STRATEGIC USE OF TECHNOLOGY IN THE FINANCIAL SECTOR: E-BANKING AND FORMS OF ELECTRONIC MONEY

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INTRODUCTION

Many traditional processes in financial industry still remain, but we are facing with major changes every day. Modern business environment is characterized by distinct dynamics and rapid modifications as the result of technological innovation, increased expectations and fighting for consumers.Information and communications technology (ICT) is at the center of these changes. Over two decades authors (Canals 1994) are aware of this phenomenon. He pointed even then that the main drivers of banking competitiveness are: deregulation,internatio-nalization, economic instability, technical changes, and financial innovations. The reason for that is that financial industry, particularly in the banking sector is one of the first sectors that began extensively applied to information technology in order to utilize it for business progress.In order to support the processing of data ICT actually had been part of the banking industry over hundred years and in the last fifty years has even begun to change the procedures in banking business. Banks in contemporary society use ICT in different ways, in order to improve the competitive position and quality of operations. Application of ICT concepts, techniques, principles and strategies to banking services is also a prerequisite for achieving local and global competitive edge. Application of new

technology has enabled innovative approaches focused on the consumers' requirements and needs.

E-BANKING

Electronic bankingis a segment of broader framework - e-business. E-business has emerged in early '1980s, but underwent an expansion in last ten years, mainly due to the development of internet. It has developed in two directions. The first was to enable faster and easier money and information transfer, between entities such as companies or government institutions, and the second was development of tools for end users who want particular product or service. Implementation of ICT in the banking industry is focused on automation of processes and control and processing information about the business using computers, telecommunications, software, and related equipment such as ATMs (Automated Teller Machines - ATM), POS (Point of Sale) devices and payment cards. Generally, e-banking is the most important area in technological innovation processes of the banking business, which is primarily related to technology for fund transfer, and the development of integrated banking system, so-called e-money. The result of these changes is the fact that banking has become a very complex area of business. In addition, banks which have not realized the importance of new technology were unable to withstand competitive pressures.Apart from that, the emergence of Internet has provided banking services a whole new dimension. Internet banking and mobile banking have enabled the use of services without physical contact with the bank as an institution, and no restrictions on working time and a place where the user performs a transaction.

ATM and POS devices. From the first ATM in 1936 which had been invented by Luther Simian until today the working concept of this device did not sustain major changes. The main difference is that until 1974 ATMs were in off-line regime and today they are using network for information transmission. POS are the most spread retail payment device. From 1970 these devices become computer-driven cash registers.

The recent development of e-banking could be observed through several perspectives. The first is the relationship between the use of cash and non-cash instruments in payment process. The second is the progress in fund transfer and the third is the improvement of electronic cash systems.

Non-cash instruments as the basis of modern banking operations

For many decades checks were the most popular non-cash payment instruments, but lately payment cards show significant increase of usage.[19]Global analysis of non-cash instruments use showed a high rate of growth in all regions of the world. Data for 2001 indicates that the number of non-cash transactions in the world was 154 billion, and in 2008 the number has doubled and was approximately 269 billion. Table 1 presents the number of non-cash transactions by the regions and the growth rate for the period 2001-2010.

[19]This is very important because the bank did not charge commissions for checks, but they obtain profit for issuing e.g. payment cards.

Bill transactions

Region	Number of transactions			
	2001	**2008**	**2009**	**2010**
North America	81	112	113	117
Europe	51	74	78	81
Asia–Pacific	8	22	24	27
BRIC	10	23	29	33
CEMEA	1	6	9	11
Latin America	2	5	6	7
Rest of Asia	2	5	5	6

Table 1 Number of non-cash transaction, 2001-2010
Source: adapted from World Payment Report 2012

There are three main non-cash payment instruments: credit transfer or direct credit, direct debit and payment cards.

*Direct credit*enables legal entities and individuals to perform electronic payments from their bank accounts.It is initiated by the payer and the payer sends an instruction to payment service provider, who transfers the funds to the payment service provider of payee. (ECB, 2013)Legal entities mostly use it for the payment of wages to workers, then the supplier of a pension, insurance premiums and dividends, while individuals use it for retail payments or paying the bills.

