RANKING OF USER EXPECTATIONS WHICH INFLUENCE THE LEVEL OF ADOPTION AND USE OF INTERNET BANKING SERVICE

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ABSTRACT

There is a growing awareness of the importance of internet banking in banks all over the world accompanied by their client's growing interest in using online banking services. In practice, it is often not enough to merely identify the expectations of users, but is necessary to determine the difference in the importance of the identified needs. In this way, employees in marketing and IT sectors can define priorities when designing and implementing strategies for successful online presentation. For the purposes of this study, in the process of identifying customer expectations, the authors used a combination of the two theoretical models: the Technology Acceptance model (TAM) and the Theory of Planned Behaviour model (TPB). The Analytic Hierarchy Process (AHP) was applied to determine the weights of the identified user requirements. The results showed that the perception of the security and financial risks, the perceived benefits, social norms and subjective attitudes, the ease of use, self-organization and the intention to manage one's own accounts do not bear the same importance when deciding on adoption of internet banking and when making decisions on future behavior. In practice, the results obtained can be used as guidelines and recommendations on how to define priorities when creating online banking offers. In theory, the presented systematization of user expectations may prove useful for future research on adoption and diffusion of online banking
Keywords*: AHP, internet banking, priorities, user expectations*

1. INTRODUCTION

The application of internet technology in banks in order to improve the quality of their presentation to customers is not new. Over the last ten years the number of services that can be offered online has been growing rapidly and there is a growing awareness in banks of the importance of applications that can support these services.

Despite the conspicuous advantages of internet banking over traditional banking, internet banking has not been accepted in all countries by a sufficiently large number of users. This lagging behind in terms of the level of adoption of internet banking is especially pronounced in developing countries, such as Montenegro. This can be due to a number of factors, such as the perception of the security of transactions, the complexity of use of online services, failure to obtain the expected benefits, failure to meet social norms and so on.

Since managements of banks aim to create functional systems for online services, in order to achieve successful design and implementation, they should be well aware of the priorities in terms of user requirements.

In the studies conducted so far on adoption and diffusion of information and telecommunication technologies (ICT), several theoretical models were used for the identification of the factors and for measuring the degree of their impact on the level of adoption and use of online services. Sets of determinants which are the subject of such studies can be identified through the Social Cognitive Theory (SCT), the Expectation Confirmation Model (ECM), the Theory of Reasoned Action (TRA), the Innovation Diffusion Theory (IDT), the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB) and many other theoretical models.

Taking into consideration the focus of this study, the authors used an integrated model: the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB). Neither of the two models separately can explain the behavior of banks' clients and the reasons for their behavior regarding the use of online services, but these two models together can lead to quite comprehensive explanations.

An additional reason for choosing a combination of these two models is the fact that they have received a consistent empirical support in a growing body of research on ICT diffusion and adoption as well as on intentions of users to use the new systems and technology (Awa et al., 2015, 76-94; Gamal Aboelmage, 2010, 392-414; Hameed et al., 2012, 358-390).

As regards internet banking specifically, over the recent years a large number of studies has been conducted based on the integration of these two theoretical models (Nasri and Charfeddine, 2012, 1-14; Khanifar et al., 2012, 8072-8079; Safeena et al., 2013, 146).

Since the intention of this study was to develop a ranking of importance of the identified factors, we used the AHP method.

The AHP method has so far been successfully used to identify and predict user requirements regarding the use of ICT (Natarajan et al., 2010, 1-16; Zhang et al., 2012. 3611-3623; Lee and Kozar, 2006, 1383-1401), which led the authors to believe that it may prove suitable for a study of this type.

The study was conducted for the banks in Montenegro, where despite many positive developments in technical and organizational terms, we still cannot talk about an acceptable level of development of online banking and the use of its services. Therefore, the authors believe that the results of this research might help managers to understand the difference in terms of value creation in the physical and electronic environment. The conclusions of the study can offer inputs to marketing and IT experts which they might find useful in the future course of action in the field of internet banking, in terms of defining priorities when creating their online offer.

On the other hand, these results can be used for comparative analyses of the banking sectors of the countries which are at the same level of socio-economic and technical development, but also to compare the differences between developed and developing countries.

