# Research on RFID-Based WalletDetection System

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***Abstract*— Many of us mostly forget our Wallet, which is a must for all as it allows for the safeguarding very priceless things. Walletis one of the most belongings, We are thus implementing a Smart Almost following you wallet. When compared to the standard wallets that are sold in the market, the smart wallet has several advantages. It is a contemporary wallet that has a GPS system integrated into it. Simply connect your smartphone to your smart wallet and use the app to track it. There are two operating modes for the Smart Wallet: Normal mode and Lost mode. The Wallet goes into lost mode when it is far away. The misplaced wallet can then be located using a GPS system. While in the default mode, if we travel a particular distance away from our wallet, we receive an alarm or alert message that we neglected to bring our wallet, allowing us to quickly locate it and carry it with us. The smart wallets can do all the tasks that the traditional dumb wallet can, but it also has additional capabilities like mobile charging and anti- theft security. It is always more expensive than a typical wallet, but it is typically well-made, has a sleek appearance, and offers some additional technological incentives. In order to address this, the research report suggests a smart wallet with features including a notification system for users who move away from the wallet.**

***Keywords*— Smart wallet, GPS System, Internet of Things, Alarm, Alert Messages.***

## I. INTRODUCTION

Everybody needs a wallet, but it's also one of the items that gets lost the most. It only takes a split second to lose your wallet for good. It could have fallen out of your jacket or purse, or you could have left it on the table at the last restaurant you visited. You lost more than just an expensive leather card wallet or billfold; you also lost your identification documents, including your driver's licence and credit cards, cash, and any other items you keep in your wallet. Your identity could be stolen in a couple of hours if someone else obtains that information. Every year, thousands of wallets are misplaced. 10% of people will lose their wallet within a five-year span. One of the most typical items lost by folks is their wallet. One of the most typical items lost by people is their wallets. We've developed a few options to aid you in keeping your wallet secure. Introducing the smart wallet that practically follows you and has a constant tracking system. A smart wallet is a wallet from the current era that includes a GPS system. The mechanism of the smart wallet has been upgraded to include a Bluetooth module, which makes this possible. It's interesting to note that the wallet just has Bluetooth connectivity to your mobile, whereas your device also includes a GPS module. Consequently, a tone would play on your phone to alert you to find the wallet when it is more than 100–200 feet away from your smartphone. Your mobile phone would show the last location of your Smart Wallet even if it is outside of the Bluetooth range of your wallet. Additionally, it offers RFID security. Radio Frequency Identification is what it basically entails. Due to its role in preventing electronic pickpocketing, Smart Wallet features the feature. Aluminum is layered in RFID-based wallets, and occasionally the metal fabric is sewed into them. This design aids in preventing thieves from tapping into your RFID frequency. You need a smart wallet since it protects your credit and debit cards. The remainder of this research study was structured so that it includes parts on a literature review, relevant work, methodology, suggested work, outcomes, and discussion.

## II. LITERATURE SURVEY

The idea of the Smart Wallet is not an original one, it is already implemented by many of the people. However, it is an original plan that if we move certain distance away from the wallet it gives an alarm or alert message. Srushti Avhad [1] introduced a Smart Wallet which follows you. The Smart Wallet will be active When we are away from the Wallet. The most unsettling aspect is the built-in camera that takes a picture of the person opening it in a lost object and sends it instantly to a smart phone. The GSM module helps the mobile device receive actual live parameters of the wallet once the GPS module tracks its location. The Location data and the stolen image are transmitted to the designated phone number via the GSM Network and WIFIModule as immediately as when the Wallet is disconnected from the user's smartphone. Further built-in functions of Smart Wallet include mobile charging, location tracking, and many others. HGD Chamika [2] proposed Smart Wallet Tracking System. The wallet is connected to GPS to give it real time tracking capabilities. An android app is developed in parallel with the hardware implementation for the users. This app gives the user the ability to check the location in real time with high accuracy. You will also be able to specify a range in the app so that the app will notify if the wallet is out of range, so that the user can check on the matter immediately. They make use of the Google Maps Application Programming Interface for the location display within the app. Real time location is displayed via the map. Further, the location tracking can be turned on and off onlyvia the app, should the user think to save battery. P. Vijayakumar [3] done various research and implemented Iot based on a counterfeit money detection system with intelligent wallet security. There are two operational modes for the proposed system. The wallet is protected by the first system, which uses RFID technology, and the monetary value is detected by the second system, which uses color sensor technology. They employ two modules for the money detection feature: Sensor, RGB also, Led laser. When paper money enters the wallet, the first and second infra-red laser diodes are cut, sending a signal that it is attempting to enter the wallet. When paper money leaves the wallet, the first and second infra

