POŠTA TELEKOMUNIKÁCIE A ELEKTRONICKÝ OBCHOD
elektronický časopis Katedry spojov

MOBILE PAYMENTS ON M-COMMERCE MARKET

Jacek Binda, Katarzyna Gruszka

Money must be ordered, not served
Seneca

Summary

The present article touches upon issues of mobile systems of payments. Their presence in an economy communicated in a web becomes an indispensable element improving the flexibility of financial operations and reducing their costs. That is why, in times of development of mobile technologies, e-money and its instruments are more and more widely used in e-commerce and e-banking[1]. Below the author presents selected solutions of mobile payments pointing to possible areas of their usage in e-economy.

Key words: m-banking, m-commerce, e-business

1 Mobile payments and their instruments

Growing social expectations concerning greater flexibility of operations especially on the electronic market aim at wireless technologies which allow cashless transactions via mobile phones or personal hand computers such as PocketPC type regardless of spatial location. The application of new technologies from the area of mobile phones in e-economy becomes a worldwide trend. It may be the result of dynamically growing number of mobile solutions users.

Mobile payments which are defined as payments realized via teleinformation mobile devices[2] such as mobile phones, personal computers: laptops, palmtops, pocket PC etc. become an indispensable tool of contemporary information society. It is caused by the increasing pace of modern life, greater availability of mobile devices, the tendency to reduce costs of transactions and the concern of market players to improve relations with customers. Mobile technologies are more and more often used not only as a tool for communicating but also as a new way of conducting financial operations via the Internet and mobile phones. Such an application of mobile technologies makes the discussed way of communication highly flexible. The success of mobile systems of e-money is due to the scale of availability of mobile solutions and especially mobile phones. The results of the survey of world mobile phone market carried by Gartner Group and IDC show an increase in the number of mobile phone sets sold. According to IDC sales in 2004 exceeded 707 million of phones while in

[1] Binda J., „Bezpieczeństwo informacji w bankowości elektronicznej", Zeszyty naukowe Wyższej Szkoły Bankowości i Finansów w Bielsku-Białej. Metody ilościowe i informatyka w ekonomii. Nr 4, ISSN 1429-673x, Bielsko-Biała, 2003
[2] Krueger Malte, „The Future of M-Payments – Business Options and Policy Issued"

2005 825 million of phones were sold - it was an increase by 17%[3]. A very important factor of this success is the level of safety guaranteed by mobile systems. Thanks to the microchip cards which are installed in mobile phones it was possible to extend their basic authorization functions and add encoding solutions which ensure greater safety of the value of e-money stored in the SIM card memory. The forecasts of Oberthur Card Systems, which is a manufacturer of new generation SIM cards with built in memory of 512 MB, expect the 2007 sales to reach 1,5 billion items[4]. It opens new possibilities for using the mobile phone as an advanced instrument of e-money.

Mobile payments are transactions made via:

- E-money understood as overpaid instrument which is based on the technology related to chip cards or the Internet which stores the value and enables bank cards users to make low value transactions .
- Traditional instruments such as bank cards, direct debit or mobile phone (used only as an access channel for the service provider)[5].
- Combined instruments which contain functionalities of the above mentioned solutions.

The first group of instruments relates to storing the value of electronic money on pre-paid microchip cards or on central server and is called net money or a mobile purse "Stored Value Account" (SVA). Functioning of such systems is defined by the European Union regulation 2000/46/EC on electronic money[6] and its national implementations. Some of the implementations of the above mentioned regulation (including Poland) do not regard the value stored on the server as electronic money because this value is not in actual possession of the user. Similarly, the net money is regarded as electronic money only as electronic value of money stored in computer memory[7]. In this solution electronic value of money is stored on SIM card of a mobile phone. Selected system solutions which are based on microchip card include:

- integration of SIM card with the electronic purse (*SIM Application Toolkit*),
- integration in a mobile phone of two SIM card readers one of which contains the solution of electronic purse,
- integration of a mobile phone and a traditional microchip card reader on which the application of electronic purse may be installed,
- solutions using touchless technologies for example a card with radio microchip

The second group of instruments consists of solutions using traditional payment instruments connected to a mobile phone. In such solutions a mobile phone only provides access to a remote operator which makes it a device similar to POS terminal. Such a solutions in a naturally way extends the use of mobile technology.

The third group includes combined solutions which integrate the possibility to store electronic money value on microchip SIM cards of phones and the possibility to use traditional methods of payments such as bank cards.

