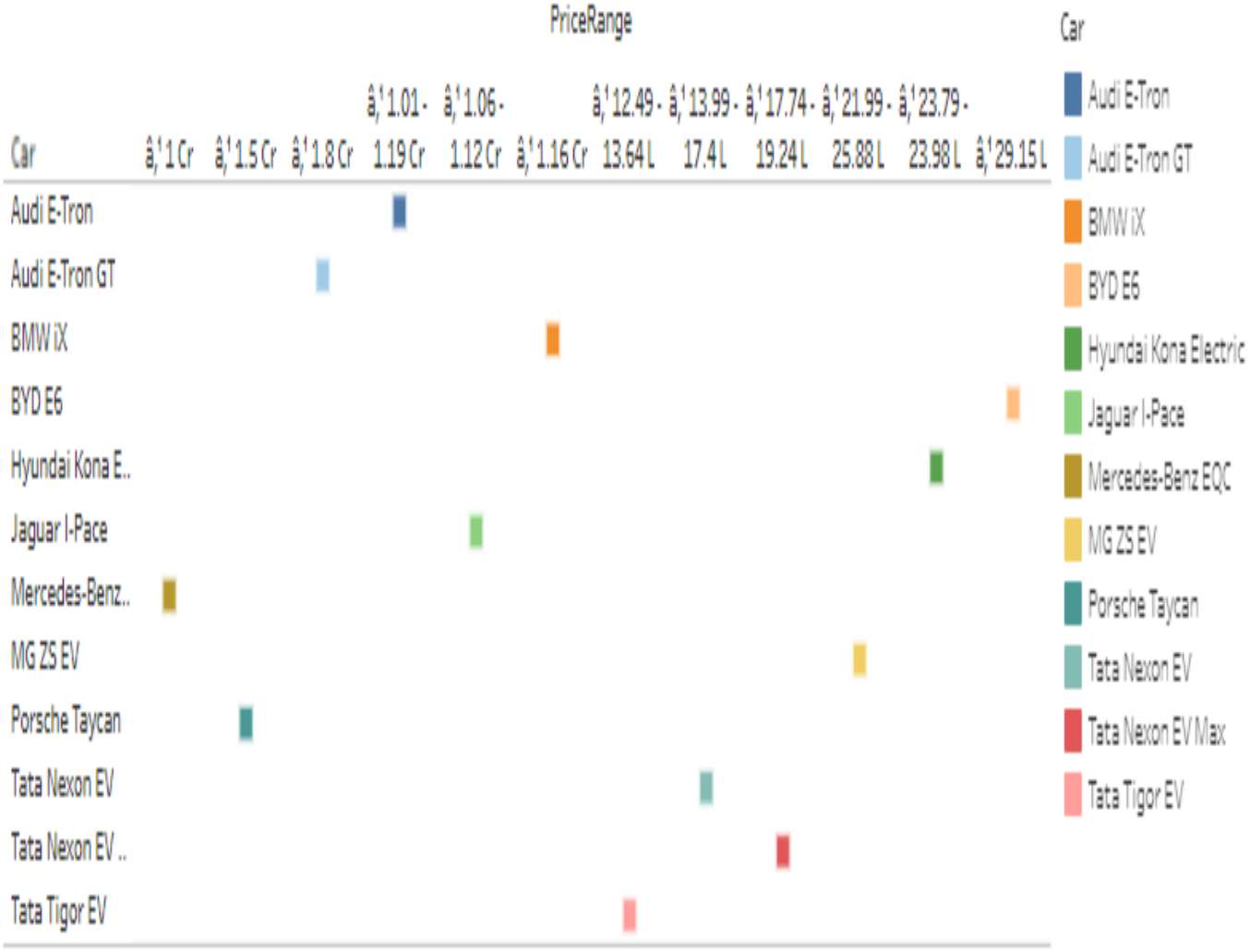

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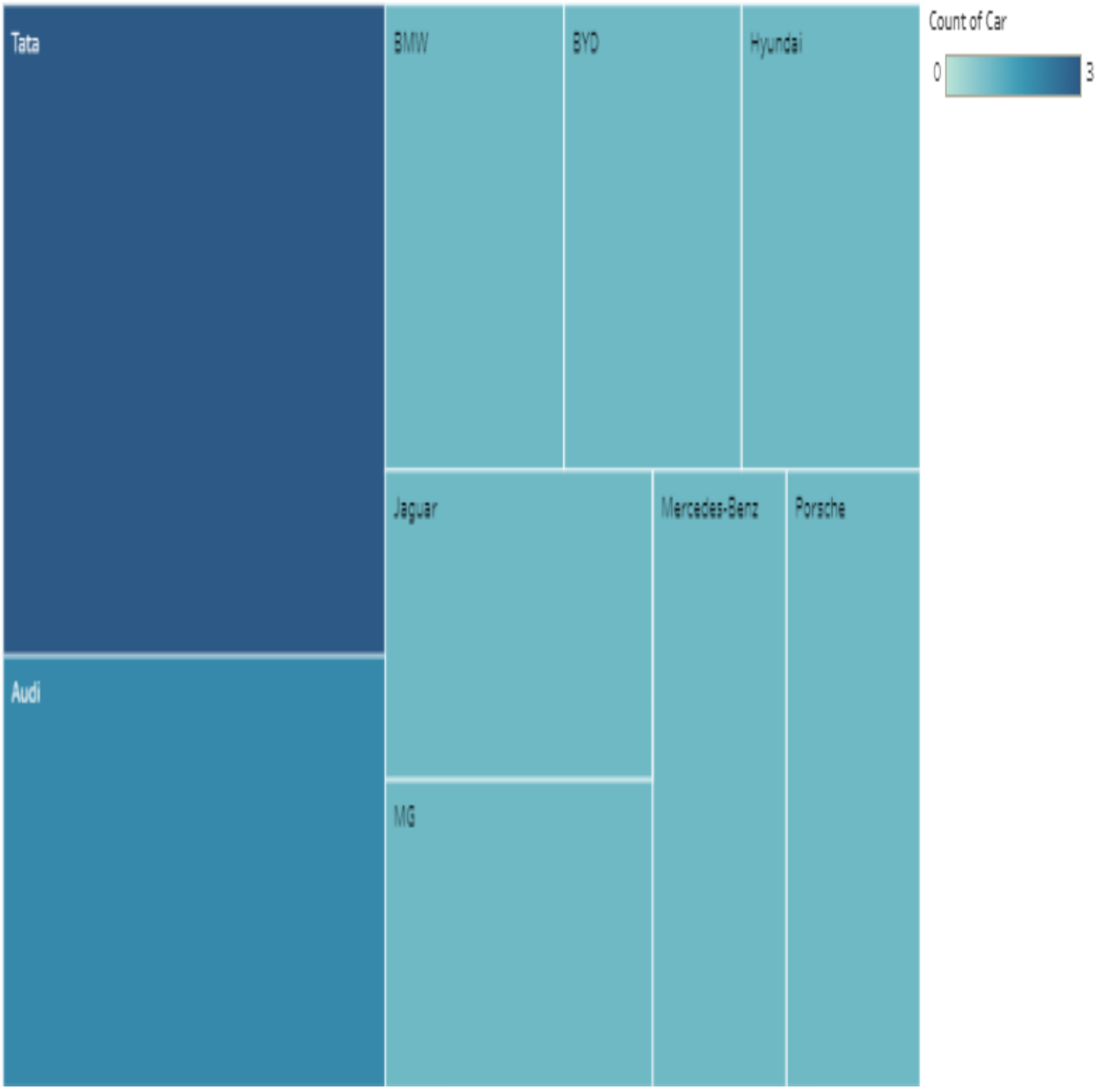


4. ADVANTAGES AND DISADVANTAGES:

ADVANTAGES:

Eco-friendly: Because electric vehicles do not utilize fuel for combustion, there are no emissions or gas exhaust. Vehicles that run on fossil fuels contribute significantly to hazardous gas accumulation in the environment, thus driving an electric car can help contribute to a cleaner environment.

Renewable energy source: Electric vehicles run on renewable power, whereas conventional automobiles function on the combustion of fossil fuels, which reduces the world's fossil-fuel stocks.

Less noise and smoother motion: Driving an electric car is significantly smoother. Because they lack fast-moving elements, they are quieter and produce less noise.

Cost-effective: Electricity is far less expensive than fuels such as gasoline and diesel, which are subject to regular price increases. When solar electricity is utilized at home, battery recharging is cost-effective.

Low maintenance: Because electric cars have fewer moving components, wear and tear is reduced when compared to traditional auto parts. Repairs are also simpler and less expensive than combustion engines.

