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DOCTORAL DISSERTATION

AUTO- SUMMARY

ON TITLE

**"THE IMPACT OF ELECTRONIC BANKING ON CUSTOMER SERVICES AND
BANKING OPERATIONS IN BANKS OF THE REPUBLIC OF NORTH MACEDONIA
AND THE REPUBLIC OF BULGARIA"**

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I GENERAL CHARACTERISTICS OF THE DOCTORAL DISSERTATION

Introduction

In recent years, the banking sector worldwide has experienced a profound transformation, driven by the rapid advancement of technology and the increasing demand for more efficient, accessible, and customer-friendly services. One of the most significant developments in this transformation is the widespread adoption of electronic banking (e-banking). E-banking encompasses a wide range of digital services and tools, including online banking, mobile banking, automated teller machines (ATMs), and other electronic channels, that allow customers to conduct financial transactions and manage their accounts without the need for physical interaction with a bank branch. This shift toward digital banking has not only redefined the way banks operate but also fundamentally altered the customer experience in the financial services sector.

In the context of the Republic of North Macedonia and the Republic of Bulgaria, both of which are transitioning economies in Southeast Europe, the adoption of e-banking technologies presents unique opportunities and challenges. As these countries continue to integrate into the European financial ecosystem, the role of e-banking becomes increasingly crucial in shaping the future of their banking industries. The impact of electronic banking on customer services and banking operations in these two countries is a subject of growing interest, as it touches on key issues such as efficiency, customer satisfaction, financial inclusion, and the competitive dynamics within the banking sector.

This doctoral dissertation aims to explore and analyze the impact of e-banking on both customer services and banking operations in the banks of North Macedonia and Bulgaria. Specifically, the research seeks to understand how the implementation of e-banking technologies has influenced the way banks serve their customers and the internal processes that drive banking operations. By focusing on these two countries, the study provides a comparative analysis of the adoption and usage of e-banking solutions in different banking environments, while taking into account the socio-economic, regulatory, and technological contexts that shape their development.

The importance of this study lies in its potential to offer valuable insights for policymakers, banking institutions, and regulators seeking to optimize the benefits of electronic banking in their respective countries. In addition, it contributes to the growing body of academic literature on digital banking transformation, providing a framework for understanding how e-banking can enhance operational efficiency, customer satisfaction, and financial services accessibility in transitioning economies.

1.1 Research objectives

The objectives of research in this paper are the benefits of electronic banking in the Republic of North Macedonia and the Republic of Bulgaria for the customers themselves. The introduction and approach of electronic banking to the customers themselves in our country is actually a long-term process that has been carried out for the last decade or more, and which has been successfully implemented and functions flawlessly with all the necessary security measures. Its application has reached an enviable level of representation in all its sectors, and in addition to customer satisfaction and their different structure, banks have successfully coped with the improvement of services.

In this paper, we will review them under the objectives, where the emphasis is placed on the management of electronic banking and its application in all financial sectors, its segmentation, its technologies as well as the problems faced by customers. We will put the main emphasis on the benefits of the customers and their reason for using electronic banking.

1.2. Hypothesis

Basic (general) hypothesis

1. How does the use of the new innovation E-banking affect consumers and banks in our country and the Republic of Bulgaria?

H1: The use of electronic banking has a positive effect.

H2: The use of electronic banking affects negatively.

1.3. Research methodology

The world we live in today is at the highest possible rate of market globalization. This globalization arises, thanks to the emergence of electronics, the Internet and the sector of information communication and telecommunication. Their interconnection created a successful new and modern economy, which is loosely called the electronic economy, where it contributed to the creation of the highest possible benefits in all industries in general. "Distance is no longer a limit" is the main motto in the new world of business, which also gets the new name "**Electronic Business**". With the new concepts of electronic economy, electronic business, electronic money was also created, where the need for its fast and safe transfer is inevitable, in which the only main players are the banks themselves and which only they can bear the burden and do it. With these new electronic concepts and phenomena, which are a product exclusively thanks to the intellect of the ICT sector, electronic banking was also created, where in the following years from its introduction until today, it achieves such a depth in the global world that, the door of the traditional bank slowly but surely closes and gradually disappears as a physical object. Thanks to the emergence of "**electronic banking**", a huge contribution and benefit is given to all customers in general with unprecedented positive proportions, and the use of their services becomes non-stop 24 hours a day. E-banking at this moment has been introduced by all the financial institutions that exist in the global framework, and all its connections represent a whole, which will remain noted and recorded as one of the most significant and brightest points in recent history made possible by the ICT sector. Today, e-banking has made the biggest change in services and prices, and with its introduction, a new competition has formed between all of them, which will be decisive for survival in the fight to retain customers and the fight to get new ones. Its introduction has created the opportunity for greater progress in all financial institutions, where they begin to resort to and introduce new and inexpensive services, to the creation of new application platforms in which the customers themselves already have them in their hands.

The main subject in this paper is the benefit of electronic banking for customers in the Republic of North Macedonia and the Republic of Bulgaria, their behavior, their use and their approval of electronic banking in this digital world.

