Home Lock Management

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Sponsored by Saratech

Project Summary

The home security market is currently dominated by smart lock companies, like Ring and Nest. These solutions are vulnerable to **power outages** and **hacking**, and often require **complex installation**.

Our innovative sensors offer a **more reliable** and **affordable** alternative. These **simply installed** devices allows users to remotely monitor their door's lock status at a fraction of the price of traditional smart locks without the complexity or vulnerability.

Fig. 1: non-invasive (left) and invasive sensor (right) prototypes next to door locks to demonstrate size

Design Approach

- Determined stakeholder needs and requirements
- Analyzed a door look to understand functions and size
- Generated concepts for different design options
- Created a decision matrix to find the most suitable components
- Created a functional decomposition diagram of components needed to detect the lock status and send a remote signal
- Developed an MVP to present to Saratech execs for feedback
- Purchased materials and began building, testing, and validating physical prototypes, and app/software

Final Design

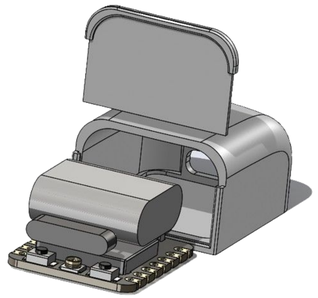


Fig. 2: non-invasive sensor exploded assembly

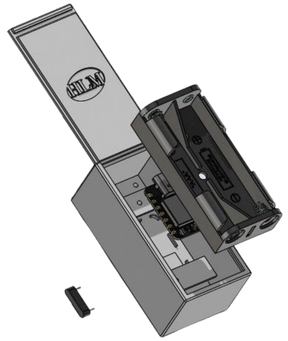


Fig. 3: invasive sensor exploded assembly

Fig. 4: invasive sensor installation mock up

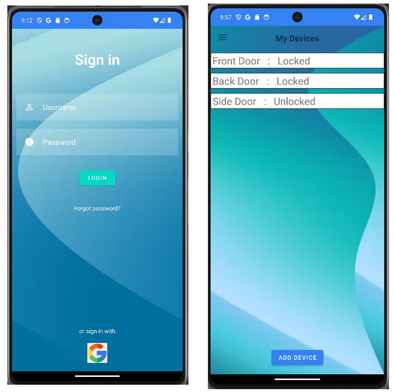


Fig. 5: Android mobile app user interface

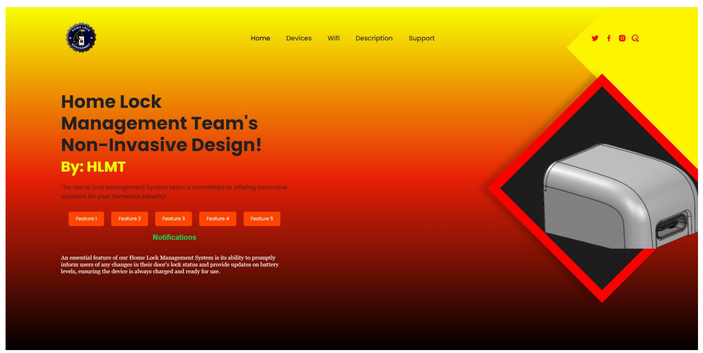
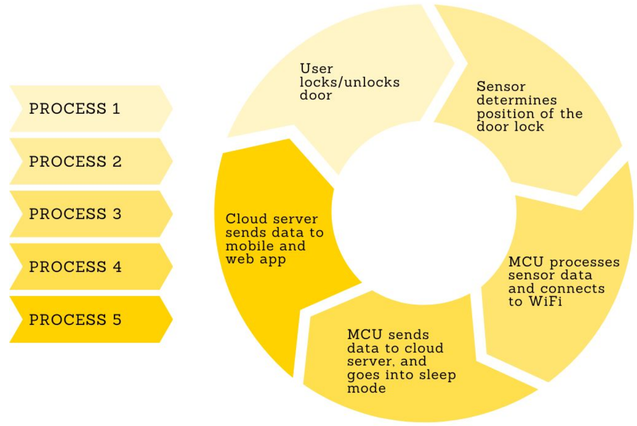


Fig. 6: web app user interface

How it Works



Product Features

MCU	Robust, power-efficient, WiFi enable computer
Sensor	Tracks the position of door locking mechanisms
Adafruit Server	Enables devices to connect to the sensor
Mobile/Web App	Displays lock status of users' doors, user guide

Future Improvements

Battery Life	Improve power efficiency and battery capacity
AWS	Integrate AWS for stronger cloud computation
Smart Devices	Smart home device compatibility for accessibility
Notifications	Lock reminders before users leave the driveway
Miniaturize	Scale down product dimensionally

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