

Charge Cards: Risk Management in the Contemporary Electronic Environment

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Summary

Information technology must be a tool which facilitates business operations rather than a hindrance to achieving business goals. Applicative solutions have to provide required performances, risk control, simple integration and necessary flexibility for successful implementation. Contemporary information tools offer attractive features, but they are also a specific implementation challenge for management structures in the financial sector. In the new setting of information challenge, business persons must be far better technologically trained on the one hand, while on the other, the new technology must become much more human-oriented.

The aim of such application is to define risk control in the approach to information technologies and organise risk protection techniques. The management of financial institutions must permanently reconsider, revise and update the risk management plan. In this, it is essential to establish the risks prevailing in the total integrated electronic trade environment. In the electronic environment, controls must be primarily preventive by nature.

Numerous and varied potential threats endangering information systems, especially those that can be qualified as crime, unequivocally impose the need to build an adequate system for information system protection. Consequences are as unknown as the directions and possibilities of establishing completely new directions, or a new and less well-known payment facility such as digital money, i.e. charge cards.

Only future will show whether it is the end of money as we know it, or the revolution of a new payment tool. It is a fact that the electronic market is here to stay.

Key words

Charge cards, information system abuse, criminal act.

1. Illegal practices in the use of money and information system criminalisation

The history of money does not provide many elements to support a linear view of the past, especially the one based on the proposal that knowledge and experience gained in one era can serve as guidelines for better management in another. Herodotus attributes this innovation to the kings of Lydia, so that we can say that the first money was minted in the second half of the 8th century B.C.

The first occurrence of money in the ancient times is associated with King Croesus of Lydia, who ruled Phrygia in the 8th century B.C. King Croesus, known as the richest man of the ancient era, circulated flat metal bullion, half-gold half-silver, coined in the royal mint. His coins, *croeseids*, featuring the images of lion and bull, soon started serving the entire economy of the region, and enlarged the King's personal wealth.

The first banks in history also emerged in ancient times, with the development of trade, in areas with the richest natural resources of Greece, the Roman Empire and the Middle East. The emergence of banks in the Middle East dates back to

between 3400 and 3200 B.C., and is related to religious rites and beliefs, so that temples were the first founders of banks. The powerful Babylonian civilisation was the site of the first bank building, in the form of a temple, in the city of Uruk. In any case, it led to the build-up of a huge amount of credit instruments, through a peculiar, religion-based accumulation. In addition to this, the temple itself was leased, and all banking operations, including loans, were done only in kind. The priests of the Red Temple in Uruk are believed to be the world's first lenders, i.e. bankers.

New terminology is still under development, and may effect the classification of financial instruments, methods of gathering statistical data, as well as the relativisation of the very concept and definition of money. Thus, many expressions have found their way into language, such as *cybermoney*, *electronic money*, *cybercash*, *digital money* etc.

Electronic instruments are described as the state of banking and telecommunication technologies. All of these novelties are referred to as electronic payment instruments, or electronic equivalents of currency. In addition, some electronic payment mechanisms are partial substitutes for monetary instruments, so that such systems should

be classified as monetary instruments within the national definition of money. These are developed at a fast rate, and are bound to have major and still incalculable impact on the monetary and financial system, which will also be accompanied by charge card abuse.

The creators and instigators of monetary destruction are always on the move, and their final targets are always places housing certain social values, primarily money. The introduction of information technology into banking and financial system has led to the transformation of funds into the so-called digital money, and large-scale movement from bank vaults into computer media, i.e. electronic vaults. The abstract forms of social assets are challenging enough for various groups or individuals, prone to criminal actions, to redirect their activities, bearing in mind that these assets will no longer be obtainable by classical methods, and the activities will have to be integrated with the new forms of highly sophisticated, i.e. white-collar crime. The American expert Martin James claimed as early as 1983 that the new robbery of the century will certainly not be the one committed on the Glasgow-to-London Post Office train, when 3 million pounds sterling was taken, but one committed by computer.

At the initial stage, the IMF distinguishes between seven electronic payment systems: credit cards, magnetic stripe cards, swipe cards, usage of payment systems, debit cards, electronic cash, and electronic debits.