1.4 Research methods

For the sake of successful processing and elaboration of the topic of the doctoral dissertation, which requires a multidimensional approach, a greater number of research methods are used, namely:

- **historical** - by applying this method, the emergence and development of electronic banking is determined historically
- **content analysis** - by applying this method, the results of the implementation of electronic banking in the Republic of North Macedonia and the Republic of Bulgaria are analyzed.
- **comparative method (comparative)** - with the application of this, is carried out a comparative assessment of the experiences in discovering the functioning of electronic banking in the Republic of North Macedonia and the Republic of Bulgaria.
- **statistical method** - by applying this method, the results of the implementation of electronic banking in the Republic of North Macedonia and the Republic of Bulgaria are processed.
- **synthesis** - with the help of this method, the data obtained with the help of the previous methods is combined.
- The preparation of the doctoral dissertation is based on data provided by international literature that allows to perceive the theoretical foundations for electronic banking.

In the reading section, data available via the Internet and research conducted by competent authorities as well as the author's own observations are used.

1.5 Scope and structure of the dissertation

The dissertation has been developed in the volume of 171 pages, and the content is structured according to the set goal of the research and specific tasks and is in accordance with the subject of the research.

Structurally, the work consists of an introduction, main text in five chapters; conclusion; used literature 71 sources in total.

THE IMPORTANCE OF E-BANKING

2.1 Definitions of the term e-banking

E-banking refers to electronic banking. Electronic Banking is also called "Virtual Banking" or "Online Banking". Electronic banking is the result of the growing expectations of bank customers. Electronic banking involves a bank based on information technology. Under this system, banking services are provided by a controlled computer system. This system includes a direct interface with customers. Customers should not visit the bank's premises. (Akrani, 2011)

Paying for goods and services in cash or without cash, as well as depositing money in financial institutions and managing these resources are a natural component of economic life. Banks serve as important intermediaries. In recent years, with the development of technologies and techniques, the possibilities for communication with banks have been expanding among customers. Customers use modern communication media for remote communication with the bank: modem, telephone, computer or payment card. A distinctive feature of these services is uninterrupted access to the client's account, which means independent of the bank's working hours and the ability to make local and international payments directly from the comfort of home or office. This reduces the cost of handling money and transport, reduces the risk of theft or acceptance of counterfeit banknotes, increases the speed and convenience of payments.

Electronic means of communication are more convenient, faster and often cheaper for customers. Banking experience shows that it is appropriate to use combinations of different communication tools, depending on individual segments, customers and types of operations, products and situations. (Chovanova, 2006)

E-banking is defined as the automatic delivery of new and traditional banking products and services directly to customers through electronic and interactive communication channels. E-banking includes systems that enable customers of financial institutions, individuals or businesses, to access accounts, conduct business or obtain information about financial products and services over a public or private network, including the Internet. (The Federal Financial Institutions Examination Council (FFIEC)).

Technology is evolving faster than ever and as banking and money management become increasingly electronic, it is important to understand the new possibilities not only for convenience, but also for security. Electronic banking, also known as electronic funds transfer (EFT), refers to the transfer of funds from one account to another through electronic methods. Understanding how

electronic banking can be used will benefit us and our finances. Using it to our advantage, it will not only improve the convenience, but it can also help in tracking our transfers and payments. (Practical Money Skills, 2015)

Science has made the world more dynamic and progressive. It brought changes in the economy, politics, culture, society and people themselves. In the financial and banking sector, this change is more noticeable because the use of computers in banks ensured accuracy and mathematical readiness. It has made banking transactions faster, easier and more convenient. Today, the customer does not need to carry checks or cash, it is enough just to carry a plastic card.

All banks are present on the Internet with their own website, which provides general information about the bank and the services it offers. However, e-banking goes a step further, as it allows customers to access their online accounts 24 hours a day, 7 days a week, directly from their homes or offices and perform the banking operations they want. In other words, we can define e-banking as one of the remote services, offered through electronic distribution and communication channels, of traditional and new banking products and services. However, it should be noted that e-banking, at least at the current stage, is not trying to replace traditional channels of distribution of banking products. It stands together with a set of channels, ranging from traditional (such as branches), to automatic (such as ATM, POS), within the framework of completing and strengthening the client-bank relationship, to realize the so-called multi-channel strategy.

Electronic banking can refer to several different things. In its simplest definition, it means any banking activity that can be done online. This may also apply to traditional banks. This is because even the most basic banks usually offer some e-banking features, such as viewing recent transactions or online transfers.

Every small transaction done with e-banking is done entirely online or over the phone. We will not see a real person, to exchange money with a merchant or wait in line at the bank for service. (VanSomeren, 2019)

Some people use the term e-banking as a substitute for internet banking. The term e-banking is broader in nature and is therefore commonly used without any further justification or description. Electronic banking is not equivalent to the term internet banking, although the latter is undoubtedly the most common type of it. Electronic banking includes multiple transaction services such as telephone banking, credit cards, debit cards, ATMs. The latest introductions are online banking, mobile banking and digital PC banking. Electronic banking is also known as

electronic funds transfer (EFT) and is basically simply using electronic means to transfer funds directly from one account to another.

The most widely accepted definition of electronic banking comes from the Basel Committee on Banking Supervision:

"Electronic banking includes the provision of banking products and services through electronic channels, including small transactions, but also large electronic payments and other banking services".

