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IOT BASED ANTI-THEFT SMART WALLET

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Abstract

A wallet is a necessary thing for people as it helps to contain very important items such as identification cards, money, and ATM cards. A wallet can become lost, misplaced, and even stolen. There can be times to find a lost or missed wallet. To solve this problem Anti-Theft Smart Wallet comes handy. The smart wallet has several features. People will forget their wallet at community places or railway station or airport, so it will be difficult to find their wallet. This problem can be overcome by using the Anti-theft smart wallet. To track and find the wallet, a smartphone application was created. By clicking the button in the mobile application, the wallet will arise the alert so that it can be found easily. The important feature is the pin lock. Once the password is entered and matched with a predefined password, the wallet will open and the concerned person will be allowed to access the wallet. If the password is unmatched, then the wallet will remain closed and deny access to the person. In addition, it alerts the owner through SMS with the help of a GSM module. GPS is installed on the wallet for real-time location tracking everywhere. This GPS module locates and forwards the wallet mobility information through IoT to the authorized person. The vibration sensor will alert the owner if someone is trying to break the wallet.

Keywords: pic microcontroller, IoT, GPS module, GSM module, vibration sensor, buzzer

1. INTRODUCTION

A wallet is needed for everyone. The people usually carry items that are valuable and kept hidden or out of sight. Nearly all of us forget our wallets at workplaces, restaurants, and festivals. Every year millions of individuals lost their wallets, and some terrible cases involve that is wallet theft. It is always unsettling to lose our wallet. The difficulties such as loss of priceless cash, the challenging chore of giving up credit/debit cards and reapplying for government identification cards occurs. As of now, the knowledge of the smart wallet is known. This is not a novel concept for the development of a smart wallet.

A lost or misplaced wallet is a very tiring and traumatic experience. The things in the lost wallet are hard to find and hence the need for an anti- theft wallet system which keeps track of the wallet even when lost. This system monitors the wallet to track its location at all time so when the wallet is lost it is easily retrievable. This wallet is considered smart wallet because of its ability to track its location.

The objective of the Anti-Theft Smart Wallet is to revolutionize traditional wallet functionality by integrating advanced technologies for enhanced security and convenience. Recognizing the common occurrences of wallet loss and theft, this smart wallet employs features such as GPS, GSM, IoT connectivity, and a vibration sensor to address these issues comprehensively. The smartphone application associated with the wallet allows users to trigger alerts, remotely control the wallet, and track its real-time location. The inclusion of a pin lock adds an extra layer of security, ensuring that only authorized users can access the wallet's contents. In the event of potential theft or loss, the wallet promptly notifies the owner via SMS through a GSM module. This holistic approach aims to not only prevent the loss of valuable items like identification cards and money but also to provide users with a seamless and secure experience in various settings, from community places to busy transportation hubs.

2. LITERATURE REVIEW

In paper [1], the author suggests an intelligent idea of how a smart wallet can be opened by the individual and at other times is closed because of biometric authentication. It comprises a fob key designed to send constant wireless signals to the smart wallet device which detects the approximate range. In paper [2], the author devised a novel method to surveil a wallet continuously by employing Bluetooth and GPS. Bluetooth tracker is small gadgets which is attached to a phone. GPS will pursue and track down those items. It shows the prime items the

individual agonizes about misplacing such as a key or a laptop. In paper [3], the author innovated the smart wallet exploiting RFID technology and it estimates how much amount is entering inside and leaving out of the wallet. It warns the owner if the wallet is found missing from the pocket, specifies the location, and provides information about how much amount was spent.

In paper [4], the author found a different method which uses GPS to capture and move ahead the wallet mobility information via communication protocol. LoRaWaN for cloud interface update for observing, through Arduino on Ubidot. The IoT platform Ubidot is the user interface. It exhibits real-time google Maps updates of wallet mobility and location information. In paper [5], the author devised an alternative method for monitoring the lost wallet. When GPS module is employed, a warning message will be sent to the person if the wallet is inaccessible. The wallet can be traced by holding down the locate button in the smartphone app. The two available modes are normal mode and missing mode. If the wallet is out of the away, then it will move into missing mode. In paper [6], the author gives an idea of developing a smart wallet with a tracking system. The mobile application has developed to track and locate the wallet. It makes it possible to track and monitor the location of the wallet in real time within a certain range.

3 METHODOLOGY

Anti-theft smart wallet is an innovation with GPS and GSM system entailed in it. The smart wallet is linked to smartphones for following the location through the mobile app. In this paper, the smart wallet contains unique features. A smart wallet is an individual electronic which is used for saving crucial information carefully. The Internet of things is employed to develop a user- friendly interface for the human to pursue and discover the missing wallet. This interface was developed on the cayenne platform. It needs the internet to acquire any device and it is not restricted to any device since it is an application-based platform. However, it is an internet data- based. This paper evolves a sustainable system to surveil, follow and find wallets when missing. Anti-theft smart wallet developed using Software-Hardware co-design as shown in Fig 1. The hardware components of the system are PIC16f8771a microcontroller, Vibration sensor, GPS, GSM, Lock and LCD display. The software developed using Embedded C.

