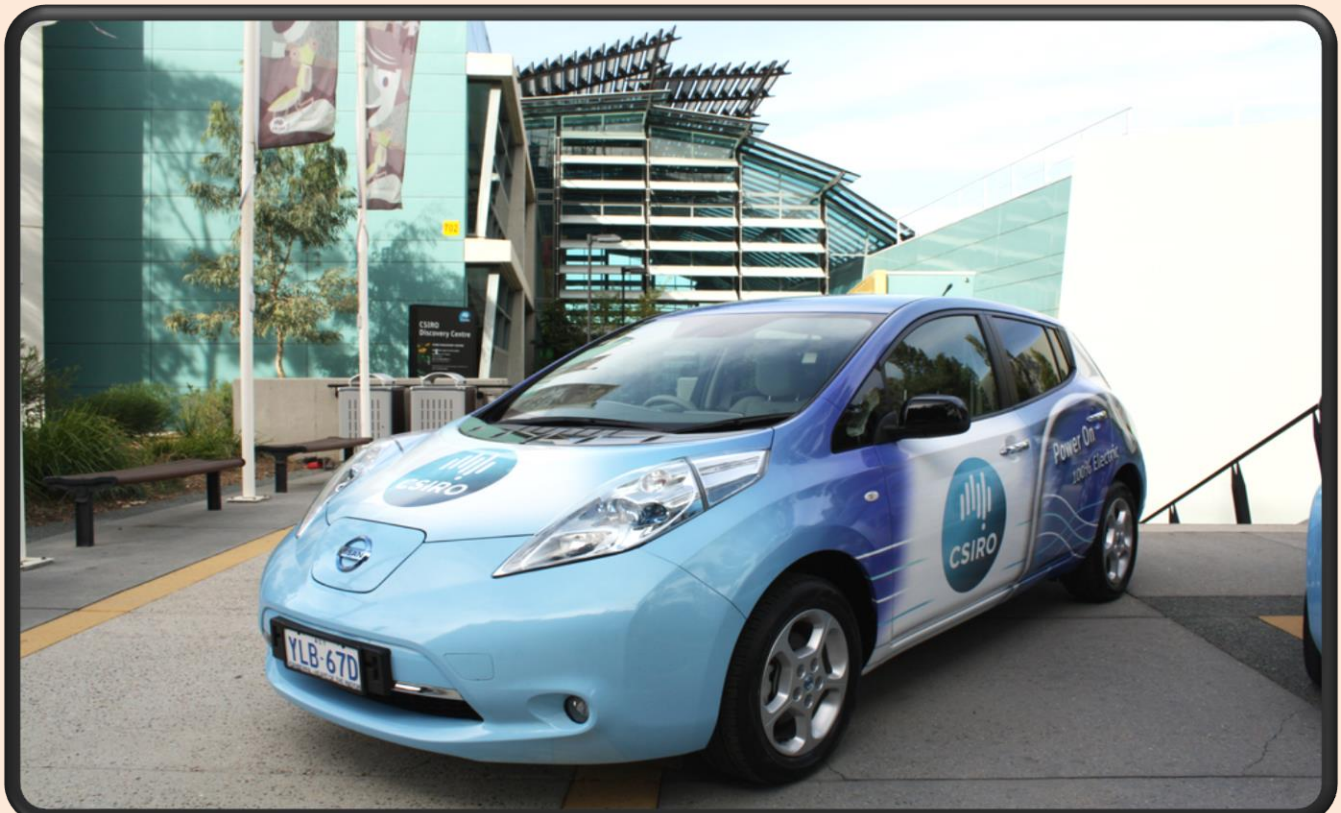


# VISUALIZATION TOOL FOR ELECTRIC VEHICLE CHARGING AND RANGE ANALYSIS



# **INTRODUCTION:**

## ➤ Overview:

As the various players in the electric vehicle smart charging solutions space continuously look for new ways to optimize performance, the key to improvement lies in monitoring data to make improvements. Massive amounts of data generated by devices, vehicles, buildings, the power grid, and many other connected things combined with increased rates of data transmission pose major data challenges. Data generated by electric vehicles comes from various sources ranging from sensors to trip logs. By monitoring vast amounts of data and analyzing it by using big data techniques, we help to create smart charging algorithms, address energy efficiency issues and optimize power distribution systems to handle extra charging loads for better vehicle-to-grid operations.