There are several terms in the literature and essentially they all refer to one or another form of e-banking: PC banking, internet banking, virtual banking, online banking, web banking, phone banking, mobile banking, etc., but all of them mostly are used alternately

However, despite this equating of terms, a certain difference should be made between the term electronic banking and the term internet banking. Namely, electronic banking means the execution of banking transactions through a direct connection between the bank and the client with the help of specialized software. That means, specialized software installed on the client's computer is needed, from which only transactions can be made and on which all the data about the changes made can be found. Internet banking, on the other hand, represents the execution of banking transactions through the Internet, during which no special specialized software is required and no data is stored on the hard disk of the client's computer. Access to the bank is possible at any time, in any place around the world, under one single condition - an established Internet connection.

The levels of electronic banking are different:

1. Basic e-banking information / websites that only inform customers and the general public about banking products and services;
2. Simple e-banking transactions that offer customers, for example, the ability to check their account balances, but not to make any transfers between accounts;
3. Advanced e-banking transactions that allow customers to make electronic fund transfers between accounts, pay bills and perform other online banking transactions.

Electronic banking mostly refers to the second and third level.¹

¹Yubin, M. (2003). E-Banking: Status, Trends, Challenges and Policy Issues. CRBC Seminar, The Development and Supervision of e-banking, Shanghai.

Many people see the development of electronic banking as a revolutionary development, but in essence it can only be seen as one step in the banking evolution. The fear that this channel will completely replace the existing banking channels of delivery of products and services may not be realistic and previous research has shown that the future of banking will be a mix between e-banking and traditional banking. However, the fact is indisputable that the successful implementation and acceptance of the electronic way of working will be of crucial importance for achieving a competitive advantage of banks.

2.2 Advantages and disadvantages of e-banking

Currently, the Internet is considered the "heart" of the multi-channel structure implemented by banks and is used to constantly increase the number of bank accounts of customers.

Some of the basic services offered by e-banking are:

- Information about the balance of the account;
- Information on the last executed transactions (overview of account movements);
- Execution of utility payments (telephone costs, electricity, water, insurance);
- Transfer of funds between personal accounts;
- National and international transfers of funds;
 - Repayment of the loan installment;
- Information about the working conditions of the bank;
- Changing the client's personal data. (Informatics)

While more advanced services (offered only by some banks) are:

- Opening an online deposit; And
- Loan application. (Informatics)

We will look at the importance of electronic banking for banks, customers and businesses especially banks

- Lower transaction costs - electronic transactions are cheaper;
- Reduced margin for human error - because information is transmitted electronically, there is no room for human error;
 - Smaller documents - digital data reduces documents and makes handling the process easier;

- More loyal customers - As e-banking services are convenient for consumers, banks experience more loyalty from their customers.

CLIENTS

- Convenience - customer can access their account and transact from anywhere 24x7x365;
- Lower costs per transaction - since the customer does not have to visit the branch for each transaction, he saves time and money;
- No geographical barriers - in traditional banking systems, geographical distance can hinder some banking transactions. However, with e-banking, geographical barriers are reduced.

BUSINESSES

- Account View - Business owners and designated staff members can quickly access accounts using an online banking interface. This allows them to review account activity and also ensure the smooth functioning of the account;
- Better productivity - Electronic banking improves productivity. This enables the automation of regular monthly payments and a host of other functions to increase business productivity;
- Lower costs - Typically, costs in banking relationships are based on the resources used. If a particular business needs more help with wire transfers, deposits and more, then the bank charges higher fees. With online banking, these costs are minimized;
- Small errors - Electronic banking helps to reduce errors in regular banking transactions. Bad writing, wrong information, can cause mistakes that can be costly. Also, easy viewing of account activity increases the accuracy of financial transactions;
 - Reduced fraud - Electronic banking provides a digital footprint for all employees who have the right to change banking activities. Therefore, the business has better visibility into its transactions making it harder for any fraudsters to cause harm.

2.2.1 Advantages and benefits of e-banking

The main advantages of electronic banking are:

- Operating costs per unit of service are lower for banks;
- Provides convenience for customers because they are not required to go to the bank's facilities;
- There is a very low incidence of errors;
- The user can receive funds at any time from the ATM;

- Credit and debit cards allow customers to receive discounts at points of sale;
 - The customer can easily transfer funds from one country to another electronically.
- (Mangalmay, 2017)

Internet banking fulfills many functions in the relationship between the bank and its clientele. In addition to the presentation and recognition of the banking institute, its initiatives and products, this type of service also offers other benefits such as:

- Convenience: unlike bank counters, bank websites never close, they are open 24 hours a day, 7 days a week. No need to waste time waiting in line, because banks are now just a click away;
- Anywhere: if we are far from the city or even abroad, we can immediately connect to the bank and account and take care of personal finances;
- Speed of transactions: online accounts often process and confirm bank transactions faster than ATMs;
- Efficiency: we can enter and manage all accounts, including deposits, pension funds, securities and others, all from one website;
- Effectiveness: most banks offer on their websites, sophisticated instruments, alarms or management programs to help manage all assets more efficiently.

Another advantage of internet banking is control and cost reduction. Thousands of customers can use this service simultaneously, without the help of cashiers and bank employees. In this way, administrative work is reduced, and thus the costs of paper, forms or various documents, which brings a significant increase in the bank's profit margin and, as a result, a reduction in the fees that banks apply to their customers. Such a service is of particular importance for people with disabilities, who can log into their online accounts by themselves and perform the desired operations directly from their home, without having to physically go to a bank or charge a third party to administer their personal finances. The online counter is not just another service or time saver for this category of people. It guarantees them something very important, because it gives them emancipation and restores their dignity, allowing them to act autonomously and maintain their confidentiality.

