

SECURE AND CARD LESS FINGER PRINT BASED ANDROID APPLICATION FOR SHOPPING AND BILL PAYMENTS

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Abstract: In today's life, every people use Credit/Debit card for e-shopping, fleet card for vehicle maintenance and vehicle expenses, check card, charge card and many other kinds of cards for multiple purposes. So there arises a problem that the person has to carry many cards with them all the time and also need to remember their password or pin number for each cards. To overcome all these issues, in this paper we proposed a biometric finger print payment system which can be used to make any payments and shopping. Biometric fingerprints payment system is very easy to use, safe and secure, convenient and highly performable which replaces cash and card based payment system. It is highly secure when compared with other.

Keywords: *Biometric, Authentication, Credit/Debit card, Finger print recognition, Card less payment.*

I. INTRODUCTION

Mobile commerce is currently a powerful technology worldwide. It is the combination of wireless web + E-Business. Through the wireless handheld devices such as mobile phone, PDAs, tablets the users do business. Mobile phones are being the most common device to do commerce and business transactions. In this current technology, without the use of mobile phones, the life is nothing. Most activities are done through mobile phone application with wireless web. This makes the user more convenient and saves their time. Since it became the part of our life, we have been using it for many purposes like m-commerce, ticket booking, for conducting business etc. But when it comes to POS transaction we follow the traditional way. POS is the combination of hardware and software that enables your business to process your sale efficiently. The hardware generally includes central computer terminal and the other devices known as peripherals. Peripherals include bar code scanners, receive printers and card machines. These all connected to the central terminal either cables or wirelessly. In this paper we propose an Innovative Finger Print based Mobile Application system for convenient and efficient payments in shopping and in other Purchases. This Finger Print based Mobile Application system replaces all other devices with a smart phone.

A. Traditional Model for Transactions: The Traditional model system follows Card Based Payment procedure. It involves two parties namely Seller and Buyer. The Buyer (who makes actual bill payment through their Credit/Debit cards) and Seller (who receives payment). There is a party called Bank server who acts as an interface between them. The user must utilize his Debit or Credit card for any payments. He must carry his card whenever during shopping and payments. The corresponding Vendor will have a swiping machine where the user will swipe his debit or credit card and enter his pin number for payment. After successful verification of the Pin Number with the Bank server the amount will be debited from the Users account and the payment receipt are provided to user. It's a traditional process and contains plenty of limitations in security and money transactions.

B. Finger Print Technique in Bill payment: The goods purchased in Point Of Sale have several ways to make payments. Either by cash or card we can pay. We already have cashless system [12] where most users started to use credit/debit cards for payment for convenience. Using this mode of payment users faced many challenge of remembering their different passwords. In 2011, the First touch screen smart phone with a fingerprint sensor was proposed and recently in 2013, Apple released the iPhone 5S with Touch ID fingerprint recognition system. This is more

secure than the passwords or pin numbers. Finger print sensors provide performance, permanence and security.



Figure 1: Finger print impression

C. Scope of Finger Print Scanner in Proposed Payment:

The Bank server is the main source of financial transaction which acts as a gateway between buyer and seller. In the proposed payment, the user places his finger print in the controller then his finger print is verified through the app with the bank server. After successful finger print verification he is redirected to the payment options in the mobile app. Then he enters his Pin Number along with payment amount in the payment page. The Pin and Payment details are converted to encrypted format for secure transaction. Then after verifying his Pin Number and entered amount the corresponding amount will be deducted from his account. Using this technique the customer need not to carry cash or card for payment. Instead they carry only their smart phones to pay bills anytime.

II. RELATED WORK

In this section we discuss the existing protocols in the secure card less payment.

A secure Account-based Mobile Payment protocol with Public Key Cryptography and Biometric Characteristics [10] Here the author uses the wireless network to transfer the payment which is suitable for M-commerce based on public key cryptography. It also provided security facilities by applying public key cryptography to mobile network using SET and iKP standard protocols.