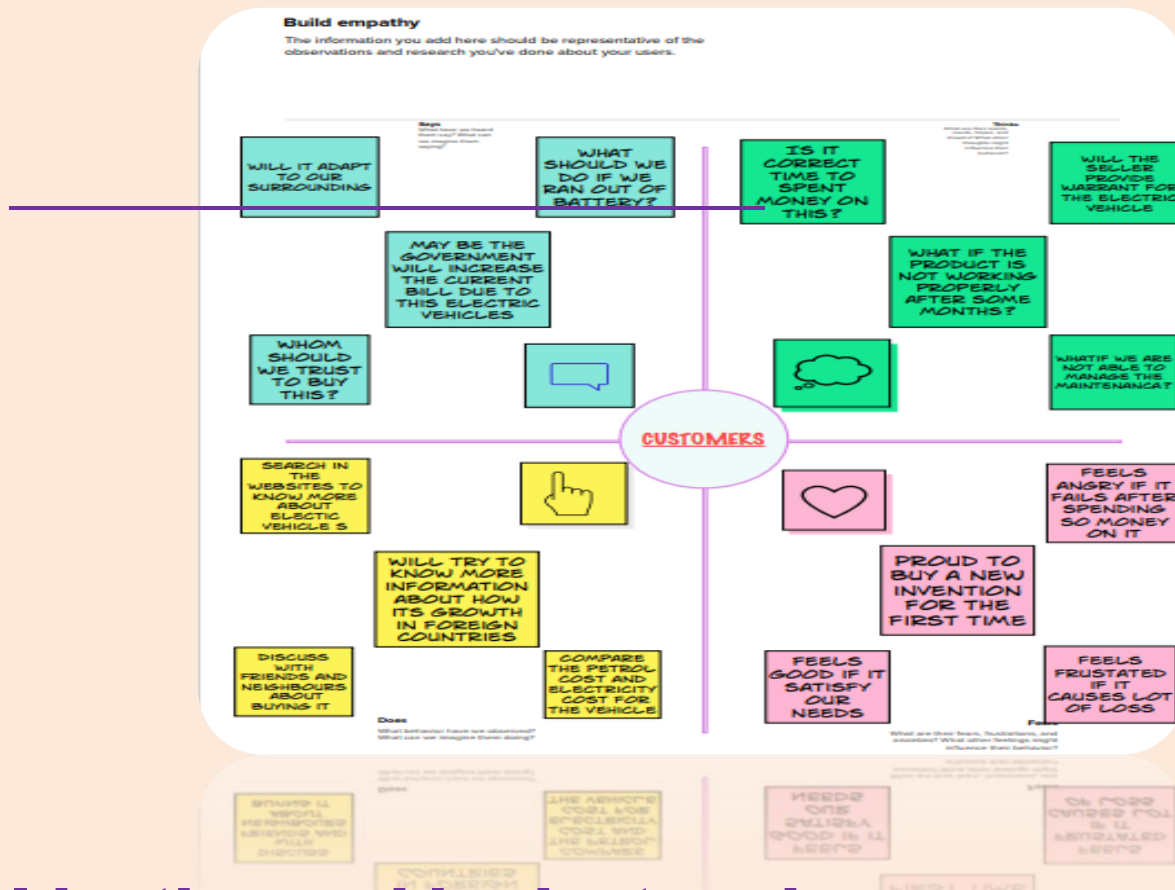
## ➤ Purpose:

Electric vehicles (EVs) have enormous potential to reduce harmful air pollution and greenhouse gas (GHG) emissions from transportation. To ensure EV charging stations are available to people in all communities, including the places most affected by pollution and underserved by existing transportation systems, policymakers and communities need better information and more accessible tools for planning.

