

DEVELOPING E-BANKING PLATFORM IN CONTEMPORARY WORLD

Zarko Radjenovic¹⁰⁷
Tatjana Boshkov¹⁰⁸

DOI: <https://doi.org/10.31410/eraz.2018.185>

Abstract: *Banks play a crucial role in promoting online businesses. Banks are trustworthy intermediaries in the online transactions and they provide a bold opening in the online business. Banks have e-payment systems like Internet banking, electronic fund transfers, plastic money (credit card & debit card) and mobile banking. These systems provide payment to online transactions. For the real working of these e-services, the need of e-banking platform development is an inevitable feature.*

This paper examines the efficient utilization of developing e-banking platform which have all the infrastructures for availing the same. For this reason we explore the impact of systems factors for E-banking platform development (scalability, interoperability, fast server response, user-friendliness ect.), Organizational factors for E-banking platform development (multistakeholders perspective, bank image and resource allocation) and Economic factors (operational efficiency, administration costs, innovation diffusion, financial information assistance). The change of economy from a traditional way to the recently demanded form needs a huge technological support and effort, better planning and efficiency in implementation thus pushing the banks to design various electronic money products.

Key words: *e-money, e-banking, platform, software alternatives.*

1. INTRODUCTION

A well-functioning financial system plays a crucial role in the transformation process from a centrally-planned economy towards one that is market-oriented. It is essential that developing countries consider steps towards financial liberalization or deregulation, which will help open the borders for capital flows and attract new investments and ideas. While financial liberalization does not guarantee quick economic growth for developing countries, it helps increase the chances for progress and creation of opportunities for financial development. Developing countries have learned through their own history and the evidence from around the world that, in order to start liberalization processes, it is essential to first ensure adequate regulation of their financial systems in line with country-specific requirements and circumstances. It is often wrongly assumed that economies with greater connection and dependencies on international trade require stronger liberalization. It is important to recognize that, when it comes to financial systems and economy, each developing country follows their own practices, processes and traditions and should also find the most appropriate liberalization model that suits their circumstances.

Banks are intermediaries in the online transactions and they provide a bold opening in the online business. Banks have e-payment systems like Internet banking, electronic fund transfers, plastic

¹⁰⁷ Faculty of Economics, University of Nish, Serbia

¹⁰⁸ Faculty of Tourism and Business Logistics, Goce Delcev University – Shtip, Macedonia

money (credit card & debit card) and mobile banking. These systems provide payment to online transactions. For the real working of these e-services, the need of e-banking platform development is an inevitable feature.

This paper examines the efficient utilization of developing e-banking platform which have all the infrastructures for availing the same. For this reason we explore the impact of systems factors for E- banking platform development (scalability, interoperability, fast server response, user-friendliness ect.), Organizational factors for E- banking platform development (multistakeholders perspective, bank image and resource allocation) and Economic factors (operational efficiency, administration costs, innovation diffusion, financial information assistance). The change of economy from a traditional way to the recently demanded form needs a huge technological support and effort, better planning and efficiency in implementation thus pushing the banks to design various electronic money products.

2. LITERATURE REVIEW

From the era of barter economy, metal and coins to gold and silver, continuing to the modern monetary systems and checks, and ending with the latest developments in the global currency, such as the introduction of cryptocurrency like Bitcoin, have passed centuries. Each type of money plays a crucial role in transactional activities in some period of time. As human society and markets developed in particular, there was a need for more sophisticated instruments for the exchange of goods.

There are two reasons for the emergence of electronic money and digital currencies. The first, according to the Austrian School of Economic Analysis money is a "social institution" subject to the already initiated institutional change and is interpreted as a consequence of a spontaneous evolution that should overcome the shortcomings of the swap and the double coincidence of desires [6, 7]. Today e-money is the last stage of this development and represents an additional degree of institutional change [8].

