Electronic Wallet

Ambarish Salodkar, Karan Morey, Prof. Mrs. Monali Shirbhate

Ambarish Salodkar, Computer Science & Engineering Department, Jhulelal Inst. Of Technology, Nagpur

Karan Morey, Computer Science & Engineering Department, Jhulelal Inst. Of Technology, Nagpur, Maharashtra,

Prof. Mrs. Monali Shirbhate, Computer Science & Engineering Department, Jhulelal Inst. Of Technology, Nagpur, Maharashtra, India

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Abstract - *The goal of this article is to propose the implementation, merits and future scope of an electronic wallet. An electronic wallet is a virtual or a cashless service used as a substitute for physical cash. Our aim is to present a new way of buying commodities without the application of physical transaction. The aim is to provide the ability to carry out secure transactions that are quick and efficient with the click of a button. The primary concern regarding such types of transaction methods is security. In our application, security has been given the highest priority. Each customer, while registering, along with their personal information, will have to create a unique security code. This code allows the user to access their account of our application. This e-wallet will be linked to the respective bank of the customer for verification reasons. Whenever the balance reaches zero, the customer can request the respective bank for a top-up. The request which the customer sends will be verified by the bank, and it will ask for confirmation from the account holder. The customer will have to fill in the respective details only once, and then have to confirm top-up transactions by using the same unique security code they use for their ATM. This application will save a lot of time and will pave the way for a secure, efficient, and a futuristic way of transactions. The project will be implemented using .NET and will make extensive use of database management.*

Key Words: Key word1, Key word2, Key word3, etc…

1. Introduction

Virtual cash or Cashless Transaction is an upcoming technology that has seen a tremendous growth in the past year. Cashless payments are now becoming a popular trend in almost every field. Be it E-Commerce websites or DTH recharge. Cashless services are proving to be the future of transaction services, with minimum or no use of physical cash. It is also being considered an alternative to plastic cash.

Our goal in this paper is to create a new architecture in which the users are able to instantaneously transfer money from user to another using a secured and fast application of e-wallet. At prototype stages this application will run on client-server basis from computers and once implemented on a large scale, will make use of smartphones through Near Field Communications (NFC).

2. Literature Survey

There are some applications of virtual cash on the internet. Some of them are PayTM, Freecharge, Mobikwik. All these applications provide commodities like bill payments, DTH recharge etc. PayTM also has its own online shopping portal where a registered user can shop and pay via the app itself. All these applications work on credit system. The user has to give his credit card number once and then his account is linked to the app. So whenever he makes a transaction, the app automatically sends a request to the respective bank for credit payment. Thousands of people have found these apps to be very useful and efficient. It saves a lot of time when we use these apps instead of physical or plastic cash. The user has to only use plastic cash once while registration.

An article that was published on 1st of July 2015 in The Economic Times stating that "*Whether you have to pay for a taxi ride or teach your child the basics of managing money, a preloaded mobile wallet could be the answer.*"

Pralay Mondal, Senior Group President, Retail Banking, Yes Bank, said "*Prepaid wallets will increasingly replace cash in the near future. They will not replace debit or credit*

cards, but will be used for specific needs and micro transactions."

The balance in semi-closed wallets which are issued by non-banking entities like Paytm, Mobikwik, Oxigen and ITZCash, cannot exceed Rs 1 lakh. Unless offered in association with banks, you cannot use your mobile wallets for cash withdrawal.

The following table illustrates the use, inception and initiatives of electronic wallets in other countries:.

2. Characteristics, Risks and Needs for Electronic Payments

Table 1. Important initiatives of the payments from the mobile environments

Country	Initiatives
Belgium	• The operators launch the payment made via the SMS;
Great Britain	• Vodafone and Citigroup announce a collaboration protocol for the payments from the mobile environment; • Contactless type combined cards between Barclays and Oyster;
France	• NFC (Near Field Communication) type pilot systems in Caen, Strasbourg, Grenoble, Paris;
Italy	• The CartaSi cards processor launches the payment service for the ski paths;
Norway	• Telenor and several banks launch the BankID system;
Holland	• NFC type pilot systems that use credit and debit cards;
Germany	• NFC implementations within the transport public system from the Frankfurt area;
Austria	• The Paybox operator attains 300, 000 users;
Croatia	• 50% of the parking fees are paid via mobile phones.