To the extent that ethnic origin can be ascribed to any economic or business activity, banking is a genuine Italian invention. As the history of coinage dates back to the Kings of Lydia, the history of commercial banking begins in Italy, central banking was first established in Britain, banknotes were first issued in China and only then in America, while the originator of charge cards, the so-called 'plastic money', was undoubtedly Frank McNamara, who invented a new means of payment in 1949, in the form of cardboard identification cards. Diners Club International was established in the USA in February 1950, as the first company to issue charge cards, followed by American Express in 1958, Bank Americard in 1958, Visa 1976, JCB in 1961, Master Charge: The Interbank Card in 1967, MasterCard in 1979, and Discover in 1985.

Although still at the dawn of the new information era, information technology has already introduced drastic changes into all the pores of social and financial life. These changes are not only positive and desirable; there have also been those that

society would be glad to give up, if possible. These include, first of all, the changes and phenomena encouraging anti-social and criminal behaviour, such as information system abuse – more specifically, charge card abuse. A special curiosity exemplifying the criminals' audacity is the twenty-year-old Bulgarian student of technology, Andrei K., who participated in online criminal traffic in financial documents, and succeeded in forging the credit card of Bill Gates, multibillionaire and master of the Internet. The most notable victim of organised financial crime group in the USA in 2009, who managed to steal 2.1 billion dollars from the citizens, is Ben Bernanke, Chairman of the Federal Reserve (FED). The person who stole the Bernankes' cheque books and credit cards was subsequently arrested after a large-scale investigation by the Secret Service and the US Postal Inspection Service. This was followed by the spectacular arrest of a group of sophisticated financial criminals. The thieves, based in Alexandria, a suburb of the US capital, were specialised in identity theft and credit card theft, which implied a wide co-operation between criminals and people with high knowledge of finance and the functioning of electronic payment and money transfer system. This system for robbing was devised by the thieves' ringleader, Clyde Austin Gray Jr., also known as "Big Head".

Among other, the first years of the 21st century are characterised by a dramatic increase in financial transaction and tenfold growth in the volume of capital on the global financial market. The globalisation of the worldwide economic activities has also imposed the speed and requirement for timely completion of financial transactions. This has, consequently, resulted in the development of many methods of utilisation of telephone lines and electronic communication, which makes the banking system somewhat more vulnerable to the impact of agents of monetary destruction.

2. Illegal practices in the use of money and information system criminalisation

The globalisation of finance and the world's economic activities has also imposed the speed and requirement for timely completion of financial transactions. Information and telecommunication technologies constitute the basis of contemporary and efficient economy, finance and business communication on the global scale. The advent of digital money has imposed a completely new philosophy in banking. It is based on the electronic exchange of data and funds, designated as electronic

banking. The development of electronic money transfers, and electronic automation of banking processes – banking engineering – are new breakthroughs in the development of the financial system, and banking in general. Electronic payment systems can be divided in four groups:

1. software-based electronic cash systems
2. smartcard-based electronic cash systems
3. electronic micro-payments system
4. credit and debit card-based electronic payment system

One of the most significant changes in the area of money transfers is the introduction of new forms of cashless payment, most notably the use of charge cards, as one of the payment instruments. The use of charge cards has enabled all kinds of financial transactions, cost-effectives, payment of all denominations, and application in various payment systems, as well as the inclusion of a large number of users and taking over the credit function.

There is a clear trend towards replacing the classical currency with plastic cards as much as possible, which is going on at a rate that is causing headaches for many banks worldwide in the course of adaptation, which neither simple nor cheap. Charge cards are being developed at a high speed, and will undoubtedly make a major and still incalculable impact on the monetary and financial system. In the currency of the future, banknotes, cheques and coins will be replaced with memory cards and compact PDA devices for data synchronisation via satellites. The question is not whether it will happen, but simply when.

Charge cards as a cashless payment instrument have significant advantages over other payment forms, which can be classified as follows:

- It eliminates the need for carrying cash in its physical form.
- It influences the reduction in the circulation of cash, and improves the banks' solvency.
- It enables efficient and simplified payment procedures.
- It enables the implementation of the credit facility.
- The card's payment function surpasses the borders of defined monetary areas.
- Charged foreign currency from foreign users i.e. holders remains registered in the country's monetary channels.

Charge cards are the property of the issuers – banks, other financial institutions, or non-banking organisations. Clients who were issued with charge cards can use them under the conditions and in the

manner stipulated by the issuer and the terms and conditions of the contract. Such a payment instrument is non-transferable, and may be used only by the person identified on the card. Charge cards can be used for drawing cash from automated teller machines (ATM) and at the counters of banks, paying for goods and services at points of sale equipped with PoS terminals, and payment in online transactions.