Their main role is to support online e-commerce, enable transactions, reduce their costs, or replace the payment of money and coins in retail. The second reason for the emergence of e-money is the Information Revolution, which is characterized by the integration of electronic information processing and telecommunication technologies, which reduces the geographical differences by means of which information can be transmitted to the whole world. The Information Revolution has changed the financial sector, making payment modes more secure and more efficient, giving an additional reason for the emergence of new monetary innovations [5].

Unlike the information revolution, the emergence of e-money is a new way of processing information for transferring purchasing power. Many financial innovations are not a new form of money, but a different way of using existing money in transactions [9]. Regardless of the consequences of the mentioned technological development, the nature of the money is still identical i.e money serves as a means of exchange, as an asset and as a value. The nature of the money will never change, so the money will remain only an intermediary in the exchange of goods and services. The e-money card is a different payment method that allows electronic transfer of the value from the card to the terminal or from the card in the wallet, both in real time and through networks [3]. It is considered that e-money is the most important achievement that transfers the predetermined monetary value so it can be used for more transactions of lesser value. The e-pocket consists of a microcomputer that contains information about the monetary

value that can be used. It is a higher degree of technological development compared to magnetic tape cards. Also, the e-pouch is more secure, which can reduce deception because cards with a chip can be more difficult to abuse than magnetic tape cards.

3. OVERVIEW OF THE IT REVOLUTION AND INNOVATIONS RELATED TO MONEY

From the aspect of the development of the e - payment method, digital currency is not physically printed by the Central Bank, too. For now, digital currency is considered with its own rules of the game. In the literature, all those who support the use of Bitcoin underscore the characteristic as a currency that does not cause financial crises. Namely, the view is that as banks can print more money to cover their national debt, thus devaluing their currencies, Bitcoin does not function in such a way.

Electronic payment method exists from the 1960s, i.e from the development of Electronic Funds Transfer (EFT), which became more sophisticated and applicable in a growing number of countries [2]. EFT implies the application of computer and telecommunication technology in payment. This method was used by banks and other financial institutions to exchange and transfer a large amount of money on a national and international level. The basis for the operation of EFT is that the money moves through a network as a substitute for cash or checks to execute a transaction. In this way, the time for paying should be shortened and the transaction costs reduced. The use of EFT has significantly increased with the emergence and acceptance of ATMs, which allow money transfer at the point of sale (EFTPOS). EFT is considered as first degree in the electronization of transactions.

In the early 1980s, thanks to the development of network technology, the costs of telecommunications and data processing were reduced, and electronic payments became more useful with the appearance of credit and debit cards, which for several years (after their appearance) became the most popular electronic small transaction tool. Also, the development of encryption has played a major role in successful card payments. This innovation is considered as a second degree in the electronization of transactions.

The growth and acceptance of card payments had negative consequences for the traditional way of payment. Many countries have made a move from the use of paper instruments, such as cash and checks, to the use of electronic instruments. For the first time in many countries, the number of checks payments has been reduced. Namely, checks as a very popular payment instrument loose the market role, thereby reducing their use [4].

4. E- PAYMENT AND TRANSACTION COSTS

Payments in classical trade require at least one buyer and one seller, with both having to have accounts in banks that are connected through clearing houses. Payments with traditional instruments such as checks require intervention of a financial intermediary like bank. Payment with e-money is similar to the traditional scheme - there are two parties - one or two banks. However, the whole process becomes more efficient and easier. The transaction does not require any code and cannot exceed the previously defined amount. If the amount that is on the chip is fully spent, the card can be automatically refilled at the merchant, without charging any fees, thanks to the special POS mechanism [1].

Once the chip is full, the user does not need to require an ATM or an exact amount of cash. Additionally, the problem of stealing or losing money is reduced to a minimum. An e-money transaction does not require an intermediary at present because the money expressed in units (called bits) is electronically transferred from the buyer to the seller. The amount of money that has been paid is prepared at the seller's terminal, i.e. from time to time his account is transferred to the financial institution.