Government support: Governments throughout the world have granted tax breaks to encourage people to drive electric vehicles as part of a green program.

DISADVANTAGES:

High initial cost: Electric vehicles continue to be quite expensive, and many buyers believe they are not as inexpensive as traditional automobiles.

Charging station limitations: People who need to travel long distances are concerned about finding adequate charging stations in the middle of their journey, which are not always accessible.

Recharging takes time: Unlike conventional automobiles, which require only a few minutes to replenish their gas tanks, charging an electric vehicle takes many hours.

Limited options: Currently, there aren't many electric car models to pick from in terms of appearance, style, or customized variations.

Less driving range: When compared to conventional automobiles, electric vehicles have a shorter driving range. Electric cars can be convenient for short-distance travel but are inconvenient for long-distance travel.

5.APPLICATION:

Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel.

Electric vehicles are more efficient, and that combined with the electricity cost means that charging an electric vehicle is cheaper than filling petrol or diesel for your travel requirements.

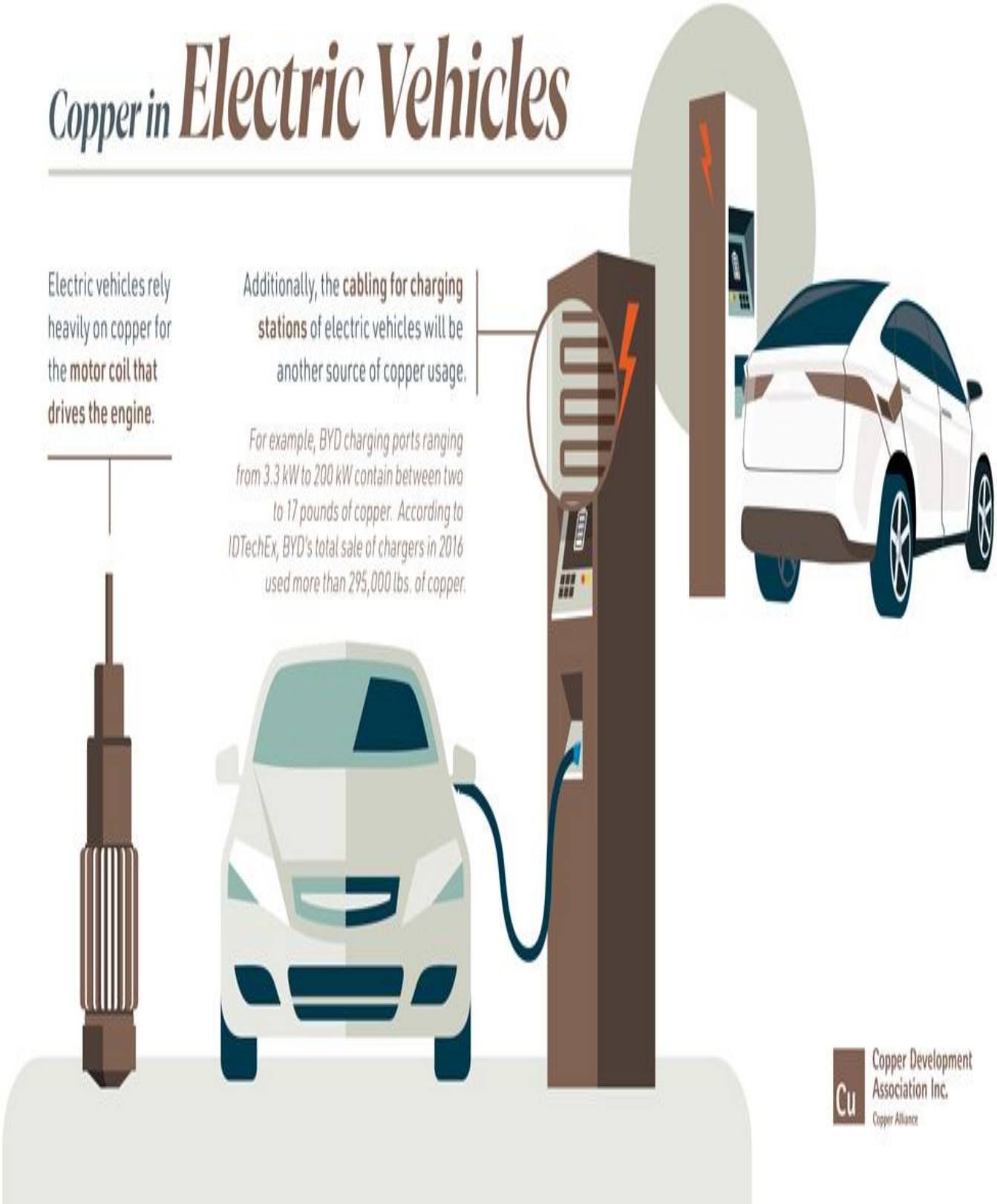
Copper is an essential material component of electric vehicles (EVs). It is used in the electric motors, batteries, inverters, wiring and in charging stations because of its durability, malleability, reliability and superior electrical conductivity.