Direct debit is automatic payment by the bank account. The scheme would not be different from a direct credit without authorizations, i.e. standing order which provider must ensure from the participants in the system. Authorizations (mandates) providedirect payment of claims. The central point of the system is a provider of payment services. According to the authorizations, provider connectsusers of the system and gives orders for payment. In their work *BradicMartinovic, Zubović and*

Jeločnik (2011) presented Serbian experience with this payment instrument.

Payment cards (or electronic payment cards) are the third non-cash payment instrument which can be viewed as a "global power" since its construction because they are the fastest, safest, and most convenient method of payment, with a well-balanced ratio of costs and benefits. According to the possibilities they offer, there can be two types: debit cards and credit cards.They can be used with ATM (automated teller machines) and POS (point of sale) terminals with two ways of identifying users (signature of the owner, or PIN – personal identification number). The costs of these services have been reduced in many countries due to significant improvement in the nationaltele-communications infrastructure. According to *McKinsey report* (2009) electronic payment cards have substantial growth in emerging markets, especially in countries that are predominantly using cash payments, such as India and China, in what the report said. The report further states that the use of these instruments continues to grow nearly in double-digit growth even in highly developed regions, such as Scandinavia. In Japan, the number of transactions carried out using credit cards increased three times since 2005.

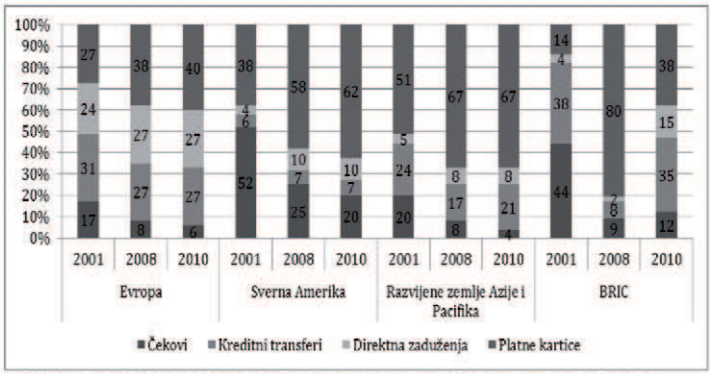

Figure 1 Shares of particular payment instruments in the total non-cash payments
Source: World Payment Report 2010 and 2012, p. 9

ELECTRONIC MONEY, ELECTRONIC CASH

One of the biggest innovations in the banking industry caused by the use of new technology is the change of money form, analyzed in the work of *Rigopoulos, Pasrras, and Askounis(2005)*. The first transformation was from the simplest form of payment, barter to a form of metal coins, as a single value measure. The money eventually becomes a universal medium of exchange, unit of account and means of preserving value.It was originally in the form of metal coins, and then got a paper form. The final stage involves the development of modern transition into electronic form (e-money).Figure 2 presents the relationship between technological development and the level of acceptance of various forms of money.

Before the popularization of internet e-money was internal bank resource and customers were not aware of its existence, but nowadays it becomes mass payment instrument presented in everyday financial transactions. E-money or digital money can be viewed as the greatest technological achievement in the development of banking. It can be defined as specific

"monetary information", which is transmitted in real time, among participants in the payment process through electronic impulses (Gledović 2008).
According to Riza (2010) e-money is recently developed phenomenon, and its technical, legal, economic and cultural components are not completely developed yet. In both aspects a great number of attempts are being developed and tested in different stages, in different legislations.

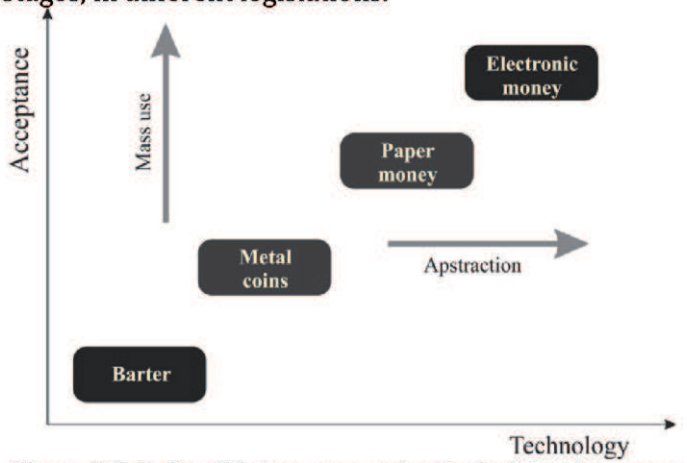

Figure 2 Relationship between technological development and the level of acceptance of various forms of money

