

DESIGN REPORT OUTLINE

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Figure 1. Application logo

1. TITLE

DRIVEX: electric car rental system in urban areas

2. PURPOSE

To connect people looking for an easy and comfortable way of moving around the city with those who wish to make the maximum out of their electric cars.

To promote the use of this type of cars for a healthier environment.

3. PROBLEM DEFINITION

- High volume of fuel-consuming cars in the cities, which is bringing the pollution levels to an all time high.
- Due to the heavy traffic, many people in these cities decide to move using public transportation.
 - Cars are left parked from Monday to Friday.
- Many young people cannot afford to buy a car for themselves.
 - Main alternatives: either public transportation or cars driven by other people (Uber, Lyft, Taxi...).
 - Not enough exposure to the real alternative of electric cars.

4. DESIGN GOALS

- Easy-to-use, online car renting system: mobile app.
- Live location of cars available near the user, including:
 - Main features of the car.
 - Area in which the car can be used.
 - Reviews of the state of the car.
- Integration of a DRIVEX device in the car system:
 - It must connect the car to the app system.
 - It must gather the information mentioned above.
 - It is meant to replace the function of the car keys.
- Integration with traffic routes and live traffic apps.
- Creation of a network of drivers who can make money by moving cars near where owners and users might need them
- Automatic pay from the user's credit card as soon as the car is turned off.

5. OTHER DESIGN ALTERNATIVES STUDIED

- Extension to fuel-based cars:
 - Rate gets harder to calculate: the fuel burnt-out depends on the car's consumption.
 - Users might have to deviate from their route to refuel.
 - Not eco-friendly.

6. FUNCTION ANALYSIS

General function: owners can get a DRIVEX device and connect it to the car security and location systems, making it accessible for users in the app. Users can easily look for cars available near them, select the one they like, pick their destination and get the cost of the route. They may pay that cost automatically allowing the app to use their credit card info. The connection between the app and the DRIVEX device will allow them to get in and out of the car.

Subfunctions:

- Restriction of the area in which cars can be moved.
- Request from owners to have their car back at a certain location and time (as long as nobody is driving).
 - Users can make money by moving the car back to them.
- Car order from users, which will carry an extra cost.

7. DESIGN DESCRIPTION

- DRIVEX APP:
 - 4 main categories:
 - CARS NEAR YOU
 - Map display
 - Cars info. displays when clicking on them
 - RENT THIS CAR
 - WRITE A REPORT
 - PAYMENT INFORMATION
 - ORDER A CAR
 - RENT MY CAR
 - ORDER MY DRIVEX DEVICE
 - Extra categories for owners
 - MY CAR LOCATION
 - GET MY CAR BACK
 - POST UPDATES
 - RESTRICT DRIVING AREA
- DRIVEX DEVICE:
 - Smartphone-like sized gadget
 - Comes with a guide of installation for the particular car model and an adaptable cable depending on it if needed.
 - Composed by:
 - Memory (storage).
 - Touch screen display.
 - Case.

- Connectivity input.
- Stores car model, insurance, mileage and license plate.
 - Introduced by the owner with his/her DRIVEX user password.
- Stores owner's contact info.
- Stays on fed by the car's electric system.

8. REQUIRED RESOURCES

- Electronics supplier for the devices.
- Finished DRIVEX devices stock.
- Shipping system.
- Servers to run the app code and database.
- Support team: handle user reports and reviews the cars' validity to be on road.

9. COSTS

- Device orders from the electronic supplier.
- A % of shipping costs.
- Server hosting.
- Internet domain.
- Development team of software engineers and data analysts.
- Support team.
- (Logistics team if the company reaches great size).
- Marketing campaign
 - Facebook/Instagram advertisements
 - Collaborations with influential social media figures

10. SOURCES OF INCOME

- DRIVEX devices sales.
- Advertisements.
- A quota from each journey.
- Premium membership: allows users to rent cars more than an hour ahead (normally not allowed to keep the cars flowing).

11. COMPUTATION LOADS

The required number of servers would depend on the active user count. In order to determine the estimated reach, a market analysis would look at the users that rent their car in the existing services with the most frequency to estimate the number of potential DRIVEX device customers, or the number of active users and growth rate of platforms such as *Lime* or *Emov*. On top of the userbase, it's necessary to consider the ideal size for the different teams.

12. LEGAL CONDITIONS SAFETY CONSIDERATIONS

- Driver and car documentation are necessary to complete any profile and use the app.
- Documentation and insurance in the car at all times.
- Legal conditions based on those of the traditional car rentals, considering:
 - Speeding.
 - Illegal parking.

- Accidents.
- Driver not carrying license/documentation.
- Compensation of damages.
- Requests cancelled 5 minutes passed the time indicated for the rental.
- Cars only open to users when they are -10m away.
- Owner must keep the car charged.
- Car removed from the system if running out of charge.
- Extra cost if the users deviate from the calculated route.
- Alert and detention system if DRIVEX gets harmed.

13. PROTOTYPE

This section contains information on how the DRIVEX device prototype was ordered to a particular supplier and how the app was developed by the engineering team.

14. CONCLUSIONS

DRIVEX has all the necessary ingredients to change the way we move in the cities. It is accesible, eco-friendly, innovative and a great alternative for both owners and drivers.

15. BIBLIOGRAPHY

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