- red semiconductorlasers are cut, and the value is added to the original incident and deducted from the overall amount when it leaves. Also, thered, green, and blue colors of the RGB sensor, which is effectively a color sensor, are simultaneously decoded to read the denominations. When a money is discovered, its details are downloaded and updated via the database server's WiFi connection using the PI (Firebase). Adeniran Mayokun Samson [4] proposed IOT Based Sustainable Wallet Tracking System The wallet was always equipped with GPS for the wallet's real-time position updating under the scheme that was suggested. This GPS records and transmits data about wallet movement using the LoRaWAN communication protocol for accessing and updating cloud interfaces on Arduino and Ubidot. A more versatile upgrade that makes it simpler to locate and locate the wallet. The user interface for the suggested system is the IOT platform Ubidot. This platform shows the location information and Realtime Google Map updates for wallet mobility. The method allows for the tracking and monitoring of the wallet's location in real time across a 2–5 km range using an IOT interface that can be accessed from any internet-connected device and always updates the wallet in real time. Sagar Karkare [5] implemented Live Tracking System. Parents and kids are the intended audience for this work. Both parties need Sim and Navigation phones, meaning that the youngster must have a tracking module and the adult must have a smart phone. that at the very least supports GPS and SMS. While GPS is available on new smart phones, SMS is a standard feature on all smartphones. Parents should use the app primarily to find their children's whereabouts. The system will be created utilizing an Android app at a later stage for implementation purposes. A virtual panel where a graphical interface may be constructed is where the Android App is to be utilized. To reach a larger audience, the Android Operating system was primarily selectedfor this project's implementation.

## III. METHODOLOGY

The Smart Wallet is equipped with a real-time system that ensures the correct operation of the GSM, GPS, and Camera Module Systems. The Global positioning system manages, and the stolen picture is transmitted to the specified contact number using GSM Technology and WIFI Module as soon as the user's wallet is unpaired from their smartphone. Other nearly essential aspects of Smart Wallet include biometric security, location tracing, and several more. This system only tracks the wallet when it is unpaired from the Smartphone.

When we forget or lose the wallet after moving certain distance, then we get an alarm to the smartphone. We can immediately find the wallet. Even if we do not check the alarm though we can track the device using GPS tracking. The suggested system shows how orders, actions, and judgements are carried out in the system. When the user first realizes that the wallet is out of range, The microcontrollers are turned on so they may be configured. Immediately after that, the GPS sensor is initialized and activated to gather information on the location of the wallet. This information is then transferred by the lora- configured transmitter module to the receiver module.

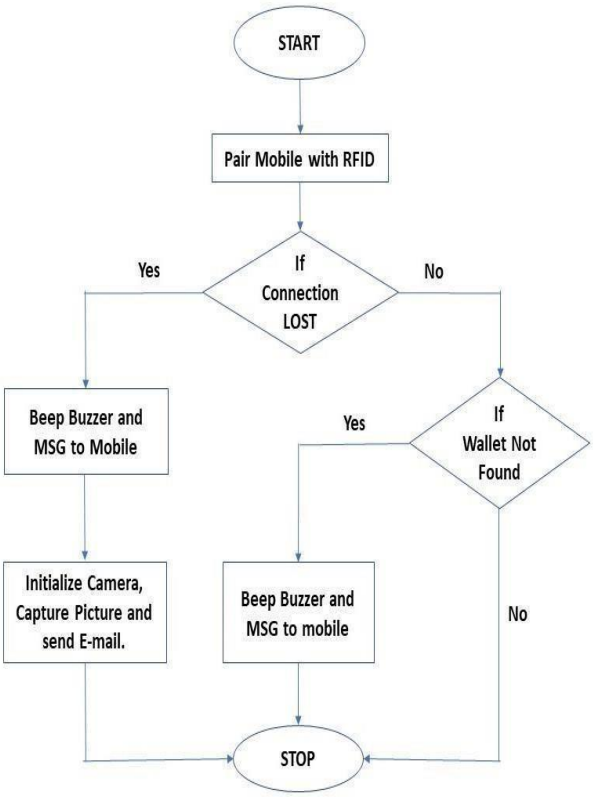


Fig. 1. Dataflow Diagram.