A secure account based Mobile Payment protocol[8] Here the author proposed an account-based payment protocol where the symmetric cryptographic technique are applied which satisfies the security properties CAIN provided by public-key payment protocol[10]. This proposed protocol has advantages over standard protocol [10] without the use of public key.

The mCard approach for Bangladesh: A smart phone based Credit/Debit/ATM card [11]

Here the author introduced a m-payment where the mobile devices like PDAs, tablets, smart phones and other devices

are connected to the mobile network for payment transaction. A creative payment system “mCard”, which replaces the existing Credit/Debit/ATM card for mobile banking.

III. PROPOSED WORK

In order to overcome the limitations and drawbacks of the existing system we propose an Innovative Finger Print based Mobile Application System for secure and convenient payments. Here the user doesn't have to depend on any other sources like a card for the payments. He can verify through his finger print and make payments. It's a card less system so user doesn't have to bear a card he can just make payments through his finger print and the pin number. The system consists of a finger print controller for finger print verification where the user will place his finger for verification. The controller is coupled with the Authorized mobile through the Bluetooth. Once the controller get's the finger print the corresponding pattern is sent to the Mobile App through the Bluetooth. Initially the user account is checked with the corresponding bank from the App by the finger print. After successful verification the user will navigated to the payment option where he enters his pin number along with the amount for payments. For security purpose we are encrypting the pin number and the amount for preventing malicious operations. Once the number is verified the corresponding amount will be deducted from his account and the user will get the notification.

Flowchart:

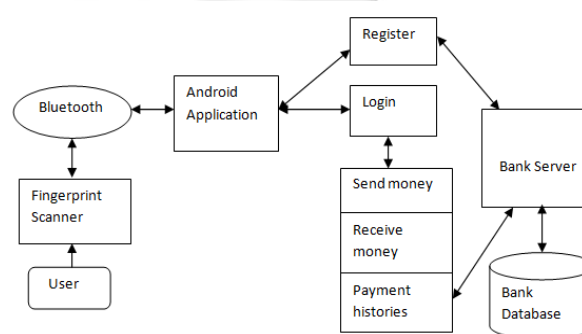


Figure 2: Innovative finger print payment

IV. PAYMENT TRANSACTION

In this paper, the user perform transaction from android application by using the three main modules i.e., “Send money”, “Collect money”, “Passbook” which are used to send money, receive money and to view the payment histories respectively.

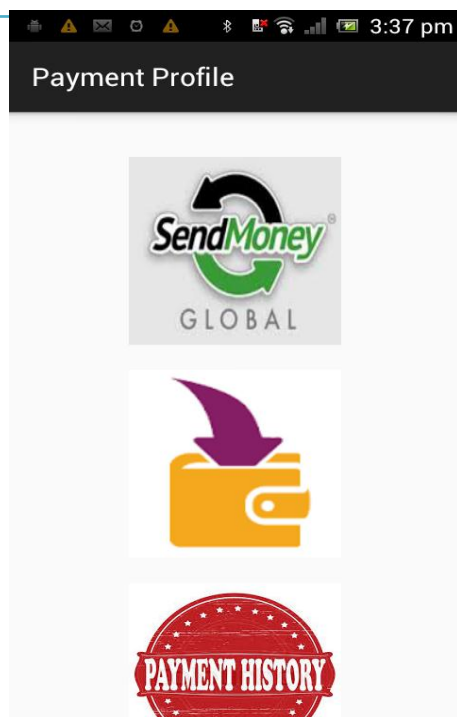


Figure 3: Home Page of Payment Profile

1. Download and install the application
2. Sign up and start the application
3. Enter the beneficiary details of the person whom you want to send money to and tap next
4. Now enter the amount you want to send
5. Tap on Send
6. If you have sufficient balance amount in your bank, the money will be successfully sent to that person. If not shows error.
7. After successful transaction you and the person will get the SMS from bank.

