AN EFFICIENT METHOD FOR SECURING THE E-PAYMENT SYSTEM : MONEY PAD

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Abstract: Money in the 21st century will be surely proved to be different from the money that we are using in the current century as our money is from the previous century. Electronically initiated debit and credit card will become the payment mode Just as now everything that we use are using are under the shadow of "e" today we have paper currency that is also being replaced by electronic money or e-cash. In the emerging field of electronic commerce, novel buzzwords like smart-card, online banking, digital cash and electronic cheques are being used as money. But how are these brand called as the new forms of a secure payment? And most importantly, which of these newly emerging secure electronic money technologies will survive into the next century? These are some of the tough questions that is to answered but here's a solution, that provide security to these modes of currencies, and these modes of currencies are exchanged by using the **"Biometrics Technology".** Money Pad deputized here uses biometrics technology for Recognition of Finger Print [2].

There are two types of Money Pad, one type is credit card and other type is smart card. The process of accessing the money pad is as follows: The finger impression of the user was scanned and matched with the already present in the database, store in the hard disk. The user is allowed to use the money pad, if the finger impression matches and if finger mismatches with the database then the money pad would not be used by the user.

Thus this provides a security mechanism to the future cash.

Keywords: Biometrics Technology, Finger Print Reader, Money Pad, Digital or Electronic Cash or Digi-cash or E-cash or E-Cash or Digital Money.

1. INTRODUCTION

The 21st century will not be "cashless", as many now predict. The currency of the 21st century will be paperless and cheques are being replaced by smart cards, digital cash and instant transfer of funds [4]. Money pad is the 21[st]century's wallet. It works as a biometric technology for the authentication of the user by the impression of his fingers. It is a form of smart card. *The future wallet holds less paper cash, coins and magnetic stripe cards. It holds money pad that contains digital cash and other financial information and update itself automatically - by PDA with a satellite communication link [5].*

As new technologies are developing for making payment through new ways, the people care arises that, "Is this upcoming biometrics technology provides privacy and security to people using money pad?" [6].So the response for this query incurred on how the technology is used. The security and secrecy are provided by the Biometrics Technology. While taking care about individual's privacy and security we also have to protect their rights and properties of the individuals, therefore in this paper we present such a security mechanism that every individual should understand easily and use comfortably. Every individuals wants to protect their wealth in their own way of applying security, it feels secure to them. Keeping this concept, we use to apply biometrics technology.

The Biometrics Technology is used to develop the e-cash handling system, which is same as credit card and smart card. The e-cash handling system is a device that provides security for transaction of currency. We call that device as "Money Pad" that is used for recognition

of finger prints of the user and decides whether the user is an authorized person or not [5]. Every time the user wants to access the money pad he has to make the impression of the finger, which will be sensed and matched with the one that is stored in the hard disk. If the finger print matches, the user can access otherwise the money pad will not be accessible.

Biometric Technology

Biometric Technology is used to identify and verify the identity of the individual's. It is based on physiological and behavioural characteristics [8]. Biometrics provides secure and private authentication. In biometrics technology the parts of human body are used. So it becomes easy, secure and also difficult to forget. The part that is used for biometrics technology is fingerprint. The fingerprint of the individual is used to access and use the money pad.

2.   LITERATURE REVIEW

1.   Basic of Present System

In present days due to the use of computer system the demand for utilization of electronic money is increasing. All the work in banking system such as deposit or withdrawal of money is done electronically through series of interbank computer network. [10] For *e*-transition the Credit card and smart card are used by the user with the computer networks. These are also being used in the *e*-cash scenario. The usage and security provided by these mediums are given as follows in the Figure 1.
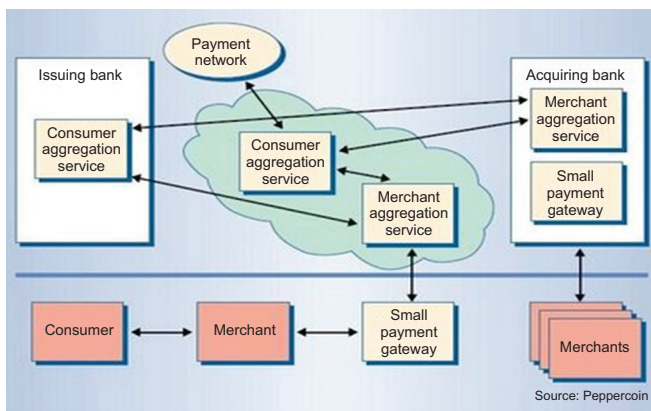

