Project Group 26

Hobby Hub

Executive Summary

Summary:

The goal of this project is to design a “smart home”, that entails a smart hub and a smart plug and can control IOT (Internet of Things) devices. These devices can be togglable plugs for lamps, appliances, etc. controllable lights, or other devices used to control or manage other home devices. Initially, the project currently entails a wall plug/socket that can be controlled remotely through WIFI via Smart hub that uses a Raspberry Pi Microcontroller. As the project progressed, we decided to shift towards creating a platform for hobbyists to create their own devices. We created a software user guide for our API to interface with commonly used development boards.

Our Approach:

As this was our own project from the start, we spent a lot of time refining exactly what we wanted to create. At first, we thought of creating many smart devices, but the scope seemed too big. We then had the idea of making something that would be for the tinkers or creatively minded people to make their own projects in a streamlined way.

Project Closing

- If possible, get a smaller transformer to shrink the size of the project. We are currently using the “Hammond Manufacturing” transformer which is 93mm by 62mm, and is quite heavy.
- Once one block is somewhat completed, try to integrate/test it out as soon as possible with other blocks to make changes in the process as early as possible. This is because it prevents the team from progressing too much with a faulty prototype/block
- Make sure everything is wired correctly when dealing with mains power, because mains
power is rated at 50/60Hz at 120V, can kill, and has a high current/voltage which can damage one's circuit.
- Be aware of explosions, fire, electrocutions and other calamities. Have an emergency plan in place when testing. This is because testing with mains power can be dangerous and result in fires if done incorrectly/without caution.
- Lead solder is considered hazardous, make sure to dispose of it accordingly. We would
suggest purchasing lead-free solder so that you do not have to dispose of the whole circuit later or inhale hazardous fumes while soldering [1].

- Working with Mains voltage is hazardous, make sure there are no exposed wires coming from Mains power. Make sure to read the datasheets of modules to see if they are rated
for mains power, and what voltage and current they can handle. Do not touch any exposed wires while connected to mains power and keep one hand away from the circuit
to avoid creating a closed loop and getting electrocuted.
- Meet as often as you can especially since during Senior year people have busy schedules and it is harder to stay on top of things. Make sure each meeting has an agenda and each member is assigned a role in order to ensure that the meeting is productive. Take notes to have a reference and look back on past designs.
- Distribute the blocks in a way that reduces team dependency. This enables the progress
of one member to not be deterred by the progress of another while ensuring combined progress of the team. Make sure to discuss the full system functionality, and ensure that Each member understands what is expected of them and the deadlines as well.
- Make sure that the team is in sync with the “technical terms/software” that the team is using.i.e. Versions of software. For example, make sure that two members working on the software side of the project, i.e. frontend and backend, use languages and softwares that are compatible with each other