Visualization Tool for Electric Vehicle Charge and Range Analysis

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1. INTRODUCTION

1.1 Overview

To tackle the problem of climate change, the target of achieving zero-emission urban freight transport by 2030 as well as zero-emission urban passenger transport by 2050 has been set by the European Commission. To achieve these goals, a shift in the transport sector from vehicles dependent on fossil fuels to alternative, less fuel-dependent transport systems is necessary. However, not all of the countries are as ready with their infrastructure as their laws showcase them to be. While the introduction of electric vehicles is key for the shift to electric mobility, also the growth and expansion of the charging networks, technical capabilities, and other supporting technologies in the field of electric mobility are important factors. E-mobility and charging networks can be a complex topic that varies from country to country and while the government, technology and infrastructure developments clearly contribute to Emobility, consumer concerns about electric vehicles appear to be a sticking point for large scale introduction.

1.2 Purpose

The main challenge of this project is creating new, innovative and truthful visualisations for each part of the Emobility infrastructure that provides interesting insights both for regular website visitors as well as for experts in the field.

2. PROBLEM DEFINITION & DESIGN THINKING

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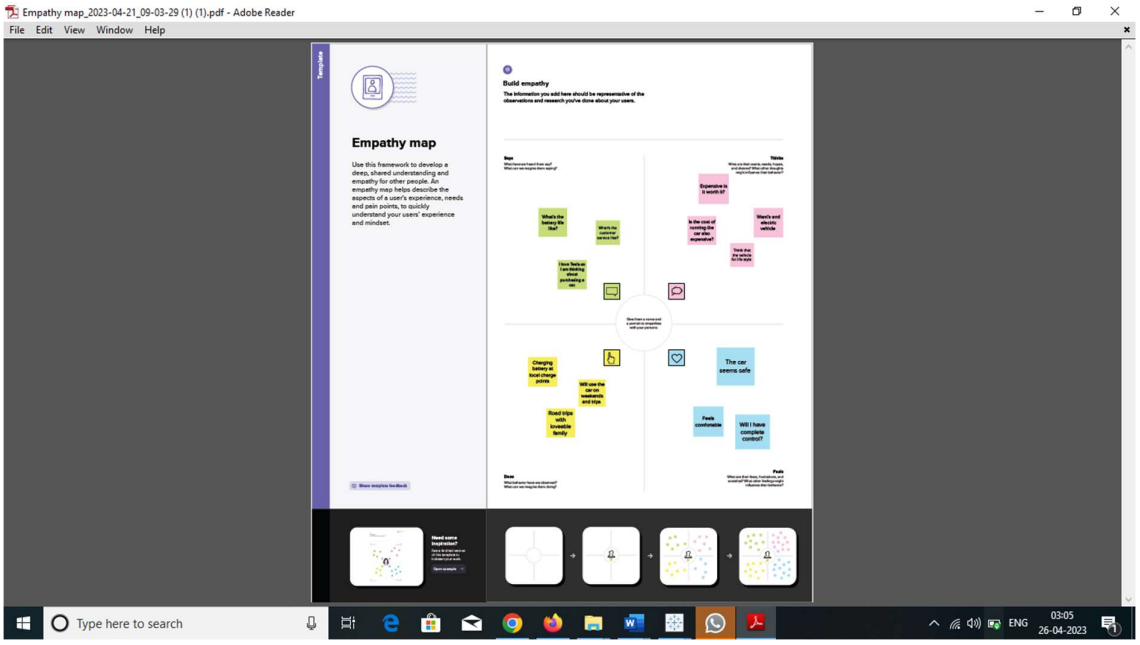
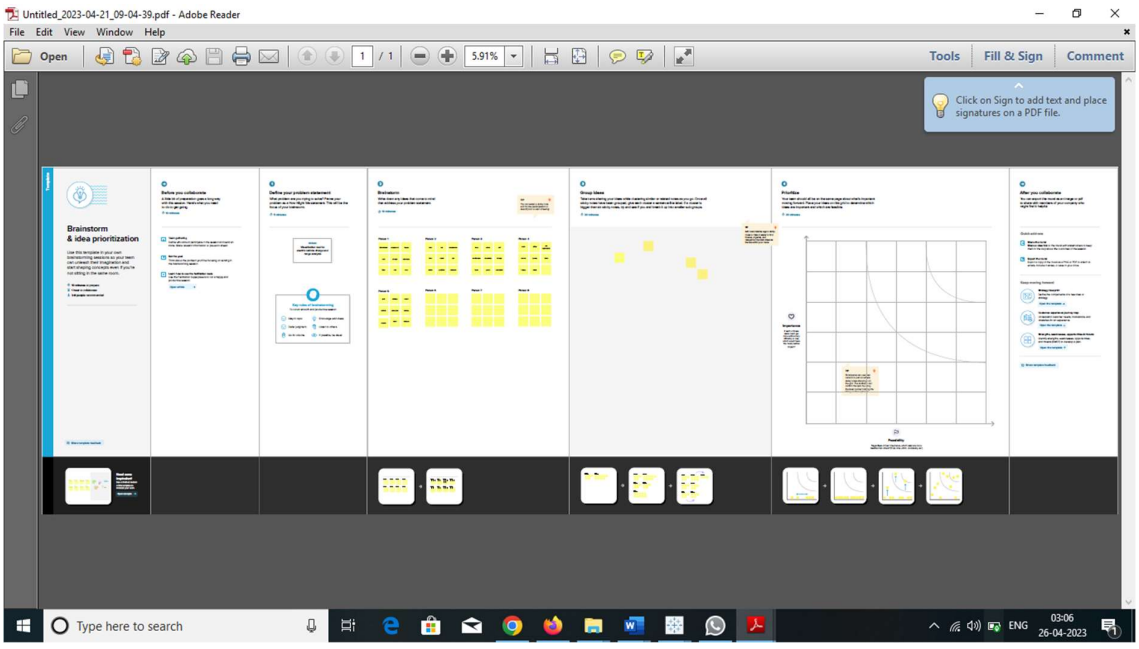