2.2.2 Benefits for customers with the introduction of electronic banking

With the introduction of electronic banking, in addition to the banks, significant benefits also appear for their customers, who use the banking services, and these are the following:

- E-banking offers more choice for customers;
- E-banking provides customers with cheaper services by allowing them to shop from many places and make quick comparisons;
- E-banking in some cases enables fast delivery of the requested information;
- Consumers can access meaningful and detailed information in seconds, instead of days and weeks.

The Internet offers banking opportunities to improve the quality of services while reducing costs. The quality of services can be improved by providing answers to customers' questions at the right time.

In recent decades we have witnessed the emergence of a new type of money, known as electronic money. This is made possible by the increasingly large and massive emergence and use of electronics, computers, in banking operations.

Instead of using cash, checks or other payment instruments, money can be deposited or purchases can be made, simply through the transmission of electronic signals. That doesn't mean the money disappears. If the money cannot be seen, held in hand, it does not mean that the money has disappeared. They just changed the form. Just like before they changed form, from full value to paper money and now money has changed form in the form of electronic signals, which are stored in the memory of computers in banks. Thus, it should be noted that electronic money, electronic banking does not mean the end of the existence of money, but it only means that the method of money transfer has changed.

2.3 Costs and disadvantages of e-banking

Although e-banking provides greater convenience, speed and efficiency, its adoption and use should be carefully considered. As far as the banks are concerned, choosing to go online brings them significant costs. The biggest costs are related to investments in technology. In the first place, these costs go to the purchase and installation of equipment and hardware and software systems;

secondly, for reorganization of the internal structure, for employment of IT personnel, for security and for integration with the internal information system.

Unfortunately, the costs don't end there. Technology is moving very fast and to keep up with its pace, as well as to maintain and improve the quality of service delivery, there is a need for continuous updating of technology. Also, the costs of system maintenance, troubleshooting, technical assistance, and internet connectivity should also be taken into account.

As for customers, the fixed costs that they have to cover initially are those for hardware and software equipment (computer, modem and necessary programs). On the other hand, the costs of using the service include technological costs (in case of hardware or software failure), internet connection costs and depending on specific conditions for each bank, the monthly subscription fee and commissions for the banking operations performed.

In addition to the costs to be covered, there are also some disadvantages:

- The start of the service may take some time: to register in the bank's online program, we may have to appear in person at the bank, fill out a form and wait until the username and password (password) are assigned;
- Learning curve: At first, bank websites may seem complicated to navigate. It will take some time to read the various instructions and learn how the online banking service works and what it offers;
- Technical problems: if for various problems we cannot connect to the Internet, we will not be able to access the online account and perform the actions we need. Also, online banking can be slow;
- Lack of personal interaction: by choosing this channel for interaction with the bank, we do not have personal contact with bank employees and do not have their advice on good financial management;
- You cannot deposit or withdraw money: Through online banking, we cannot deposit physical money or checks into the account. We will have to go to the bank for that. Even to withdraw physical money, we will have to go to the bank teller or the nearest ATM.

Disadvantages for the bank - Legislation

Electronic banking has a global character, and the legal regulation is local and differs from country to country. The legislation did not follow the rapid development of electronic banking, so in practice there are problems due to the inconsistency of the rules and the possibility of their different interpretation.

Insufficiently widespread internet

In countries where access to the Internet is low, the use of electronic banking is significantly reduced. Because of that, banks are not able to plan their operations and introduction of electronic products.

Problems with security of transactions

The usefulness of the Internet is great, but the number of abuses over the Internet is constantly increasing. Technology is constantly advancing, so if banks do not follow new trends and innovations, online operations may be at risk.

High initial costs

Electronic banking is based on modern technology, so the initial costs for the bank are high. The improvement of the necessary equipment takes place very quickly, which creates the need for constant investment in order to achieve a competitive advantage.

Disadvantages for users - Mistrust towards innovation

A greater number of people accept new products and innovations with mistrust and little interest in them, and it takes a long time for them to be widely accepted and used. The same is the case with the Internet, which was initially used by very few people, but later, after realizing the possibilities it offers, its use expanded rapidly.

Problems with security of transactions

The Internet and the electronic way of working provide a number of advantages, but users should pay special attention to their security. The lack of information from the banks or the carelessness of the users themselves when using and storing the data significantly reduce their reliability and increase the possibility of abuses.

Global shortage

Electronic banking can cause problems at the global level, the most significant of which are: the problem of taxation of profits made on the Internet, the possible destabilization of exchange rates and a negative impact on the money supply in circulation.

THE ELECTRONIC BANKING SYSTEM IN MACEDONIAN BANKS AND BULGARIAN BANKS

3.1. Legislation for e-banking in R. North Macedonia prescribed by NBRNM

The introduction and adoption of the Law on data in electronic form and electronicsignature in 2001 was an announcement that a new way of functioning of the banks in North Macedonia is on the horizon, that is, the establishment of a system for electronic operations.

