M-Banking Payment Service Model Concepts

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ABSTRACT--- *This paper consists of four important sections to identifying how mobile phone (Smart phone) works to pay the online payments. First section has an introduction for the mobile payments requirements for reliable service. Second section shows types & models of mobile payment service but not taking into account the service patterns and the electronic money systems. In the third section as a case study is shown an author solution may be improved taking into account the security and economic issues presented in the first two sections. The fourth or last section presents a summery of technologies available for improvement of the mobile payments services. The main method is achieving the goal of the research is the modeling method which will be used to descriptively model global events and processes as well as construct the fundamental model of mobile payment. For the purpose of correct defining of analogies in the process of creating the model according to the original, we will be using the systematic approach. This approach my means of system analysis and synthesis assures dynamic modeling of the process and events relevant to the construction of the model and the result of this payment system (m-banking) are the potential of the mobile telephony globally and the technical security related to the technologies, but also with the customer trust, privacy and security in terms of social experience.*

**Keywords--- *i)* M-payments, M-order ii) 2D barcode, DOV (Data Over Voice)   iii)   NFC   (Near   Field Communication), iv) Mobile micro payments, Ticketing system,   Cashless   Payment v) Online   cashless   and branchless transaction

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1. INTRODUCTION

In the last few years many new services which make the very demanding digital data exchange in mobile telephony possible have been introduced. Along with the traditional spoken communication, SMS represents one of the most significant and utilized resources in mobile telephony. Now a day's people are living with mobile for solving everyday problems of the human being. Now a day people are very busy with their work schedule to not get enough time to go to bank and standing in a queue to depositing or withdrawing money (Porteous, 2008). On the other hand bank does not provide service to their clients, legal & natural person with the conditions necessary to access and do transactions on their bank account through internet in net-banking. On the other side within a mobile communication system, some banking institutions have constructed autonomous systems giving reports to the users of bank account soon any chances that take place on the account. Similarly some offer m-pay service which as a rule to restricted specific forms of payment for certain types of services. The potential exhibited by SMS is sufficient for creating a system of mobile payments from bank accounts by means of mobile payments order. This is principle open doors to revolutionary changes in the way banks do business in globally (Maurer, 2008) by raising the decrease the amount of manual labor of the front office banks, currently is use in the world.

Managing to avoid waiting in lines can be a crucial motive to the users of computer technologies for using e-banking systems & handling different monetary transaction via internet (Karjaluoto, 2002). However there are more limitations on communication resources in terms of technical equipment as well as cost. Moreover there are a relatively small number of users of computer technology in comparison to the number of users of mobile communications. Thus one can conclude that it is necessary to work on constructing a theoretical model of payment via SMS as a rational basis for establishing a pragmatic m-banking system. The model, resulting from the conducted research, encompasses the following components-ergonomics of using the system of payment via SMS, conceptual hard ware system demands, systems of digital exchange, concept of interpolation safety as well as the fundamental analysis of event & processes which occur within the mobile payment system (Cracknel, 2004, Info DEV, 2006).

<u>Types and models of Mobile Payments</u>*:* One of the main problems is which entity is going to provide the support for the financial infrastructure, banks, mobile operator, other private & public company or consortium (Ivatury and Mas, 2008) . There are three different models available for m-payment solutions on the basis of payments-

i) Bank account based.

ii) Credit card based.

iii) Tele Communication company billing based.

<u>Models of Mobile-Banking:</u>

Mainly, the mobile payment service is provided taking into account one of the following models-

i) <u>Operator Centric Model:</u> The mobile payment service is displayed independently by a MNO (Mobile Network Operator). An independent mobile wallet with electronic cash or money (store in the SIM, interval/external crypto chip to the mobile device or software application) may be provided by the mobile operator. The changing of the electronic wallet may be done through the user mobile account (telephone company bill) and the money withdraw may be done using specialized offices with mobile operator agreement. Mobile network operator should be interoperable with the bank network is order to provide advanced mobile payment service is bank and under bank environment.

ii) <u>Bank Centric Model:</u> The mobile application or devices are provided by a bank to the customers for the mobile payment transaction achievement and the bank provides to the merchants the compliant point -of-sale (POS). Mobile network operators are used as simple carriers or device providers.

iii) <u>Collaboration Model</u>*:* The bank, mobile operators and a trusted third party are collaborating for providing the mobile payments service including the issuing of co-branded devices that ensures the customer loyalty.

iv) <u>Peer-to-Peer Model</u>*:* A private or public institution or company independently from financial institutions and mobile network operator is the mobile payment service provider.