[3] Numer jeden to znów Nokia, Rzeczpospolita 1.03.2006
[4] "Nie jest potrzebna dodotkowa pamięć", PC Format, pp. 13, 4/2006
[5] Arbusa Anna, „Imagine your telco is your bank, but a bank it ain't", ePSO Newsletter Nr.1 – July 2000
[6] Rozwiązania te objęte są regulacją Unijnej Dyrektywy 2000/46/EC Parlamentu Europejskiego i Rady z dnia 18.09.2000 r w sprawie podejmowania i prowadzenia działalności przez instytucje pieniądza elektronicznego
[7] W artykule przyjęto szerokie rozumienie pieniądza elektronicznego i instrumentu pieniądza elektronicznego zgodne z Dyrektywą.

Big dynamics of technological changes in mobile technologies, big number of potential users of mobile services and strong competition on mobile payments services market are the reasons why more and more often the suppliers of mobile purses are non-banking institutions such as mobile phone operators.

2 Mobile Telephony of third generation.

From the last few years the new possibilities in a space of mobile payments offers telephony of third generation called 3G. The system of mobile telephony of third generation UMTS (*Universal Mobile Telephony Service*) provides its mobile users with the access to the services offered by the net regardless of their spatial location. The global idea of the system comprises terrestrial elements, global satellite net and standarization of services common for all the users of UMTS which allows creating an environment in which it is possible to access the same set of services from each point of public and private environment VHE (*Virtual Home Environment*). For the operators of these services it creates an opportunity to deliver a complex environment regardless of spatial location and the way of access[8]. According to International Telecommunication Union's forecasts in 2010 45% of mobile telephony users will use UMTS. Then a mobile phone may become a pocket personal computer which is not only a device needed for work but also it allows the access to goods and services and offers a possibility to make a payment thanks to the built in electronic purse.

3 Models of mobile payments.

The development in the market of mobile payments systems involves many entities who can participate in the creation and then in delivering final services. The operators of mobile telephony and banks play a special role in building stable and safe systems. The former do so because of they are in possession of teleinformation infrastructure and accounting systems which collect payments for telecommunication services[9]. A very important role within this teleinformation infrastructure play also companies offering services similar to those offered by accounting banking systems (i.e. MASH, DanNet, Cibernet). The role of the banks, on the other hand, results from their experience, the possession of certain instruments and effective mechanisms in selling traditional payments products. What is also vital is the role of the banks in spending e-money. The role of financial institutions cannot be denied as it diminishes the risk of services with added value. Taking into consideration the above mentioned factors and the fact that payment services carry much more risk than the voice transmission services the cooperation between banks and mobile telephony operators seems to be fully justified. Depending on the level of domination of key institutions we can talk about a payment model dominated by a bank or a payment model of bank-operator cooperation. The battle between banks and telecommunication services operators to win the key position on the market causes that the latter attempt at diminishing the role of the banks. An example of such activities can be the creation by the biggest European telecom players a payment organization called Simpay[10].

The dynamics of creating mobile payment systems proves a big interest in this form of services and the benefits they offer. Among *European mobile payments systems* based on

[8] Norris M., West S.: *E-biznes*, Wydawnictwa Komunikacji i Łączności, Warszawa 2001
[9] Billingi dla klientów własnych oraz innych operatorów w tym sprzedawcom prowadzącym działalność w internecie
[10] www.simpay.com

cooperation between operators and financial institutions there is one worth mentioning here. It is a Spanish company Mobipay which provides one open standard for all interested institutions and uses the existing payment infrastructure and international payment organizations. In the process of identification and authorization Mobipay uses the protocol of text messages USSD, thanks to which sending messages takes place in open sessions which allows on-line communication. Compared to SMS text messages it is a faster and more comfortable solution. The system has been designed for small as well as big payments with the usage of credit cards, debit cards and electronic wallet installed on central server. With Mobipay users can do payments in shops and services, in virtual points POS (transactions via the Internet and telephone) . It is also possible to send values between different users (P2P transactions). Mobipay International's intention is to create a global system of payments served by a mobile phone with the cooperation from operators, financial institutions and international payment organizations[11].

Another interesting solution is *the Asian system of mobile payments* called Octopus. The workings of this system is based on pre-paid cards in touchless technology[12]. It allows to make payments for spedition services, in shops, fast food bars, in recreation centers or vending machines selling for example goods or tickets. With the system users can re-charge their cards up to 129USD in terminals placed in public places such as stations or retail outlets. This system is very successful which is proved by the end of August 2003 figures. The collected data show that in this period there were about 9 million cards in circulation and 6,8 million transactions daily. The total value of these transaction amounted to 6 million USD[13].