Given that confidential and sensitive information is transmitted through the e-banking system, itwas necessary to establish standards for banks regarding the security of their informationsystems. For this purpose, based on the Law on the National Bank of the RSM and the Law onBanks, the Council of the NBRSM on 28.2.2008 passed a Decision on the security of the bank'sinformation system. This Decision contains 33 articles grouped into 6 parts: general provisions,process for managing the security of the information system, ensuring business continuity,electronic banking, company for auxiliary services of the bank for the information system, andtransitional and final provisions. The security of the bank's information system, according to this Decision, is defined by fulfilling the following criteria:²

1. Confidentiality: the information system is available only to users who have authorized access to it;
2. Integrity: protection of the accuracy and completeness of the information system;
3. Availability: uninterrupted access to the information system for authorized users.

²Нарпдна банка на Република Северна Македонија. Пдлука за инфрмативнипт систем на банката. Службен весник на РМ бр. 31/2008

Each bank is obliged to implement a process for managing the security of the information system and risk assessment measures. It is obliged to report on the performed risk assessment at least once a year through the preparation of a special report. The basics of the risk management process are covered in the Security Policy, which every bank is obliged to introduce and apply. This policy should contain several essential elements, among which the most important are:

- Protection of personal data, depending on the valid regulations in the Republic of Moldova;
- Annual training plan for the Bank's employees and clients, for the correct use of the services that are available through the Bank's information system;
- Managing security incidents and establishing an appropriate mechanism for their identification, reporting and efficient removal of possible threats to the security of the information system;
- Defining the role of the organizational unit for information technology in the bank, which should have adequate personnel capacity and internal work procedures, in accordance with the adopted acts in the field of information system security;
- Defining an appropriate audit trail for the critical parts of the multi-level audit system, such as the operating system, databases, telecommunications equipment, in order to confirm the identity and sequence of the activities performed in the information system;
- Defining the way of managing security updates, updating new versions, changes in the parameters and codes of the applications, preparing and putting the applications into use;
- Defining the method of telecommunication connection and ensuring protection of the data that is transferred, etc.

As a separate part of this Decision, electronic banking is covered, which according to NBRSM implies the offer of banking services and products through attractive electronic communication channels, such as access to financial information, information about products and services, execution of banking transactions, etc. At the same time, NBRNM prescribes certain

standards and measures that banks should fulfill and apply in order to be able to implement the system of electronic operations. In addition to the criteria for security of the information system, banks that have introduced an electronic model of work should additionally fulfill two more criteria: confirmation of the user's identity and irrevocability of transactions. The verification of the user's identity should be through reliable and efficient methods of confirming what he is doing in several ways: through a set of characters known only to the user, such as a password, through a device that is only owned by the user, such as an electronic card, token, etc., through some unique physical characteristic of the user, such as a fingerprint, iris, etc. At the same time, if the customer wants to make a banking transaction using electronic banking, the bank needs to obtain an identity confirmation by a combination of at least two of the above-mentioned methods.

Irrevocability of transactions implies the provision of proof of transfer for certain information or transactions by a user.

If the Bank identifies any problem or event that threatens the security of the bank's information systems or if changes have occurred in the key parts of the security management process of the information systems, it must notify the National Bank of the Republic of North Macedonia.

3.2 THE ELECTRONIC BANKING SYSTEM IN THE REPUBLIC OF BULGARIA

Online banking, or Internet banking, also called by the more general term electronic banking(including the use of electronic credit/debit cards, etc.), is a means of real-time access to thebank's services, with a high degree of security, integrated into the Internet environment.

It enables 24/7 real-time fund management such as:

- statement on the status and movement of the account;
- making bank transfers;
- buying and selling of currency;
- online trading of goods and services;
- obtaining financial information.

Advantages

Convenience: unlike traditional banking, online banking websites are accessible from all points of the country and do not close - they are available 24 hours a day, 7 days a week;

Efficiency: manage all accounts from one place in a secure environment;

Efficiency: more services are supported for effective financial management, even those that traditional banking does not offer.

Disadvantages

The main disadvantage of electronic banking is security, because there is no direct visual access to what is happening with the finances. This is a prerequisite for a drop in customer confidence, which slows down the uptake of such services.

Security

Unlike online stores, in electronic banking the password does not provide enough peace of mind for either the customer or the bank. Therefore, online banking websites usually use the secure protocol HTTPS (this is the standard HTTP (Hypertext Transfer Protocol) + SSL (SecureSockets Layer)). It encrypts all traffic - all information, plus the access password - making it almost impossible for third parties to obtain it. However, the protocol only encrypts the traffic, and if the client computer is not well protected, the password can be “brought” to third parties directly during entry.

This is done through programs called keyloggers, which record keystrokes. There are also physical devices with the same functions that are often misused. Of course, there remains the danger of “breaking” (or guessing) poorly chosen passwords, as well as their theft if they are written down somewhere. As an additional security, access to online services is practiced only through a fixed computer, as well as a transaction authorization number - TAN, which is an alphanumeric code that users use once to sign orders to the bank. Electronic banking in the Bulgarian banking system is developing in synchronization with international norms, but with a certain delay, especially this applies to the use of Internet banking. Despite the huge growth of electronic transactions over the Internet in 6 years (in number - more than 5.9 thousand times: from 54 in 1999 to 319,058 in 2004, and in value - more than 88.000 times: respectively from 128.25 BGN to BGN 11,320,600); the

