Swift Cash: One Card For All User Payment And Identity Needs

Manjiri Rane[1], Pradnya Sarang[2], Abhijeet Patil[3], Asst.Prof Anjali Almale[4]
[1, 2, 3, 4] Dept of Computer Engineering
[1, 2, 3, 4] JSPM's BSIOTR Wagholi, Pune

Abstract- *The credit card is the most widely used electronic payment technology for transferring money between two peers. Peer- to-peer (P2P) money transfers have moved to the next stage of development with the concept of mobile wallets and mobile banking and P2P money transfers. The system presents an approach by which one card can communicate with another using near-field communication (NFC) technology to digitally transfer money from the payer's bank to the payee's bank .This will eliminates the need for physical cash and also serves all types of payment and identity needs. It will be act as cashless card-to- card transactions. Thus, efforts of going to ATM machines is been reduced which may contribute to the smooth functioning in market. The information is sent to bank server to complete the transactions, generating a secure payment system. A capacitive fingerprint sensor helps to increase the security of the card. The module sends an SMS via GSM to the cloud with required details of the payer. Thus by using cards we can transfer money from one card to another card by keeping our information preserved along with this the card serves as an virtual identity (ID) card accumulating the information of all types of Identity cards.*

Keywords- NFC Technology, Server, Transactions, Security, Identity

I. INTRODUCTION

A. *Project Idea*

In the recent times there has been a fast progression in digitization of systems where in the mobile technology has created a huge impact on life. As the wireless payment is an essential part of mobile commerce applications for mobile device users, to build a secure system has been the subject of discussions [1]. According to the Wireless World Forum, mobile payment on wireless devices will provide excellent business opportunities in the coming years. By 2005, the leading countries across the world will generate the largest mobile payment markets because there will be more than 200 million regular mobile users that will spending billion dollars in total using the new mobile payment system.

The chronology of digital payment system development was from JW model to Samsung Pay[2]. Despite the success of the new digital P2P payment methods, we believe that, to fully enable this increasing rise of digital wallets, relevant challenges still need to be addressed.

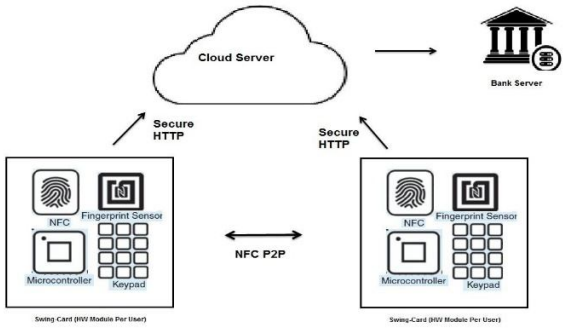
With the goal of instantly transferring money between two peers, the concept of electronic fund transfer through the Internet developed also many possible solutions, like wire transfer and ATM networks have been developed to support this goal. Using crypto currencies like Bitcoin and Lit eco in, one can transfer money to anyone in the world in the blink of an eye.

Although now we have a number of types of electronic payment solutions for Internet-based applications and commerce, we are still faced with new issues and challenges in wireless payment because of lack of study and experience in wireless payment.

B. Motivation

1) Emerging payment technologies create both opportunities and challenges for the future.
2) Being a quick and convenient process, contactless payment gained momentum, especially with merchants, with throughput being the main parameter.

II. ARCHITECTURAL DESIGN



A. *The Swing-Pay has three role players in the system:*

1) The hardware module
2) The cloud server
3) The bank.

The hardware module communicates with the cloud server, which then communicates with the bank server to make the transaction happen[4]. Each user will have HW module with his/her unique information. In the Swing-Pay framework, the payee activates his card using his fingerprint. If the fingerprint is authenticated, then the card is activated. After that, the payer selects the Pay Money mode and the payee selects the Receive Money mode from the module. Then the payee authenticates himself using the fingerprint sensor and taps his card with the payer's card. [5] If the authentication is successful, the unique ID of the payee is transferred to the payer module by NFC P2P mode. When the payer gets the payee's unique ID, he then sets the amount to be sent using the capacitive keyboard. This information will be send to bank server to complete the transaction.

