

The Impact of the Electronic Payment System on the Development of Nowadays Society: an Economic and a Managerial Perspective

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Abstract: The paper “The Impact of the Electronic Payment System on the Development of Nowadays Society: an Economic and a Managerial Perspective” presents the aspects concerning the impact of the electronic payment system on the development of nowadays society as an economic and a managerial perspective.

Our research focuses on issues related to the payments sector, the Smartcard, the Electronic Banking, payment systems based on bank cards, the Cyber cash, and the electronic payment systems (1) Net Cash and (2) E-Cash, Micro-payment systems with (1) Millicent and (2) Cyber Coin, as well as the electronic check payments.

Key words: electronic payment system, payments sector, smartcard, electronic banking, bank cards, cyber cash, net cash, e-cash, micro-payment systems, Millicent, cyber coin, electronic check payments, development, economic and a managerial perspective

Introduction

The basic function of money is to be exchanged by means of payment depending on the requirements and characteristics of trade. Conducting payments must be made in optimal conditions, thus ensuring fluency and safety of the entire payment process. Currency must react to modern means of payment, being influenced by external economic environment, society, contemporary civilization, conducting more frequent payments through banks and evolving to sign electronic monetary impulse, breaking total real value of the currency of contents constituting challenges and responses of the coin.

In banking was born, using the continuous development of computer science, a new form of money, namely electronic money (e-cash). This term refers to electronic payment systems that allow customers to store and redeem financial value. These systems operate by electronic store of value. Funds can be transferred between people using compatible electronic systems, in some cases without resorting to banks or other financial intermediaries.

1. The payments sector

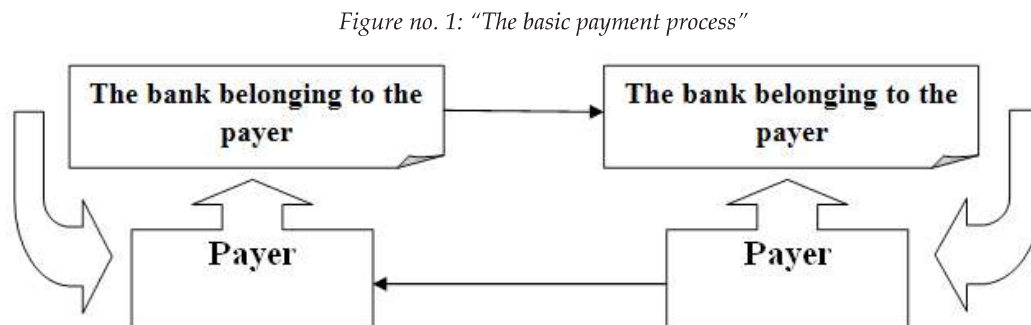
The most important element underpinning electronic card payments (Baddeley,

Michelle, 2004) is used to pay from their own accounts or withdraw money from these accounts. For more complex operations are issued the Smartcards (Cameron, Debra, 1997).

In the traditional system, using card payment transaction shall be:

- The person holding the card presents the service provider;
- It verifies the authenticity card;
- The service provider communicate and assess the data centre using authorization card;
- Authorization centre approves payment from the cardholder;
- Finally be given a receipt in triplicate, in which one remains provider for archiving, one bears the cardholder and the other is for the bank for settlement.

Figure no. 1: "The basic payment process" illustrates a basic scheme simple, reflecting the electronic payment process for certain goods, services, remittances etc. As can be seen, drawn up paying for the invoice (payment document), the payer's task to initiate payment is effective transfer between the payer and the payer bank and in the end it issues a statement to complete the process (Ionescu, Mihai, 2000).