relative share of internet banking is less than 1% of electronic financial transactions. Considering that 77% of all commercial banks provide electronic banking services to their customers, internet banking in the Bulgarian banking system is at an early stage of its development. It is obvious that the clients of the banks in Bulgaria do not have enough trust in the internet for the time being when making their financial payments. Let's compare the level and dynamics of electronic banking in Bulgaria with the trends in electronic banking in developed countries. In 1997, the consulting company Ernst & Young conducted a study of 100 largest banks in 26 countries in the world regarding the use of various channels in banking. According to a study by Ernst & Young, in 1997, through ATMs, banks performed 27% of their financial operations with customers, and this share increased to 29% in 2001, and through POS - 36%, respectively, and increased to 41 % in the studied 100 large banks in the world. Thus, in 1997, through the mentioned electronic methods, banks performed a total of 63% of the entire financial operation, which increased to 70% according to the estimate for 2001 (against the value in 2004 with 98.1% in our country, of which the main share taken by ATM withdrawals). However, a different view provides a more general indicator of activity intensity, namely the number of customer contacts made through different channels. This indicator was obtained as a result of another study conducted by Forrester Research in the same period (1997) only in US banks. According to data from Forrester Research in US banks in 1997, the relative share of customer contacts carried out over the Internet in the total number of all contacts was 15% and increased almost 3 times to 42% in 2001. that is the main form of electronic banking in developed countries is undoubtedly internet banking. This is also confirmed by Ernst and Young's research regarding the use of electronic networks outside the Internet (for example, in 1997, banks performed only 2% of financial operations with customers outside the Internet, and this share increased slightly to only 5% in 2001 in the surveyed 100 large banks in 26 countries).

Currently, two models of electronic banking are widespread: a) completely virtual banks, which operate in a global, local or private electronic network and do not have "physical" offices; b) traditional banks, which in addition to traditional banks also have electronic banking services, so-called multi-channel banks. There are only multi-channel commercial banks in the Bulgarian banking system. Research shows that 91% of all commercial banks in our country have a website, and 77% provide their clients with electronic banking services. The competition between the mentioned two models of electronic banking has a decisive influence on the development of the banking sector as a whole. For now, traditional banks are winning in the competitive struggle due

to their stronger initial positions: a) many years of experience in working with clients; b) the body established over many years; c) the reliability rating of these banks in the banking system.

Among the economic consequences for the banking system from the development of electronic banking, the most basic are: 1) intensification of competition in the banking sector; 2) redirection of the entire banking system towards the practical implementation of the concept of a multi-channel (integrated) model of the bank; 3) possibility of diversification of banking operations; 4) attracting to the banks the most promising clients, who get the opportunity to manage their finances and invest most profitably in real time mode; 5) increasing the concentration of capital in the banking sector; 6) providing a path to real globalization of banking; 7) international legalization of electronic banking; 9) consolidation of the banking sector with non-bank contracting parties that begin to provide financial services in the field of electronic payment systems.

CONCLUSIONS

In the technologically developed world, the adoption of new innovative systems faces major obstacles such as lack of support, poor quality or poor motivation of customers to entrust their personal data to a wide virtual network. In addition, the problems of developing countries are attributed to a lack of infrastructure, capital resources or government policies to favor new technological advances.

The greatest benefit derived for banks and financial markets, and for humanity in general, is related to the use of the Internet and is due solely to the intelligence of the Information, Communication and Technology (ICT) sector, its implementation in all those sectors, markets and banks in the world and their digitization with mutual connection.

The role and importance of the ICT sector is at such a high level, that they have bridged the limits of the impossible, and made the Internet in their world of technology the most used service of all time until today. Its implementation in technology and making an unbreakable connection with the banks was a challenge for the ICT sector, and with that they are doing the most essential work that has been done in the banking industry until then, and thus introducing the new terms “E-bank”; and “E-banking.”

The factors of change related to progress are numerous and they are an integral part of any social arrangement of all countries, which in terms of their development are somewhat similar, and the most famous are political changes, internal pressures, customer demands, variation the economic climate and many other factors, which are part of the socio-economic and a good part of the political-general relations and environment and directly affect e-banking. In the following years, electronic banking is slowly but surely implemented in banks and becomes an integral part in those leading institutions in the electronic world that are later called e-banks, where their daily use creates rapid progress, great competition and the expansion and introduction of new products and customer services. The management of an electronic bank in such globalization today is really a challenge that everyone is facing and it is gaining momentum every day. For success in e-banking, planning should be on the pedestal in the priorities of each bank and should be constructed in advance, with clearly defined goals, resources, budget and required time. The strategy, which is part of the management, is the key to success for the expansion of e-bank and the key success for the future of e-banking. Also, an e-marketing strategy that has become part of that unbreakable