4 Conditioning on m-commerce market

Mobile commerce (m-commerce) up to now has been focused on providing goods of electronic nature: MMS – photos and video, information and entertainment content, location services, data transmission and access to the corporate net. The development of third generation mobile telephony offers new multimedia products and creates the need for even more new, fast and cheap methods of making small payments for these services[14]. Mobile phone as an instrument of mobile payments allows to make cashless operations for:

- Goods and services in real trade and services outlets (taxi, pizza, newsagents', shop),
- Terminal payments (i.e. for parking the car),
- Internet payments,
- Payments in machines accepting money, parkometers, photo booths
- Payments in m-commerce and telesales sector,
- Transactions between private users,
- Charging pre-paid accounts and paying bills (post-paid),
- Cash transactions.

For mobile users it means that they can make the transaction at any time and place and they can use different payment accounts safely. This safety is achieved thanks to proper safety

[11] Kaszubowski R., Widawski P.: *Mobilne systemy pieniądza elektronicznego i instrumenty mobilnych płatności*
[12] rozwiązanie wykorzystujące karty z mikroprocesorem radiowym.
[13] Janowicz R.*: Pieniądz elektroniczny w wybranych krajach – charakterystyka, główne funkcje i zastosowanie*, BANK I KREDYT, styczeń 2005
[14] Binda J., Rynek usług w e-biznesie, Wyższa Szkoła Bankowości i Finansów w Bielsku-Białej, ISBN 83-918417-0-7, Bielsko-Biała, 2003

tools[15]. Their aim is not only to penetrate the market of mobile phones (in 2004 in Sweden and Portugal saturation of the market exceeded 100% and in the Czech Republic and Italy reached 98%[16]), but also to exert a considerable influence on the demand for e-money instruments. The factor which can effectively slows down the development of m-commerce is high margins of over 50% of the value of goods purchased. A proposed solution to this phenomenon for the user may be a small annual fee which would replace all the other charges incurred for the use of e-wallet. For traders accepting the payments, the cash accepting machines operators and other acceptants there will also be a small fee (smaller than those for credit card transactions). In Belgium, where the system of e-money is extremely profitable, the fee charged from an acceptant is only 0,7 Euro.

5 Conclusions

The development of world economy shows that everything begins from an idea and its realisation and when a given product or service is ready the demand is being created. Today's mobile phone is not only a device for communicating with others but also a multifunctional multimedia tool. The application of solutions enabling mulitple usage of mobile telephony and the service of net distribution of digital contents creates big opportunities for e/m-commerce. Time will tell if in the same way it will be possible to introduce the application of an idetification document, driving licence and passports as well as data related to the state of health needed in case of medical services.

Literature

Binda J., „Bezpieczeństwo informacji w bankowości elektronicznej", Zeszyty naukowe Wyższej Szkoły Bankowości i Finansów w Bielsku-Białej. Metody ilościowe i informatyka w ekonomii. Nr 4, ISSN 1429-673x, Bielsko-Biała, 2003

Binda J., *Rynek usług w e-biznesie*, Wyższa Szkoła Bankowości i Finansów w Bielsku-Białej, ISBN 83-918417-0-7, Bielsko-Biała, 2003

Computerwolrd Online z dnia 03.02.2006r. *ATM: kierunek m-commerce*

Dom Inwestycyjny BRE Banku S.A., RAPORT ANALITYCZNY Telefonia komórkowa wIH2004 z dnia10.09.2004r., Warszawa

Janowicz R.: Pieniądz elektroniczny w wybranych krajach – charakterystyka, główne funkcje i zastosowanie, BANK I KREDYT, 2005

Kaszubowski R., Widawski P.: Przegląd systemów pieniądza elektronicznego bazującego na kartach mikroprocesorowych oraz perspektywy budowy takiego systemu w Polsce

Kaszubowski R., Widawski P.: Mobilne systemy pieniądza elektronicznego i instrumenty mobilnych płatności

Norris M., West S.: E-biznes, Wydawnictwa Komunikacji i Łączności, Warszawa 2001

RAPORT POLSKIEJ TELEFONII KOMÓRKOWEJ CENTERTEL, Wyniki 3Q 2004 z dnia

www.BiznesNet.pl

www.nbp.pl

www.mpay.pl

15 W mobilnym systemie płatności elementem identyfikującym jest zwykle numer telefonu użytkownika a inicjowanie transakcji odbywa się bezpośrednio z klawiatury telefonu. Stosowane są również techniki kryptograficzne

16 Dom Inwestycyjny BRE Banku S.A., RAPORT ANALITYCZNY Telefonia komórkowa wIH2004 z dnia 10.09.2004r., Warszawa

Prof. WSBiF dr hab. inż. Jacek Binda – Wyższa Szkoła Bankowości i Finansów w Bielsku-Białej, Katedra Finansów i Bankowości

mgr Katarzyna Gruszka – Zespół Szkół Zawodowych w Skoczowie