A commercial bank, as the owner of the charge card, is motivated to issue as many cards as possible. In such a manner, bank as a financial institution broadens the range of its services, reduces operating costs and simplifies book-keeping. Issuing the new payment instruments, banks increase the income earned through several channels – commissions, account maintenance charges, interests on loans and overdrafts.

Charge cards with electronic data sensing enable the transfer of information from the card into the retailer's computer within a few seconds after the purchase. If the retailer is digitally linked with a permanent, i.e. online link, payment can be effected immediately. Apart from the card user, the benefits of this payment instrument are also enjoyed by the acceptors. For the acceptor, the use of the card implies an increase in turnover, reduction of business risk and security of collection.

The evidence of transaction is a corresponding printed receipt, signed by the authorised user. According to place and purpose of use, the evidence of transaction may be:

- Electronic PoS terminal record as an indication that payment was effected at the point of sale. The card holder has to sign the receipt, by using a signature identical to the specimen at the reverse of the card, or enter the PIN code.
- Electronic record from the ATM is the evidence of cash withdrawal. At ATMs, entering the PIN is regarded as the holder's signature. In some Western countries, the basic concept of ATM was extended by adding new functions to the ATMs, resulting in the creation of multi-functional systems. Modern ATMs are multimedia devices, enabling the provision of a whole range information to their users, by means of visual and audio systems.

The rules listed above do not fully apply in cases of online purchases, i.e. electronic trade, or in cases of purchases via catalogue or telephone sale. Increase in the number of charge card frauds have lead to introduction of the commonly used online authorisation, even for transferring minor amounts

of money. Electronic payment with charge cards uses both techniques, i.e. both digital signature and online authorisations.

The producers of internet browsers and credit cards have been jointly promoting another standard – Secure Electronic Transactions (SET), coding the credit card numbers on the vendor's server, so that only banks and card issuers can read them.

Unfortunately, no electronic transaction can guarantee 100% credit card data security, but it is a fact that opportunities for fraud are much smaller in the online world than in brick-and-mortar retail outlets. To provide confidentiality of information on the users' credit card numbers, protection systems have been introduced: data confidentiality, arbitrary data alteration, and sender identity authentication. The best known protection systems are encryption and decryption systems. Two systems are in use:

- secret-code encryption
- public-code encryption

Depending on the medium used for carrying information, charge cards may be

- magnetic stripe cards, where information is 'stored' on magnetic tracks at the reverse of the card, and the required data is sensed from the magnetic stripes. Magnetic records comprise three layers of magnetic tracks. Usually, the first and second track is used for reading the card.
- integrated circuit cards use information and communication technologies for carrying information, as they also contain a microchip. Integrated circuit cards are also referred to as smart or intelligent cards, due to their huge information capacity. Chip cards contain data on the magnetic tracks, as well as the PIN, cryptography keys, and other data that the card-issuing bank opts for. Smart cards provide holders with a higher level of protection, as the chip on the card is practically or virtually impossible to forge, as they are micro-computers the size of standard bank cards, containing:
 1. one or several integrated circuits, including a microprocessor
 2. EPROM or EEPROM memory for storing programs and data
 3. user interface.

The physical structure of smart cards is specified by the International Organisation for Standardisation

By the payment systems, charge cards can be classified as follows:

- Credit cards are the cards where the client's account is debited subsequently, i.e. the client does not have to have funds available on the account. The cardholder spends money up to the amount of approved credit limit, previously defined by the issuer. Bills are paid on maturity date in compliance with card issuer's policy, based on the received sum of all individual transactions.
- Debit cards are the cards where the client's account is debited immediately. The user spends money up to the amount available on the account, whether in foreign or domestic currency.
- Credit-debit cards.

By the territory of use, charge cards can be classified as:

- International charge cards issued on the territory of Serbia:
 - a. Master Card (Maestro)
 - b. Visa
 - c. Diners Club
 - d. American Express (Amex).
- Local or domiciled charge cards, which can only be used on the territory of the republic of Serbia:
 - a. Yuba Card
 - b. Dina Card.

