NeoCharge:
Vision and Scope

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Credits

Name	Date	Role	Version
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Pranathi Guntupalli	October 3, 2019	Business Requirements	1.0
Hannah Kwan	October 3, 2019	Competitive Analysis	1.0

Revision History

Name	Date	Reason for Changes	Version
Team	October 3, 2019	Initial version	1.0

1 Business Requirements

1.1 Background

Currently, buying an electric vehicle requires some planning. Owning a fully electric car traditionally means that a home charging point needs to be installed. EV owners can refill at home, however using the standard outlet, or Level 1 charging, takes quite a while. For a quicker charge, users can invest in a 240-volt, or Level 2, wall-mounted charger. The problem is that an electrician is needed to install a special 240-volt charger thousands of dollars for labor and parts. Furthermore, for home renters, modifying outlets might not be an option and therefore, as they may not even have the permissions to install the faster charging point.

NeoCharge directly plugs into 200V outlets that already exist in the house and no electrician is required. It can detect when other appliances are running, and will stop charging the car automatically to not overload the circuit and cause fires. Furthermore, NeoCharge is far cheaper in price and does not have a steep learning curve, it is very intuitive to use.

1.2 Business Opportunity

NeoCharge recognizes that most individuals have access to 220V outlets to power common home appliances such as washers, water heaters, and dryers. Thus, there is an opportunity in the market to use the already existing outlets to create a Smart Splitter that will provide electric vehicle owners 2 EV charging at home for a fraction of the cost it would traditionally take to have a dedicated outlet installed by an electrician.

Now, the company wants to go one step further by designing an application that integrates with the Smart Splitter to allow users to customize their charge, provide relevant metrics, and allow users to have remote control over the charging.

1.3 Business Objectives and Success Criteria

The goal of the business is to build an application that can work in conjunction with the Smart Splitter in order to create a more customized experience for the user. The purpose of building this application is the following:

- User schedules charges

- Updates on the status of the charge
- Remote Control over the charging

1.4 Customer or Market Needs

Customer Needs:

- 220V Smart Splitter
- No Electrician
- No permits
- Provides home renters charging access
- Saves homeowners thousands of dollars
- Allows users to charge up to 2 electric vehicles at once

1.5 Business Risks

2 Vision of the Solution

2.1 Vision Statement

NeoCharge is a smart splitter designed to increase the availability of electric vehicle charging at home. Unlike other charging devices, Neocharge works with the 220V dryer outlet already present in most homes, so that an electrician is not needed to install a dedicated outlet. Currently, the vehicle is charged whenever it is plugged in. Some competitors to this product plug into the dryer socket, but are not 'smart', meaning the dryer cannot run at the same time the car is charging. Other competitors have similar charging apps but require an electrician to be installed. Neocharge is the only device which utilizes the dryer socket in an intelligent way and will come with an app that integrates with the charger.

2.2 Solution Overview

Our product is a mobile app that easily integrates with the Neocharge device to increase its functionality. Most importantly, the app will provide a way for the user to schedule charging at times that utilize clean energy. Users will also be able to see how charged their vehicle is, how green their energy usage is when charging, how expensive the energy is currently, their previous charging history with prices and energy usage, and be able to charge and schedule charging sessions from the app.

2.3 Major Features

FE-1	Users can schedule charge times with a calendar based charge scheduling page
FE-2	Users can view weekly, monthly, and yearly power usage metrics by kWh or USD in a graphical format
FE-3	App will integrate with the WattTime API to display the carbon emissions saved during charging
FE-4	Users will be notified of charging statuses and interruptions
FE-5	Users can enter relevant car information into a settings page
FE-6	Data will be recorded in a session-time format and stored locally
FE-7	App will request updated data from a server on startup
FE-8	A tutorial will be displayed to first time users
FE-9	App will be available to users with an iOS or Andriod phone

2.4 Assumptions and Dependencies

AS-1	Users will have a neocharge device connected to the internet that can recieve software updates
AS-2	Users will have an iOS or Andriod phone able to install new applications

3 Scope and Limitations

3.1 Scope of Initial and Subsequent Releases

Feature	Release 1	Release 2
FE-1	Not Implemented	Fully Implemented
FE-2	Full Implemented	
FE-3	Full Implemented	
FE-4	Full Implemented	
FE-5	Full Implemented	
FE-6	Full Implemented	
FE-7	Full Implemented	
FE-8	Not Implemented	Full Implemented
FE-9	Not Implemented	Full Implemented

3.2 Limitations and Exclusions

None specified at this time.

4 Business Context

4.1 Stakeholder Profiles

Stakeholder	Value	Attitudes	Interests	Constraints
NeoCharge Owners	Provide and discuss requirements/Maintain hardware components	Receptive to new ideas / flexible with platform decisions / excited	Mobile app to interface with charger product/Competitive with current leading brands	None
Users	Insight into preferred functionality an app should provide	N/A	Ability to track and adjust electric car's charge	None

4.2 Project Priorities

4.2.1 Release 1

Dimension	Driver	Constraint	Degree of Freedom
Schedule	Q1 includes completing Software Requirements Specification, High-Level Architecture, and prototypes; Software construction and development releases follow in Q2 and Q3		
Features			Q1 release includes planning and educated architecture decisions that will facilitate the implementations of features in Q2 and Q3
Quality			Formal measurements for required quality TBD
Staff		Maximum team size is 5 developers, individual primary roles are still TBD	
Cost		Time, need to manage time effectively to complete tasks on time while balancing project with other classes	

4.3 Operating Environment

OE-1	The NeoCharge application will be a mobile app (either Android or cross-platform)
OE-2	The application must interface with an AWS-hosted database for sending/receiving information from charger
OE-3	Charge data must be refreshed frequently for accurate, real-time statuses of a charge in-progress
OE-4	Although service interruptions are not critical, servers should have minimal downtime to provide users with a reliable experience
OE-5	Security in place to prevent connections to charger from other users that are not the charger's owner

5 Competitive Analysis

5.1 Overview

There a several competitors to NeoCharge, but in different aspects. There are several electric vehicle chargers that plug into the dryer outlet that have apps to track the usage, but they are not appliance splitters. There are a few appliance splitters available but do not have safety measures built in, or are not widely available.

5.2 ChargePoint

ChargePoint is an electric vehicle charger and the cheapest model costs five hundred and nineteen dollars on Amazon. The charger does require installation, which costs over six hundred dollars. The charger has an associated app, which allows the user to schedule charging, view charging stations that are part of their charging network, track charging and set reminders.

5.3 JuiceBox

JuiceBox Pro 40 is another electric vehicle charger that plugs into the dryer socket. It costs five hundred and seventy-nine dollars and is sold at Amazon and other vendors. The JuiceBox Pro 40 has an app that allows smartphone controls. The app notifications when charging begins and ends, access to historical data. The user can schedule charging sets and set a limit on the amount of amps.

5.4 Dryer Buddy

Dryer Buddy specializes in appliance splitters for dryer outlets. Although there is no app to monitor the usage, the Dryer Buddy does have a screen that displays wattage, amps, voltage, and kilowatt hours. The Dryer Buddy also has automatic switching between outlets. The average cost is about two hundred dollars. The product is made to order and sold online by BSA electronics. They are built by the owner, and can take several months to arrive.

5.5 Parkworld

Parkworld makes a simple appliance splitter that has no display. It also does not automatically switch between outlets, which customers noted that it trips the circuit breaker when both are in use. It is sold on Amazon for seventy dollars.