

# E-COMMERCE IN DINACARD SYSTEM

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Case study

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**Abstract:** *This paper presents the status of e-commerce in Serbia with the focus on the domestic DinaCard system, its architecture and participants in the system. We reported results on Internet transaction in DinaCard system in 2009, 2010 and 2011. We found that the number of all participants, including banks with the license for acquiring, banks with the license for issuing and Internet merchants was extremely low (up to 5) and showed no significant positive trend. As a consequence, the number of transactions with the DinaCard cards was also unacceptably low. Based on these results, we concluded that the DinaCard system for Internet transactions have a great potential, but all the participants have to make an effort to significantly increase the use of the domestic card in e-commerce.*

**Key words:** *e-commerce, DinaCard, Internet payments, e-business*

## INTRODUCTION

In recent years of constant and rapid changes, especially in the field of Internet technology, companies need to incorporate e-business in their business, to keep or even improve their position on the market. In order to achieve this aim, companies should quickly adapt to a changing environment [6].

Although e-business has markedly been involved in many parts of business in developed countries, situation in Serbia is different. Electronic business has recently started to develop in our country and no literature data on the status of e-commerce on Serbian market has been published so far. In order to promote and support the use of e-business, the National Bank of Serbia made a great effort to introduce Internet transaction through the domestic DinaCard payment system in our country. Thus the aim of this paper was to systematize information from relevant literature on the e-business and payment models in electronic commerce, and to present the situation in Serbia related to e-commerce using the DinaCard payment system.

## LITERATURE REVIEW

The literature which describes and defines the concepts of electronic business and electronic commerce, their similarities and differences is extensive, but on the other hand, the data related to this issue in Serbia are very sparse.

The meaning and limitations of both e-commerce and e-business are still a matter of the debate among consultants and academics worldwide. Laudon and Traver [8] defined e-commerce as the use of the Internet and Web for business (business transactions), or digitally enabled commercial transactions among organizations and/or individuals. The most frequent forms of e-commerce are: 1. transactional forms, which provide online sales, 2. service-oriented forms which encourage shopping and make closer relations between buyers and sellers, 3. brand building which promote and develop brands and 4. portals which provide various types of information [3].

Electronic business is a transformation of a business based on a connection of the company, customers and partners in the form of association process

(integration), process of cooperation (collaboration), and a global network connection (aggregation) using the Internet as a medium [16]. There have been many polemics in the literature on the difference between e-commerce and e-business, but the following three states are mostly cited: Electronic commerce overlaps with the electronic business in some levels [1], electronic commerce is equivalent with electronic business in scope [15] and electronic commerce is a subset of electronic business [4].

E-business and e-commerce are completely dependent on technology, from the hardware to the application layer. There are 4 layers in the infrastructure needed for e-business and e-commerce: network technology substrate (telecommunication networks and protocols), transmission (transportation services and representation standards), middleware (the connection between the transmission and application layer, including services related to security and authentication) and application (client application) [8].

The appearance of electronic commerce has also brought new financial needs, which often could not be met by the traditional payment system. For example, in electronic commerce it was necessary to find a solution for payment peer-to-peer, and for so-called micro-payments, which could not have been paid by existing credit card and classical payment systems. Based on these needs, the following payment systems in e-commerce have been extracted: Internet transactions with credit card, digital wallet, online stored value, digital accumulating balance, digital checks and contactless payment systems [5].

System of Internet transactions with credit cards is one of the dominant forms of Internet payments. The process of Internet transaction with credit card is almost identical to process of classic transactions with credit card directly used at merchant's place. The main differences between Internet transactions and standard transactions with credit card are physical absence of the both cardholder and the card (CNP - cardholder not present), as well as the absence of a signature, i.e. physical authentication of the client.

Privacy and security are very important parts for the clients, and it has been proven empirically that

privacy (protection of personal data) and security (protection of users from fraud and financial loss) have strong impact on trust of the online financial services [9].