Transactions must be carried out securely. For cash payment, it is only a matter of physical security, while in the credit card payment system, the operation is much more complex. The card holder wants the information on his/her card to remain secret, i.e. to prevent their theft. On the other hand, the card acceptor wants the payment to be effected without obstacles. Protection against these risks is provided in the form of cryptographic techniques. In an ideal world, all customers and vendors should be fully confidential, and in that case the transactions carried out would be perfectly safe. In the real world, each transaction entails a certain degree of risk, and the payment system tries to minimise this risk, in a manner appropriate to the significance and value paid, and the degree of exposure in which it is carried out.

3. Current problems and prospects

In view of the above presented concept of the general nature and aetiology of financial crime, especially white-collar i.e. high-tech, contemporary social and economic philosophy and reality will inevitably influence the innovation in the legal regula-

tion of economic relationships. It is therefore necessary to seek a new, more modern approach to conflict resolution in economic and financial relations.

Classifying and grouping risks is by no means a simple issue, in view of the practically unlimited number of risk sources, especially those from high-crime zones. Any uncertainty in banking comprises a risk. In view of the specific entrepreneurial character of banks and the fact that they deal with a specific asset – money – determining risk in these institutions must be more narrowly specified. The extent of banks' exposure to risks from the sphere of monetary destruction depends on the degree of regulation of the financial market, structure of the financial market, type and character of the bank, its size, organisation and information equipment, etc.

Risk identification is a set of analytic techniques for establishing elements of uncertainty. The global risk management policy implies systematic monitoring of external and internal risk factors, and the appropriate strategy for their realisation.

The risks to which banking operations and money transfers are consciously exposed due to the logic of profit have required not only the introduction of specific security and protection measures, but also changes in legislation on electronic trade, charge card payment, electronic mobile banking and creation of human resources and technical conditions for the implementation of these laws.

Reasons for such actions lie in the fact that economic damage resulting from high-tech white-collar crime is measured in billions of US dollars annually. The amount of damage from this form of crime would undoubtedly be much higher without the application of a whole range of safety procedures and protective measures aimed at deterring and preventing criminal abuse of contemporary cashless payment instruments, where charge cards take up a prominent place.

Risk analysis in cashless payment by charge cards should be viewed as a manner of providing objectively based approach to risk assessment and management. As a risk assessment and decision-making tool, risk analysis enables not only the identification of potential losses unacceptable for the given system, but can also be used for choosing efficient and effective protective measures, which can be used for reducing or neutralising the identified risk.

In view of the large number of available risk analysis methods, one of the key steps is the choice of appropriate techniques and level of analytic refinement, which can be regarded as acceptable for

a particular situation. Most risk analysis methods initially require identification, assessment of the object of protection and potential losses. In the final third of the 1990s, losses of companies such as VISA and Master Card did not exceed 20 cents to every 100 dollars paid by charge cards. Today, this loss amounts to 5 cents.

In June 2005, the renowned US company Cardsystems shocked the public by admitting that 40 million of credit card holders had become possible crime victims, as all the data about the users were stolen. When the damage was subsequently recovered, it was found that at least 200,000 people, mostly American and Japanese citizens, had lost money. This is the most audacious attack on financial institutions by hackers in the world.

To reduce the risk of card abuse, it is necessary to define a set of measures on the preventive and repressive plan, so as to combat this criminal phenomenon. Switching to cards is simply a risk we must accept, as the use of cash in the future will be discontinued or minimised.

In practical application, it is necessary to adopt one of the following strategies:

- **Risk avoidance:** limited elimination of individual functions of the system that are most threatened, and for which there is no efficient cost-effective protection;
- **Risk acceptance:** not taking any protective measures in relation to identified threats, as damage incurred by these threats would be smaller than the costs of taking appropriate measures.
- **Risk transfer:** transferring the consequences of detrimental events to other subjects, such as insurance, contracts to third parties etc.;
- **Risk control:** taking appropriate protection measures in relation to detected threats, aimed at reducing them to the acceptable level of probability of their occurrence.

Charge card industry increasingly insists on their security. Charge cards, therefore, must meet certain technological and technical requirements. They are made from plastic: polyvinyl chloride, or polyvinyl chloride acetate. The characteristic of these plastic materials and the cards themselves are defined by certain standards. Standards for charge cards in the Republic of Serbia are defined by the JUS standard – ISO/IEC 7810. Cards can be produced exclusively by authorised manufacturers. The production and distribution of each card is registered.

