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INTERNET OF THINGS BASED CASHLESS MONEY TRANSACTION – ELECTRONIC DEMONETIZATION APPROACH

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ABSTRACT

Demonetization is a process of removing a cash system of its condition as paper money. More interesting and much more ambitious are the crypto currencies, mainly bit coin which is truly untraceable and therefore like cash cannot be recovered if lost or destroyed. Alternatives to cash include smart cards that are credit, debit cards.[1] In the same way one can use an E-card which is connected to server and go through the database and perform operations to transfer money within no time. GPRS (global packet radio service) is the technology used to connect cards to server. ARM 7 microcontrollers is the hardware used to build E-card, which is the advanced microcontroller. It even composes of LCD display, Keypad, RFID reader and tag, Fingerprint module. For smartphone users one can make use of NFC technology (Near Field Communication) in order to transfer money. In this paper the main advantage is to completely eliminate corruption which mainly relay on hard cash which lead to demonetization.

Keywords: NFC, GPRS, E-Card.

I.   INTRODUCTION

An embedded system is an organization of many computer systems with a dedicated function within a larger mechanical process, often dealing with real time problem solving computing constraints. It controls many devices which are being used today. These systems have low power consumption, small size, and low per unit cost. In complex systems commonly microprocessors are used for the process to go in ease but in modern embedded systems it is based on microcontrollers. These embedded systems are used to perform certain tasks and the engineers can reduce the cost and size of the system which produce high performance and reliability. Consumer electronics are those electronic devices which are used in homes for daily use. It include TVs, video games, cell phones, printers etc. these devices use embedded systems. In this system we are completely eradicating the concept of money and we are transferring the money by using the technologies like GPRS, smart card and ARM LPC2148 microprocessor.

Without any distance measurement money can be transferred from one user to another user within no time. Every individual will be having a smart card if he want to transfer the money with the other user then he can swipe the card with other persons card where it will having the required database like name, account number, balance which will be connected to the server.

The receiver who will receive the money by just swiping the card instead of not going to ATM and wasting his time. He can transfer or receive the amount with a less time.

It is included in many fields as it has wide range of applications. Therefore there will be no hard cash only electronic money will be in circulation which can help in eradicating corruption.

II.   LITERATURESURVEY

The accepted methods for payment of money used so far are cash, credit cards, cheque. The recent established method for transfer of money include mobile payment to do payments or buy goods and services.[1] The major components used are database, query and an lookup for verification. Initially peer-to -peer design will be implemented. Later once new technology is well-known then one can make use of the adoption of central database.

The next upcoming technology is wireless technology which led to useful resolutions. The technologies such as NFC, Bluetooth, Cellular Networks and Infrared are evaluated based on their suitability for making cashless payments. Each of these is analyzed and evaluated based on their acceptance criteria.

The digital economy comprises of mobile payments and card payments. The entire transactions are cashless payment. The entire world is following to get used to use cell phones for their payments and for buying products. Each individual will be having a card for digital transaction which is unique for each individual. [3]

To lead a quality life people need to upgrade as and when technology gets updated. Transfer of money between cell phones, it is a dangerous threat and can be misused.

The more simplest and usable technology is use of NFC communication. It is a short range wireless connectivity method. [4] Though it looks simple and secure, at the background many actions will be carried out.

III.   PROPOSED SYSTEM

The proposed system comprises of two modules.

ƒ   Sender Side\Receiver Side.
ƒ   Server End.

The smart card in this project acts as both sender and receiver. Either of the cards can act as sender or receiver. It is decided by the person whether he has to become sender or receiver. It is either transmission of money or receiving money.