2.1 Ideation&BrainstormingMap;



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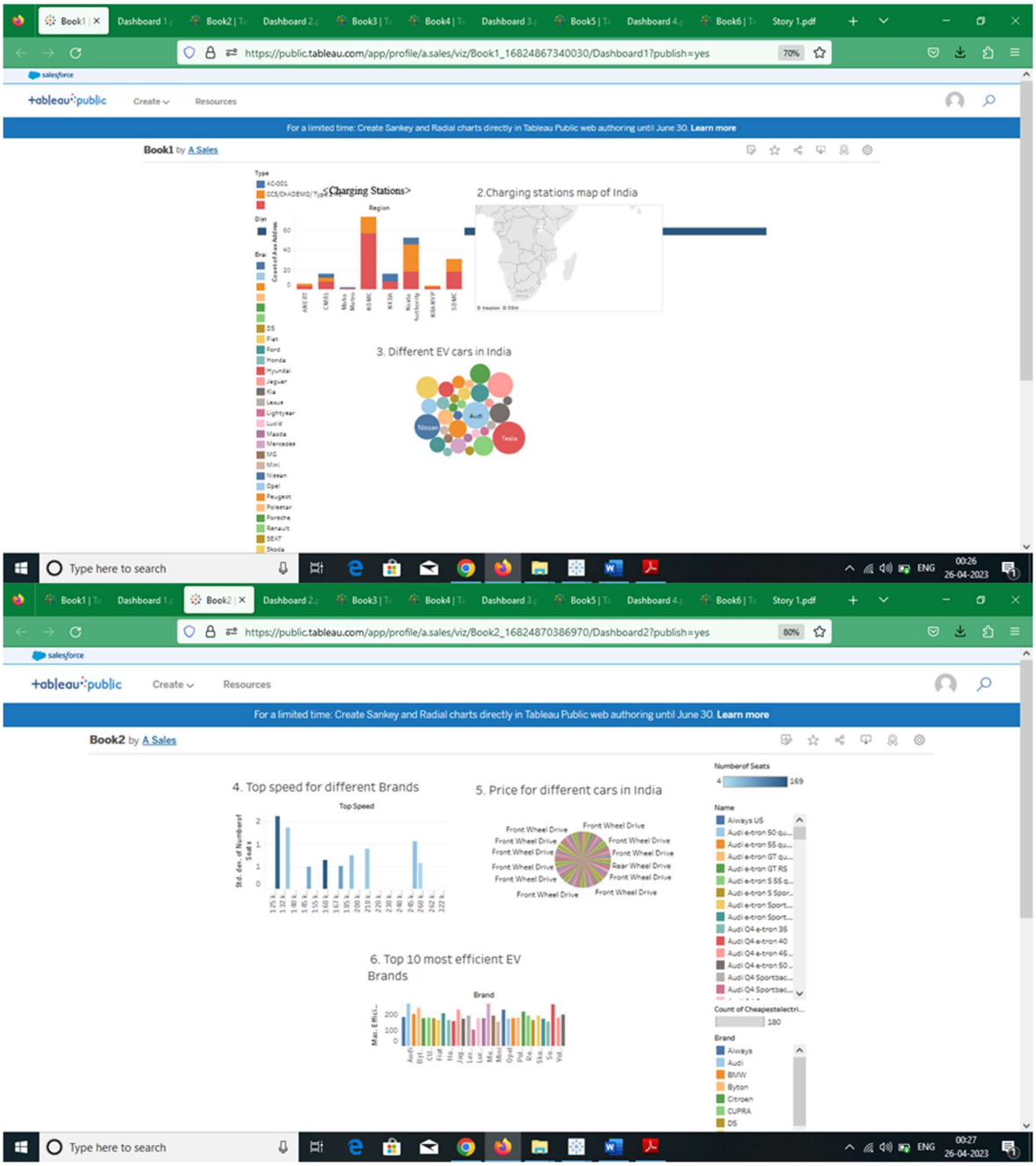
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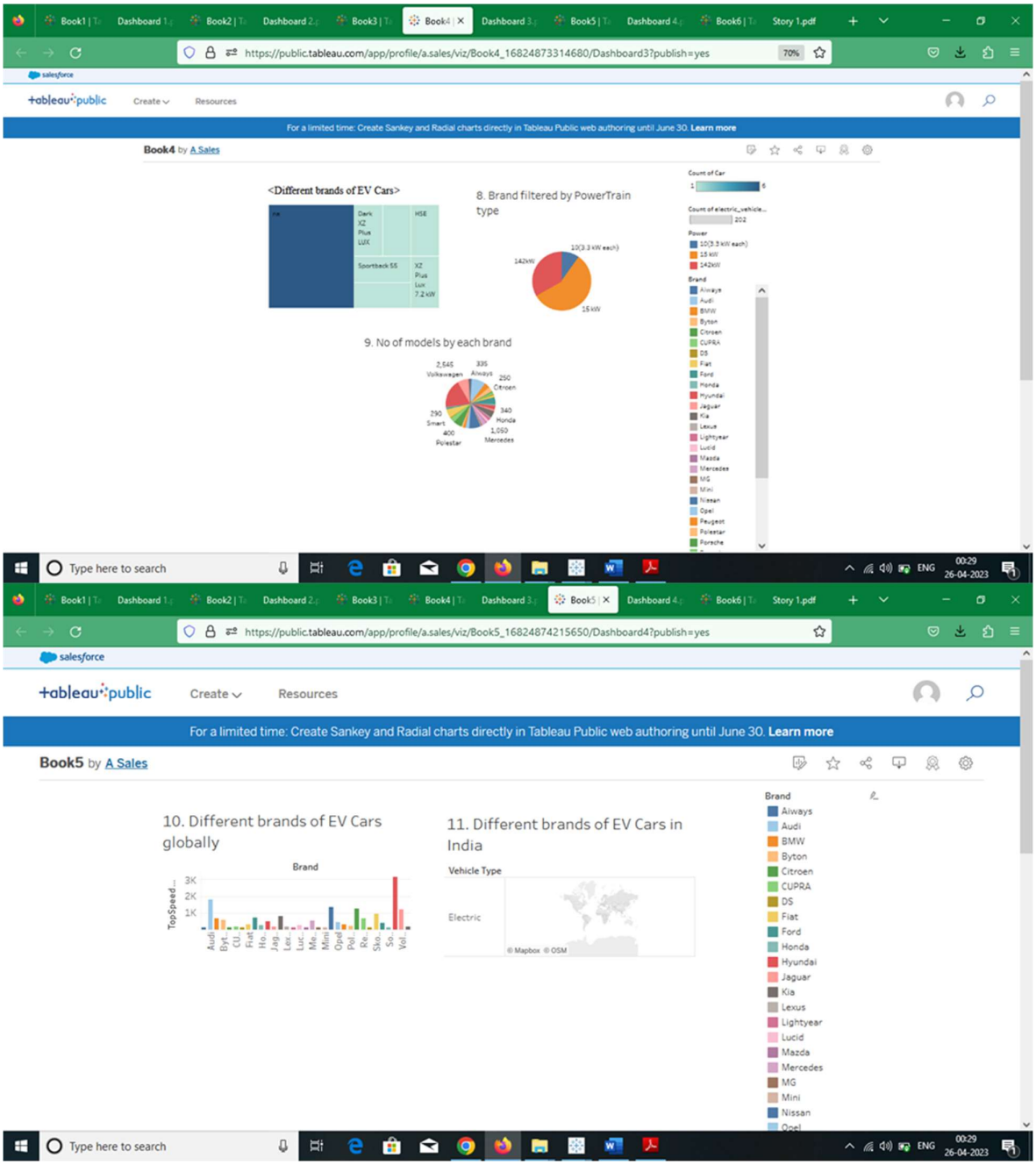