Payment with e-money reduces transaction costs, and time is shortened compared to other forms of payment. Humphrey and colleagues estimate that "the cost of using electronic money amounts to one third to half of the cost of paying paper money. When all transactions in one country would be carried out electronically, it would be possible to save more than 1% per year BDP.

5. E- BANKING PLATFORM ANALYSIS USING MULTICRITERIA DECISION SOFTWARE: EXPERT CHOICE

5.1. EXPERT CHOICE ANALYSIS

The Expert Choice program is based on the principles of multi-criteria decision-making using the method of analytical hierarchical processes (AHP). On the other hand, the AHP method in determining weight coefficients and deciding on the optimal alternative is based on the Saaty scale. In order to find the best software alternative for the development of the electronic banking platform, the first seven best software solutions were selected in the world. The current positioning of these software solutions in electronic banking does not mean that they are the best choice for a given banking organization, since each organization has its own specificities in the way it operates. It is important to note that using the Expert Choice program and the application of the AHP method, the model consistency index should be considered, which should not be greater than 0.1 in order to satisfy the validity of the model itself and the relationship of attributes and alternatives. In order to best optimize the ranking of these software solutions, certain attributive factors have been selected which in the best possible way represent the characteristics of the electronic banking platform in the author's opinion. They are grouped into three major parts:

- **Systems factors for E- banking platform development:**
 - Scalability,
 - Interoperability,
 - Fast server response,
 - User- friendliness,
 - Networking,
 - Big data analysis,
 - Data aggregation,
 - Security,
 - Easy application navigation,
 - Real time information transmission,
 - Web- based platform,
 - Providers,
 - Expert chat availability.

- Organizational factors for E- banking platform development:

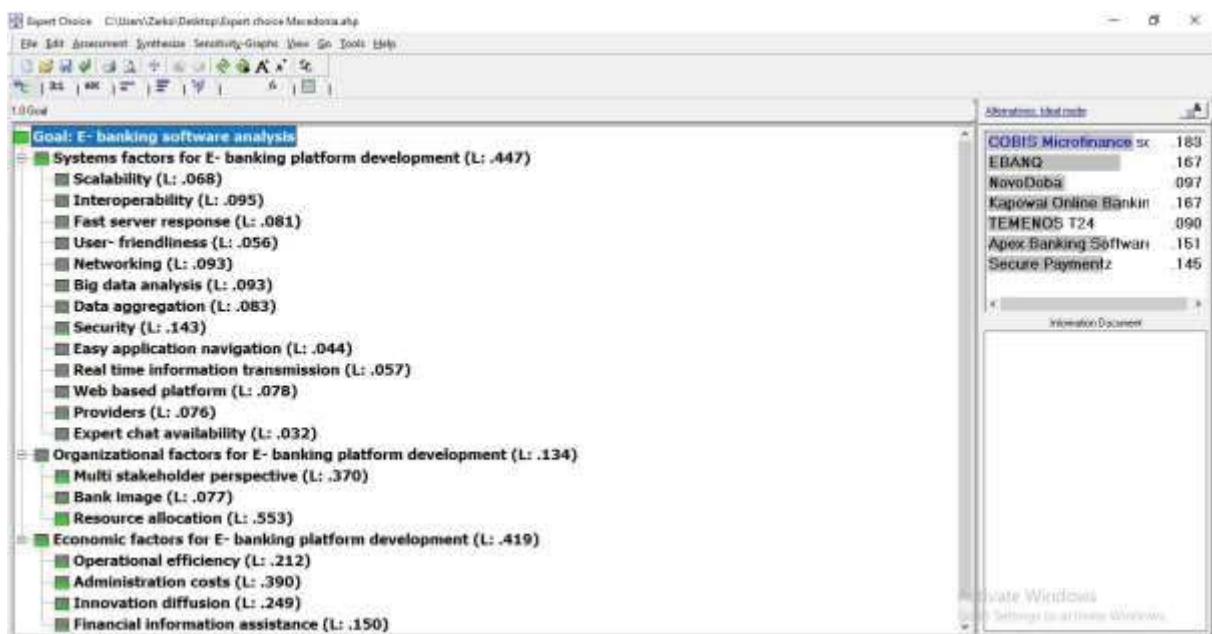
- Multistakeholders perspective,
- Bank image,
- Resource allocation.