The paper is structured as follows:

The following section provides an overview of literature on internet banking and the justification for using the TAM and TPB models. It also presents the results of previous studies. The third section explains the research methodology, research tools and characteristics of the sample. The fourth section presents and discusses the obtained results. Finally, the authors offer conclusions and an overview of the theoretical and practical implications of the study. In addition, the final section features an overview of the limitations of the study and offers recommendations for future research in this field.

2. RELATED WORKS

One of the important criteria for measuring the success of a system based on ICT is the degree of its use and adoption.

For this reason, in a significant number of studies (Lee, 2009, 130-141; Kesharwani and Singh Bisht, 2012, 303-322), the TAM model was used as a conceptual framework for identifying the

factors that influence the adoption of internet banking (Davis, 1989,318-339). This model evolved as the result of the adaptation of the Teory of Reasoned Action-TRA (Fishbein, 1980). This model suggests that the level of use and adoption of the technology can be influenced if we know the perception of usefulness and the perception of the ease of use of the system.
The perception of usefulness is defined as the extent to which the user believes that the system will contribute to the realization of benefits, while the perception of the ease of use is defined as the degree to which the system will facilitate one's work (Davis et al., 1989, 318-339).
Since the decision on the degree of the use of the system is not influenced by personal perception only, the need arose to expand the list of determinants of the TAM model by the determinants of another model.
Hernandez and Mazzon (2007,72-88) combined the Innovation Diffusion Model and the TAM. Gounaris and Koritos (2008, 282-304) based their research on a combination of the TAM and the Perceived Characteristics of Innovation (PCI) model, while (Awa et al., 2010, 6(1),1) combined this model successfully with the TOE framework.
As regards research on internet banking, the most commonly used model alongside the TAM is the TPB model.
The TPB model sheds light on the three factors influencing a person's decision to use a system: (a) behavioral beliefs about the likely outcomes of the behavior and the evaluations of these outcomes; (B) normative beliefs about the normative expectations of others and the motivation to comply with these expectations; and (c) control beliefs about the resources and opportunities possessed (or not possessed) by the individual and also the anticipated obstacles or impediments toward performing the target behavior (Ajzen, 1991,179-211).
In the context of this study, the authors considered it unacceptable not to add the factor of risk perception to the factors included in the previously explained methods.
Security and privacy are important determinants of the adoption of online banking services (Zandhessami and Geranmayeh, 2014, 1369-1374; Nasri and Charfeddine, 2012,1-14).
While most previous studies used standard statistical methods for testing the importance of the defined determinants, in this study we opted for the AHP. Due to its flexibility, the AHP is widely applicable in the situations when a decision is to be made to solve problems with multiple criteria, when it is necessary to determine the importance or weight of a criterion and when it is necessary to make a ranking.
In addition, this model has found a foothold in many studies in the field of marketing, finance, management, etc.

3.RESEARCH METHODOLOGY, RESEARCH TOOLS AND CHARACTERISTICS OF THE SAMPLE

In accordance with the defined goal of the research, the major research question in this paper is: What is the weight of user expectations that influence the level of adoption and use of online banking services by customers, i.e., whether the ranking of these expectations might yield the results that would serve as an input in the management of IT resources?
As has already been pointed out, in order to find the answer to this question, the authors used one of the methods of multi-criteria decision-making: the Analytic Hierarchy Process (AHP).
A multi-criteria analysis or multi-criteria decision-making is decision making in situations where there are a number of usually conflicting criteria, which allows for solving real problems. There is a wide spectrum of problems that can be solved by using multi-criteria analysis, but all these problems have some common characteristics, such as: a larger number of criteria, a conflict between the criteria, incomparable units of measure for different criteria, a larger number of alternatives (solutions) to choose from and the process of selection of one final decision (which may be designing the best alternative or selecting the best alternative from a set of predefined final alternatives).