Figure 1:   Credit Card

Credit card is payment device that allow the consumer to make purchase within guaranteed limit defined by the issuer of card. Processing of funds is done electronically[22]. The user insert he card into the card reader machine, the machine asks secure information like password etc. for the verification of the user. After providing the authentication the user is allowed to perform the transaction. As credit card provides privacy and security it also has disadvantages:

- Clearing of funds instantly is not possible.
- Once the card is expired it has to be renewed.
- User has to pay additional charges to get the service from the bank thus it always in under the pressure of limits
- Using fixed encryption transactions is insecure.

2.   Smart Card

Smart cards have embedded with a microchip and it appears like a credit card, but it store information and sometime even performs simple calculation. Payment value in the form of currency value is stored in this chip and can be retrieved with specially designed card reader.[24]. Common smartcard chips hold about 8,000 bytes of information that can perform variety of functions. As credit card has disadvantages, smart card also has disadvantages:

- Using fixed encryption transactions is insecure.
- Due to chip failure there is a risk of data loss.

3. METHODOLOGY

In this era, internet is getting very demanding. Everything is done through internet like online shopping, banking or business etc. In recent days the money will be available online at anytime in the form of digi-cash and cyber cash etc. In future internet is going to capture the whole world and the private currency will become the media of exchange in e-banks replacing government currency. Keeping this in mind and to overcome the drawbacks of credit card and smart card we present a medium of exchange to carry digital cash wherever user wants, which we name as "Money Pad".

1. Money Pad

Money pad is secure medium of exchange for currency. It carries digital cash as paper cash will not be there. Money pad contains biometric technology. It is similar to credit cards and smart cards just like floppy disk. It consists of touch sensor and magnetic disk as its peripherals. Touch sensor records the fingerprint of the user, and magnetic disk has read and write permission and also and holds authentication details of user.

Advantages

- Easy and fast
- Portable
- Flexible
- Highly secured

Disadvantages

- Expensive
- For security purpose it uses fingerprint detection, so if person's finger gets accidently cut or injured the detection technique will fail to match the patterns.
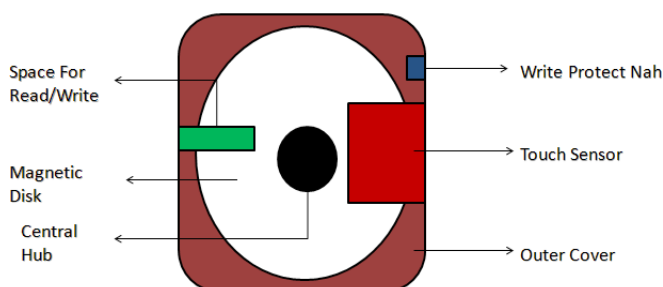
2. Operation of Money Pad

Figure 2: Money Pad with Touch Sensor

3. How to use Money Pad

➢ **New User:**

- With *e*-banking facility visit a nearby bank
- With some balance create an account
- Give important details along with fingerprints
- Along with money pad user is given bank code and account number

➢ **Transaction Using Money Pad:** The user has to put the finger on the sensor which is a finger print reader, to access the money pad. The machine will then ask for bank code so that he can enter into his *e*-bank, and then machine asks to enter his account he has to enter his account number. After this the reader will access the fingerprint and matches with that present on money pad as well as present in database server [19]. If the match is found then the user is allowed for further transaction and if the user is not authorized then the user is not allowed for further transaction and the digi-cash that is present in money pad is e-mailed back to authorized account holder using user details that is present in money pad. The read and write feature of the money pad will update the user information as carried out by the user.

➢ **Why Use Money Pad?**

- **Instant clearing of funds:** The instant clearing of funds means the end of 'float', which is the time spent waiting for a fund transfer to clear. As man himself carries digi-cash with him payments can be instantly made. There is no need for any mediate party to clear the funds.

1.1. Avoids the Unsafe Way of Carrying Money

In the present scenario, carrying cash may have trouble to the user. The trouble may in the form of robbery or theft and it is also difficult the carry a large amount

of cash from one place to another. Therefore by using the money pad eliminated the fear from the user since it does not use hard cash and store the cash in the form of digital money. In case if someone mislays the Money Pad, the provision can be made such that the lost cash can be recurred into his own account through e-mail.