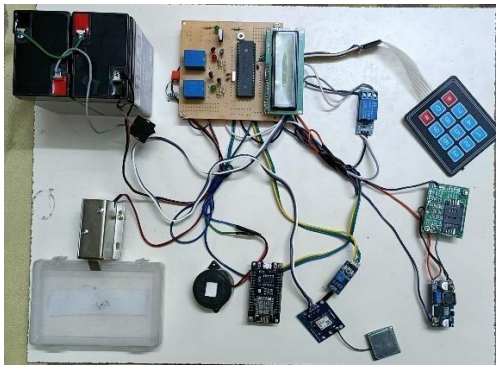

Fig 1 Anti-theft smart wallet kit

PIC16F877A

The controller is known as the heart of the entire system, which will check for the input and operate the output accordingly. The microchip technology developed PIC which is a family of Hardware architecture microcontrollers. It is originated from PIC1640. This microcontroller exploits FLASH memory technology, which permits for unlimited write-erase cycles. A microcontroller is a multipurpose device that combines some of the components of a microchip architecture onto a single chip. It is a mini PC because it has an internal CPU, memory, and peripherals.

Battery supply

The transformer, which is coupled to the usual ac voltage of 220V, steps that voltage down to the desired level of AC. A dc voltage is produced by a simple capacitor filter. After that a diode rectifier supplies a full-wave rectified voltage. Ac voltage fluctuation is typically seen in the resulting dc voltage. Voltage regulation is accomplished by extensively used voltage regulator IC components. A 5-volt direct current powers all of the components except the lock.

GPS module

Global Positioning System is a satellite-based navigation system which provides position and timing information. With the aid of a Bluetooth module, this system is combined with a wallet. The location of the wallet will be traced with the help of the GPS module when it gets lost. This GPS module locates and forwards the wallet mobility information through IOT to the authorized person.

GSM module

A device that offers a wireless data link to a network using the Global System for Mobile communication (GSM) mobile technology is called a GSM module. This module merely functions as a distant Bluetooth alarm system. First, connect our smartphones to the smart wallet using this GSM module. The alarm will start playing when the button on the smartphone app is pressed. The serial data will be received by this module, which will then send the data as text SMS. When the wallet leaves the area or is accessed by an unauthorized individual, it is utilized to send an alarm message.

Buzzer

In this system, a buzzer is connected to the digital direction of the controller. It will work based on the on-and-off operation through the given signal from the controller. The alarm will start playing when the button on the smartphone app is pressed. It will give the alert sound based on that the wallet can be easily found out.

Driver/ Relay module

The microcontrollers digital pins are attached to the driver relay circuit. The controller will transmit a signal to the driver/relay circuit (ON/OFF) analogously to the pre-loaded code. When the driver/relay circuit acquires ON condition, the lock will be opened. A 12-volt direct currentsource will be used to switch on the lock.

Vibration sensor

A vibration sensor measures the amount and frequency of vibration in a system. Theft detection is done using this sensor. The smart wallet has been equipped with vibration sensors. When this module vibrates unnaturally, it will sense it and send a warning message through Bluetooth.

IoT module

Microcontrollers may link to 2.4 GHz Wi-Fi employing IEEE 802.11 bgn to the ESP8266 module. It can operate both as a standalone microcontroller and as a node in the IoT ecosystem. Cayenne is a user interface for this system. This module is connected to the hot spot and the data stored in the cloud will be sent to the user

4. RESULT

Smart wallets are password protected. A password is required to access the smart wallets. When the PIC16f877A microcontroller is powered up for initialization, the system will automatically lock the wallet as a security measure if someone tries to access the wallet with the wrong password. GPS sensor starts collecting data on the location of the wallet as soon as it is initialized. The information about the location of the wallet is forwarded to the individual via SMS through the GSM module and will be uploaded online to show on IOT platforms. Client can perceive the location in real time employing its coordinates online. The location of the wallet can be pursued utilizing these information and Google Map locations as shown in Fig 2.

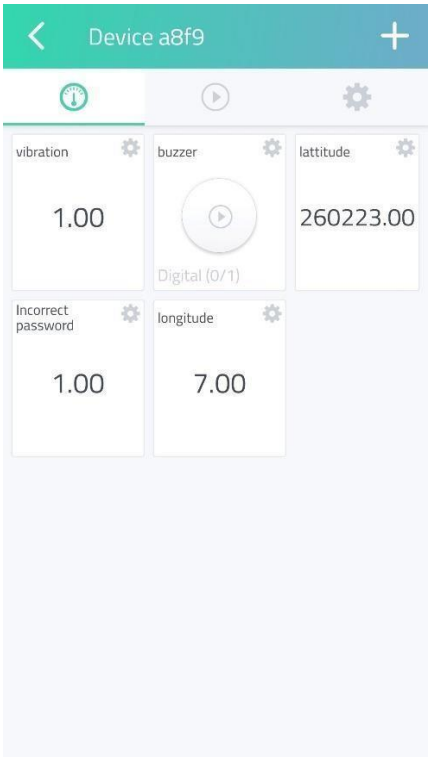

Fig 2 Mobile Application

When the client logs into the online user API interface produced on the Cayenne platform, the client can browse the IOT API of the wallet on any internet-connected device. Smart wallets have a buzzer. Using the Cayenne platform, the user can set up an alarm if the wallet is lost. It has a sensor for vibrations. This wallet may break over time due to wear and tear if something creates unusual vibrations. The vibration sensor will send the user a message if it experiences an abnormality. The aim of the anti-theft smart wallet is to make user information more secure and reduce the rate of lost or stolen wallets.

5. CONCLUSION

The proposed IoT based Anti-Theft Smart Wallet is faster and more accurate than the comparable existing system. This IOT based system is a upgraded system because this system allows the clients to communicate with their wallets, follow the location of the wallet employing android smartphone. The smart wallet is used to detect theft. When a mismatched password is typed, the location of the wallet is forwarded to the detailed phone number utilizing the GSM module. The proposed system is to decrease the percentage of lost wallets being misplaced or stolen and make the information of users more secure. In the future, the proposed method can be enhanced by including a camera that will capture the theft image.

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