Their information is later transported, processed, and sent to the internet for displaying and availability on IOT platforms through the communication gateway once the microprocessor has extracted the coordinates. The user may view the position in parameters in real time online.

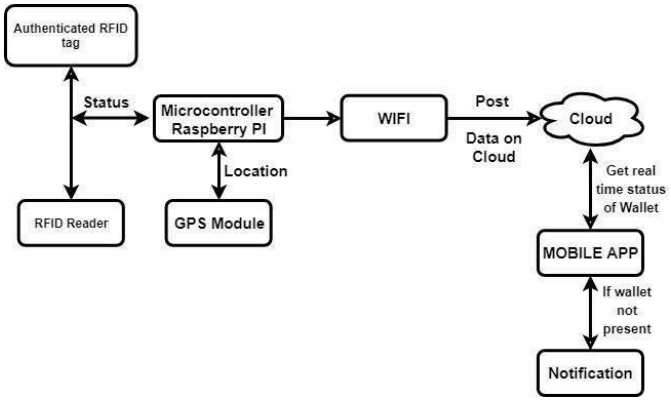


Fig. 2. Protection System

### *A. RFID Module*

An RFID reader is inserted into the pocket, and the user receives and stores an authenticated matching tag in their wallet. The Raspberry PI is linked to the RFID reader. Whenever the card is verified and near to the reader, meaning its

A "Connected" signal is given to the reader when the UID matches that of the issued tag (Firebase). When the RFID reader finds no badge or an unauthorized tag, the "Missing" signal and the Wallet's current location using the Navigation systems integrated within the Wallet are transferred to the cloud.


Fig. 3. RFID Module

### B. *Global positioning system Unit Module*

Whenever the wallet shifts into lost mode, its location is tracked using many components. The GSM module helps the mobile device receive the live parameters of the purse once the GPS module tracks its location. This setup uses a Global system for mobile communication, a small GPS module and an 800 module.

### C. *Camcorder Module*


Fig. 4. GPS Module

This module is used to take pictures of the theft while the wallet is open. The The mechanism that opens the camera is controlled by a magnetic switch. WIFI Module is employed to transmit the captured images to the user's mobile device.

Fig. 5. Camera Module

### D. *WIFI Module*

A SOC microchip called a Wi-Fi majority of the module utilized to benefit creation of endpoint Internet of Things (IoT) applications. It is referred to as a freestanding radio transmitter, and it is reasonably priced. In order to enable various embedded device programs to link to the internet, it is used.

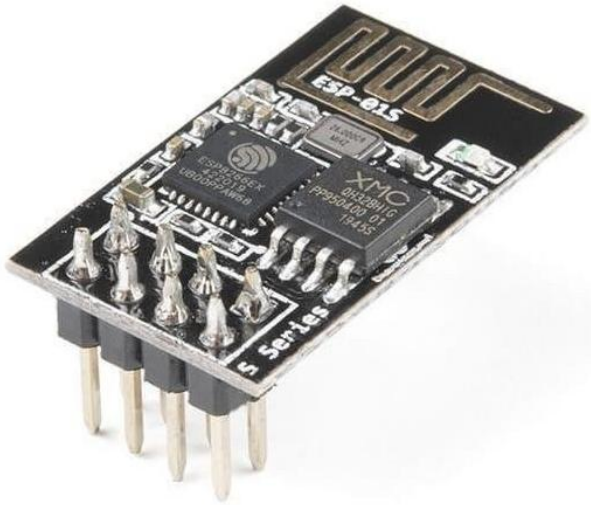


Fig. 6. WIFI Module

### E. *Buzzer Sensor Module*

A passive buzzer is the Sensor-Buzzer. Similar to an electromagnetic speaker, it requires electricity at various frequencies in order to produce the appropriate sound. When the frequency rises, the pitch increases louder.