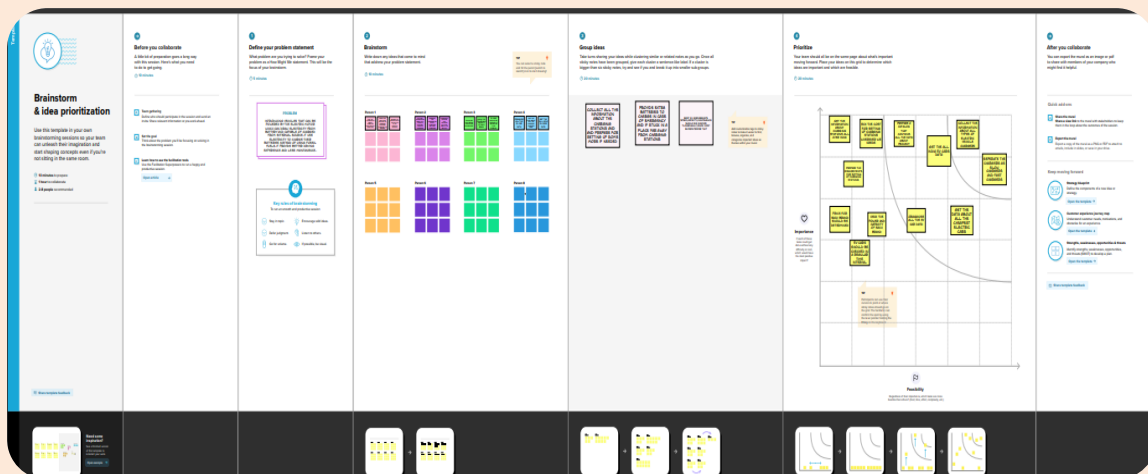
# PROBLEM DEFINITION AND DESIGN

## THINKING:

### ➤ Empathy Map:

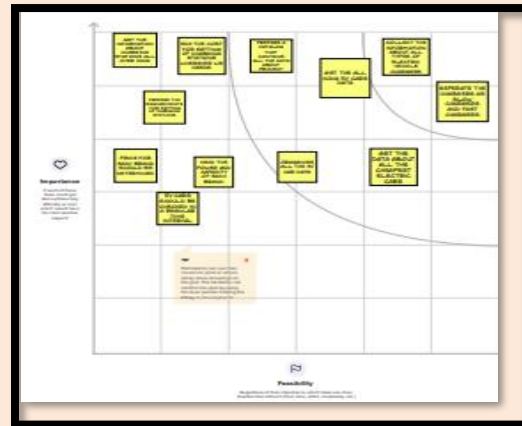


### Ideation and brainstorming map:



## PROBLEM

INTRODUCING VEHICLES THAT CAN BE POWERED BY THE ELECTRIC MOTOR WHICH CAN DRAW ELECTRICITY FROM BATTERY AND CAPABLE OF CHARGED FROM EXTERNAL SOURCE.IT USE ELECTRICITY TO CHARGE THEIR BATTERIES INSTEAD OF USING FOSSIL FUELS.IT PROVIDE BETTER DRIVING EXPERIENCE AND LESS MAINTANENCE.



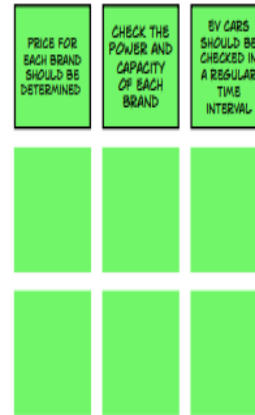
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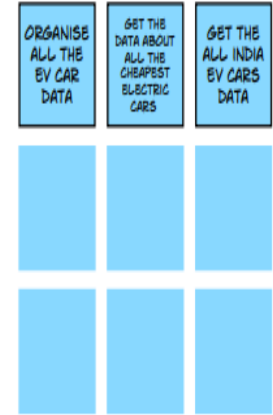
### Person 2