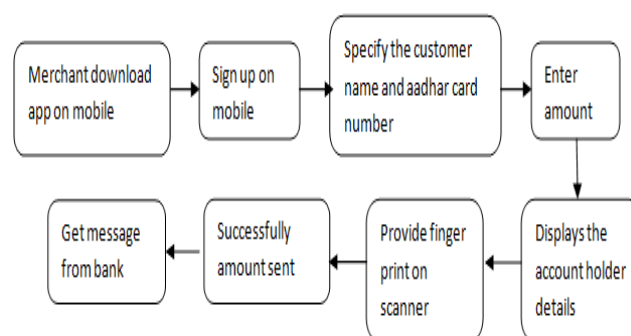


Figure 5: Merchant payment

The following steps are done by the shopkeeper:

1. Download and install the application
2. Sign up and start the application
3. Enter the customer name, bank name and aadhar card number
4. Enter the amount
5. Now the customer account details are displayed
6. Provide finger print of the customer on scanner
7. Tap on Send
8. If you have sufficient balance amount in your bank, the money will be successfully sent to the merchant account. If not shows error.
9. After successful transaction the merchant and the customer gets the SMS from bank.

Module 2: Add money

In this module, the user can receive their money to be stored into the digital wallet that the application provides. The money that is added to the add money module is sent by another user. It contains the sender name, amount sent, bank name, branch and amount sent time and date.

Module 3: Passbook

The passbook module is used to show all the user's financial transactions at one place. This feature is similar to the physical bank passbook where all the debit and credit entries and all the transactions are entered. Thus using the digital passbook module it shows the following modules,

For making energy aware payment transaction in between client and server we used GCM Server(Google Cloud Messaging) that used XMP Protocol , that is xml based protocol so it is light weight protocol , that server doesn't directly communicate with our application instead of GOOGLE PLAY application and then forward to your application so we don't to run server.

Module 1: Send Money

Sending money to friends, relatives, or for bill payments through this android application is really simple, fast and convenient. Send money module has two sections. In first section the user pays his amount through his own mobile application and in the second section the customer pays the amount through merchant (shopkeeper) app. Both must download the app and sign up using mobile.

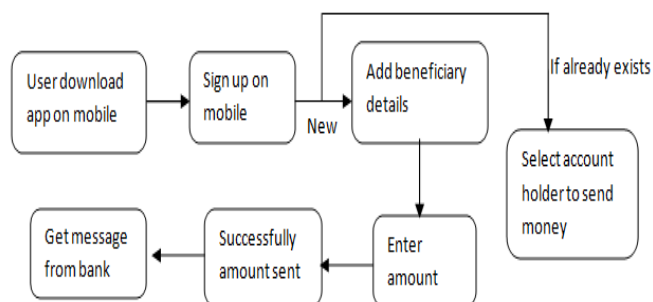


Figure 4: User payment

The following steps are used by the user to send money to other users:

- The funds that are added
- The funds that are received
- And the money that is paid and added in the send and add money module.

details are stored in Bank database to make transaction. After registration completes it automatically login with user name. Then fig: send money appears.

V. RESULTS AND DISCUSSION:

Shown below are the screenshots of the various activities from the Android application with their description.