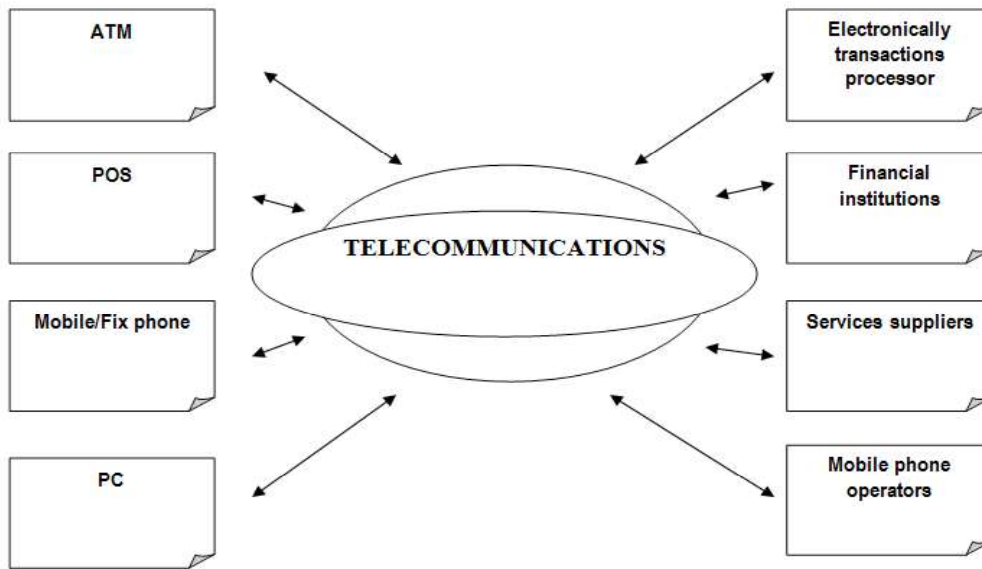


Source: Adaptation after Vasilache, Dan, "Plăți electronice. O introducere", Rosetti Educațional Printing House, Bucharest, 2004

Figure no. 2: "General electronic payment figure" shows the general scheme of electronic payments at participating: telecommunications, electronic transaction processor, cash machines (ATMs), point of sale

(POS), fixed or mobile phone, computer, financial institutions, service providers, and the mobile phone operators (Ionescu, Mihai, 2000).

Figure no. 2: "General electronic payment figure"



Source: Adaptation after Vasilache, Dan, "Plăți electronice. O introducere", Rosetti Educațional Printing House, Bucharest, 2004

In modern systems are considered final three stages mentioned above. This system is characterized by the fact that the approval and settlement of the transaction takes place much faster. An essential role in this process is played by the ATM's, which are designed to accept and record the data on a card (Coulouris, G., Dollimore, J., Kindberg, T., 2001).

2. The Smartcard

A smartcard is a chip that supports a particular integrated circuit. Because this

card contains one or more electronic chips or integrated circuits that can store and protect information, smartcard can be called also chip card or integrated circuit card (Guttmann, Robert, 2003). If, in addition to the integrated circuit, a smart card comprises a microprocessor, it may calculate the addition and subtraction of the value found there. Capabilities embedded chips are what make the card can be called "smartcard". Many of these are actually memory cards because they do not contain a microprocessor chips. Memory cards can store data and values, but they cannot perform complex calculations (Manolescu, Gh., 2007).

Another important aspect of smartcards is the security chip, thus making data and information recorded in this type of card is virtually impossible to access, copied and reproduced by people who are not real owners of smartcards. Smartcards are preferred because their use involves reducing operational time and should no longer call the transactional operations to check each part, resulting in a final time and lower cost per transaction. Smartcard chip's memory can store more data and information such as the identity card data; the passport data; the driving license data and loyal customer loyalty points (Mansell, R., When, U., 1998).

3. The Electronic Banking

Electronic Banking is a general term for the process by which a customer may perform banking transactions electronically without having to visit a bank. This concept has several forms of e-Banking, such as PC Banking, Internet Banking, Home Banking, Mobile Banking, remote electronic banking (e-banking remote) etc. PC Banking, Internet Banking and Mobile Banking services are most commonly used by customers (Pascariu, Gh., 2005).