### Person 3



### Person 4



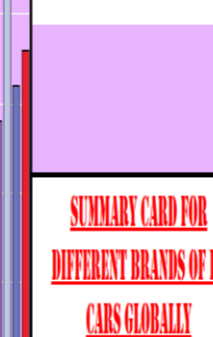
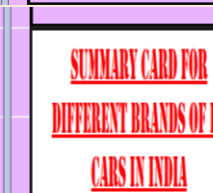
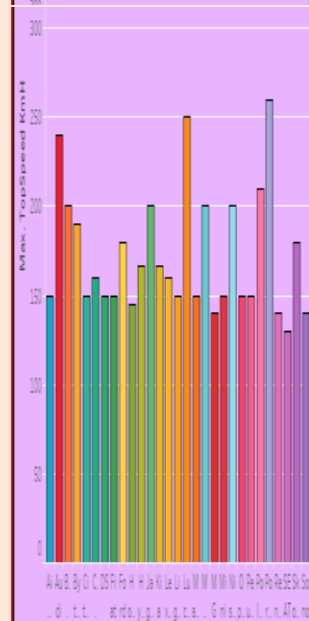
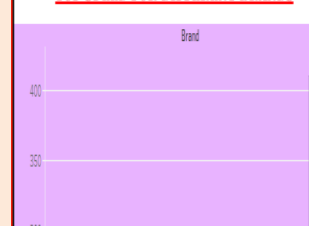
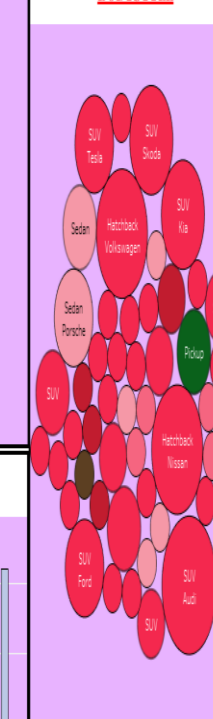
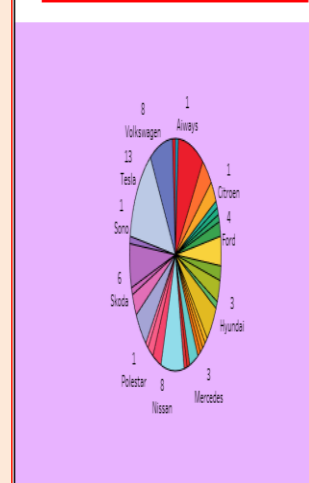
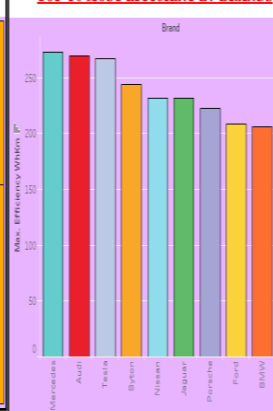
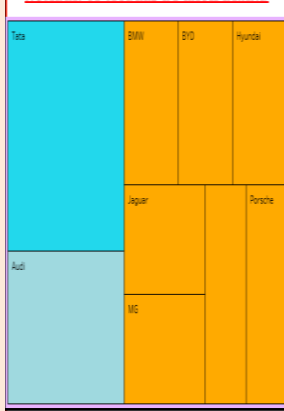
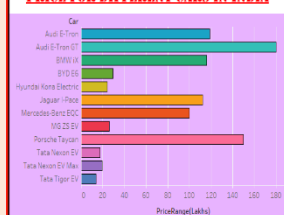
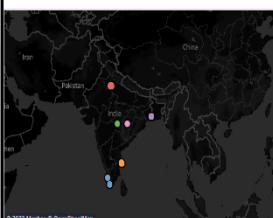
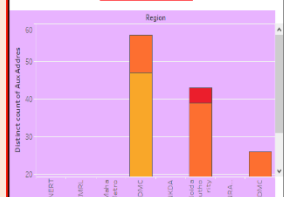
COLLECT ALL THE INFORMATION ABOUT THE CHARGING STATIONS AND PREPARE FOR SETTING UP SOME MORE IF NEEDED