## DINACARD SYSTEM

To support the development of card business in Serbia, the National Bank of Serbia implemented a national payment card project in 2003. The new domestic card has been called DinaCard. The National Bank of Serbia provided the conditions for full implementation (technical, regulatory, organizational) of the national system for payment cards, through the newly established organizational unit (National Center for Payment Card, NCPC). All the terms and conditions for involving banks and other participants in DinaCard system have been precisely defined by the release of the DinaCard Operating rules document and DinaCard Technical documentation. In this way, banks in Serbia were able to introduce payment card business significantly faster, simpler and cheaper, and the other participants could have been involved in this system easily. Thereby card business in Serbia made a great progress and end users got used to payment cards and their use through a network of ATM and POS terminals. NCPC has constantly been working to introduce new services in DinaCard system, according to the trends of international card systems, and users' needs. Basic Card Services as payments and cash withdrawals were extended with additional services, including m-commerce and e-commerce services by introducing the Internet payments in DinaCard system.

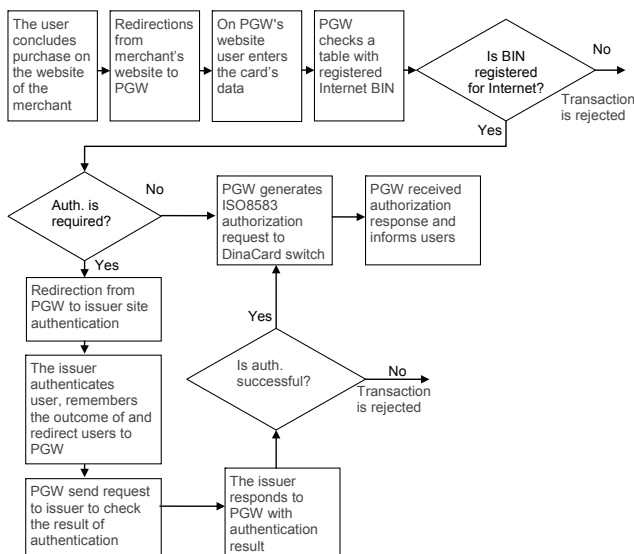
The DinaCard system for Internet payments was developed based on existing solutions in other international card systems, but taking into account specific needs and requirements of the local market. One of the specificity of the implemented system was a bigger involvement of the Payment gateway provider (PGW) in the process of internet transactions, unlike the other card systems, in which the biggest role had merchants and card issuers [7].

Participants in DinaCard Internet payment system, in addition to bank card issuers which should

enable payment via the Internet with their cards, are the bank acquirers for Internet transactions, Internet merchants, the bank issuer's processors, the bank acquirer's processors, PGW, the NCPC's central switch and customers or users of the services [10].

The payment flow on the Internet in DinaCard system is shown in Figure 1. As it can be seen on Figure 1, PGW actively participates in conversion of started transaction, but also in user authentication, which is usually done by the Internet merchants. The aim of this bigger involvement of PGW is to minimize the participation of Internet merchants in the technical part and to facilitate their inclusion in the Internet payment system.

FIGURE 1 PAYMENT FLOW FOR DINA CARD INTERNET TRANSACTIONS



**METHODOLOGY**

This study was designed as an interpretive case study. The main reason for this design was the lack of the relevant literature for Serbia. Our guide for investigation was specific research questions during the interviewing of the participants in the DinaCard

Internet payment system, document analysis, and web site analysis for collecting data. We collected the data on the status of Internet payments in DinaCard system for 2009-2011, and compared the data during this period.

**RESULTS**

The number of banks which have been licensed for Internet issuing and Internet acquiring, the number of the Internet merchants and the number of PGW and processors in the DinaCard Internet payment system are presented in Table 1. As it can be seen from Table 1, the number of all these participants in the system is very small and doesn't show any significant positive trend.

Table 2 presents the data on the number of successful and rejected Internet transactions in DinaCard system during the period from 2009 to the end of 2011. The number of both successful and rejected transactions was very low and in case of successful transactions even decreasing during this period.

