CSPB 3112 – NauticCharge App

Team Members:

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Vision:

This project we propose is to create a phone app for Windfall Power for the NauticCharge hybrid supercapacitor battery. This project will be broken into different sprints to provide realist timelines and trackable metrics. Using the above methods will expand our professional skills in learning how to do app development following customer requirements, the skill set of writing the code, how to apply the agile method to set expectations for deliveries and product hand offs.

Motivation:

This project is important to us because one of our team members is related to the founder of windfall power. Besides family ties, it is an area that interest both of us, for it can be a gig company for side work or work experience in app development. It is an example of how coding can deliver real world products in sprints, perfect for small start-up like business, plus solid examples that can show proficiency in many parts of a business, from project planning, product review, software development, delivery of product and potential life cycle of a product.

Metric:

The project will be longer than the 45 hours allotted. The plan is to focus on the MVP product (Minimum Viable Product) wish is defined for development on the iPhone, Bluetooth pairing and limited dashboard. The future sprints post this phase will include the introduction of Android phones, device registration (for warranty), direct order page (or links to distributors) and enhanced dashboard including user defined alerts.

The MPV miles stones are as follows:

(note, some phases are multi week milestones)

1) Milestone 1:
    a. Select framework, such as reactive native, flutter, Swift UI-iPhone Only or Jetpack-android only)
2) Milestone 2:
    a. Setup coding environment to support decision (install Xcode, install NodeJS, etc.). Create GitHub, sign up for apple developer and etc.
3) Milestone 3:
    a. Design flow diagram of how application will look. This diagram will be broken into MVP and staggered (modifiable) flows. An example is created for MVP.
4) Milestone 4:
    a. Present concept to Windfall Power. Adjust as requested
5) Milestone 5:
    a. Create proof of concept in simulator with provided logos, etc.
6) Milestone 6:
    a. Push code to an iPhone to see if it works as expected.
7) Milestone 7:
    a. Provide code to tester at Windfall Power (provides hands on review by customer). (split task, update if required, while integrating BMS)
8) Milestone 8:
    a. Start integration into the BMS. The vendor provided some info on how it works.
        i. Create test application to validate BMS can pair with device
        ii. Integrate Nordic nRF probe or similar for Wireshark captures to validate commands are correct (if required).
        iii. Add pairing functionality to phone (single battery).
9) Milestone 9:
    a. Add Bluetooth to phone application and present.

Note, some milestones will take more than week, wanted to outline sprint concept. Also, I our team may split milestones or practice paired programming.

Risks:

1) Select and learn a new language
2) If selected language does not perform as required (Bluetooth, etc)
3) Customer cannot agree on layout or timelines.

4) Bluetooth integration
    a. Select framework is not able to support Bluetooth
    b. BMS cannot connect as expected
5) App fails in testing; plan is to limit our selection of test devices to what we own.
6) Windfall must provide graphics, logos, or licensed art for application.

Mitigation:

1) Change language mid
2) Bluetooth issues
    a. Do network captures via Nordic Probe and analyzes
    b. Contact Vendor for support (XiaoXiang, via Windfall Power)
    c. Reduce supported devices
3) If customer cannot agree on design, create app meeting the required MVP.

Project Assessments:

1) Designs are accepted by Windfall Power (or we develop MVP app for class project follow the spirit of the request)
2) Working app on iPhone
3) Can pair with BMS on Battery
4) Can activate Battery and monitor basic metrics as requested from Windfall Power
5) Passes basic product testing by the customer.

Project portfolio link:

We have a git repo for this, but since it a product to hand off, we will incorporate the design flow, images on our web pages and piazza. As discussed on the office hours, since it is a project to be provided to Windfall Power.

Future:

1) Expand into Android.
2) Create enhanced Dashboard
3) Create alerts

4) Integrate into watches
5) Disable Battery feature, explore options
6) Integrate into database for warranty tracking, recalls, etc.
7) Create a shopping page, for direct purchase or links to distributors
8) Front End to review and edit database (vendor portal)