At receiver end the personal computer will be installed with the web based application that will possess with all the database of the cards being used. The transfer of money can be done by swiping the card before that the user has to enter the password and the amount to be transferred in the keypad. The GPRS will make the device active and sends the request to the server in the process of transaction. At server end the database will be verified with all the details of the card holders then the amount will be transferred instantly. The acknowledgments will be sent to the card holders regarding the amount transfer or receive by the user. The database gets be updated in the server by how much money has been transferred or received within no time. This above modules is done in NFC technology. But in FFC the account holder details like name, account number will be entered in the process instead of swiping the card then the password and amount to be transferred are repeated.
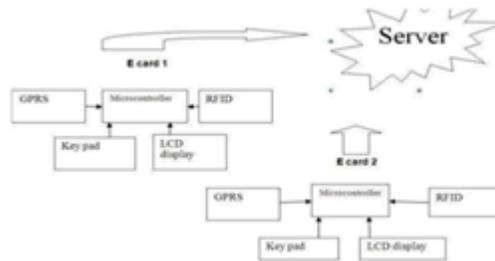
IV.   ARCHITECTURE

Fig.1. Block diagram of NFC integrated payment device.

The cards in the architecture are completely portable machines as shown in the Fig. 1.which is connected to the wireless sensor technology. Both the E card is connected to the server which contains all the database of the cards. The card possesses latest technology that is GPRS, and also uses ARM LPC 2148 microprocessor. The internal integration of the E cards contains GPRS, power supply, LCD display, RFID reader, keypad and microprocessor 2148. The cards have microprocessor which are connected to the digital display system which will display the

details of the card holders that is name, password. A RFID (radio frequency identification) is used for tracking and identifying the tags attached to objects. RFID reader is used to read the information of another card, GPRS (global packet radio service) is an extension of GSM that enables high data transmission rate. It is used to connect to the server which will allow for transaction. A keypad is used enter the details of the user. In this device we are looking for a smart card which contains GPRS and RFID which is connected to the network. All will get a card which is unique from each other.

A. Technology overview
The research contracts with two ways of transactions technology.
- NFC (Near Field Communication)
- FFC (Far Field Communication)

Smart phones have NFC technology which is a short range wireless communication technology which even use P2P protocols for the connected peer devices.

It works based on the modes. The modes are:

Read/Write Mode: This mode is used to read/write. The URL's and SMS have to be read by devices comprising of NFC technology. E.g. Tags which can be read by devices.

Emulation of card: Element is embedded inside a system which is highly secured. And the subtle data can be stored in that database which is harmless.

Peer-to-peer Mode: Two NFC devices are the key for this mode. Data are exchanged between devices based on this operational mode.

B. Mobile payment overview
Mobile payment makes use of three perceptions Interactive Voice Recognition (IVR), Database, Web Server. The IVR use the technique of voice based confirmation. The GSM module will call a service provider and ask for PIN for further transactions. Further even SMS application ask for confirmation as "yes" or "no" for final payment to be done. It makes use of Short Message Peer-to-Peer Protocol (SMPP).Even Wireless Applications Protocol (WAP) uses a push messages in accordance to the WAP browser which uses a URL which will lead to a webpage for further steps of transactions. One Time Password (OTP) uses synchronizing system with the portable devices and time for OTP code to be sent to portable devices and authorized.

V.   RESULTS AND DISCUSSION

New Cashless Payment Systems: Usage of smart phone has increased in these years. Internet and Wi-Fi has improvised and furnished the smart phones era. RBI has given the permission for all these transactions. Demonetization has given a thrust for cashless trades in the motherland. Old cashless payment systems like cheques, demand drafts, debit cards, credit cards, gift cards and internet banking. Advanced payment schemes which practice big data, near field communication and artificial intelligence for making digital payments more easy and cost effective

Mobile Wallets: It is a method of keeping a copy of cards digitally in smart phones. Instead of using plastic cards user can pay through mobile. 29% of all online dealings worldwide are done on mobile.

Contact less Payment : Near field communication (NFC) technology and QR code technology can mark mobile expenses useful. They are going to be greatly used in the future days which are successful to increase the cashless payments. **Voice-based Payments:** Usage of IVR system by banks and payment services providers are offering great way of payments. One can make payment using self-voice.

Internet of Things (IoT): Connection of devices and automation is very easy through IoT and payments can be done anywhere. The future generation will be built on this concept.