PROVIDE EXTRA BATTERIES TO CHARGE IN CASE OF EMERGENCY AND IF STUCK IN A PLACE FAR AWAY FROM CHARGING STATIONS

BEST EV CARS BRAND'S SPEED,CAPACITY,MAINTANENCE SHOULD BE CHECKED THOUROUGHLY,SINCE MOST BUYERS PREFER THAT

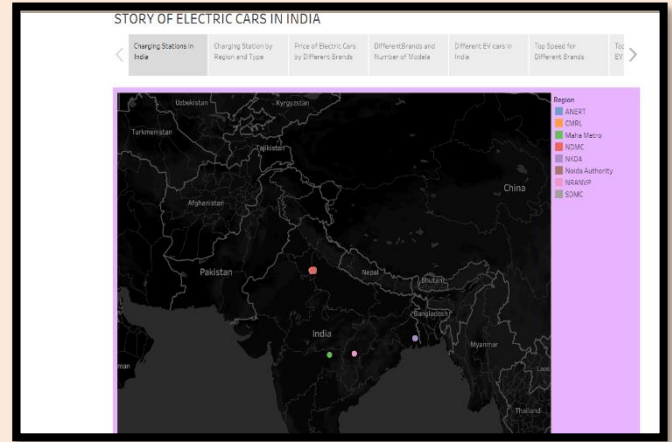
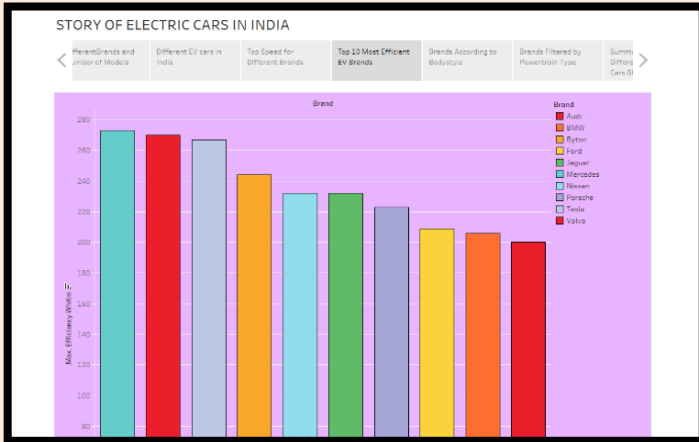
## RESULT:

## ➤ Dashboard:

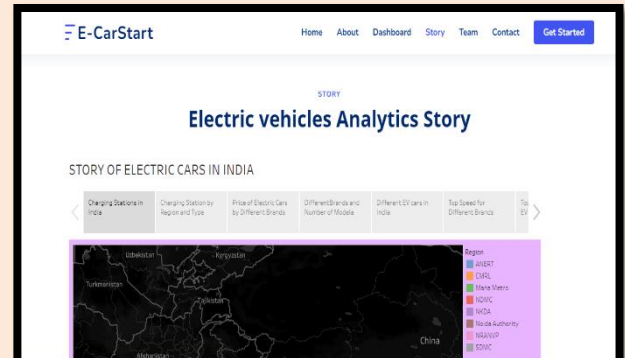
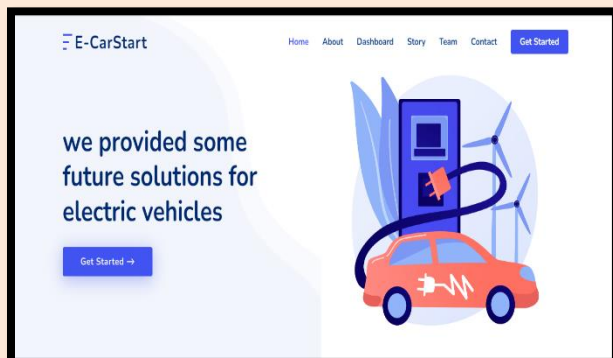
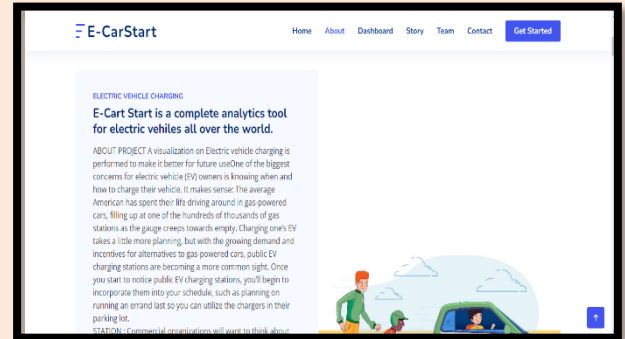
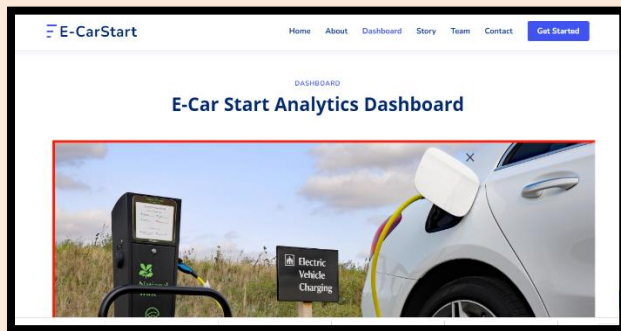


