



DIGITAL WALLET USING ARM MICROCONTROLLER

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ABSTRACT:

As the world is getting digital there are few things which are used as it is for a long time. The most important thing which we do in our daily life is the transaction of money. Money transaction is a process which should be digitized for more security and the ease of the individual. So, by making a digital wallet the money transaction can be made much simpler and effortless. Using digital wallet we can keep all our important cards such as health card, driving license and other important papers in only one place with much more security.

The digital wallet can be our transaction medium which can be used anywhere such as shops, malls or for giving money to someone else. And with such high security, all the information which the wallet is carrying will be safe. In case, if the wallet is lost, GPS will help to detect the location of our device and GSM sends message of the location to the user mobile and that what makes the wallet a digital safe. Digital wallet and user mobile will be connected wirelessly through Bluetooth.

If the digital wallet is lost, the Bluetooth connection between the user mobile and digital wallet will be lost and this is identified as Bluetooth connection lost in the mobile. Immediately GPS will track the wallet location and GSM will send the location parameters to the user mobile.

KEYWORD:GSM, GPS, electronic Digital Wallet, Arm Microcontroller.

1.INTRODUCTION

A digital wallet refers to an electronic device that allows an individual to make electronic commerce transactions. This can include purchasing items at a store. Increasingly, digital wallets are being made not just for basic financial transactions but to also authenticate the holder's credentials. For example, a digital-wallet could potentially verify the age of the buyer to the store while purchasing alcohol. It is useful to approach the term "digital wallet" not as a singular technology but as three major parts: the system (the electronic infrastructure) and

the application (the software that operates on top) and the device (the individual portion). An individual's bank account can be linked to the digital wallet. They might also have their driver's license, health card, loyalty card(s) and other ID documents stored on the PC.

A digital wallet has both a software and information component. The software provides security and encryption for the personal information and for the actual transaction. Typically, digital wallets are stored on the client side and are easily self-maintained and fully compatible. Digital

wallets are gaining popularity among major retailers due to the security, efficiency and added utility it provides to the end-user, which increases their satisfaction of their overall purchase.

The components used in the digital wallet will be ARM7 processor, display, GPS, GSM, Bluetooth and buzzer. GPS will also be used in the device as a safety feature for the wallet which will help to locate the device and security features. GSM is used to send the wallet location parameters to the user mobile.

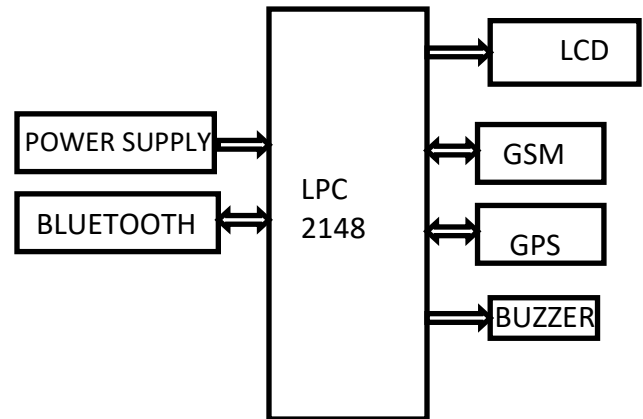
II.EXISTING SYSTEM:

In existing system, the objects like Bike keys, Wallet etc will be equipped with RF transmitter. The user will be provided with RF receiver. If any object is missing and the user cannot find it, he can track the object using RF receiver kit. If this receiver is brought near the object, the RF transmission occurs and the buzzer fixed to the object alerts. With this buzzer sound, the user can identify the object. This system can detect the missed objects only in the indoor places.

III.PROPOSED SYSTEM:

The proposed system contains Bluetooth, GSM and GPS technologies to detect the lost wallet not only in the indoor unit but also outdoor places. The wallet will be equipped with all the three modules in it. When the Bluetooth transmission is lost between the user mobile and the wallet, immediately GPS will be enabled and tracks the location of the wallet and GSM will send the location parameters as a message to the user mobile. Thus, the wallet can be traced easily without any loss.

IV.SYSTEM ARCHITECTURE:



V.EXPERIMENTS and RESULT:

MODULES:

The Main Control Module: In this design, we chose an ARM7TDMI-S core based microcontroller called LPC2148, which is the production of NXP Semiconductors. The LPC2148 microcontroller is high-performance 32-bit RISC Microcontroller with Thumb extensions, it has 512KB Flash Memory and 40KB Static RAM, it use 12.00MHz Crystal, so it can process data with the maximum high speed at 60MHz when using it with Phase-Locked Loop (PLL) internal MCU. It has Real Time Clock circuit with 32.768 KHz XTAL and Battery Backup. Support In-System Programming (ISP) and In-Application Programming (IAP) through On-Chip Boot-Loader Software via Port UART-0 (RS232), circuit to connect with standard 20 Pin JTAG ARM for Real Time Debugging. Has standard 2.0 USB as Full Speed inside, has Circuit to connect with Dot-Matrix LCD with circuit to adjust its contrast by using 16



PIN Connector. RS232 Communication Circuit by using 2 Channel. SD/MMC card connector circuit by using SSP. EEPROM interface using I2C. It has PS2 keyboard interface and general purpose I/O pins. GSM Modem: Communication among vehicle, owner, police and emergency is established accordingly as per requirement through GSM (Global Service for Mobile communication). GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it may be a mobile phone that provides GSM modem capabilities. A GSM modem could also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on our computer.