The overall components of the proposed system are shown in Fig.1 and Fig.2. The system is built with the centralized microcontroller (ARM7), LCD display, Keypad, RFID reader, RFID tag, GSM module and Power supply circuit.
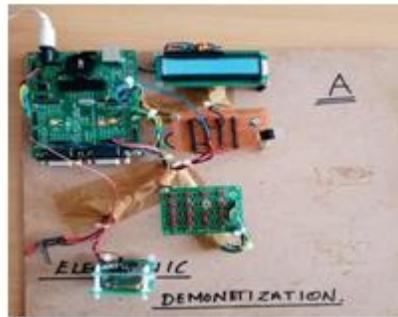

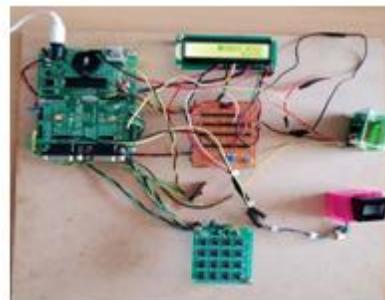*Fig.1: Components of E-card A*

Fig.2: Components of E-card B

At first when the users need to transact money. The card starts and power and displays as Fig.3. The LCD displays as SWIPE YOUR CARD as in Fig.4. The user can now swipe card and allow the card to connect to its server for further process. Once the card is connected to the server it asks for further steps for transacting money.

Fig.3: Start of Card

Fig.4: Swipe your Card

Now the card connects to the server for establishment of secure connection to verify the card database as in Fig.5.
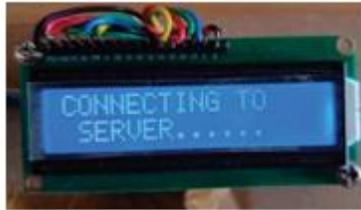

Fig.5: Server Connection for card verification

Now the card number and user name to whom the user has to transfer money will be displayed in the user card for user perfection as in Fig.6 and Fig.7

Fig.6: Receiver card number.

Fig.7: Receiver card name

Fig.8 it asks for the password for verification of the card. Once the card gets verified the user is ready to transact amount.

Fig.8: Password verification

Once the user is ready to transact, he can provide the amount he needs to transfer shown in Fig.9. If the users are not near, then it asks for the Account No. to whom the money has to be transferred.

Fig.9: Amount for transaction.

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Now the card starts to update the information of the card holder details such as balance, credited or debited amount. The cards are connected to server for updating of information and display image as below in Fig.10.

Fig.10: Connecting to Server

Server updates all information such as Account No., Transaction ID, Credit, Debit, Transaction Type and Balance. Every time transaction occur the server updates above details exactly. Here 222 is one card and 111 is another card whose information is updated as and when the transaction is done. And the updating webpage looks as below in Fig.11.

Fig.11: Addition of data to server after each transaction.

Digital payment resulted in steady raise about 50% every year in India. And ATM transaction is about 15% and branch-based transaction has come down to 7%.
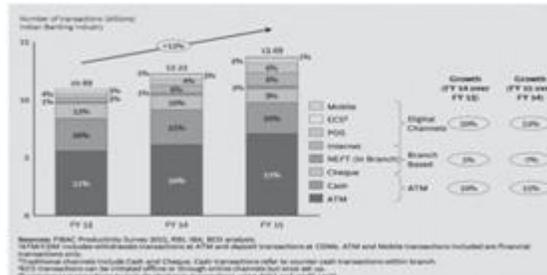

Fig.7: Digital Transactions Growth.

Digital payments are increasing in order of improvement in smart phone development, internet connection improvement. And support by the central bank towards digitization. The growth is rising every year. The rough estimation is shown in graph Fig.12.

VI.   CONCLUSION

People will have their own unique card which will be different from each other where money will be transferred instantly within no time. It differs from the usual credit, debit cards by using LCD display, Keypad, Finger print sensor, RFID reader.

VII.   FUTUREWORK

Cashless economy is not possible in rural areas as per the network problems. Hence mainly network system must be advanced in those areas.

VIII.   ACKNOWLEDGEMENT

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