Copper in Electric Vehicles

Electric vehicles rely heavily on copper for the **motor coil that drives the engine.**

Additionally, the **cabling for charging stations** of electric vehicles will be another source of copper usage.

For example, BYD charging ports ranging from 3.3 kW to 200 kW contain between two to 17 pounds of copper. According to IDTechEx, BYD's total sale of chargers in 2016 used more than 295,000 lbs. of copper.



Copper Development Association Inc.
Copper Alliance

6.CONCLUSION:

The first step of our process is defining problem statement and making solution for our problem. Using this solution, we made an ideation template. With these ideas we made an Empathy map and Brainstorming template which is our first milestone defining problem and problem understanding. Secondly, according to our project we collect data sets from sources, and we made the data in SQL to make use of it. After that Tableau software is installed and we connected Tableau desktop to SQL workbench successfully, which is our second milestone. Thirdly, we prepare the data for visualization which is our third milestone data preparation. The next step is number of visualizations we made a bar charts, line chart, maps etc., We made the visualization for our topics like, 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, Brand filtered by powertrain type, Number of models by each brand, which is our fourth milestone data visualization. The next process is responsive and design of dashboard, a dashboard is a

graphical user interface that displays information and data in an organized, easy to read format, which is our fifth milestone dashboard. Further process is number of scenes of story, a data story is a way of presenting data and analysis in a narrative format, intending to make the information more engaging and easier to understand, which is our sixth milestone story. Then, amount of data rendered to DB, utilization of data filters, number of visualization or graphs, then save to tableau public, which is our seventh milestone performance testing. The next process is embedding dashboard and story with web bootstrap, we made a template of our project using bootstrap templates and we included our dashboard and story with the template, which is our eighth milestone web integration. Project demonstration and documentation is our ninth milestone. We have nine milestones in our project handbook and we completed our project electric vehicle charge and range analysis.

7.FUTURE SCOPE:

Electric car manufacturing is getting increasingly popular, and its market share is likely to grow significantly. By 2022, India's GDP is predicted to increase by a staggering 25%.

The best aspect is that, in addition to decreasing pollution, EVs can reduce oil imports by $60 billion by 2030. Currently, imports account for 82 per cent of India's oil requirement. As a result, it is clear how helpful it will be for the Indian economy if the import cost is decreased.

The market research report provides a comprehensive overview of the current trends in the global market. It discusses the present-day technology, the outlook for the future and the position of electric vehicles in this market segmentation. The analysis looked at four key areas. These are power source, battery technology, charging systems and the regional analysis.

Power source is one of the most important aspects and the global market segmentation is analyzed with detailed information. The present-day electric vehicles are using different sources such as the wind power, solar power and hydroelectric power. Most of these technologies have evolved in Africa. Some of the countries which have developed these technologies are Morocco, South Africa, Tanzania, Namibia, Zimbabwe and Brazil. It should be noted that these nations all have very low fuel

costs and this means that it is very affordable to install a charging system on the cars.

Batteries have been the primary concern all over the world. With the development in technology, lithium-ion batteries are replacing the ordinary alkaline batteries. This has posed a serious challenge to the manufacturers. The market research report offers details on the major key players of this industry and the various plans that are taken by them to overcome the challenges.

8.APPENDIX:

DASHBOARD:

LINK:
https://public.tableau.com/views/tableauworkbench/Dashboard1?:language=en-US&:display_count=n&:origin=viz_share_link

STORY:

LINK:
https://public.tableau.com/views/tableaustory_16814523999020/Stor

yofelectriccarsinIndia?:language=en-US&:display_count=n&:origin=viz_share_link