TABLE 2 NUMBER OF INTERNET TRANSACTION IN DINA CARD SYSTEM

Year	No. of successful Internet transactions	No. of rejected Internet transactions
2009.	79	59
2010.	50	109
2011.	12	110

In order to compare these results with the Internet transactions in Serbia made with other card's brands and with the total number of the DinaCard transactions in the same period, the data related to these types of transactions are shown in Table 3.

TABLE 1 THE NUMBER OF PARTICIPANTS INVOLVED IN THE DINA CARD INTERNET PAYMENT SYSTEM

Year	No. of the Banks with licence for Internet acquiring	No. of the Banks with licence for Internet issuing	No. of Internet merchants	No. of licensed PGW	No. of processors
2009	1	3	3	1	1
2010	2	3	5	1	1
2011	2	4	5	1	1

**TABLE 3** NUMBER OF INTERNET TRANSACTIONS WITH INTERNATIONAL BRAND CARDS AND TOTAL NUMBER OF DINA CARD TRANSACTIONS

Year	No. of successful VISA and MasterCard Internet transactions	Total No. transactions which are made with DinaCard cards
2009.	72,467	28.7 millions
2010.	71,184	29.1 millions
2011.	104,183	31.8 millions

## DISCUSSION

This study is the first study on the e-commerce in Serbia and region. Although we showed the data on Internet transactions using Visa and Master cards in our country, we were mostly focused on our domestic DinaCard Internet payment system in the period from 2009 to 2011.

Based on the data of the Statistical Office of the Republic of Serbia on the use of Information and communication technologies (ICT) in the Republic of Serbia, the number of households who had Internet access increased from 36.7% in 2009 [12], and 39.0% in 2010 [13] to 41.2% in 2011 [14]. The same source reported Frequency of use e-commerce services by individuals and showed that the number of people who used e-commerce increased from 13% in 2009, to 18% in 2011 [12-14]. However, more than 80% of people have never used services for e-commerce.

The results of our study showed that the number of all participants in Internet payment system of DinaCard is extremely low. Moreover, these numbers showed no significant positive trend. As a consequence, number of Internet transaction in the DinaCard system was also unacceptably low. At the same time, total number of transactions in the DinaCard system, as well as the number of Internet transactions using other card brands, was far much higher. These results indicate that cardholders were familiar with the use of cards in traditional way, but also for Internet transactions, although they use DinaCard cards for Internet payments very rarely.

One of the possible reasons for this situation in Serbia is an insufficient number of the banks issuers which need to allow their DinaCard cards to be used for Internet transactions in DinaCard system. At the end of 2009, 26 out of 34 banks have been

licensed for issuing any type of DinaCard cards, and at the end of 2011 there were 27 of the 33 banks in Serbia with this license [11]. However, only 1-2 banks had the license for Internet acquiring and 3-4 had the license for Internet issuing in this period. Additionally, the number of Internet merchant activated in the system was similar, up to 5. All these participants are important for the process of Internet transactions. The banks with acquiring license for Internet transactions are necessary because Internet merchants must be legally connected to the system through the banks with that type of license. Considering that only 1 or 2 banks could have provided the DinaCards for Internet payments, it is clear why the number of cards, transactions and Internet merchant is so small.

Taking into account that our region passed transition in the last two decades, it would be interesting to compare these results with the neighbouring countries. However, according to our knowledge, no studies related to e-commerce have been conducted so far in the region.

The importance of this research is in closer understanding of the need to transform business processes in line with new market requests and economic circumstances, including electronic business, electronic commerce and Internet payment systems. Since customers are the core of bank's existence [2], banks have to respond to their needs.

## CONCLUSIONS

We concluded that the potential of the DinaCard system for Internet transactions is huge but untapped. The market is still developing, and the use for the DinaCards in e-commerce is negligible when compared with classical transactions with the same

card, as well as with the use of other brands cards (Visa, MasterCard) for Internet payments. In order to significantly increase the use of DinaCards for this purpose, all participants involved in this process must actively contribute by promoting the system.

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