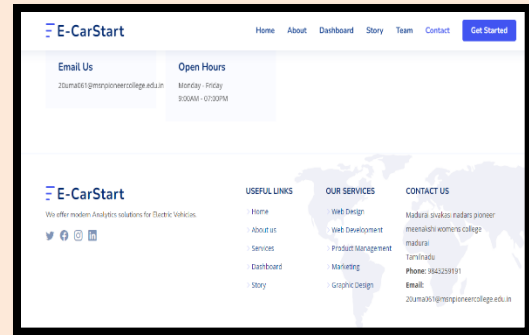
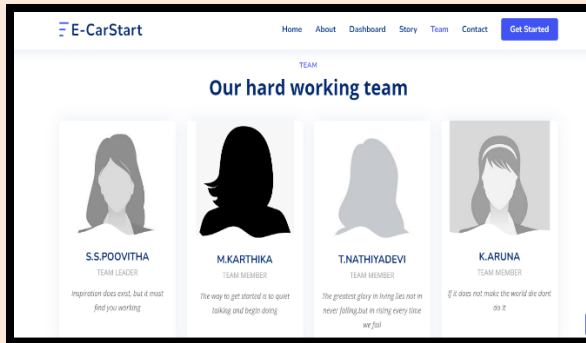


## ➤ Story:



## ➤ Web Application:





## ADVANTAGES:

- No fuel required so you save money on gas

Paying \$0.10 per kW is the equivalent of driving on gasoline that costs less than \$1 per gallon. On average, drivers save about \$700 in fuel costs per year while driving electric cars.

- Environment friendly as they do not emit pollutants

Drivers of electric vehicles have reduced CO2 emissions by more than 177,758,804 kg

- 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

Buyers Guide Electric motors lose very little energy as they are extremely low friction and heat up less than combustion engines. Electric vehicle motors are extremely efficient – with calculated values ranging from around 80 to over 90 percent efficiency.

## **DISADVANTAGES:**

- Limited Battery Range. The average petrol car can easily do four or five hundred miles on a tank of petrol. ...
- Battery Lifespan Concerns. ...
- Charging Infrastructure Worries. ...
- Long Charging Times. ...
- Low Top Speeds. ...
- More Expensive to Buy. ...
- Environmental Impact.

## **APPLICATIONS:**

### ❖ The typical charging power -

The objective of charging an electric vehicle just like “filling up” a traditional car is of crucial importance to the development of the entire infrastructure in the field of e-mobility. Therefore, an increased voltage of 800–1000V is already being pursued to quickly deliver the same amount of power with the same



current. From today's perspective, an increased charge current of 350A will be possible with future battery technology using liquid-cooled charge plugs. This means that an operating range of 400 km could be achieved with a charge voltage of 1000 V within about 11 minutes.

### ❖ Higher power levels for fast charging stations -

Future fast charging points must offer charging power levels of up to 350 kW and guarantee the charging of vehicle batteries with differing battery voltages and capacities. Powerful multipoint charging stations for long-haul electric traffic with several charging points will require their own medium voltage connection.

## **CONCLUSION:**

In this project we have clearly seen the visualization on electric vehicle charging. Using all the data we had we made some visualization. And those visualization are summarized as dashboards and also as stories. We hope these give modern solutions for the upcoming problems. In the documentation we have also included the empathy map ideation and brainstorming. We have organized the users thought and gave some ideas to solve upcoming quarrels. Thus we finally concluded the project