The mobile payments service may or may not include electronic money (also known as e-currency, e-money, electronic cash, digital money, digital cash, and cyber currency) exchange. Example of electronic money are- EFT (Electronic Fund Transfer), direct deposit, digital gold currency and virtual currency united under the term of "Financial Cryptography". There are three types of electronic money system-

a) <u>Centralized System</u>*:* Sell their electronic money directly to the customer (e.g. PayPal, Web money, Netcash.is, Pay-owner, Cash u, Hub culture's van Octopus card, Eagle cash - private for US Army and other local system in E.U and USA for canteens, sport areas and library access).

b) <u>Decentralized Systems</u>*:* Will sell their electronic money through third party digitally exchangers (e.g.- Ripple monetary system, Bit coin, Loom). Offline "anonymous" system- e-cash/digi-cash ("pure anonymous"), semi anonymous and based on electronic purse/wallet (not 100% electronic money) -Monteux in UK, Visa-Cash in USA, Geldkarte in Germany, Chipknip in Netherlands, Proton in Belgium, Felica in Japan, Moneo in France, Quick- Euro-pay in Austria, Mint-chip in Canada, Mini-pay in Italy.

No matter which model of payment service provider is adopted, there are four primary models for execution of the mobile payment transactions-

➤ Premium SMS based transactional payments.
➤ Direct mobile billing.
➤ Mobile web payments (http v/s old WAP with secure layers).
➤ Contactless-OCR (Optical Character Recognition) from images or text, NFC (Near Field Communication) NFC 2.0 or DOV (Data Over Voice).

The entire process of the mobile payment may include various technologies for communications between the client and the merchant, "money transfer" and /or ticket delivery (but it is dependent by the implementation).
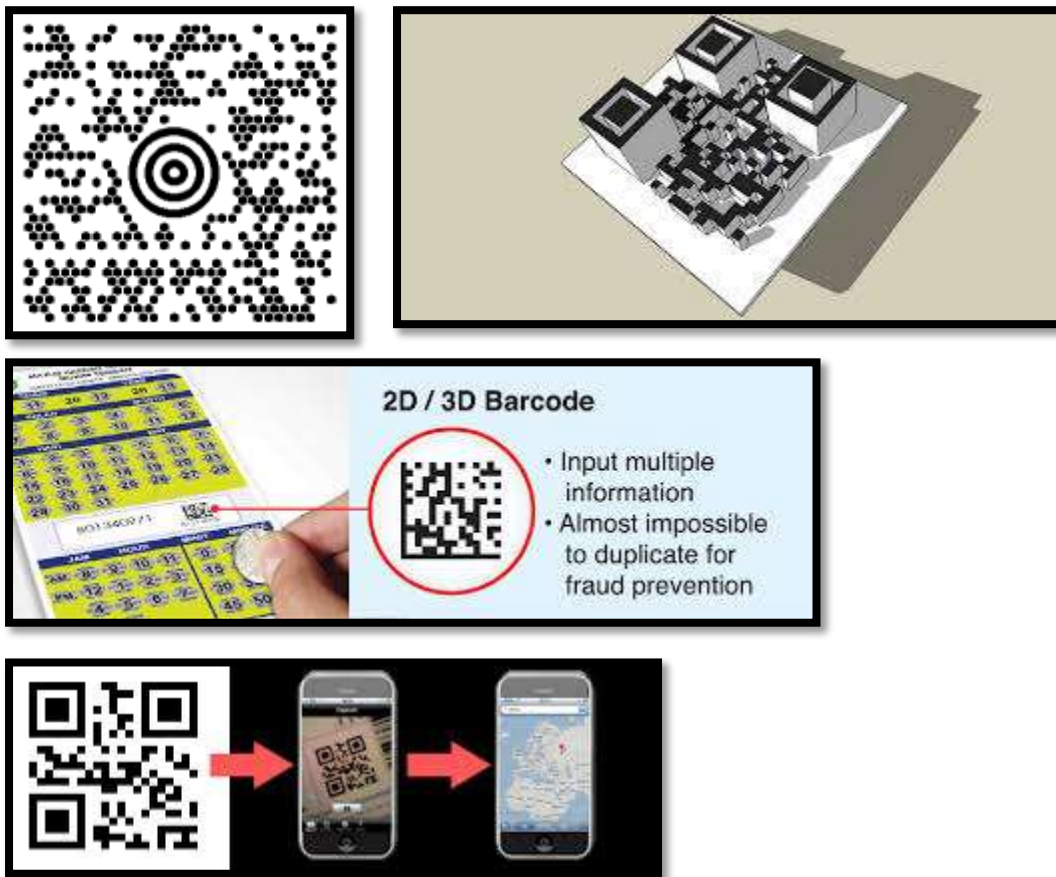
Figure 1: showing about 2D and 3D barcode
Source: Images taken from Google image.