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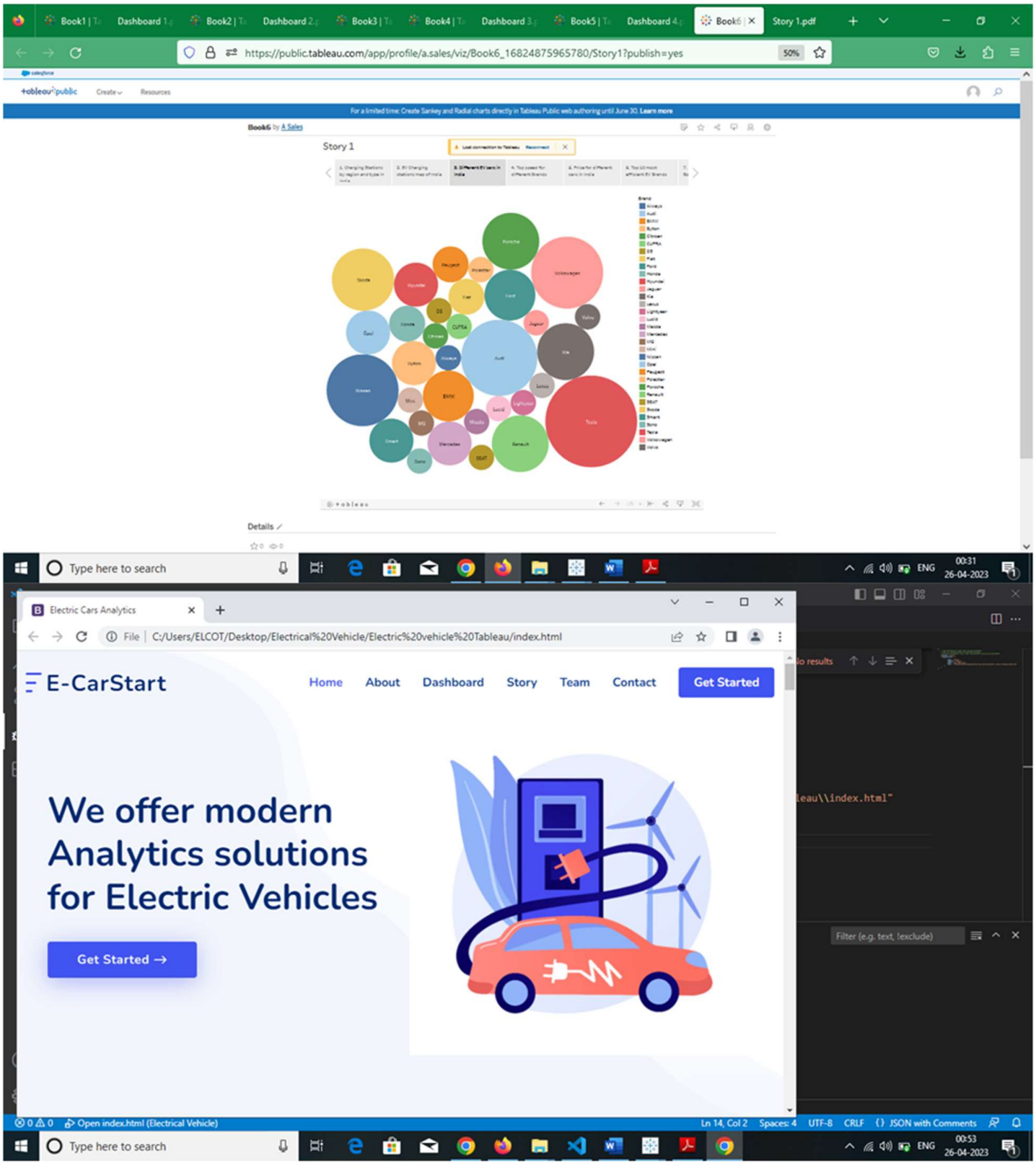