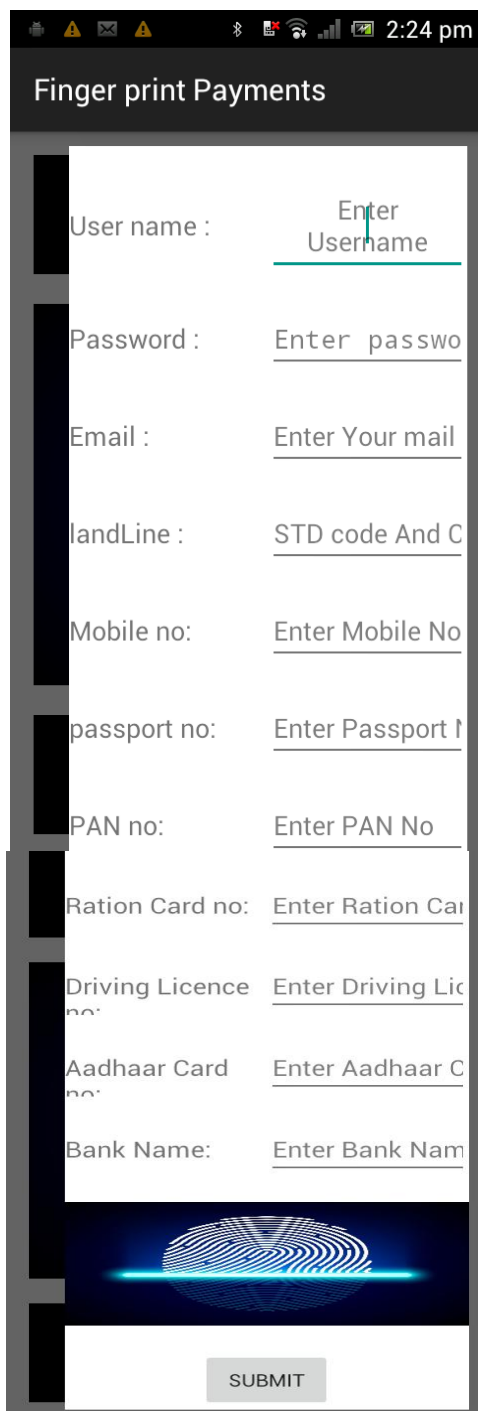


Figure 6: User registration

Description: The user who sign up this app, register their details to make payment. User fills entire fields and also registers their Finger Print in scanner. Once registered, the

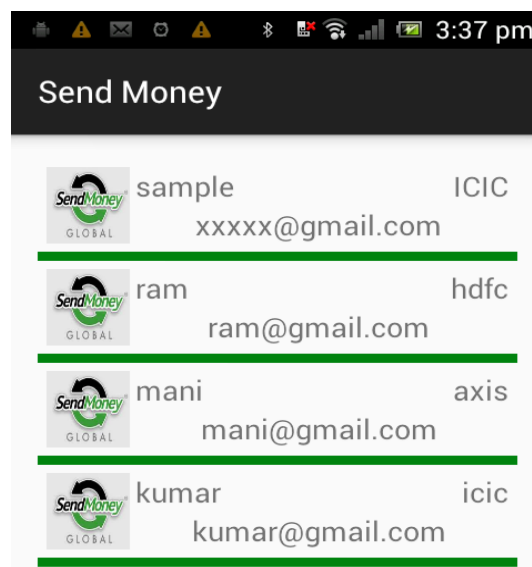


Figure 7: Send money

Description: The user selects the beneficiary to whom he wants to send amount. These details are already available to user for convenient purpose.



Figure 8: Payment information

Description: Here first row represent the user account balance, second row represent beneficiary name, third row represent bank name and last field used to enter the amount to send. After the details are entered, click done. Now the amount is sent to the beneficiary. After successful payment the amount is deducted from the user account. It's secure and efficient authorized payment system. Only single user can use his finger print for payments. The user doesn't have any kind of limitations like preserving the card. The user can use

his finger print during any emergency situations. It's a innovative card-less transaction and it replaces all the drawbacks of the traditional payments.

VI. CONCLUSION

In this Paper we propose a novel Finger print based Android application for secure and convenient payments. It's an innovative approach for card less payments and it replaces all the limitations of traditional transactions and removes the barriers during payments. We are also enhancing the security by encrypting the important information of the user during payments and also by introducing finger based verification over traditional approach. Not only in bill payments and shopping in future this android application can even be used in various platforms.

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