The first charge card abuses began immediately with the advent of this cashless payment instru-

ment. The first charge cards had an inadequate level of protection, and were very easy to forge and abuse, even more easily than forging money or cheques. Means and equipment for the fabrication of false charge cards were more available and cheaper, which is, to a high extent, the case in the modern setting as well. At the beginning of the 21st century, this equipment is ordered and purchased online. The price of ten pieces of blank white plastic is 13 USD on the online market, while magnetic stripes can be purchased directly from manufacturers, without any required identification.

From the aspect of financial stability, a significant level of attention could be devoted to reducing risks caused by criminogenous factors in the payment and accounting system, by the use of new information technologies, especially in the charge card segment. In addition to profitability, financial institutions must also take into account the solvency and security of business. This means that business policies must also appreciate the risks arising as the consequence of the above mentioned principles of banking operation. The conflict of the bank's goals arises in all cases when a bank departs from one of the basic principles of business. Thus, for instance, focus on profitability jeopardises solvency, which is manifested through risk escalation.

4. Charge card market in the Republic of Serbia

Financial services sector, both in Western and in Eastern Europe, is undergoing significant changes, not only due to the consolidation of banks and globalisation, but also to technologies, and partly also due to pressure from legislative bodies. Global spending in 2007 rose to 77.3 trillion dollars, which is an increase of 12.2 percent over 2006, when it amounted to 68.9 trillion dollars. A similar trend was recorded in 2008 as well. This assessment is based on the value of the Commercial Consumption Expenditure (CCE) Index, published by Visa International.

Table 1 Volume of commercial spending in 2007 by regions

Geographic region	Spending in 2006 in trillion USD	Spending in 2007 in trillion USD	Share in global spending in %	Growth in %
Europe	23.4	26.8	34.6	14.3
USA	18.7	19.7	25.5	5.5
Asia-Pacific	16.8	18.9	24.5	13.0
Central/ Eastern Europe, Middle East and Africa	4.3	5.1	6.7	20.5
Latin America and the Caribbean	3.7	4.5	5.8	19.8
Canada	2.1	2.3	3.0	11.9
Total global value of the CCE Index	68.9	77.3	100.0	12.2

The data also shows that a rise in spending was recorded in all geographic regions, with Europe having the highest share in the total commercial spending. The CCE index was developed to measure the penetration of commercial payment products and to help financial institutions develop solutions tailored to meet the evolving payments needs of economy and government.

Although they have lost the status of novelty on our market long ago, charge cards were placed in the focus of interest of the domestic public due to the measures by the National Bank of Serbia, which decided to discontinue the credit function of cheques. The fact that cheques and cash are still in wider use than charge cards in the world is not surprising, but only confirms the growth potential of this method of payment. On the world's largest charge card market, the USA, charge cards payments are on a par with cheques in consumer spending, while cash payment is still less present.

As one of the first in our country, the National Post Office Savings Bank started the implementation of a home banking system, by introducing the Telebank system for telephone banking services with interactive voice and telefax response. This system served about 36,000 users daily. As the first Yugoslav Internet Payment Provider (IPP) and a service provider at the same time, it enabled the electronic online authorisation of charge cards, and was operative for payments of:

- Beogradska Banka's VISA Electron card and
- Karić Banka's BKB Card

The first bank to join the E-bank authorisation and online transaction system was Karić Banka. From early September 1999, all BKB card users were able to purchase goods and pay for services

online by using electronic PIN received from the bank. From early November 1999, this facility was also available to the users of Beogradska Banka's VISA Electron card. Visa International licensed Beogradska Banka and the first 1800 cards were sold by the end of the year.

Komercijalna Banka became a member of the Europay International system, obtaining the right to be the first national issuer for the then Yugoslavia of Eurocard, MasterCard, Maestro Card, and Eurocheque Pictogram. Membership in this system also meant that Komercijalna Banka was going to develop the acceptor network on the territory of the then Yugoslavia, which would accept all cards bearing these brands from domestic and foreign users.

Komercijalna Banka was the first bank to renew the contract with the renowned international company American Express, for the distribution of international charge cards, so that the cardholders on the territory of the then FR Yugoslavia could once again use the benefits of payment by this worldwide appreciated and widely accepted card.

In May 2001, Astra Banka (the former Karić Banka) got a licence from Europay, the payment system world leader, for MasterCard cards. All users of Astra Banka's charge cards could pay for products and services worldwide, in a highly sophisticated online network of over 5,000,000 points of sale equipped with PoS terminals, over 600,000 ATMs and over 400,000 bank branches. In addition to its Astra Card debit card, the bank also issued MasterCard credit card based on Principal's licence.