## IV. RESULTS

We'll talk about the outcomes of this project's implementation in Section VI. Fig The Smart Wallet Security system's hardware connections are illustrated in Fig. This system communicates the Global positioning system and RFID information to Firebase in the cloud when it is connected to the internet, which is subsequently retrieved by the Mobile application as shown in Fig. 3. Similar to this, the hardware solution for money detection is depicted in Figure 4. Whenever the sensor recognizes movement of notes, it updates Firebase, which subsequently transmits the information to the Android App.

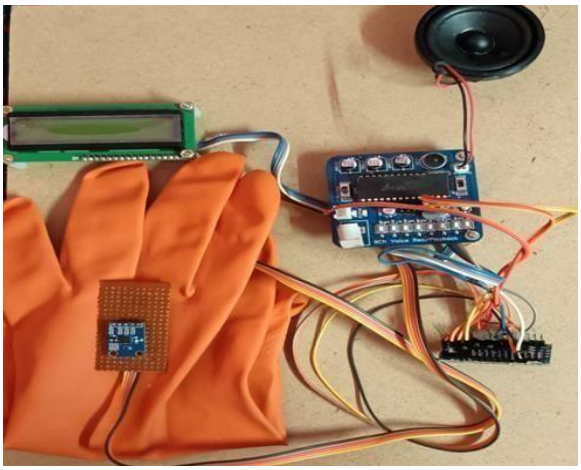

Fig. 7. Security Implementation

Once you click on the application, the user interface for the wallet appears as Fig.8, there you have certain options and an option for the pairing of the wallet with our smart phones. By clicking the option your device will be paired to the wallet, then you can choose the remaining options as you like checking the status, notifications and can find the wallet. Once your wallet is paired with the smart phone means the wallet is in your range, so if you want to find it then simply click the buzzer option in (Fig.10) to get the sound from the wallet then you can trace it easily. If it is out of range then you will get coordinates notification, so you can track it comfortably.