PC Banking is a form of online banking environment that allows customers to perform banking transactions through a computer connected to the Internet. Most banking institutions offer customers a software-based system that allows customers to conduct financial transactions on their computers (Rajput, Wasim, 1998). Then get in touch with the bank customers through the Internet, download data necessary for software, and the software running on the computer. Currently, many banks offer PC

banking systems that allowed customers to obtain information on bank statements, credit cards, pay bills, transfer funds between accounts.

Internet Banking, Online Banking sometimes called is an outgrowth of PC banking community. It is used via the Internet, which can follow the development of banking activity, such as fund transfers, pay bills, view account, paying mortgages, and purchasing financial instruments. Customer accesses (Cameron, Debra, 1997) their account using a browser running programs on the server Bank Internet Banking, and the user's computer.

Mobile Banking site (or m-Banking) can be defined as all technical procedures or procedures by which the payment or proof of payment are made via mobile phone or as a standalone action or in commercial transactions or made in mobile financial system (Pascariu, Gh., 2005).

4. Payment systems based on bank cards

Most transactions (Mansell, R., When, U., 1998) giving rise to purchase goods and services on the Internet is performed using a bank card that contains the customer's data; this data can be captured during transfer over the Internet. Without the software to ensure the confidentiality of the information on the card, any Internet user can obtain and use, illegally, data on the card. It is therefore necessary to achieve good security systems in place, ensuring these payment systems to run properly. Regarding this delicate area firms MasterCard and Visa have reached an agreement, uniting their electronic payment systems, thus taking birth SET protocol

(Secure Electronic Transaction).

This protocol aims security of e-commerce and has the following targets (Mansell, R., When, U., 1998):

- Classification and payment instructions claim and payment information;
- Preserve the authenticity of the data transmitted;
- Ensuring the legality customer and that only the right person is the owner of the card, consents regarding credit card transactions and relationship with the bank concerned;
- Use the safest security to ensure smooth conduct of e-commerce;
- Protocol is not dependent on transport security, and also to not hinder its use;
- Supporting and facilitating effective relationships between software vendors and network providers (Cameron, Debra, 1997).

5. The Cyber cash

While electronic money are used in fund transfer mechanisms through computers, such as credit or debit cards, and to access ATMs and points of sale, the term is used in systems Cyber cash remittance made via the Internet. It is difficult to distinguish clearly between electronic money and Cyber cash because these terms are merged (Mansell, R., When, U., 1998).

Cyber cash Enterprise Incorporated in the United States, founded in 1994, made shortly, particularly in the following year, a secure credit card transactions made using the company's server and while ensuring optimal customer service. For transactions with small amounts, use Cyber cash system is rather a disadvantage, being quite uncomfortable and relatively expensive.

Cyber Cash Company uses a security cards that are used on the Internet. Also, customers and vendors can benefit from a software program developed by the firm. The customer (Cameron, Debra, 1997) can download this program for cards and a wallet like usual, can be used by the buyer to make payments made using several cards. Of course, there is a software program seller alike.

When you buy a product seller server sends a notification to the customer's payment card, describing the acquisition and card types accepted for payment. Card software then allows the client to validate the purchase and the amount, and the next step is choosing the type of card that you buy the product (Baddeley, Michelle, 2004).

After these steps, the seller receives a payment notification from the customer which lists details of the transaction and the digital signature of the customer. In turn, the seller resends the portal Cyber cash all these details, together with its digital signature. Then Cyber cash running a comparison of items received both the seller and the person acquiring such product. If there are no problems and compared data coincide with each other, then the application is approved vendor and operating software with this client consents card payment.

In order to ensure greater security Card Company Cyber cash Incorporated has developed its own payment system, providing facilitation and simplification of electronic payments systems by introducing Secure Cash / Check and Secure Check and, if smaller transactions system was introduced Cyber Coin. Exactly, Cyber Cash Company, in partnership with the University of Southern California worked together, putting in place systems Net Cash for transactions

using electronic money and Net Cheque system that uses electronic checks (Baddeley, Michelle, 2004).