GSM MODULE:

For providing communication between the GPS, GSM and the allocated mobile number GSM SIM900 module is preferred. The name SIM900 says that, it is a tri band work ranging a frequency of 900MHz to 1900 MHz such as EGSM900 MHz, PCS 1900 MHz and DSC 100 MHz Receiving pin of GSM module and transmitting pin of GPS module are used for communication between the modules and the mobile phone.

GPS MODULE:

To find the location on the earth the whole is divided into some coordinates where the location can be easily captured by a module

called GPS module. Here the GPS used is SIM28ML. This GPS module will find the location of the vehicle and the information fetched by the GPS receiver is received through the coordinates and the received data is first send to arduino and the information is transmitted to the saved contact through GSM module. The frequency is operated in the range of 1575.42 MHz and the output of GPS module is in NMEA format which includes data like location in real time.

LCD MODULE: To display the numbers, alphabets and special characters an LCD module with 16x2 alphanumeric types is used. Using the higher bit data lines of LCD pins such as pin 11,12,13 and 14 are interfaced to digital pins of Arduino such as pin 8,9,10 in 4 bit mode as shown in the below figure. RS and E pins of LCD are connected to pin 12 and 13. To perform the write operation on LCD the read/write pin is connected to ground.

BLUETOOTH MODULE HC-05:

Bluetooth module HC-05 is used for wireless communication between Arduino Uno and smartphone. HC-05 is a slave device and it can operates at power 3.6 to 6 volts. It has 6 pins: State, RXD, TXD, GND, VCC and EN. For serial communication connect TXD pin of Blue tooth module HC-06 with RX (pin 0) of Arduino Uno and RXD pin with TX (pin 1) of Arduino Uno. Connection diagram of Adriano and Bluetooth (BT) module is illustrated.

RESULT :

Digital wallet is a very innovative design implemented to make payments very efficiently with utmost safety security. As it comes to the online payments, there is a great need to save it without any loss. If the digital wallet is lost, there is very much chance to duplicate the things and misuse the wallet where the loss cannot be measured. To use the digital wallet with great safe and security, we have designed this project to trace out the lost digital wallet.

This design consists of LPC2148 microcontroller, GPS, GSM, Bluetooth, LCD display and buzzer. LPC 2148 checks the Bluetooth connection established between the user mobile and digital wallet. The digital wallet contains the GPS, GSM modules in it.

If the digital wallet is missed or lost and the user is far away from his wallet, then the Bluetooth will be disconnected immediately and this indication can be seen in the user mobile. As soon as the Bluetooth is disconnected, GPS enables and tracks the wallet location. These location parameters will be sent to the user mobile as a message using GSM. Thus, the user can trace the wallet at the earliest without losing any money or data.

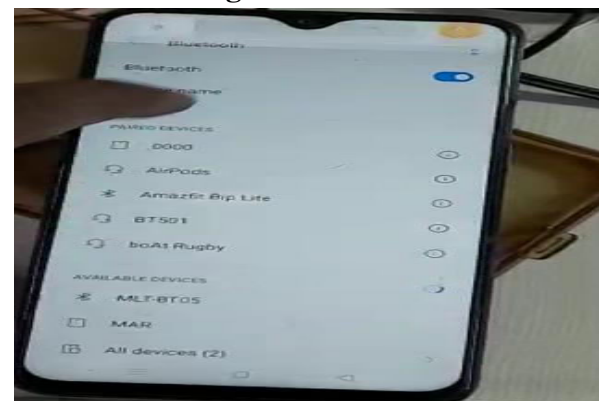
Project pics: Project setup



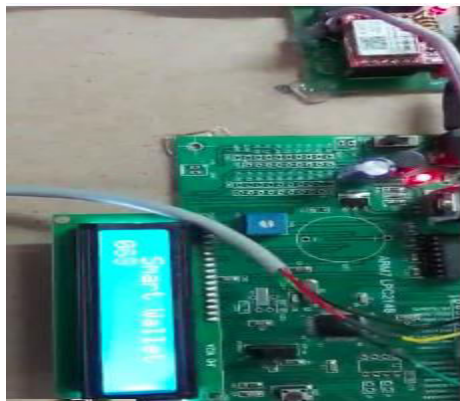
Pairing Bluetooth of digital wallet with user mobile:



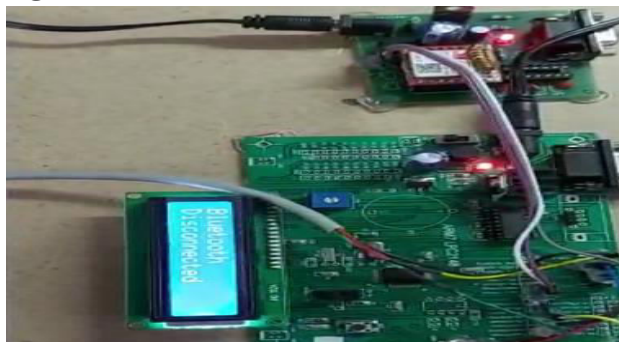
Bluetooth settings in user mobile:



Bluetooth enabled, showing the strength:



Bluetooth disconnected, here showing as digital wallet lost:



Bluetooth disconnected, GPS collecting the digital wallet location in terms of Latitude and Longitude:



GSM sending the location parameters message to user mobile:



Message sent successfully to user mobile:



CONCLUSION:

Throughout the ages the method of payment have evolved and provided effective means for exchange of value. This has ultimately created the business world which has become integral part of everyone's life. The emergence of electronic world and the rise of eCommerce have forced to invent new payment methods. Without payment there is no business and eCommerce cannot exist



without effective means of exchanging values. The proposed work provides a very safe and secure way of payment which can be used in everyday life and enables tracing of wallet using technologies like GPS, GSM and Bluetooth.

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