- Economic factors for E- banking platform development:

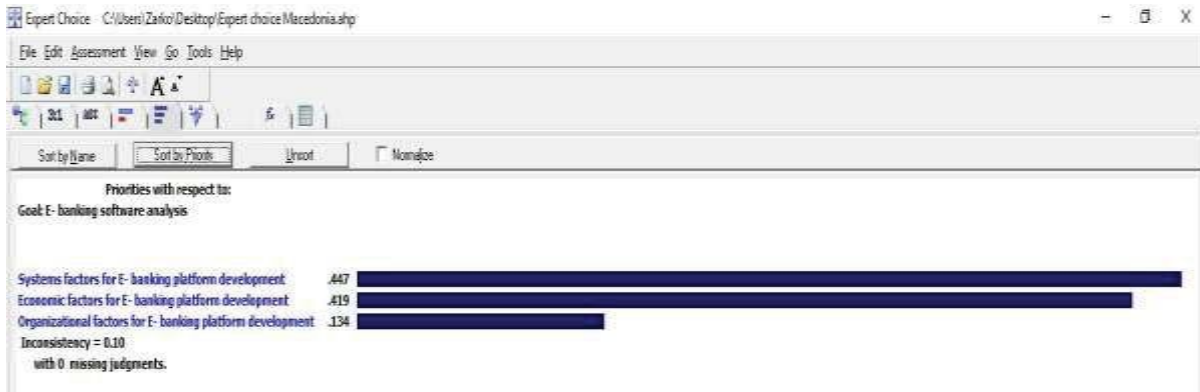
- Operational efficiency,
- Administration costs,
- Innovation diffusion,
- Financial information assistance.

The top seven world software alternatives for e- banking platform according to Capterra are:

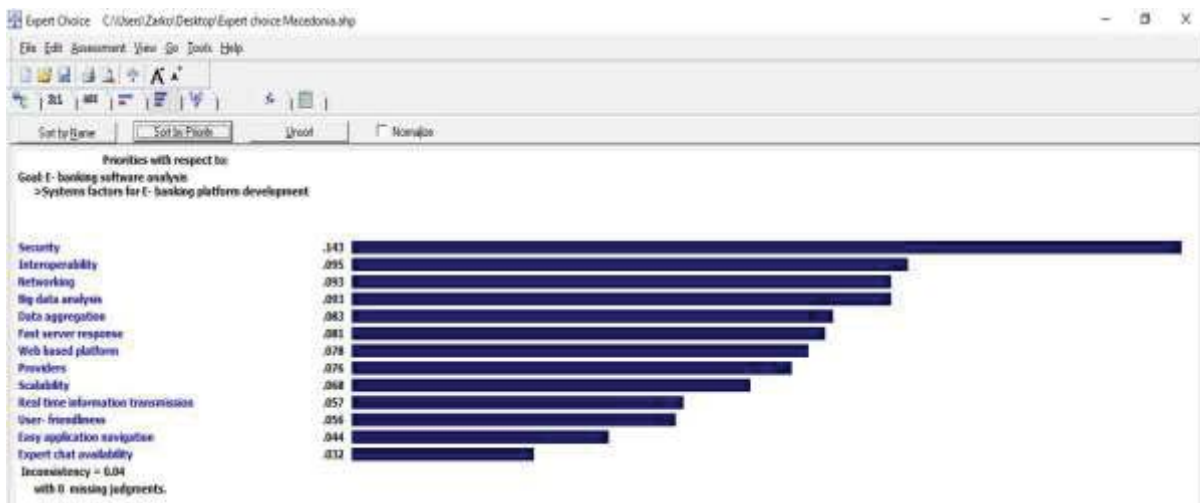
- COBIS Microfinance Softwares,
- EBANQ,
- NovoDoba,
- Kapowai Online Banking,
- TEMENOS T24,
- Apex Banking Software,
- Secure Paymentz.