In the early 1990s, card market of the Republic of Serbia suffered a great attrition of charge card operations and acceptor network due to well-known reasons such as the break-up of former Yugoslavia, discontinued foreign transfers, hyperinflation, imposition of economic sanctions etc. Relaunch of cards operation in Serbia was marked by an extremely rapid growth in the number of charge cards. According to the data of the National Charge Card Centre of the National Bank of Serbia, in early 2003 Serbia had fewer than 400,000 issued charge cards, whereas, according to the official data of the Ministry of Finance of the Republic of Serbia, the figure today is 5,728,789.

After an intensive development in 2005 and 2006, credit card operations in Serbia in 2008 and 2009 were characterised by a somewhat more moderate, but also more stable growth.

The total number of issued charge cards in Serbia at the end of 2008 was 5.73 million, which is at

the similar level as the end of 2007. However, despite the expansion of charge cards in Serbia, the number of active charge cards is about 48% of issue, which is, nominally, 2.7 million charge cards.

Table 2 Number of issued charge cards in the Republic of Serbia (Sikimić, 2009)

Year	Number of issued charge cards
2002	400,000
2003	500,000
2004	2,100,000
2005	3,800,000
2006	5,240,000
2007	5,720,000
2008	5,728,789

The structure of issued charge cards comprises 79.4% debit, 18.9% credit, and 1.7% business charge cards. Likewise, 2008 saw a decrease in the share of credit card payments in the total sum of charge card transactions, amounting to 13.9%. It had been 16.8% in 2006, 21% in 2005, 14.4% in 2005, and 4.6% in 2004. It can be noted that the share of credit card transaction in the total amount of charge card transactions in 2008 was at the share level of 2005, when the credit function of the cheque was discontinued.

The top of the list is taken up Visa cards, numbering about 2.8 million, and the national DinaCard, with about 2.7 million holders. DinaCard is issued by 26 of 32 banks operating on our market, while DinaCard system comprises 30 banks and 10 processing companies. In addition to Visa card, internationally accepted cards issued by banks and non-banking organisation are MasterCard, Diners Club and American Express.

At the end of 2008, the number of issued credit cards amounted to 1,082,771, which is 43,729, i.e. 4.2% more than at the end of the previous year.

Statistically, the volume and forms of charge card abuse are too complex in relation to the time when the application of payment money began in this region. As early as 2004, the total material damage incurred in Serbia through charge card abuse amounted to 198.659 US dollars, 84% of which went to charge card abuse at points of sale, while other types accounted for 16%. A special characteristic of Serbia is that in 34% cases charge cards were abused in retail outlets selling food. Today, these factors are negligible.

Table 3 Number of ATMs and PoS terminals on the territory of the Republic of Serbia (Sikimić, 2009)

Year	Number of ATMs	Volume of transactions in billion RSD	Number of PoS terminals	Volume of transactions in billion RSD
2004	450		16,266	
2005	837		31,816	
2006	1348	109.0	48,194	65.0
2007	2074	165.5	55,340	91.3
2008	2494	224.5	57,919	117

In a brief period of time, Serbia developed an acceptor network which is, by distribution, close to European standards, in view of the fact that there are 57,919 points of sale equipped with PoS terminals, where cards be used for payment, while at the end of 2003 there were only 5,000 such places.

There is also a possibility for paying smaller amounts without entering the PIN and swiping the card through terminals. Innovation is called Pay-Pass card, and is entering out market. This type of cards is used for paying smaller bills, up to 25 euros per transaction. It contains a mini chip, and it is enough to tap it against the terminal. Due to new technical possibilities, it does not have to be made from plastic or rectangular, but can be incorporated into key fobs, mobile telephones, wrist watches and other things that most people carry. In the domestic financial practice, they will first be issued by Banca Intesa, and at the moment of their launch, users will be able to use them in Delta City retail outlets. The minimum amount to pay into the account will be 2,000 dinars.

5. National strategy for preventing charge card abuse

The primary goal of introducing cashless payment systems and plastic money was to solve the problem of paper-based payment systems, by using the potential advantages of information technology. These changes influenced the significant novelties in the area of financial transfer, provision of financial services and change in the structure of payment instruments, featuring a decreasing share of cash.