relationship with the bank, affects e-banking and is of great and essential importance, primarily due to the security and quality of services. With the emergence of social networks, especially blogs, electronic marketing also becomes the most deserving of expansion, with the introduction of those new products and services on web pages. Of course, the structure for good management and the relationship of the managers with those internal structures, which is key to the success of the management of customer relations, where the requirements are of an essential and different nature and are part of the progress for the electronic future that lies ahead for us all, is the most deserving. us. Of course, the problems that arise from such operations, which are susceptible to various types of abuses and cybercrime, and have a direct destructive effect on the work of the bank, as well as the bank's website, which presents an image to the world, but in digital form, are certainly an integral part. Destruction, as an integral part of operations, sooner or later complicates the way of working of all electronic distribution channels and for the introduction of new electronic products and services in e-banking, and it is necessary to work on this problem with continuous intensity. All this day-to-day work of the bank and the way we all move in the digital world, burdens the top management from the e-industry every day and are the good generators in the e-world. Their biggest must is e-crime or cybercrime. This problem is continuously being worked on, in order to improve security and fight against e-destructiveness of that cybercrime, which are currently the most bitter problem and are a priority to solve. Therefore, daily in large banks significant investments are made in new platforms for mobile systems, to convey better types of business values from increasing efficiency and reducing costs, but also with the aim of improving operational efficiency and customer service, as well as providing a greater competitive advantage, provided at the maximum level. The banking industry and its operation is perhaps the most complex business created in the world, while the systems that provide it today make it more difficult and efforts are made daily to facilitate and interconnect. Regarding the focus for the website, it should be on how communication with customers can be improved by using the wide range of media available. Finally seeing the effectiveness and efficiency of the e-banking service, as benefits of the biggest innovative service from the banking industry, the fact of customer opinion and their benefits being the main benchmark for e-future in the world is inevitable. In the last fifteen years, users have been segmented in new ways that are made according to the devices they use, customers who value channels, education, cybercrime, gender, income, security services, age, acceptance of technologies and it is certain that in the future , this segmentation will change with

the change and progress of societies as a whole. To the question "What awaits us in the future"? The likelihood is high that the next billion consumers will go online, and with it, new digital solutions for the mobile device will be created - which will be very different from the practices of the previous users who created the current e-commerce or e-industry. It is also expected that the cross-border influence will increase, as a field of competitiveness and development.

All this opens up new and fast-growing markets, which will function even in conditions of stagnation and a slow economy, and the best examples of this are the services Alibaba, AliExpress, Amazon, Google, which will seek exit and growth in new markets and new production areas. Emerging economies will continue to evolve differently, alongside their new online users.

From the study, it is clear that the digitization of banking services in the Republic of North Macedonia and Republic of Bulgaria is on the right track, but this field is constantly growing. For this reason, commercial banks in the country, under the supervision of the Central Bank of the Republic of North Macedonia, must continue with the application of achievements in the field of information technology, which further improve the payment system, especially in electronic form. It is clear that the introduction of e-banking significantly costs the banks. The increased expenses had a positive and negative impact on the financial operations of the banks. The study aims to investigate whether electronic banking has a positive or negative impact on the intensity and existence of services provided by institutions. After reviewing various articles regarding the adoption of e-banking, data has been collected which shows that various articles and authors believe that there are a number of important factors for the adoption of electronic banking. Among the articles, some of the factors were repeatedly mentioned by different authors, considering them as the most important factors regarding the adoption of electronic banking. These factors are Internet usability, security, quality of information, trust, quality of service, convenience and privacy. In the following years, electronic banking is slowly but surely implemented in banks and becomes an integral part in those leading institutions in the electronic world that are later called e-banks, where their daily use creates rapid progress, great competition and the expansion and introduction of new products and customer services.

The management of an electronic bank in such globalization today is really a challenge that everyone is facing and it is gaining strength every day. For success in e-banking, planning should be on the pedestal in the priorities of each bank and should be constructed in advance, with clearly

defined goals, resources, budget and required time. The strategy, which is part of the management, is the key to success for the expansion of e-bank and the key success for the future of e-banking. Also, an e-marketing strategy that has become part of that unbreakable relationship with the bank, affects e-banking and is of great and essential importance, primarily due to the security and quality of services. With the emergence of social networks, especially blogs, electronic marketing also becomes the most deserving of expansion, with the introduction of those new products and services on web pages.

Scientific contributions

This research provide several scientific contributions, and they are:

1. *Impact Assessment of E-Banking on Consumer Behavior and Bank Operations:* The research provides valuable insights into how e-banking has transformed consumer behavior, enhancing convenience and accessibility while improving operational efficiency for banks. It highlights how the integration of e-banking services has positively impacted customer satisfaction, financial inclusion, and cost reduction for banks, specifically in the context of North Macedonia and Bulgaria.
2. *Identification of E-Banking Challenges and Risks:* The study identifies and discusses the negative aspects of e-banking adoption, such as security concerns, digital exclusion, and the decline of physical banking services. By addressing these challenges, the research offers a comprehensive understanding of the risks involved and the need for improved cybersecurity measures and inclusive digital literacy programs.
3. *Role of E-Marketing in E-Banking Growth:* This research contributes to understanding the importance of e-marketing strategies in enhancing e-banking services. It emphasizes how the use of social networks, blogs, and digital platforms can help banks reach a larger audience, improve customer engagement, and introduce innovative financial products and services.
4. *Regulatory and Technological Implications:* The study highlights the importance of regulatory frameworks in supporting the growth of e-banking, emphasizing the need for updated laws regarding cybersecurity, privacy, and consumer protection. It also underscores the technological infrastructure challenges that banks face, especially in emerging economies, and the necessity of continuous investment in digital platforms.
5. *Strategic Management of E-Banking in a Globalized Context:* The research provides valuable strategic insights for banks aiming to expand their digital services. It outlines the critical need for well-defined planning, resource allocation, and the adoption of e-marketing strategies to ensure successful e-banking operations in a highly competitive and evolving financial environment.