Source:Rigopoulos, Pasrras, and Askounis(2005)

E-money is broadly defined as electronically stored value on a technical device that can be widely used for electronic payment that is necessary to involve a bank account, for the prior subscription (ECB 2013a). E-money can also be observed as a stored value or prepaid product with recorded sum or value available to the user. This includes prepaid cards, which are sometimes called electronic purses, bags and prepaid software products that use computer networks such as the Internet, called digital cash. These products are

different from the so-called access products that allow the consumer to use electronic communication channels to access conventional payment services (e.g. the use of the Internet to make a payment by credit card or for online banking services) (BIS 2003).
There are two forms of e-money: electronic cash based on electronic cards (plastic cards for small payments) and network money CyberCash which is store on the computer memory media. Transfer of e-money is done through a network, and that is usually the Internet. Market representatives of these product categories are eCash Technologies and CyberCoin.
We can also make distinction between identified e-money and anonymous e-money. In the first case banks can identify payee's identity and can track money, but in other case the transactions are untraceable. It is functioning like cash.
Payments by e-money have a significant role in retail payments and estimations are that the e- money will gain greater popularization at the future.The trend is particularly evident in developed countries.For instance e-payment transactions in US retail sector exceeded the amount of checks transactions for the first time in 2003.According to data from *Illionis Banker Association* (2005), in 2000 total amount of check transactions US was$ 41.9 billion, compared to $ 30.6 billion in electronic transactions, while three years later the situation has changed, with$ 44.5 billion electronic transactions, compared to $ 36.7 billion check transactions.

EUR mil, not seasonally adj. at the end of the period

Year	Total
2006	729
2007	683
2008	1,177
2009	1,723
2010	2,449
2011	3,087
2012	4,028

Table 2 E-money issued in the Euro area
Source: ECB (2013b)

The EU statistically monitors e-money issued by MFIs denominated in the euro currency, in the Euro area. From 2006 to 2012 saw a significant increase as we can see in Table 2.
According to *Deutsche Bank Research (2012)* there are several factors which could increase the future use of e-money:
a) Development of mobile payment systems i.e. hardware based e-money;
b) The digitalization of financial services, i.e. software based e-money; and
c) Many potential users in younger generations.

RECENT TRENDS AND TRANSFORMATION IN BANKING SECTOR

One of the most important challenges for the banks in the future is the fact that customers, thanks to technological abilities, will be able to compare the quality of services among them. Banks will not be able to impose particular service to customers, but in contrary they will need to explore and predict customer's requirements. Also, they will need to create a certain niche with specific type of

services.The customer relationship management (CRM) will be one of the main points of support in this process.

The second issue related with ICT implementation is connected with the decision process in banks. As a result of development of entire business environment banks are facing the problem of flood information. Today it is of most importance to distinguish really important information as a basis for decisions. In order to provide that banks must improve management information systems (MIS) and decision support systems (DSS). Only with reliable systems banks can improve process efficiency and enhanced quality of data. Development of knowledge and human capital is closely connected with this matter. Banks must develop workforce as a basis for sustained and competitive advantage with extensive leverage on technology.

Relatively new dimension in data processing is analytics. Banking and especially payment transactions generate huge amount of data. *LalBhasin* (2006, p. 589) argued that it is beyond human capability to analyse this huge amount of raw data and to effectively transform the data into useful knowledge for the organization. By using data mining to analyse patterns and trends, bank executives can predict, with increased accuracy, how customers will react to adjustments in interest rates, which customers will be likely to accept new product offers, which customers will be at a higher risk for defaulting on a loan, and how to make customer relationships more profitable.These tools can also provide following features: anticipation of demand, increasing of marketing promotion success, limit customer attrition, minimize business risk and detect fraud. This way banks are able to achieve customer confidence.