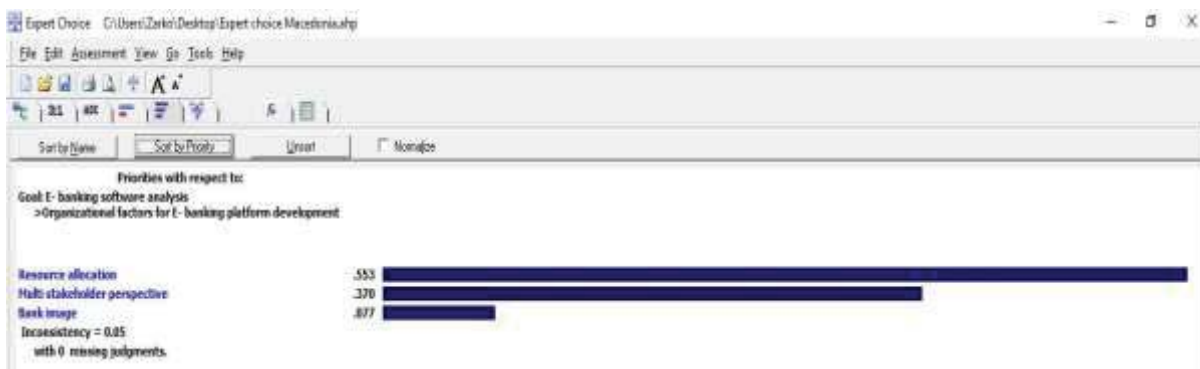
Based on the first picture, it can be concluded that the ranking of the best ranked alternatives based on the aforementioned criteria has changed in view of the specificity of the banking sector and business practices, but that COBIS Microfinance Softwares retained its original position. On the other hand, alternatives such as EBANQ (0.167), Kapowai Online (0.167) and Apex (0.151) match each other and show favorable ranking in the overall score. The last alternative of which is the 0.09 rank is TEMENOS T24.



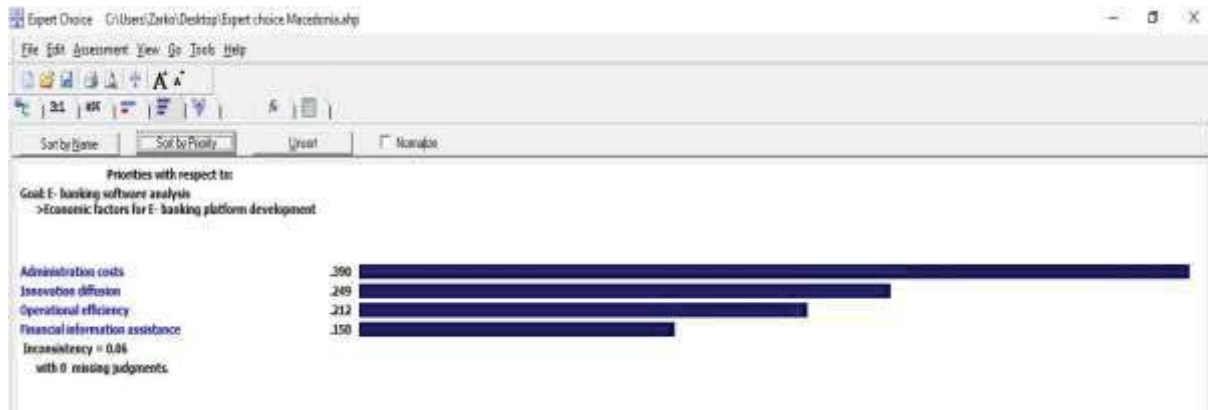
The most influential factors in choosing a software solution for electronic banking are Systems factors for E- banking platform development.



