International Journal of Commerce and Management Research
ISSN: 2455-1627
Impact Factor: RJIF 5.22
www.managejournal.com
Volume 4; Issue 2; March 2018; Page No. 10-11

Smartcard and mobile payments

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Abstract
Almost a decade ago we all might have heard about the smartcard and it's role in the financial sector, especially for retail transaction. Smart card provides a special security when Compare to normal money transaction. But it's implementation in the case of Retail payments has not been so popular. But it found really useful in the area of transit payments and personal identification. M-commerce is a new field, extended from the combination of electronic commerce and emerging wireless and mobile networks. With M-commerce customers get new opportunities for their business from any location at any time. Mobile application transforms the mobile phone into a mobile wallet with digital cash supporting both anonymity and security. In this article we suggest a new strategy to support m-commerce transaction which provides fully anonymity with security for mobile users. In this paper we are trying to reach evaluate the use of smart card and it's importance in the financial transaction.

Keywords: smartcard**,** m-commerce (mobile commerce)**,** financial sector**,** digital cash

Introduction
A smart card, a type of chip card is a plastic card embedded with a computer chip that stores and transacts data between users. The card data is transferred via a reader that is part of a computing system. Smartcard technology has found its way to a number of proprietary financial applications like credit/debit card , transit application, Personal Identification card, loyalty card for purchasing applications…etc. Also we cover in brief the potential of mobile payment schemes in the coming years. In the final section gave a small survey result regarding the future of electronic payments.

Summary
The smart card has been technically proved to be secure even almost a decade ago. But so far the industries have failed it's technological advantage. They we're a few implementations of the smart card payment system and ultimately it did not receive enough attention. Some of the hindrance for its popularity is as mentioned.

- The Financial Industries were watching the technical developments in smartcard technology to get matured.
- The standardization of different smartcard technology slowed down the "fast to market" strategy of the industry.
- Since the use of smart card is mainly for the financial industry, security of the smartcard need to be proved before going for any implementations
- Infrastructures to implement the smart card payment like smartcard reader were expensive.
- The emergence of new Payment scheme based on this new Technology might have led to new Business Model. This new business models itself need to be proved towards profitability.
- After the initial Buzz about the smart card, customers had much higher Expectations

Review for the study
Eugene Wang [1] in his article stated that A network with mobile devices supports localization and customization. A mobile device performs localization and customization using update packages retrieved from a SIM/Smart card in the mobile device or downloaded from a content server or a DM server. This facilitates localization of mobile devices using SIM/Smart cards that are manufactured for a location/ locale/country with a different language/culture from the place where it is used the first time.

Scott Goldthwaite and William Graylin [2] in their article examine that. The contactless smart card module is adapted to receive and read information stored in the contactless smart card and transmit this information to an entity through the wireless mobile device and the wireless network. The wireless mobile device of this invention is used to conduct financial transactions using the contactless smart card. The financial transactions include face-to-face or remote purchases, payment with electronic cash stored in the contactless smart card, or payment with the contactless smart card through a financial institution, and downloading and storing of digital goods or services in the contactless smart card.

Daniel Richard Tayloe [3] in his article explains about the A telephone, such as a radiotelephone, is provided having the capability to concurrently operate with two subscriber identification module (SIM) cards. The telephone advantageously permits a single phone to have two telephone numbers associated therewith.

Aguibou Mountaga Barry [4] in his article says that. The

exemplary smart card comprises a microphone for capturing an audio signal. The exemplary smart card also comprises at least one processor for processing the audio signal.

Methodology of study

For this survey we have undergone the following steps and strategy.

- Step 1: We have collected the details about the existing payment schemes, like EFT, Debit/Credit card payments etc.
- Step 2: We collected the existing implementation of Smart card and Mobile payments.

Existing payment schemes

Some of the electronic payment schemes which are popular now days are the credit/Debit card payments, Electronic Fund transfer...etc. But these schemes are in the verge of extinct due to the lack of security in the transaction. VISA and MasterCard has announced that they won't be supporting the magnetic stripe card from December 2004 onwards but had agreed for an extension. VISA also stopped the settlement of dispute due to any fraudulent transaction due to the use of magnetic stripe card.

Smart card payments

The primary motivation for evangelizing the smartcard is due to its security. In addition to the security the smart card is capable for saving the information inside the card itself. This information can be used to identify the user itself, for e.g. in simplest case the PIN card of the user can be saved inside the card. Security implementation can be made, so that the transaction will be initiated only when the user enter the PIN correctly.

Mobile payments

"Mobile commerce is the use the of mobile hand held devices to communicate, inform, transact and entertain using text and data via connection to public and private networks"
(Lehman Brothers)

With the high penetration of mobile phone in the daily life have led a new business opportunities for the mobile operator. They have started providing value added services to retain their customers. The competition in their market was so heavy that they started thinking about some "killer Application" to hold their customer so as their business. One such application has led the way to mobile commerce or m-commerce.

Some of the criteria's are as follows

- SMS Based Payments
- WAP/GPRS
- Reverse SMS Billing
- Proximity Payments

Relation between SIM card and smart card

Subscriber Identification Module (SIM) is a smartcard which is being used by the mobile phone to identify each mobile device with other.

This will provided by the mobile network provider. Each SIM card contains a unique key. Mobile phone will use data encrypted with this key to communicate with its network. The Mobile equipment (ME) will talk to the SIM card for the encryption in some standardized way. When the user connects to the mobile network, the mobile equipment requires executing some command for authorizing/authenticate the user. This is done by the application inside SIM card. For this purpose the ME initiate a set of GSM standard commands in some particular order and achieve the result. The GSM specification standardized the communication with the SIM.

Future trends

The Business drivers and survey results by the various research organizations have clearly shows the need for new payment schemes. Result of various survey shows that there is high penetration of mobile phones in society. As mobile phones may become payment instruments, we hope that there is the possibility that cards could be replaced by mobile phones. Even the financial institution has the plan to make use of mobile network as a new channel for the financial transactions. There is a trend that magnetic cards will be replaced with small chip set and RFID tags which is embedded in all mobile devices.

Conclusion

Hence the smart card being most secure and proven for its security, but was not popular amount the payment schemes. The financial institutions were watching the developments in the area of smart card, until it get mature. But in spite of its proven capability in the area of security, smart card failed to get enough popularity. From the above discussion it is evident that the financial institute, mobile operator and customer are looking towards a reliable, flexible and proven framework for mobile commerce.

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