43136

***Proposal for the development of E-Money***

Prepared by Ramya RadhaKrishnaKumar,Sushant Sharma and Vinokkumar Uthayakumar  
*Computer Engineering Technology Students  
https://github.com/RamyaRadhakrishnakumar/ceng355*

**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 user login/sign up information, fingerprint data and Banking account information. The database will store #REF!. The mobile device functionality will include It enables us to handle our banking needs and also lets us generate the QR-code for the money we intend to send/transfer/pay. and will be further detailed in the mobile application proposal. I will be collaborating with the following company/department Humber college parts crib, prototype laboratory, Humber library, toronto public liberary and A1 electronics.. 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 Ramya Radhakrishnakumar, Vinokkumar Uthayakumar and Sushant Sharma.. 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 Certain banks have limitations such as one can use his/her bank card for free only for certain number of transactions in a month. If someone has to use more than the limited transaction allotted in a month then he/she might be charged an interest. To avoid this problem, we have come up with an idea which generates a QR code for the money one wants to transfer.. A bit of background about this topic is We thought of E-Money transfer application because we wanted to reduce the use of card to do transaction or going to a bank to send money to a person/a merchandise whom we owe money. We wanted to enhance the security when transferring money via the internet. We have decided to use fingerprint reader in our device to fulfill security requirement. This project is better than money transfer online through website because one just needs a QR scanner and a fingerprint reader to accept the money rather an answer for a security question. Using the QR code makes the transfer quicker compare to online transfer. By generating the QR code the recipient scans the code. This displays a small information containing who sent the money, who will be receiving it and the amount being sent. Doing so will reduce multiple payments to the same recipient. Now the person who receives the money can login to his account after authenticating access using his fingerprint to check if the money was deposited in his account..

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.

We are planning to purchase jumper wires, an acrylic case for sensors and raspberry, android phone, breadboard, led display, data cable wire to connect the phone to the pi. Wires to connect all the sensors together. And also need to purchase the firebase(database) membership.

**Concluding remarks**

This proposal presents a plan for providing an IoT solution for We will be working together consistently as a team every week. We will be getting help from Mr.Kelly and Mr.Vlad to get better understanding to things. Safety is our first priority and we will make sure that we do not take any dangerous step. Also we would like to work on the software part so that it collaborates with our hardware needs.. 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] CanaKit Raspberry Pi 3 Complete Starter Kit - 32 GB Edition. (n.d.). Retrieved September 18, 2017, from https://www.amazon.ca/CanaKit-Raspberry-Complete-Starter-Kit/dp/B01C6Q2GSY . Ordered the fingerprint sensor from adafruit "https://www.amazon.com/gp/product/B019TPP1UK/ref=ox\_sc\_act\_image\_3?smid=A14AIPUXD2PDDS&psc=1" and the qr code scanner from eyoyo "https://www.amazon.ca/Barcode-Scanner-Eyoyo-Handheld-Computer/dp/B01I35GSKE "

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

[3] LibGuides: Accessible Computer Science Research Guide: Writing & Citing. (n.d.). Retrieved September 18, 2017, from http://dal.ca.libguides.com/c.php?g=257109&p=1716811