Results of the analysis

Electronic banking, apart from worldwide, is experiencing a boom in our country as well, especially in the last few years. Proof of this are the statistics on the payment infrastructure and payment instruments made by the National Bank of S. Macedonia and the Republic of Bulgaria, according to which the percentage of non-cash payments is increasing year by year, the share of electronic transfers in the total made at the state level, transactions with payment cards at POS terminals and ATMs are increasing, the number of services that customers can use is increasing they can do them through electronic banking, etc. All banks in S. Macedonia and Bulgaria offer the possibility of electronic payments for both individuals and legal entities and constantly invest in the introduction of new, innovative services.

The greatest benefit derived for banks and financial markets, and for humanity in general, is related to the use of the Internet and is due exclusively to the intelligence of the information, communication and technology sector (ICT), is its implementation in all those sectors, markets and banks in the world and their digitization with mutual connection. The role and importance of the ICT sector is at such a high level, that they have bridged the limits of the impossible, and made the Internet in their world of technology the most used service of all time until today. Its implementation in technology and making an unbreakable connection with banks was a challenge for the ICT sector, and with that they are doing the most essential work that has been done in the banking industry until then, and thus introducing the new terms " E-bank " and " E - banking. " The factors of change related to progress are numerous and they are an integral part of every social arrangement of all countries, which in terms of their development are somewhat similar, and the most famous are political changes, internal pressures, customer demands, the variation of the economic climate and many other factors, which are part of the socio-economic and a good part of the political-general relations and environment and directly affect e-banking. In the following years, electronic banking is slowly but surely implemented in banks and becomes an integral part in those leading institutions in the electronic world that are later called e-banks, where their daily use creates rapid progress, great competition and the expansion and introduction of new products and customer services. The management of an electronic bank in such globalization today is really a challenge that everyone is facing and it is gaining momentum every day. For success in e-

banking, planning should be on the pedestal in the priorities of each bank and should be constructed in advance, with clearly defined goals, resources, budget and required time.

The strategy, which is part of the management, is key to success for the expansion of e-bank and key success for the future of e-banking. Also, an e-marketing strategy that has become part of that unbreakable relationship with the bank affects e-banking and is of great importance and essential, primarily because of the security and quality of services. With the emergence of social networks, especially blogs, electronic marketing also becomes the most worthy of expansion, with the introduction of those new products and services on web pages. Of course, the structure for good management and the relationship of managers with those internal structures, which is key to the success of customer relationship management, where the requirements are of an essential and diverse nature and are part of the progress for the electronic future that lies ahead for all of us, is the most deserving. Of course, an essential part are the problems arising from such operation, which is susceptible to various types of abuses and cybercrime, and has a direct destructive effect on the bank's work, as well as the bank's website, which presents an image to the world, but in digital form. Destruction, as an integral part of operations, sooner or later complicates the way of working of all electronic distribution channels and for the introduction of new electronic products and services in e-banking, and it is necessary to work on this problem with continuous intensity. All this day-to-day work of the bank and the way we all move in the digital world, burdens the top management from the e-industry every day and are the good generators in the e-world. Their biggest must is e-crime or cybercrime. This problem is continuously being worked on, in order to improve security and fight against e-destructiveness of that cybercrime, which are currently the most bitter problem and are a priority to solve. Therefore, daily in large banks significant investments are made in new platforms for mobile systems, to convey better types of business values from increasing efficiency and reducing costs, but also with the aim of improving operational efficiency and customer service, as well as providing a greater competitive advantage, provided at the maximum level. The banking industry and its operation is perhaps the most complex business created in the world, while the systems that provide it today make it more difficult and daily efforts are made to facilitate and interconnect. Regarding the focus for the website, it should be on how communication with customers can be improved by using a wide range of available media. Finally seeing the effectiveness and efficiency of the e-banking service,

as benefits of the biggest innovative service from the banking industry, the fact of customer opinion and their benefits being the main benchmark for e-future in the world is inevitable.

The results of the research on the use of electronic banking by legal entities indicate a large percentage of its use and application. There are differences in (non)use note depending on the size of the company. Micro firms use electronic banking in smaller numbers compared to small and medium-sized businesses, which is generally due to the belief of the owners of these firms that it is a question of complex processes and procedures. In contrast, larger companies already use it as a daily tool in their work and provide all informational, financial and other services through this channel.

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DECLARATION OF ORIGINALITY AND TRUST

By Semrah Bujari M.Sc, self-study PhD student at the Finance Department of Higher School of Insurance and Finance (BY3Φ) - Sofia.

I declare that the dissertation presented by me on the topic THE IMPACT OF ELECTRONIC BANKING ON CUSTOMER SERVICES AND BANKING OPERATIONS IN BANKS OF THE REPUBLIC OF NORTH MACEDONIA AND THE REPUBLIC OF BULGARIA is an original paper and contains results obtained from my research, with the support and help of my supervisor.

I declare that the results obtained, described and / or published by other scientists are properly cited in the bibliography, subject to copyright requirements.

I am informed that in case of finding plagiarism in the submitted dissertation, the defense committee has the right to reject it.

I declare that the dissertation has not been presented at other universities, institutes and other higher education institutions for obtaining an educational and scientific diploma.

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Declarant:

Semrah Bujari , M.Sc