- Text Messaging(SMS): USSD (Unstructured Supplementary Service Data) and messages through WAP push visual inspection or OCR
- Picture messaging (SMS, EMS, WAP Push & MMS) usually uses a 2D barcode or QR.

Especially for access to service provided by systems that use till now exclusively contactless ICC (Integrated Circuit Card) as NXP Phillips Mifare/Desfire/JCOP, Calypso etc. Now the merchant are using complaint devices that exchange data through radio connection in proximity ranges with the customer mobile devices through the device RFID enabled chipset

A sample of NFC implementation of Mobile Felica (the mobile phone is in a contactless ICC emulation mode) is Japanese Osaifu-Keitai"Wallet Mobile" a trade marks of NTT DoCoMo. An alternative to radio communication are the technologies NSDT (Near Sound Data Transfer) DOV (Data Over Voice) and 2.0 which produce audio signatures that allows the microphone of the mobile device to play a certain sound in order to trigger electronic transactions.

Figure: 2 showing about DOV (Data Over Voice)

Source: Images are taken from Google Images.

Independently by the communication methods between the customers mobile devices and the validation devices or POS, the trend in the mobile market is to provide a dedicated mobile application that run within the smart phone OS that are

Google Android, Apple Ios, RIM Blackberry OS, Microsoft windows mobile, Me-Go, Intel Tisane, Palm OS, Garnet OS, HP web OS-deprecated, simians obsoluted but with a large number of devices in the market. The mobile application can store and render barcodes delivered via SMS or GSM connection GPRS/UMTS/LTE. The barcodes are rendered in the device by the dedicated application which is especially useful for transport tickets.

Cashless Payments: A payment system that does not rely on credit or debit card does not require the merchant and purchaser to have money. Any kind of transfer between individuals and long distance remittances and involve partnership between bank and telecommunication provider (Porteous, 2006).

Internet user penetration in Asia-Pacific, by country, 2012 -2018 (%of population in each group)

Country	2012	2013	2014	2015	2016	2017	2018
South Korea	78.1%	78.5%	78.9%	79.2%	79.4%	79.6%	79.8%
Japan	75.9%	76.6%	77.3%	77.7%	78.0%	78.3%	78.6%
Australia	74.7%	75.6%	76.0%	76.2%	76.4%	76.5%	76.6%
China	42.4%	46%	48.5%	50.3%	52.1%	53.9%	55.9%
Indonesia	24.0%	29.0%	33.0%	36.5%	39.8%	43.2%	46.8%
India	10.2%	13.7%	17.4%	20.2%	22.4%	24.5%	26.7%
Other	19.9%	22.0%	23.9%	25.3%	26.6%	27.8%	28.6%
Asia-Pacific	27.8%	30.9%	33.5%	35.5%	37.3%	39.0%	40.7%

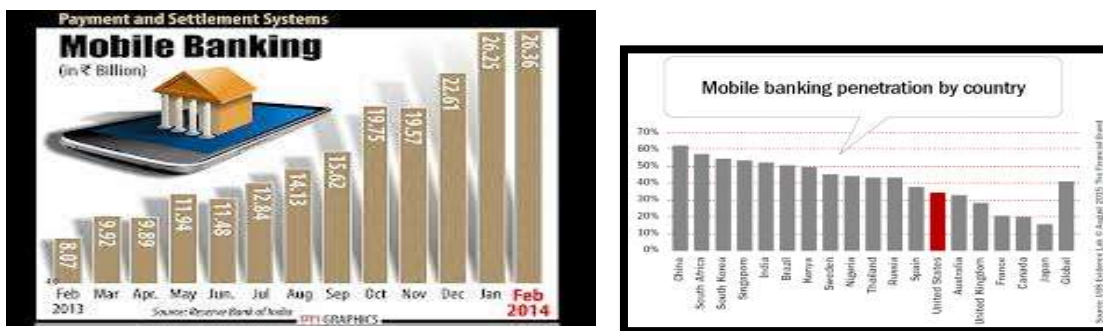Figure: 3 (No of Global Mobile Phone subscriptions)
Source: www.Marketer.com

Figure: 4 Shows how payments and settlement systems works and penetration by country wise.

M-Order model: The concept is that the system of mobile banking payments will consists of the service providing position which will be organized within the information system of an individual bank and the client position which pertains to the mobile device. That means of which data will be exchanged. According to the high quality work of the service system within the information system of the bank, it is necessary to installed special subsystem which will include the SMS server installed in the PC and the GSM modem. It is also possible to install and use more services on one PC. Yet in order to achieve cost effectiveness of processing, it would be the best that, for the purpose of SMS service. A special computer providing service for the GSM modem is installed. Further more this computer will serve the purpose of the executing the program application which will work according to the same principle as the prototype program application developed within this research. This program application communicates with the SMS server through one of the ports (usually the serial port or USB port). Furthermore it communicates with the GSM modem by receiving the data from the local port sent by the GSM modem and by returning the data to the GSM modem in order for

the GSM modem to be able to forward them. The SMS server in accord with the protocol stores. The received data in a defined file with receives messages and the noted messages and instructions are forwarded from the file created for out going messages. Pragmatically the program application communicates with the SMS server through the above mentioned incoming and outgoing file defined according to the protocol as well as the file with detected errors.