6. Electronic payment systems

6.1. Net Cash

The Net Cash is an electronic payment system which is carried out online and was created at the University of Southern California, specifically in the ISI (Information Science Institute). Unlike E-Cash payment system, which is 100% secured payment anonymity if Net Cash system we can talk about that money can be detected, providing other ways but payments can be anonymous to a certain extent.

This system includes the following elements (Baddeley, Michelle, 2004):

- Customers;
- Dealers;
- Servers' currency (SM).

Servers' currency issue electronic money, which in turn has the following characteristics:

- Currency server name;
- Currency server address;
- The validity of electronic currencies;
- Electronic coin series;
- Value.

The acquisition process through Net Cash system comprising:

➤ The client directs electronic currencies in the notification of payment;

➤ Upon receipt of electronic currencies, the seller is to check their validity, sending them to the server in order to have money to be replaced by other coins of this type or with a check;

➤ Currency server accesses its database to check the validity of coins;

➤ The seller notes that payment was properly prepared, returning them to final customer payment confirmation.

6.2. E-Cash

E-Cash is a payment system designed and implemented to make purchases over open networks such as the Internet. Need a payment system that performs electronic transactions is increasing, which is directly proportional to the increasing use of Internet in our daily lives. Electronic payment systems today have a major problem, namely, they cannot deal with security and anonymity of users and at the same time, these systems are reliable only on the cost of maintaining the anonymity of the users (Mansell, R., When, U., 1998).

Digi-Cash is a private company founded in 1989 by David Chaum. It has made the introduction of money on the Internet, now referred to as "e-cash". E-Cash-created by this company was used for several types of transactions and represents a value stored in a cryptographic system that facilitates electronic commerce using the software that runs on personal computers. It provides a way to implement anonymous electronic payments in an environment of mutual distrust between the bank and system users (Mansell, R., When, U., 1998). The manner of representation Digi-Cash values are cryptographic tokens that can be withdrawn from bank accounts held in other bank accounts, or transferred to another person. Its properties include ideal security, anonymity, portability, ability to run offline, easy to use by customers, widespread acceptance.

Payment Protocols via e-Cash can be used in two ways: online and offline, last mode is ideal for optimum operation of a protocol.

The characteristics of these protocols are (Mansell, R., When, U., 1998):

a) Electronic payment protocol offline: offline payment is made when the dealer checks the user's electronic money, then to be stored after the payment transaction has been completed. This means that a user can freely transfer money system offline by the retailer at any time of day without involving a third party, such as a bank. This is done using a device similar to a smartcard reader located at points of sale. The device is used with confidence by the bank, checking the authenticity of the coin, but cannot verify that the coin was spent twice. Offline systems are more sensitive to the problem, the costs and, therefore, suitable for small transactions.

b) Online electronic payment protocol: merchant bank to verify the validity sound chip user before accepting payment and deliver the merchandise to. Online payment is required for transactions that require a high level of security. With an online system, payment and submission are separate steps. Online systems require communication with the bank during each payment, and thus more expensive. However, online protocol is simplified version of the protocol offline. Since online systems must be able to verify the credibility payers, it is almost impossible to protect the anonymity of its users, requiring communication with a third party during the payment transaction.

7. Micro-payment systems

In the virtual environment (Socol, Adela, 2005) there are many services that deal with promoting newspapers, shops

generally cheap items, small, which if sold individually, the advantage of being attractive to people who use the Internet. These people are willing to invest an amount of the order cents to purchase at least one item that awakens interest if they see first item. An application that does not require a large investment is defined by the payment of accessing websites.

Such micro-payments are designed to support the existence of economically outline to help lower the transactions, the order of a few cents. In these systems, micro-payments we find two concepts that are used for electronic payments, namely:

- Millicent;
- Cyber Coin.

