

## **Electro\_Shock Pro Project Proposal**

### **Project Overview**

"Electro\_Shock Pro" is designed to assist electricians and engineers in making essential electrical calculations accurately and efficiently. Traditional methods of performing calculations like Ohm's law, voltage drop, and power consumption can be error-prone and time-consuming, requiring either manual input or separate, non-integrated tools. This application consolidates these functionalities into a single, user-friendly tool optimized for fieldwork, allowing electricians and engineers to streamline their workflow while minimizing calculation errors.

### **User Interaction and Business Logic**

Electro\_Shock Pro goes beyond a simple CRUD interface by providing dynamic calculators for specific electrical engineering needs. The app requires users to input variables (e.g., current, voltage, wire size) to receive calculated results, such as voltage drop or power consumption, critical to ensuring that systems are correctly sized and efficiently designed. Each calculator tool is tailored with business logic specific to industry standards, making it an interactive and essential tool for real-time decision-making in the field.

### **Problem Solved**

Electricians and engineers often face the challenge of accurate, real-time calculation while on-site. Miscalculations can lead to safety issues, system inefficiencies, and increased project costs. This application addresses these challenges by providing a reliable, on-demand tool that automates complex calculations, thereby reducing the risk of errors and improving productivity.

### **User Personas and Value**

- Field Electricians: Require quick and accurate tools to validate calculations on-site without needing cumbersome calculators or references.
- Electrical Engineers: Benefit from having multiple electrical formulas in one app, enhancing efficiency and accuracy in project planning.
- DIYers: Can use the app to verify calculations and ensure compliance with electrical codes, helping to ensure safe and accurate project execution.

By providing a consolidated tool for electrical calculations, this app saves users time, reduces project costs, and enhances safety and compliance, making it an asset to any field or project management toolkit.

## User Interaction

Users will interact with the app primarily through the input fields for each calculator. The interface will guide users through each calculation step with prompts, ensuring they input the correct variables. Results will be displayed immediately, with an option to save calculations for later reference, streamlining workflows and enhancing user experience.

## **Minimum Viable Product (MVP)**

### Overview of Features

The MVP for "Electro\_Shock Pro" will include the following primary features, sufficient to meet the essential needs of our target personas:

1. Ohm's Law Calculator: Takes voltage, current, and resistance inputs to calculate the missing variable.
2. Voltage Drop Calculator: Allows users to input cable size, length, current, and type to calculate the voltage drop, ensuring compliance with electrical standards.
3. Power Calculation Tool: Determines the power consumption or requirements based on voltage and current inputs, aiding in energy efficiency and equipment sizing.

### User Flow and Interface Support

- Navigation: Users start by selecting the type of calculation needed from the main menu.
- Input Fields: Each calculator will present relevant fields for input, labeled for easy understanding.
- Results Display: Results will be displayed immediately, with a summary page allowing users to review and save their results.

### Technical Architecture

- Frontend (Ionic & Angular): The Ionic Framework with Angular will create a responsive, mobile-friendly interface, optimized for touch interactions.
- Backend (Node.js & Express): A simple backend API on Node.js will handle any server-side processing and storage.
- Deployment (Heroku): While Heroku would typically be used to host the app for ease of deployment and scalability, for this assignment, the web application will be available locally at localhost:8100 through VS Code.

- Capacitor Plugins: Capacitor will be used to access device features, like offline access and data storage, ensuring a native feel and efficient performance.

### Data Management

For the MVP, data will be stored locally using Capacitor's storage options, allowing the app to run offline. Persistent objects include:

- User Input Data: Stored temporarily for each calculation.
- Calculation Results: Saved with an option to export or share as needed.