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Proposal for the development of 180-Switch

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https://github.com/PRana02/USB-Microphone-Alexa-Skills-Based-

Executive Summary

As a student in the Computer Engineering Technology program, I will be integrating the knowledge and skills I have learned from our program into this Internet of Things themed capstone project. This proposal requests the approval to build the hardware portion that will connect to a database as well as to a mobile device application. The internet connected hardware will include a custom PCB with the following sensors and actuators USB Microphone. The database will store details that include users' information (names, email-id, history of messages or commands,etc), built in commands for Amazon Alexa, services and server files that supports Amazon Alexa on the devices.. The mobile device functionality will include an android app that uses voice recognition and allows the user to create an account on the app that uses firebase database and connects him to the hardware using Raspberry Pi. User can ask or type in a text for the information about the weather, news, current time, etc. to the audio assistant which would be connected to the Raspberry Pi and Database. In addition to that, user will also be able to convert text into audio and vice versa. and will be further detailed in the mobile application proposal. I will be collaborating with the following company/department Humber Prototype Lab. In the winter semester I plan to form a group with the following students, who are also building similar hardware this term and working on the mobile application with me Tunde Olokun - N01046746. The hardware will be completed in CENG 317 Hardware Production Techniques independently and the application will be completed in CENG 319 Software Project. These will be integrated together in the subsequent term in CENG 355 Computer Systems Project as a member of a 2 or 3 student group.

Background

The problem solved by this project is is the people with disabilities like impaired vision or hearing problem cannot not perform some task succesffully. To help them, we are making voice recognition application with hardware as well. The challenge is to connect the hardware to the firebase database and implementing the task successfully. The persistence of the device could be tested during the task implementation since it is a bit vulnerable.The main problem is to recognize the voice due to different accent of users and to fulfill the expectations of the user thorugh this device. The other problem is that we ended up buying two Raspberry Pi since it was individual project last semester but we figured out the solution for that too.. A bit of background about this topic is A new year brings new technological advances. We live in a society where smartphones are owned by mostly everyone from teens to young adults, from adults to seniors. With the idea that many consumers already own smartphones, we can assume that this will make our project more affordable for most users, as it will lower the total cost value. With that being said, the intention of our project is to create a device that can help both the impaired and the unimpaired. We intend to make the ability between individuals easier, providing users with global information at the tip of their fingers, as well as giving users with a fun & interactive device..

Existing products on the market include [1]. I have searched for prior art via Humber's IEEE subscription selecting "My Subscribed Content"[2] and have found and read [3] which provides insight into similar efforts.

In the Computer Engineering Technology program we have learned about the following topics from the respective relevant courses:

- Java Docs from CENG 212 Programming Techniques In Java,
- Construction of circuits from CENG 215 Digital And Interfacing Systems,
- Rapid application development and Gantt charts from CENG 216 Intro to Software Engineering,
- Micro computing from CENG 252 Embedded Systems,
- SQL from CENG 254 Database With Java,
- Web access of databases from CENG 256 Internet Scripting; and,
- Wireless protocols such as 802.11 from TECH152 Telecom Networks.

This knowledge and skill set will enable me to build the subsystems and integrate them together as my capstone project.

Methodology

This proposal is assigned in the first week of class and is due at the beginning of class in the second week of the fall semester. My coursework will focus on the first two of the 3 phases of this project:

Phase 1 Hardware build.
Phase 2 System integration.
Phase 3 Demonstration to future employers.

Phase 1 Hardware build

The hardware build will be completed in the fall term. It will fit within the CENG Project maximum dimensions of 12 13/16" x 6" x 2 7/8" (32.5cm x 15.25cm x 7.25cm) which represents the space below the tray in the parts kit. The highest AC voltage that will be used is 16Vrms from a wall adaptor from which +/- 15V or as high as 45 VDC can be obtained. Maximum power consumption will be 20 Watts.

Phase 2 System integration

The system integration will be completed in the fall term.

Phase 3 Demonstration to future employers

This project will showcase the knowledge and skills that I have learned to potential employers.

The brief description below provides rough effort and non-labour estimates respectively for each phase. A Gantt chart will be added by week 3 to provide more project schedule details and a more complete budget will be added by week 4. It is important to start tasks as soon as possible to be able to meet deadlines.
Raspberry pi from Amazon : CAD $90, USB Microphone from Amazon : CAD $10 and Speakers from The Source : CAD $30

Concluding remarks

This proposal presents a plan for providing an IoT solution for We both bought Raspberry Pi and other required materials, since it was an individual assignment last semester. To take advantage of this we would be creating a backup of our each and every task in the second Raspberry Pi in case if it gets corrupt or undesired thing happened. To overcome the problem of the voice recognition, we will be providing user with the feedback on success and failure of the activity. We will be providing user on how to use the app/device in efficient way with different test plans and guide. To backup the user data, we will be creating the copy of database for the users.. This is an opportunity to integrate the knowledge and skills developed in our program

to create a collaborative IoT capstone project demonstrating my ability to learn how to support projects such as the initiative described by [3]. I request approval of this project.

References

[1] Alexa. (n.d) alexa-avs-sample-app
Retrieved from https://github.com/alexa/alexa-avs-sample-app/wiki/Raspberry-Pi

[2] Institute of Electrical and Electronics Engineers. (2015, August 28). IEEE Xplore Digital Library [Online]. Available: https://ieeexplore.ieee.org/search/advsearch.jsp

[3] Reader instrument of basic texts to the teaching of blind people (2002, Aug 06) Retrieved from http://ieeexplore.ieee.org/document/802666/