M-Payment: Mobile payment or m-payment is a field with an economical grows supported by the decreasing cost of GSM communications devices and application (Gamow, 2008). An important factor for m-payment grows is the end-user awareness and the products and services compliancy to fast and simple payment methods.
The products and goods that can be achieved with the m-payments methods could be-

➢ Electronic Content: Applications, E-books, Games, VOD (Video On Demand), Music, Ringtones, Wallpapers etc.
➢ Hard Goods: Concert's Tickets, Books, Journals, Magazine etc.
➢ Service Access: Transportation Fare, Bus, Subway or Train, Parking Meters, Cinema Access and other services.

2. RESEARCH METHODOLOGY

M-payment, m-order, SMS, 2D Barcode, DOV (Data Over Voice), NFC (Near Field Communication), Mobile micropayments, Ticketing System, Cashless payments represent an extremely powerful and widely accepted resource offered by mobile communications due to its simplicity and low cost. Considering the wide spread utilization of mobile communications, it is reasonable to take a look at the areas in which, the potential of mobile communications can be realized. These are all very important part of banking business. The advantage of these types of doing business with banks and monetary institutions are reflected in the total mobility of the service user. The service can be put to use anytime, anywhere within the world.

Considering the nature of the problem, the research will be carried out deductively, starting from the stated hypothesis, one will try to consider the global developing trends in the society and define the necessary structure, events and processes which outline the model of mobile payment order. The main method is achieving the goal of the research is the modeling method which will be used to descriptively model global events and processes as well as construct the fundamental model of mobile payment. For the purpose of correct defining of analogies in the process of creating the model according to the original, we will be using the systematic approach. This approach my means of system analysis and synthesis assures dynamic modeling of the processes and events relevant to the construction of the model. Along with the relevant mentioned research methods, we will implement other scientific methods such as the methods are obstruction and the derived methods of classification, generalization, aggregation, specialization and composition, the historical method, dialectic method etc.
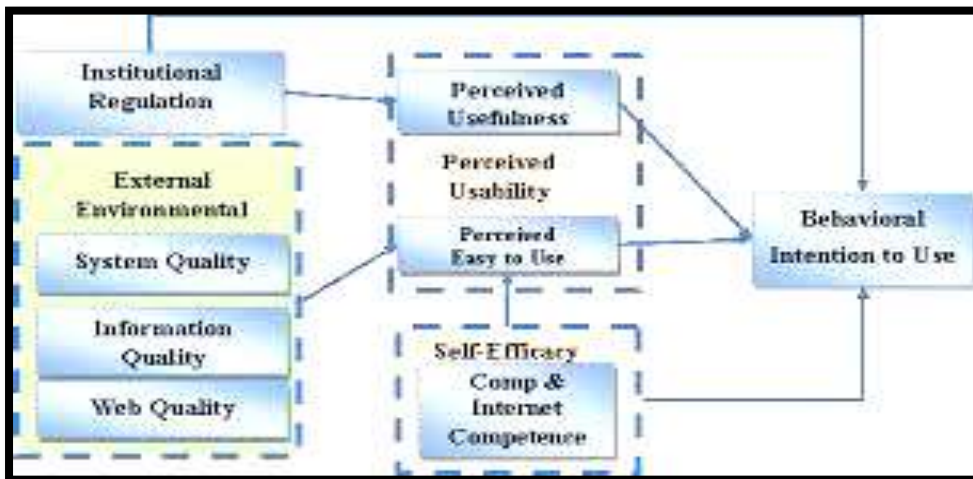

Figure: 5 show that how mobile banking works with variables.

3. CONCLUSION

The result presented in this paper represent the community of research which has been the main interest of the authors in recent times and which is directed towards finding optimal conditions for using the potential of the mobile telephony globally and the technical security related to the technologies, but also with the customer trust, privacy and security in terms of social experience. Mobile payments have to be as anonymous as cash transactions and the system should be fool proof resistant to attacks from hackers and terrorists. This may be provided using public key infrastructure security, biometrics and passwords integrated into the mobile payment solution architectures. Lots of challenges are to be

overcome for a successful implementation of mobile payments to be widely accepted as a mode of payment. Businesses, merchants and consumers have to come forward and make value-producing investments.

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