MOBILE PAYMENT (M-PAYMENT)

The recent expansion of high-speed networks has created a new commerce channel, while sophisticated mobile devices are enabling to perform the virtual exchange of payment information.Mobile paymentsare services which operate under appropriate regulation and performed from or via mobile devices. Specifically, mobile payments are "paying for goods or services with a mobile device such as a phone, personal digital assistant (PDA), or other such device" (Liu, et.all 2006).

New generations use mobile devices every day for many purposes and as a result of that *m*-payment, according to Gartner Worldwide report[20] will have very sharp increase presented in Figure 3 which shows global mobile payment transaction volume from 2011 to 2016.

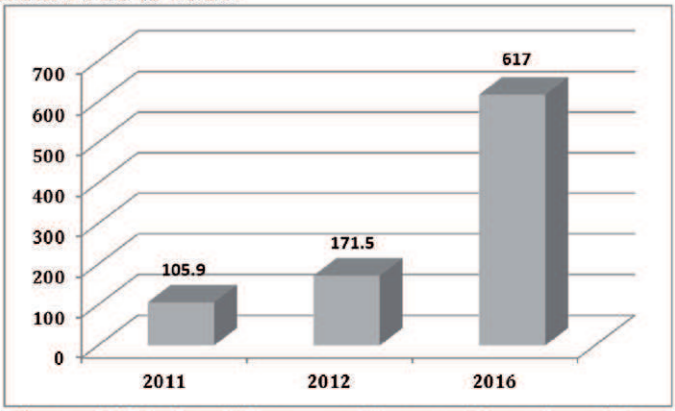

Figure 3 Global mobile payment transaction volume from 2011 to 2016(in billion US dollars)

Source: Gartner Worldwide report

[20]Referenced from Krill, J. Statistics and Facts about mobile payments, http://www.statista.com/topics/982/mobile-payments/

Possibly the most common system for e-cash transfer is Pay Pal, together with Wirecard, Web Money, Amazon Payments etc. The customers of E-bay use Pay Pal system as a paying instrument, which is probably the reason of its popularity. Increasing volume of Pay Pal transactions can be observed in Figure 4.

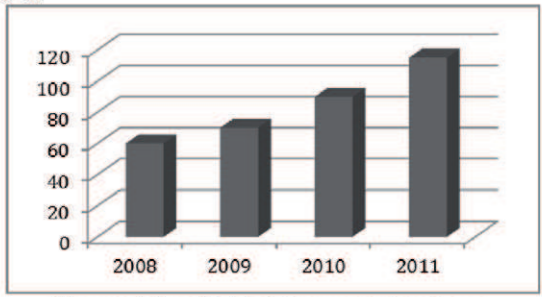

Figure 4 Pay Pal total payment volume

Source: adopted Deutsche Bank Research (2012)

We cannot forget to mention Google Wallet, one of the most popular *m*-payment innovations. It is an Android application which can mainly store payment information and transaction history, based on cloud computing.

Picture 1.The interface of Google Wallet live application

Special use of electronic cash is micro-payments. The value ofthese transactions does not exceed$12. Micro-payments must have very low commissions, so the

system uses symmetric encryption and does not verify each transaction.Example of virtual market is, for example, Xbox Live Marketplace (XBLM) where user can buy electronic content such as movies, computer games, maps, photographs and pay with virtual currency - Microsoft Point.
At the end we must consider various innovations in this area. First of them is new mobile phone devices for small payments – PayTag. It is a stick-on credit card, a product of the Barclaycards Company which allows customers to pay for their purchase.

Picture 2.Illustration of PayTag devices

The same company also launched service for money sending through smart phones, by using Pingit application. This app allows users to send and receive money using their smart phone number.
Smart Voucher Personal Payment System is also innovation. It is a system which randomly generates "one time unique voucher number. This concept allows for the creation and purchase of vouchers in-store and their redemption on the Internet, and in a number of 'closed loop' and 'white label' solutions in Europe and the USA." (www.smartvoucher.com).

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Instead of conclusion this topic we want to point out that the competition in the field of e-banking has never been greater. Thanks to innovations new entrants has appear in this area. For example, network providers receive a brand new role in the global payments system, and as a result of the the

position of previous participants is even more difficult.However, we should not lose sight of that technology offers various possibilities for profit.Many study shows that new services and processes in bank operations become very cost-effective. In this matter probably the main area of research would be the answer on the question: How can banks measure the impact of ICT on their business performance?

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