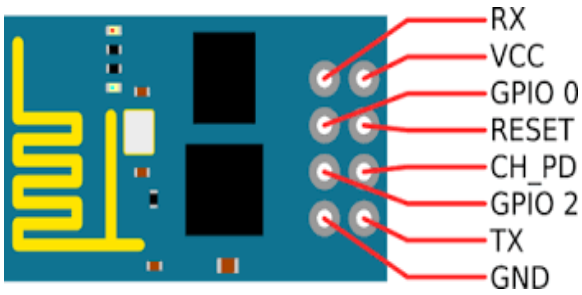
III. METHODOLOGIES

A. ESP8266 Module

The ESP8266 WiFi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much WiFi-ability as a WiFi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration[6] allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces; it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

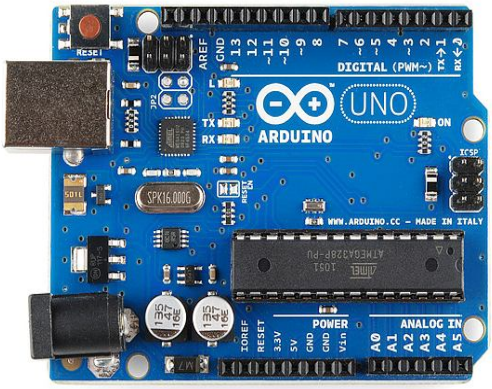
Module Pin Diagram



1. GND(Ground from power supply)
2. GPIO2(Digital I/O programmable)
3. GPIO0(Digital I/O programmable, also used for BOOT modes)
4. RX- UART Receiving channel
5. TX-UART Transmitting channel
6. CH_PD(enable/power down, must be pulled to 3,3v directly or via resistor)
7. REST-rest, must be pulled to 3.3v
8. VCC-3.3v power supply

B. Arduino

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.
The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.



C. R307 Fingerprint Module

R307 Fingerprint Module consists of optical fingerprint sensor, high-speed DSP processor, high-performance fingerprint[7] alignment algorithm, high-capacity FLASH chips and other hardware and software composition, stable performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.

IV. FEATURES

Perfect function: independent fingerprint collection, fingerprint registration, fingerprint comparison (1: 1) and fingerprint search (1: N) function.

Small size: small size, no external DSP chip algorithm, has been integrated, easy to install, less fault.

Ultra-low power consumption: low power consumption of the product as a whole, suitable for low-power requirements of the occasion.

Anti-static ability: a strong anti-static ability, anti-static index reached 15KV above.

Application development is simple: developers can provide control instructions, self-fingerprint application product development, without the need for professional knowledge of fingerprinting.

Adjustable security level: suitable for different applications, security levels can be set by the user to adjust.

- Finger touch sensing signal output, low effective, sensing circuit standby current is very low, less than 5uA.

V. ESP8266 MODULE

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VI. LITERATURE SURVEY

A. *A Secure Protocol For Exchanging Cards In P2p Trading Card Games Based On Transferable ECash*

Trading card games (TCG) differ from traditional card games mainly because the cards employed are not shared among players in a match. Instead, users play with the cards they own (e.g., purchased or traded with other players), which corresponds to a subset of all cards produced by the game provider. Even though most computer-based TCGs rely on a trusted third party (TTP) for preventing cheating during trades, allowing them to securely do so without such entity remains a challenging task.

B. *Enforcing Trust Preferences in Mobile Person-to-Person Payments*

The technological advancements in Internet speeds, increased computing power and smart phones have pushed the rise of new digital methods supporting mobile person-to person (P2P) payments. Despite the growing interest in these new methods, we believe that, to fully enable this increasing rise of digital wallets, there is the need for tools helping a person in judging the risk of a money transfer. For this purpose, this paper aims at exploiting social network connections.

C. *Thing-to-Thing Electricity Micro Payments Using Blockchain Technology*

Thing-to-thing payments are a key enabler in the Internet of Things (IoT) era, to ubiquitously allow for devices to pay each other for services without any human interaction. Traditional credit card-based systems are not able to handle this new paradigm, however blockchain technology is a promising payment candidate in this context. The

prominent example of blockchain technology is Bitcoin, with its decentralized structure and ease of account creation. This paper presents a proof-of concept implementation of a smart cable that connects to a smart socket and without any human interaction pays for electricity.

D. A Secure Protocol for Exchanging Cards in P2P Trading Card Games Based on Transferable E-Cash

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E. Swing-Pay: One card meets all user Payment and Identity Needs

Transactions performed using NFC technology.

VII. CONCLUSION

The project is about building a Smart NFC card which will help user to make all his/her payment in contact less fashion using NFC technology in order to remove all the constraints we faced in the prior traditional payment methodologies. A complete prototype of all in one digital card used for the payment and identity needs has been discussed. A capacitive fingerprint sensors have been deployed on the card thus increases the security of the card. Upon successful fingerprint authentication, the module sends an SMS via GSM to the cloud with the full details of the payer, the payee, and the transaction amount in a particular format. To receive the SMS and to pass the data to the cloud sever for the transaction to happen an android application is developed. The proposed digital card may have numerous applications in the near future, including P2P money transfer, identity card virtualization, POS payments, and conventional debit or credit card information and access control. The protocol is able to protect information about the relationship type, depth and trust of the discovered paths.

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