The disadvantages of the use of charge cards in domestic financial practice are, at the very beginning, most obvious in the form of lack of security of financial transactions, absence or inadequacy of legislation, resistance to innovation, and threats of criminal abuse of information systems. An increasing volume of trade and banking is done through

the use of computer and telecommunication networks, and high-tech based devices. These changes have led to the emergence of new forms of criminal. There has also been a rise in the incidence and volume of crimes involving the abuse of high technology for personal gain.

In any discussion on combating charge card abuse and financial crime, it has become redundant to say that this form of crime has become international, and its perpetrators are closely linked across different regions of the world, with a single clear and recognisable goal - to make illegal profit. Regardless of this fact, and the internationalisation of the world finance, the specific features of combating monetary destruction are bound to remain within individual jurisdictions, especially legislation which qualifies particular actions as felonious. These specific features are conditioned by numerous factors which are difficult not only to analyse but also observe in their entirety.

National and international financial institutions, judicial systems, law-enforcement agencies - practically, all those who are in direct contact with, or targeted by this form of white-collar crime, which is also supported by powerful information technologies and expansion of telecommunication, are the most concerned about computer-based crime, fraud and charge card abuse, with organised crime in the background in most cases.

Table 4 Share of economic crime in the structure of the total number of criminal offences on the territory of the Republic of Serbia (Ministarstvo unutrašnjih poslova Republike Srbije, 2009)

Year	Total number of criminal offences	Total number of criminal offences classified as economic crime	%
1998	122,086	16,717	13.69%
1999	92,141	12,806	13.89%
2000	106,021	12,964	12.22%
2001	121,310	12,916	10.64%
2002	95,017	13,839	14.56%
2003	90,041	12,114	13.45%
2004	98,947	12,069	12.19%
2005	101,752	13,143	12.91%
2006	99,060	10,470	10.56%
2007	104,118	10,587	10.16%
2008	106,015	10,477	9.85%

Migration of crimes committed by charge card abuse and forgery to the countries of South-eastern Europe was expected in 2009. This crime migration is bound not to spare the Republic of Serbia and its financial institutions. The reason for relocating such criminal activities to the countries of South-eastern Europe is the implementation of chips in charge cards, which is, according to standards, compulsory for charge card users on the territory of the European Union. The reason for switching to the use of chip technology on charge cards is increasing the level of protection in the use of charge cards.

Table 5 Structure of white-collar crime (Ministarstvo unutrašnjih poslova Republike Srbije, 2009)

Year	Total	Structure									
		Total number of crimes against computer data security	Computer sabotage, Article 299	Computing fraud, Article 300 unauthorised access to	Computer network and electronic data processing, Article 302	Total number of crimes against intellectual property	Unauthorised use of authored work Article 199	Showing pornographic content and use of children for pornography, Article 185 para.3	Unauthorised use of others' trademark, Article 233	Charge card abuse and forgery, Article 225	Obtaining means for forgery, Article 227 para.2
2006	966	5	2	2	1	705	700	3	73	180	
2997	1077	5	2	1	2	435	435	1	116	520	
2008	1313	17		12	4	330	330	4	37	920	4
I-IV 2009	260	1			1	81	81		17	161	

- In compliance with international standards and guidelines, appreciating international experience and national specificities, it is necessary for the legislators of the Republic of Serbia to revise and innovate the criminal legislation with norms adapted to the new forms of socially detrimental behaviour arising from the use of information technology, in the domain of fraud by means of digital money. Efficient combating and prevention of this type of crime requires a contemporary legislative framework, good organisation, training and equipment, of law enforcement agencies, as well as good knowledge of these issues on the part of judicial bodies. The new Criminal Law of the Republic of Serbia is not harmonised with the provisions of the European Convention on Cybercrime and its Supplementary Protocol.
- The Criminal Law of the Republic of Serbia which entered into force on January 1, 2006 prescribes sanctions for two offences in the domain of charge card use:

Article 225: Charge card abuse and forgery

Para.1

Any person who produces a false charge card or makes changes to real charge card with the intention of using it as a real one, or uses such a false card as a real one shall be imprisoned for 3 months to 3 years.

Para.2

If the perpetrator of the crime referred to in Paragraph 1 this article has acquired illegal material gain, he/she shall be imprisoned for 6 months to 5 years.

Para.3

If the perpetrator of the crime referred to in Paragraph 1 this article has acquired illegal financial gain exceeding 1,500,000 dinars, he/she shall be imprisoned for 2 to 5 years.