Also, the factor that is most distinguished within the mentioned group is of importance Security. Also this criteria is followed by Interoperability, Networking and Big data analysis.



On the other side, the most ranked criteria from the second factor group is Resource allocation.

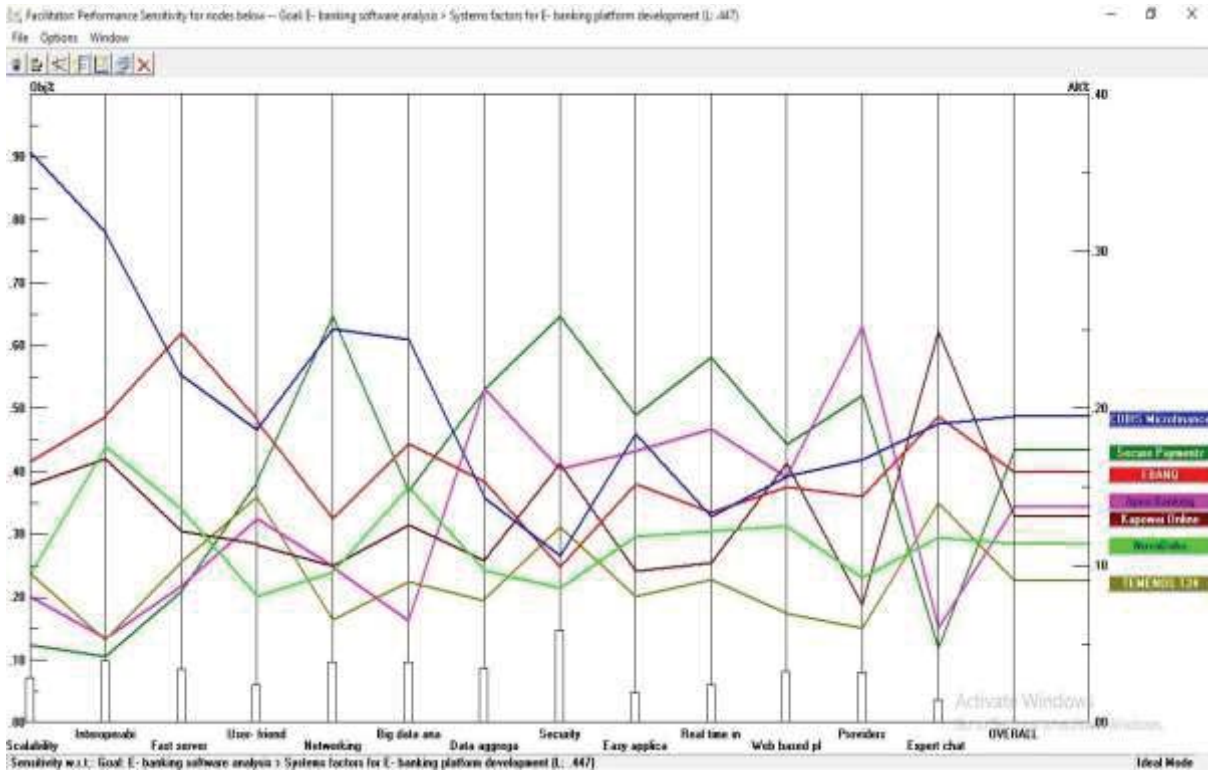


In the group of economic factors which influences on the e- banking software decision the most important criteria are Administrative costs.