Fig. 8. Mobile Application User Interface

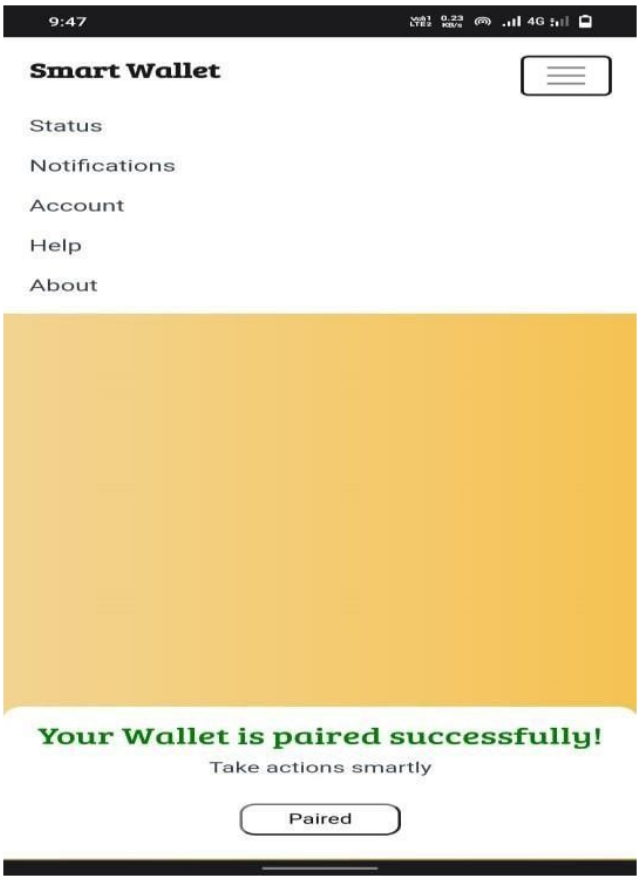


Fig. 9. UI After Pairing with Wallet

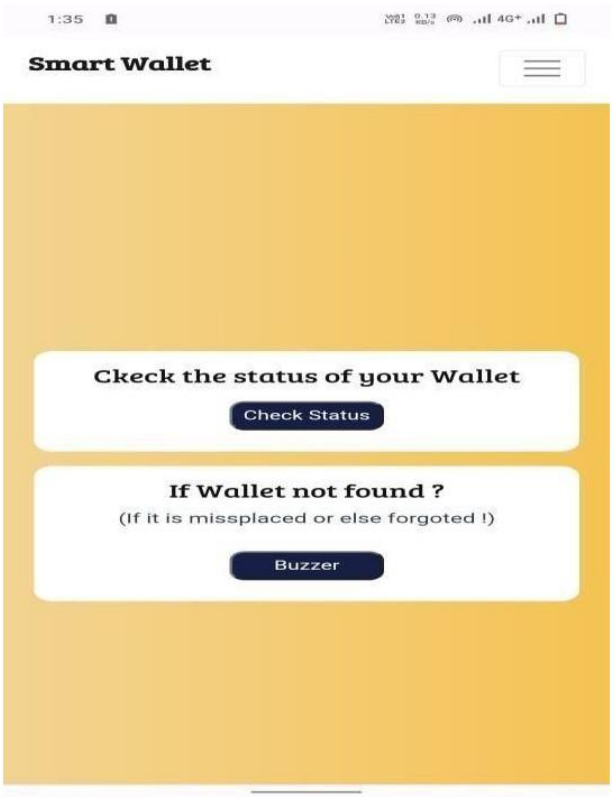


Fig. 10. UI to check the status.

Figure 11 displays a snapshot of the smart wallet's location on the user's phone as determined by the Global positioning system ( gps. These coordinates are transmitted by the GSM modem to the user's phone, and by following them, we may determine where the wallet is right now.

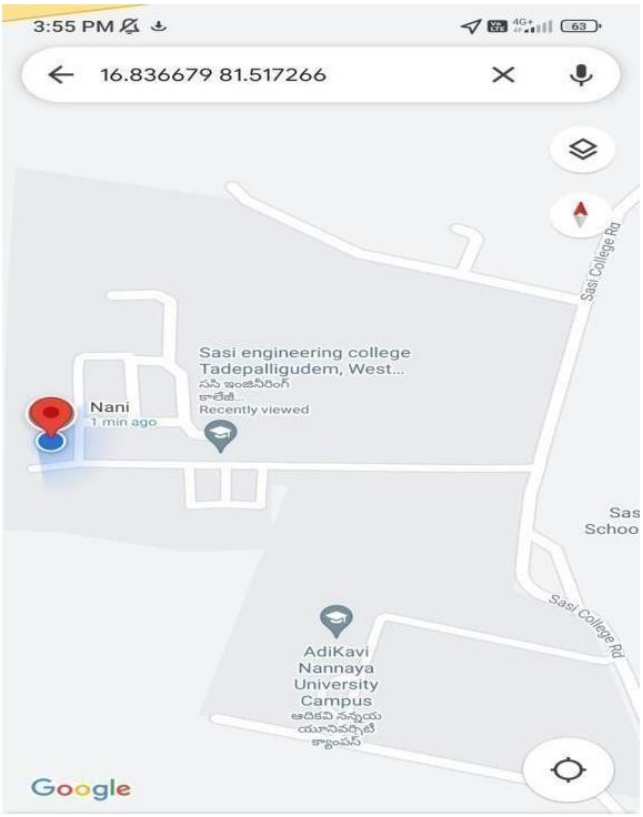


Fig. 11. Location Coordinates Screenshot

## V. CONCLUSION

Proposed a developed version of an existing system prototype called smart wallet using IOT. In terms of real- time accuracy of wallet tracing, this technology primarily represents an enhancement over an existing method. This system can be used to find the wallet when it is out of range by sending the co-ordinates of the wallet to the mobile interface and with an alarm buzzer with the images of a person whoever opens the wallet when it is out of range. Even if you want to find your wallet within the range, then you can track it or with a buzzer option you can get a sound from the wallet where you can find it easily when it is in your range. The suggested approach can be improved in the future by shrinking the size of the materials that are used to make the sensors, which makes the wallet handier, and pocket sized and makes it more compactable.

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