7.1. Millicent

Millicent scheme is to develop a secure distribution and use of scrip's. Scrip is a specialized form of the digital cash, designed for the use of low-value transactions (Socol, Adela, 2005).

Millicent interest since several of its security techniques have results that differ from the results of other security systems. Scrip site is a form of digital cash that is available only to a particular supplier, is designed as follows (Socol, Adela, 2005):

- Has value only to a specific provider;
- Can be used only once;
- It is difficult to counterfeit;
- May be used only by the rightful owner;
- Is produced and validated effectively.

Scrip is generated and distributed by brokers, who may be financial institutions or providers in the virtual environment. Brokers changes scrip (Socol, Adela, 2005)

for your real money buying scrip (or right to generate the scrip) from suppliers, taking advantage of the discount and resell scrip at the expense of the customer's credit card or other forms of payment. Customers can purchase scrip for several vendors from a single broker and paying taxes until after a certain period of time. Millicent was designed as an electronic cash offer adequate security to prevent misuse. Security's scrip is based on digital signatures and encryption is used for keeping secret information where necessary. Cryptography that does not require a high cost in this case is used as the cost of breaking the security system is greater than the value of transactions for which it is used. Millicent scheme can be implemented without the support of other services as a trusted identity does not depend on external customers or suppliers. Instead, Millicent generates and distributes unique secret key for use by parties to transactions scrip sites.

7.2. Cyber Coin

If this system of micro-payments using credit cards is proven to be cost-effective because Cyber Coin is used in very small amounts payments, the maximum being \$ 10 (Worstell, K., Gerdes, M., Kabay M., 2001). Customers can access their accounts in banks to transfer money to their own card. When the card is loaded, the client can begin to use it, making micro-payments company-approved sites Cyber cash with a program called Cash Register. Cyber Coin is based on the notion of Cyber Coin session (U.S. Department of Treasury, 2000). This session is similar to a check book, which in turn owns more checks, each check is not reusable. The session ends with the use of all checks or if their expiry

date has passed (Worstell, K., Gerdes, M., Kabay M., 2001).

8. Electronic check payments

Electronic checks (Sumanjeet, Singh, 2009) were made to make payments using electronic signatures and messages that are provided in terms confidential. The electronic check qualifies in terms of preventing crime, both from banks and from customers. Electronic check replaces the usual paper and electronic signature on the handwritten. Smartcard protects electronic check any unjustified use by persons who want to use that check, thereby stopping the fraud. Smartcard, in turn, is secured by PIN known only to the person who owns the card (Şerbu, Răzvan, 2004).

The handwritten signature of the cardholder turns out to be almost impossible to fake. However this can only be achieved if falsification private key of the cardholder (Şerbu, Răzvan, 2004) is within everyone's reach. The private key must be properly secured so that only the signatures belong to the legitimate holders of cards (Srivastava, S., Saraswat, V., 2012).

The electronic check system comprises the following steps:

- ▶ The buyer completes an order form, attach your check electronically sign it with his private key, then the public key certificate is attached, following encryption private key and sent to the supplier;
- ▶ The seller using its private key checks the certificates buyer, signature and checks it, then attached submission form, approved form using public key certificates. These are sent to his bank;
- ▶ Bank provider verifies signatures and certificates and send the check for payment;

► Where the check is approved, the amount is credited to the account of the seller;

► The buyer receives regular advice from the bank account management.

Conclusions:

In this paper we highlighted the main forms of electronic payments. In the banks are used in a proportion higher increasingly electronic money (e-cash), via computer store.

Among the special features of a smart-card chip include, chip, microprocessor and not least high data security included.

Electronic Banking is based on several forms, the most common being PC Banking, Internet Banking and Mobile Banking.

Among the most common are electronic payment systems through bank cards. This system is based on data confidentiality, authenticity, and security for the purposes of the transactions.

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