When solving a problem by using the AHP, the three components can be identified.
These are: decomposition, comparative judgment and synthesis of priorities.
When decomposing a system the elements of the hierarchy should be established, with the goal at the top, the criteria at the level bellow and the alternatives at the bottom of the hierarchical model.
In this paper, the goal was to rank the importance of user expectations from internet banking.
Since it was necessary to establish the criteria for the next level of the hierarchy, based on the literature review and the study of the TAM and TPB models and after eliminating the repated elements of these two models, while taking into account the safety and security of electronic transactions, the authors defined 6 determinants affecting the level of adoption of the services.
The set of these determinants comprises: the expected benefits, the ease of use of the system, the perception of risk, the possibility of self-organization and managing one's own resources, social norms and subjective attitudes.
The confirmation of the significance of studying these very factors was found in the research completed so far.
It is clear that the expected benefits can significantly influence the user's intention to use a certain online system (Lin and Chang, 2011,424-444; Wei et al., 2009,370-388), that complexity and complicatedness might discourage them (Morosan and Jeong, 2008, 284-292), and that the user will not use the service unless they are sure that they are guaranteed privacy and security (Zandhessami and Geranmayeh, 2014, 1369-1374).
Just as the subjective attitude influences the behavior and intention to use a specific system (Puschel et al., 2010, 389-409), so social norms, the attitude of the environment, pressure from friends, co-workers, the media, people in authority, etc., may influence future behavior (Aboelmaged and Gebba, 2013, 35-50
In addition, numerous studies (Lin and Chang, 2011, 424-444; Aboelmaged and Gebba, 2013, 35-50) confirm that the degree of use of online systems will always be greater if the user believes that thanks to the online systems they will increase the level of self-organization and management of their own resources: money, time, place, ...) in a manner and at a time that suits them.
At the bottom level of the hierarchy are alternatives, that is, banks operating in the banking system of Montenegro.
The second component of the problem is comparative assessment, which means that at every level of the hierarchy elements are compared pairwise. The goal of this phase is to obtain local criteria priorities, i.e, the weights of each of the observed criteria and alternatives depending on which level of the hierarchicy is observed. The preferences of the decision maker are expressed using a scale. In our model, a ratio scale (the Saaty Rating Scale) was used which has five levels and four intermediate levels of verbally described intensities and corresponding numerical values for them on the scale from 1 to 9 (Saaty, 1980, p.54). The Saaty's scale is shown in Table 1.

Table following on the next page

Table 1: The Saaty's scale (Saaty, 1980, p.54)

Intensity of Importance	Definition	Explanation
1	Equal Importance	Two activities contribute equally to the objective
2	Weak or slight	
3	Moderate importance	Experience and judgement slightly favour one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgement strongly favour one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favoured very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values	

The third component of the problem is to synthesize all the local priorities of the criteria and alternatives to yield a set of overall priorities for the hierarchy, that is, to obtain a ranking of alternatives.

For the purposes of this study, the authors used a survey. The data collection took place between September and December 2015. The respondents were clients of Montenegrin banks. Out of a total of 1,500 questionnaires sent, 775 were returned fully completed.

The authors used the integrated TAM and TPB models as the conceptual framework for defining the survey, while a 5-point Likert scale was used for the assessment of attitude.

The respondents were informed about the goal of the research and were asked to express their views on a scale from 1 (strongly disagree) to 5 (strongly agree).

The data obtained were first entered in an Excel spreadsheet, and then a table with the processed data was exported into Expert Choice software.

4. RESULT AND DISCUSSION

As already mentioned, six criteria were used in the analysis which influence the increase of the degree of adoption and use of internet banking in Montenegro. Using the TAM and TPB models, the authors defined the criteria and based on the processing of the surveys, the data were obtained that are shown in Table 2.

Table following on the next page

Table 2: Evaluation of users' views

Banks	Safety and security risks	Perception of benefits	Subjective attitudes	Social norms	Ease of use of the system	Self-organisation and the ability to manage their own resources
Bank 1	4.95	4.11	3.35	1.01	3.98	3.56
Bank 2	4.56	4.21	3.56	1.22	4.15	3.33
Bank 3	4.68	4.23	3.57	1.35	4.13	3.48
Bank 4	4.69	4.02	3.50	1.65	3.96	3.68
Bank 5	4.88	4.25	3.41	1.26	3.67	3.47
Bank 6	4.81	4.31	3.36	1.63	4.05	3.65
Bank 7	4.86	4.32	3.33	1.34	4.89	4.01
Bank 8	4.79	4.05	3.41	1.11	4.07	3.69
Bank 9	4.35	4.09	3.24	1.09	3.82	3.54
Bank 10	4.83	4.41	3.35	1.25	3.63	3.66
Bank 11	4.67	4.22	3.42	1.36	4.12	3.48
Bank 12	4.59	4.24	3.36	1.45	4.03	3.64
Bank 13	4.62	4.36	3.53	1.24	3.76	3.48