Paragraph 1 prescribes sanctions for both producing and changing any data on the original charge card, as well as the use of such cards. It is not conditioned by illegal gains, but these are added as aggravating circumstances. What is significant that Paragraph 5 prohibits the possession of a fake charge card, whether it was used or not, as well as all forms of obtaining data based on which charge cards can be forged.

Article 227: Obtaining means for forgery

Para.2

Any person who produces, obtains, sells or provides means for the fabrication of false charge cards, or false value designators shall be fined or imprisoned for up to 2 years.

On the national level, the need has arisen for the formation of appropriate agencies or bodies which would monitor the state of affairs in this area, analyse occurrences, investigate the causes, perpetrators or methods, and propose appropriate measures and actions for preventing, detecting and providing evidence for this type of crime. Such bodies would also conduct cooperation with their international counterparts – bodies, organisations and institutions in the area of information protection, in the domain of preventing charge card abuse and fraud. In accordance with these needs, May 2004 saw the establishment of the Forum for the Prevention of Charge Card Abuse within the Banking and Insurance Board of the Chamber of Commerce of Serbia, as a permanent body of the Charge Card development, with the aim of minimising the negative impact of charge card fraud.

The members of the Forum are charge card issuers – 31 banks operating on the territory of the Republic of Serbia, representatives of four processing companies, representatives of the National Bank of Serbia, the Ministry of Internal Affairs, and judicial bodies. The specific feature of this Forum is that it comprises issuers of all types of charge cards – Visa, Master, Maestro, Amex, Diners, Dina and other brands, because criminals are indiscriminate in this area.

The Forum's most significant project is the database for the prevention of charge card abuse, functioning since October 2005. The database comprises software installed as a web application on the server of the Chamber of Commerce of Serbia, which:

- contains data and information on charge card frauds and attempted frauds;
- enables online communication between Forum members, aimed at preventing large-scale charge card abuse on our market;
- enables real-time information exchange, as it proceeds, i.e. while fraud attempts are in progress, which enables timely response by the police in discovering perpetrators.

The specific feature of this database is that all Forum members upload information into the base, thereby making it available to other members. The database is accessible to all Forum members, charge card issuers and processing companies, while the Serbian Ministry of Internal affairs has limited access.

6. Conclusion

Direct and indirect inference in the field of information technology criminalisation, i.e. charge card abuse, is important for further research to be conducted. This stems from a firm belief that the need for such research is gaining significance on a daily basis. Knowledge of a phenomenon entails a possibility of adequate suppression measures aimed at its eradication, so that it is essential to persist in researching into new forms of threats to the financial sphere. One of the hypotheses of the research is to propose a broad-scale research project involving all economic subsystems, which would be the object of analysis by experts of numerous profiles in the field of financial and legal science.

For these reasons, it is necessary to develop a modern concept, with the condition of attaching the attribute 'modern' to an efficient, democratic society and economy, suitable for responding to the contemporary needs. This concept cannot be

established without the insight into the core of this phenomenon and its subtle but firm links with other phenomena and processes, but also without adopting up-to-date crimino-political procedures and principles. It is also necessary to reinterpret current results, and adopt a critical attitude to several basic challenges whose resolution results in principal postulations for creating a rational perspective on the financial and monetary crime.

The elementary conditions in the theory and practice of any form of combating information system abuse and monetary destructions include: material framework, expert human resources and technology. These elements, combined into a well-conceived strategy, appropriate business projection, organisation and self control, make any creative work successful.

Based on the insight into the state of affairs in various areas of the abuse of money and money flows gained through conducted research, and consideration of experiences from foreign countries, which have encompassed far more complex and organised forms, it is possible to forecast to an extent and give a prospection of further development of illegal developments in the area of finance. This refers not only to existing forms, but also the emergence of new forms of threats.

A special challenge in the research is the fact that high-tech financial crime is a sensitive area, and combating and prevention thereof is partly veiled in national and banking confidentiality. Literature for the analysis of the issue of threats to the financial sphere is not extensive, or available to the wider circle of public, which is quite justifiable, in view of the high level of social threat posed by this phenomenon. Conceiving and compiling such a body of work would not be possible without the assistance of experts familiar with this issue.

Promoting measures that would provide elementary fair practices in financial transactions of any type and better knowledge of the issue would provide a beneficial, reassuring effect. What remains is hope and wish that the time to come will fully confirm such expectations.

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