Source: Adaptation after (Jong, 2007)

The electronic payment systems have to meet several minimal characteristics in order to be efficient

- Atomicity: This characteristic takes into account that during the transfer no existing money is lost or no money is created.
- The impossibility of the non-reputation: None of the users involved in the transaction can decline his responsibility conferred by the electronic signature.

Also, the solutions of the electronic payments represent the central point of different requests, more or less economical:

- Security: the system must retain the possibility of frauds within the electronic environment
- Availability: the systems must be accessible and available at any moment in time.
- Cost efficiency: The transaction cost must be reasonable even in the case of the micro-payments.
- Integration and scalability: The systems must be inter-operable with all the other existing systems, also they must integrate themselves with the new payment methods from the online environment.
- The ease of using: Any system of electronic payments must be accessible through different types of hardware terminals and from different software platforms.
- Confidentiality: the data regarding the parties involved into the transactions must be available for the others only up to the confidentiality level established by the collaboration protocol.

According to the requests imposed to the solutions of electronic payments, the digital currency has to observe several defining restraints, thus it has to be:

- Universally accepted
- Electronically transferable
- Divisible
- Impossible to falsify or remove without authorization
- Private (nobody except those who are involved in the transaction, knows value of the transaction)
- Anonymous (nobody can identify the payer)
- Able to also be operated off-line, without needing a previous on line verification.

4. Architecture of e-wallet
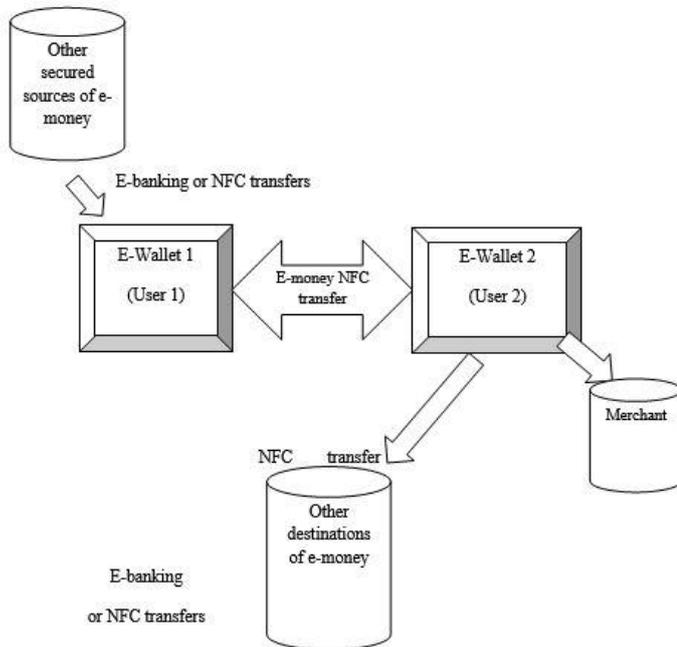
Figure 1. A proposed architecture for transferring e-money between two e-wallets.

As it can be seen in the figure no. 1, we can implement the e-money transfer between User1 and User2, supposing that both users have smart devices with NFC capabilities included. The money is stored in our secured application and it is transferred through the NFC tags. This stage of the transfer makes use of the Android platform. The prototypical stage involves transfer between two computers using the client-server model. At each stage of transaction process, messages will be transferred. Every message includes information about:

- The amount of transferred money
- The security certificate of every monetary unit
- The payer
- The receiver
- The date and time of the transfer

5. Applications

There will be various applications of e-wallet. These can be as follows:

- Bill payments
- Money transfer
- Faster payments in shops
- Ticket booking (Air, Train, Bus)
- Bank account management
- E-Commerce
- M-Commerce

6. Conclusion

Taking into account the foreseen technological evolutions, the strategies announced by the banks and by the card issuer companies, as well as the increased needs of the buyers and merchandisers regarding the security and flexibility of the transactions, we consider that the future of the electronic payment systems will be based on the following defining elements: the mobile environments and devices, the electronic wallet and standards meant to increase the flexibility of the transactions.

This application will definitely pave the way for a secure, fast and futuristic way of transactions. The e-wallet will give a user the liberty to shop and pay from anywhere with just a click of a button and without any kinds of worries regarding the security. The transactions that took a lot of time will now be completed in a matter of seconds

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