CEN 4010 Principles of Software Engineering, Spring 2018

Milestone 1 Project Proposal and High-level description

Team 12: Internet of Things

Group 12

Members:

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Date: 2/10/2018

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| History Table | |
|  | Revision # | | Revision Date | Revision Description | Revision Notes |
| 1. | V.1 | | 2/10/2018 | Completed M1 requirements | N/A |

# 1. Executive Summary

We are developing an application to network individual devices together and wrap their interfaces into one concentrated control center. Under the working name, “Flight Control”, the application will give access to various nodes and stations to the user despite them not being physically close to them. A user will have a control center streamlined that will expand into each device's sub-menu and user controls. For example, a user might want to authenticate themselves at a workstation or clock their time spent in the lab. The application would provide the tools to record clock in times matched with their authentication time stamp to give a verifiable record and trusted documentation. Additionally, a user may wish to modify settings on a particular device such as the light intensity of a controlled bulb or the volume to a speaker. The app should allow similar integration of functionality in its evolution cycle.

# 2. Competitive Analysis

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| Key Features | Us | Competitors |
| In the case of power failure, automatically reset to their last known state | No safety measures in place in the case of a power outage |
| Two-factor authentication | Vulnerable security measures |
| Optimized for mobile | Un-optimized for mobile |
| Automatically assign available work station | Requires user interaction |

The advantages of our planned features, as opposed to those of competitors, is the ability to provide consumers with a secure, optimized, and user friendly product. We aim to have the users efficiently, and effortlessly use our product as opposed to the already available applications with obscure user interface and inaccessibility. Also, as a means to cut down the need for interference by an administrator, it is our goal to offer the user an easy automated system.

# 3. Data Definition

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| Data Definitions |
| ESP8266 | A WI-FI enabled microcontroller |
| E-WeLink (App) | A smart home remote control software that can remotely control hardware products regardless of its type and brand. |
| API | (Aka application programming interface) is how a remote server communicates with a client. When an API receives a request from a client, it transfers that data to the remote server, the server will then send a response back to the client based on the clients’ initial request through the API. |
| SDK | (AKA software development kit) are tools used by developers in order to help them program applications for a specific operating system. |
| Frameworks | A basic structure (or template) developers use in order to add a greater functionality to that system. |
| Internet of Things | The interconnection of everyday objects with computers via the internet. |
| Database | A server used to store and organize information so that it can be easily accessed and managed |

# 4. Overview, scenarios, and use cases

Students would utilize their mobile device to access a website that would be used to gain access to work benches and machines in the Engineering buildings. They would be assigned an available bench. To gain access to work benches and machines, the student would either have to be in a university course that permits the use of the facilities or they would have to be in a special “learn to use” class offered by some faculty members. In any other case the student can show an admin that they can operate the machinery at a competent level, and the admin can allow access. Student use their Z number to log-in. If a assigned bench is not to the student’s liking then they can ask for a reassignment. The student would take a picture of the bench to send, so that an admin can confirm that the bench is not as it should usually be.

Administrators would oversee the benches and allow benches to be used by students who do not meet the formal requirements to use a work bench. They can also allow more time for students whose bench time is close to done.

# 5. Initial list of high-level functional requirements

The system must be able to respond to specific situations and inputs:

* If connections have been interrupted
* If connections have become unsecure
* User wants to
  + Add a device
  + Remove a device
  + Access history of using devices
  + View a list of all devices
  + Favorite a set of devices

# 6. List of non-functional requirements Initial list of high-level functional requirements

The application will have required parameters to be met:

* Connection with authentication server must be secured and private
* Connection with devices must be maintained
* A well-organized user interface must be interact-able intuitively
* The system must be flexible for added functionality
* System must have database interactions capable

# 7. High-level system architecture

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| High-Level System Architecture |
| Software Products/Tools | Languages | APIs | Supported Browers | Frameworks |
| E-WeLink App | Arduino Language | E-Welink API | Chrome |  |
| ESP8266 | HTML |  | Safari |  |
| SONOFF Modules | CSS |  | Firefox |  |
|  | PHP |  | Mobil Web browsers (ex: Samsung Internet) |  |

# 8. Team

Ernesto D. Rivero: Product Owner

Michael Anderson: Scrum Master

Shawn Ponciano: Development Team

Kevin Vallejo: Development Team

# 9. Checklist

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| Tasks | Status |
| Team decided on basic means of communications | DONE |
| Team found a time slot to meet outside of the class | ON TRACK |
| Front and back end team leads chosen | DONE |
| GitHub master chosen | DONE |
| Team ready and able to use the chosen back and front-end frameworks | ON TRACK |
| Skills of each team member defined and known to all | ON TRACK |
| Team lead ensured that all team members read the final M1 and agree/understand it before submission | DONE |