3. ADVANTAGES & DISADVANTAGES

Advantages:

- **No fuel required so you save money on gas.**
- **Environmentally friendly as they do not emit pollutants.**
- **Lower maintenance due to an efficient Electric motor .**

- **Better performance.**

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. ...**

4. APPLICATIONS

To animate some of the visualizations, Adobe After Effects has been used. The software is a digital visual effect, motion graphics and compositing application that can be used for keying, tracking, compositing and animation. The Lottie plug-in by Airnbnb is an iOS, Android and React Native library that renders After Effects animations as json codes so that they can easily be implemented into the website.

5. CONCLUSION

E-mobility, still at its infant stages, is expected to grow and become the dominant means of transportation across Europe and the world. This is mainly motivated by sustainability goals such as cutting down on greenhouse gases that negatively affect global climate. One challenge that stakeholders of Emobility should address adequately is the availability of charging infrastructure. This has been pointed out in various studies used in this paper and has been directly linked to the progress of Emobility. That is, the more available and accessible the Emobility infrastructure, the higher the confidence of consumers to use or purchase electric vehicles.

6. FUTURE SCOPE

One topic that has not been visualized and has only been mentioned in the facts and general content section of the final project is the context of renewable energy. As mentioned, several times throughout the report, the goal of reducing CO2 emissions

is one of the main driving factors of Emobility. Possible topics that could be discussed and visualized are:

1. How is the rise of Emobility contributing to offsetting CO2 emissions worldwide?

2. What is the percentage of renewable energy used to charge EVs?

7. APPENDIX

Another subject that has been discussed only briefly in the project is the impact of political actions such as subsidies for purchasing EVs and tax reductions as well as fines for automakers when failing to reach the CO2 target. As the regulations differ a lot among the different countries it is challenging to compare them and draw conclusions regarding the success of a certain policy. Amongst other things, because the acceptance of E Mobility depends on a lot of other factors as well, such as the openness to innovation and the purchasing power of the population of a country.