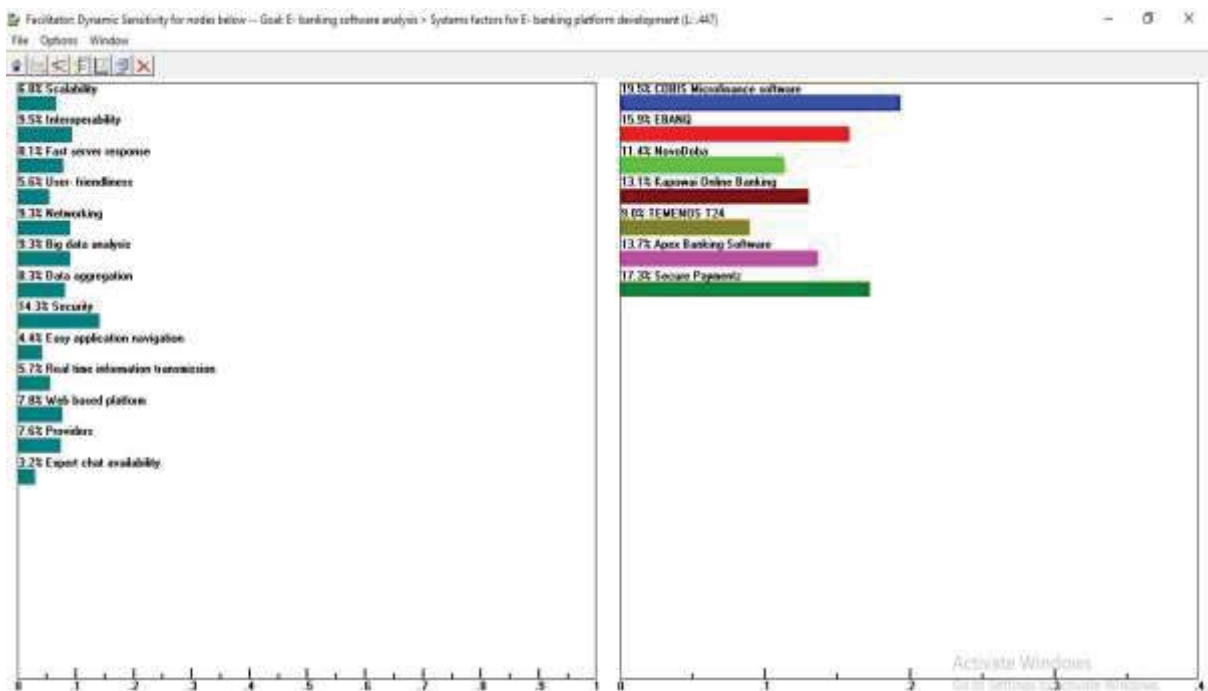
Particular attention is paid to Performance Sensitivity Analysis, which shows the influence of particular criteria from the first group of factors on the ranking of alternatives in the final order. The influence of the weight of all criteria on the final ranking of the alternatives leads to the fact that the chart clearly reads the best alternative, as well as its advantage over competitors according to the chosen criteria.

The value of the criteria and the sensitivity of their movement in a given interval are shown by vertical rectangles, while the alternatives are represented by horizontal lines. The weight of the criterion is defined by the height of the rectangle, which is read on the left axis of Obj%. On the other hand, the priority of the alternative according to a given criterion is formed in the cross section of their horizontal lines with a vertical line of criteria, which can be read on the right axis Alt%. The values of the criteria determined by the height of vertical reagents are of a dynamic type, and by their shift, the values of the criteria themselves change, but also their influence on the alternatives themselves and their ranking.

For example, sensitivity analysis give us different ranking according to systems factors which have the biggest impact on the e- banking software solutions beside the other two factor groups. On the second plays now is Secure Paymentz and the factors with the biggest impact on its implementation from the first factors group are noticed on peaks of its chart: networking, security, real time information transmission and providers.



By applying dynamic analysis, one can see how dynamically changing the priorities of the alternatives in changing the weight of particular criteria. This view allows us to review the overall contribution of the weight of particular criteria in prioritizing alternatives. If we change the weight of one criterion, the other weights change proportionally to the initial weight of the criteria. On the left side are shown the percentage values of the impact of particular criteria on the priorities of the alternative. The expert chat availability criteria has the lowest contribution in e-banking software ranking and further implementation according to the first factors group.