2.1. Provide Strong Security

With the use of Biometric Technology, one in a billion case of having two persons can have fingerprint in common. Thus due to these consideration the Money Pad have high security feature that uses Biometric Technology.

3.1. Can be Meet by a Common Man

Since credit card and smart card require large amount of money to be present in the bank account but in Money Pad it does not require any high deposits whereas it requires a small amount which a common man can afford it.

4.1. Avoids the Issue of Renewing

Money Pad doesn't require any kind of renovation, as once issued it is permanent

4.   DESIGN OF THE SYSTEM
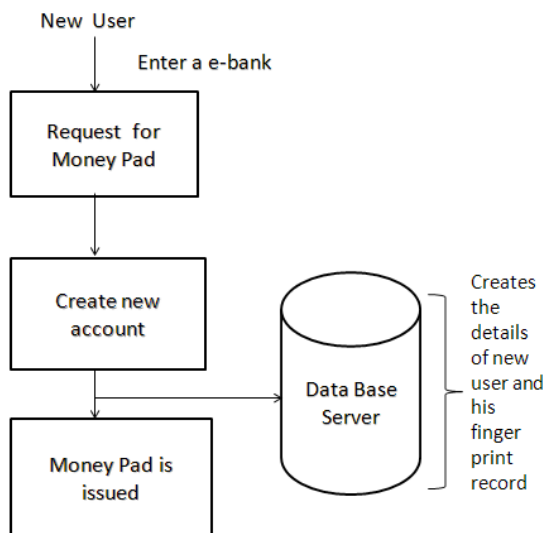
> **Process in Request of Money Pad:**

Figure 3:   Process in Request of Money Pad along with Finger Print Record
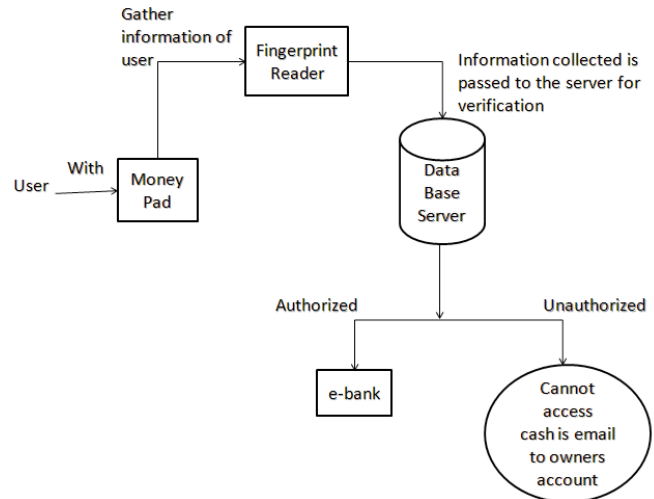
> **Checking for Authentication:**

Figure 4: Checking For Authentication Using Finger Print

5.   TECHNICAL IMPLEMENTATION

The money pad uses the biometric technology. This technique is used to provide security and protection. The identity of an individual can be verified by money pad because it involves Biometric Technology. This involves identification of his or her physiological and behavioural characteristics. The biological characteristics can be studies through Biometrics. But in computer science, the biometrics refers to the authentication techniques using biological characteristics that are unique of an individual and also identifiable to an individual. Fingerprint verification using biometric system, authenticate whether the user is an authorized person or not.

The cleanness of any biometric system is measured in two ways:

5.1. False Acceptance Rate – Where an impostor is accepted as a match.

6.1. False Rejection Rate – Where a legitimate match is denied access.

Biometric system contains fingerprint verification, which authenticates whether the user is an authorized person or not. It has a glass plate that involves the user to place his or her finger over it, which resides over a high-resolution change coupled cameras. The image

that is captured is compared to the image in system database and decides the user authentication.

6.   FIELDS OF APPLICATION:-

➢ **Applicable in any kind of e-banks and e-transaction:** The money pad device is adequate of carrying digi-cash and hence it is useful to perform any kind of e-banking or any kind of e-transaction.

➢ **Can be used to carry out remote transaction:** As money pad can carry digi-cash it is useful to perform remote transaction like e-payments, dig-cash transfer etc.

➢ **Useful to carry Digital Cash:** The future currency is Money Pad because the paper currency is obsolete and individual does not need to carry hard cash. As Money Pad provides a secure means to carry digi-cash it will be very needful in future.