6. CONCLUSION

Advances in information and communications technology have enabled the appearance of new methods of electronic payment in the real world and the virtual world. The reason for the spread of these products has been their greater effectiveness compared with the traditional payment systems. However, statistics on payment systems indicate that electronic money development is still at an early stage of development and that cash continues to be the most important means of payment for retail transactions. Thus, contrary to some early expectations, cash has not been yet replaced by electronic money.

Tatjana Boshkov is a University Professor at Goce Delcev University, Stip. Her subjects of researching are: Exchange Rates, International Finance, EU Convergence, Macroeconomics.



Boshkov is a Rotary member and author of many papers published in international journals and 8 books as participant in projects, conferences, Researchers Club of NBRM.

The most influential factors in choosing a software solution for electronic banking are Systems factors for E- banking platform development. Also, the factor that is most distinguished within the mentioned group is of importance Security. Also this criteria is followed by Interoperability, Networking and Big data analysis. On the other side, the most ranked criteria from the second factor group is Resource allocation.

In the group of economic factors which influences on the e- banking software decision the most important criteria are Administrative costs. Particular attention is paid to Performance Sensitivity Analysis, which shows the influence of particular criteria from the first group of factors on the ranking of alternatives in the final order. The influence of the weight of all criteria on the final ranking of the alternatives leads to the fact that the chart clearly reads the best alternative, as well as its advantage over competitors according to the chosen criteria.

For example, sensitivity analysis give us different ranking according to systems factors which have the biggest impact on the e- banking software solutions beside the other two factor groups. On the second plays now is Secure Payments and the factors with the biggest impact on its implementation from the first factors group are noticed on peaks of its chart: networking, security, real time information transmission and providers.

By applying dynamic analysis, one can see how dynamically changing the priorities of the alternatives in changing the weight of particular criteria. This view allows us to review the overall contribution of the weight of particular criteria in prioritizing alternatives. If we change the weight of one criterion, the other weights change proportionally to the initial weight of the criteria. The expert chat availability criteria has the lowest contribution in e- banking software ranking and further implementation according to the first factors group.

Governments could play a potentially significant role in changing the habit persistence problem and thus promoting the use of e-money. For instance, by encouraging the use of e-money in small transactions such as public parking meters and public transportation services, they could significantly increase the number of users of electronic forms of payment, helping to achieve the critical mass of users necessary to trigger network effects.

7. REFERENCES

- [1] Baddeley, M., 2004. 'Using E-Cash in the New Economy: An Economic Analysis of Micropayment Systems' [online]. *Journal of electronic commerce*, 5 (4), 239-253.
- [2] Bounie, D. and Abel, F., 2006. "Les déterminants de la détention et de l'usage des instruments de paiement: éléments théoriques et empiriques". *Revue d'Economie Financière*, 174.
- [3] Chakravorti, S. and Victor, L., 2006. "Payment instrument choice: The case of pre-paid cards". *Economic Perspectives*, 2Q, 29-44.
- [4] European Central Bank, 2005. *The Blue Book*. Bucharest: European Central Bank.
- [5] Goodhart, C. A. E. and Krueger, M., 2001. "The Impact of Technology on Cash Usage". *The magazine of De La Rue*, (4), 9-11.
- [6] Hayek, F. von., 1976. *Denationalisation of Money: An Analysis of the Theory and Practice of Concurrent Currencies*. Londres: Institute of Economic Affairs.
- [7] Menger, C., 1892. "On the origin of money". *Economic Journal*, 2 (83), 239-55.
- [8] Schmitz, S. W., 2001. "The Institutional Character of Electronic Money Schemes: Redeemability and the Unit of Account" in M. Latzer and S. W. Schmitz, eds. *Carl Menger and the Evolution of Payment Systems: From Barter to Electronic Money*. Cheltenham, UK and Northampton, MA: Edward Elgar.
- [9] White, L. H., 1996. "The Technology Revolution and Monetary Evolution" in J. A. Dorn, ed. *The Future of Money in the Information Age*. Washington, D.C.: CATO Institute