➢ **Utilization of individual data in filling order forms:** The personal data that is stored in the money pad can be used to fill order forms thus saving users time.

➢ **Applicable in *m*-commerce transaction:** Money Pad a form of digital cash so it can be utilize as digi cash and carried out all the business transition.

➢ **Applicable in daily life:** It is applicable in daily life as it is helpful in shopping, identification, telephone services and licenses.

7.   FUTURE ENHANCEMENTS

Understanding the disadvantage of the current working of money pad that is the fingerprint scan, not so worthy for the disabled people. In the new version of Money Pad which is enhanced by me includes retina scan instead of finger print. In current version finger print of the user is used in biometric system and the disadvantage of it was that if the user doesn't have the finger so he/she can't access the money pad. Now in the future the user that doesn't have finger can also access the money pad through retina scan.
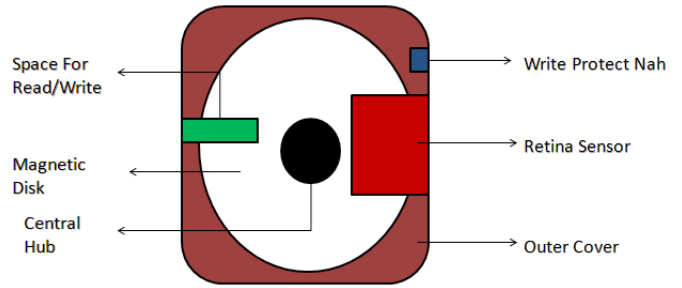
8.   OPERATION OF MONEY PAD

Figure 5:   Money Pad with Retina Sensor

9.   DESIGN OF THE SYSTEM

➢ **Process in Request of Money Pad:**
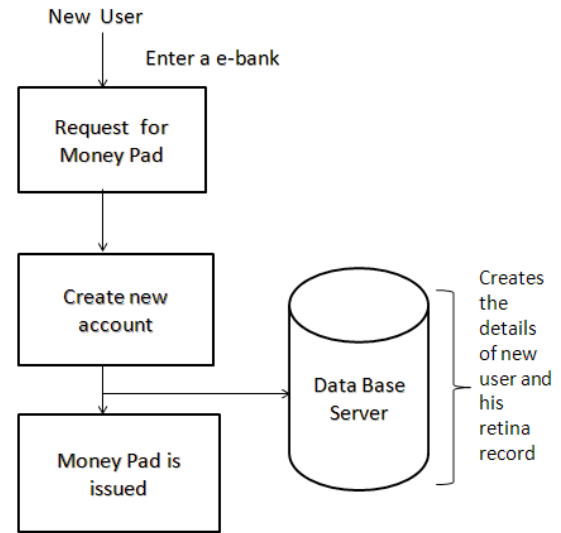

Figure 6:   Process in Request of Money Pad along with Retina Record

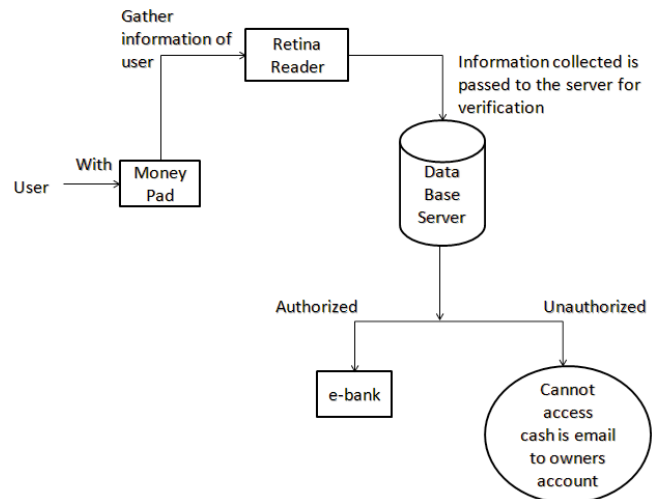➢ **Checking for Authentication:**

Figure 7:   Checking For Authentication Using Retina Scan

10. CONCLUSION

The following are three necessary requirements

- Instant clearing of funds
- Elimination of payment risk
- Using strong encryption there is a secure transaction

Since the money pad is able to satisfy the above requirements there will be no doubt that in future it will be widely suggested for use.

In future when the internet will capture the whole world. All the work will be done through the internet then there will be no use of any card or pad, just a small device which can detect the fingerprint will be attached at any place throughout the world.

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