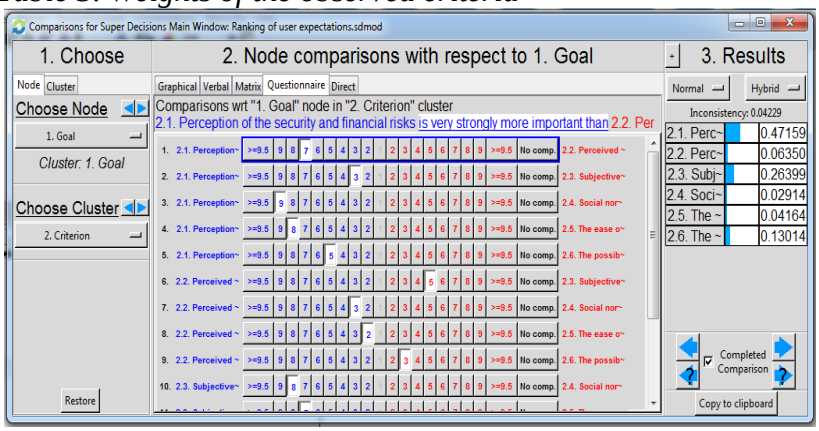
The obtained data were adjusted for further analysis through the AHP, and the weights of the observed criteria were obtained (Table 3).

The results show that the most important criterion for the adoption of internet banking is the perception of possible security and safety risks (0.47519). This result was expected and confirmed not only in many pioneering works (Booz et al., 1997; Sathye, 1999), but also in recent papers on the subject (Nasri, 2011,1-14; Zandhessami and Geranmayeh, 2014, 1369-1374).

However, both practice and theory show that troubleshooting the issue of vulnerabilities on a network proves often to be detrimental to the ease of use of the system. French (2015, 1-14) showed that clients do not mind if the measures taken to protect a system decrease the ease of use of the system. The results of our study confirmed the previous findings and in this case the ease of use of the system is at the bottom of the list of user expectations (0.04164).

This research has also shown that when individuals make decisions on the use of an e-banking system the weights of the subjective, i.e., personal attitudes of users (0.26399) are greater than those of social norms, and social incentives and pressures (0.02914). The rationale for these results should be sought in the fact that external incentives and pressures may be a significant determinant when making decisions to adopt an ICT innovation, but they cannot have an impact on the decision whether to continue using the system. In contrast, subjective attitudes influence both the adoption and the further use of the system, and, therefore, have a greater weight.
The result which comes as a surprise is that the criterion of self-organization and the ability to manage their own account (0.13014) carries more weight than the expected benefits (0.06350). This result was not expected having in mind the low purchasing power of the Montenegrin population. However, it can be justified by the fact that the clients in the sector of business-consumer (B2C) fall primarily into the category of the employed, better-off and highly educated, that is, those users who prefer comfort.

Table 3. Weights of the observed criteria



One of the characteristics of the AHP model is the possibility of assessing the level of consistency, as a measure of inconsistency in assessing the elements in the model. This means that the model can identify and analyze inconsistencies of decision-makers in the process of reasoning and evaluation of the elements of a hierarchy. If the level of consistency is less than 0.1, the result is sufficiently accurate and there is no need for adjustments in comparisons and the repetition of the caclulation.
In this paper, the level of consistency is 0.04229, which indicates that the model is well established and the errors in the estimates are very small.

5. CONCLUSION, PRACTICAL IMPLEMENTATION AND THEORY CONTRIBUTION

The paper used the AHP method to rank by importance the factors defined by the TAM and the TPB model. This integrated model was extended by the determinant which estimated the users' attitude towards the security and safety of transactions.

The results showed that, as regards the adoption and use of these technologies, the most important determinant is the perception of security of transactions. This means that the priority in defining the policy of online performance should be given to the activities of defining security policies and security measures and the issue of their implementation as well as the ways of dealing with safety and security concerns and sanctioning in case of violation of the pre-set goals in this domain.

Since the subjective attitude is the second most important determinant, the banks should do more to promote internet banking and thus influence the personal attitudes of their clients so as to persuade a greater number of them to move from the traditional to the electronic environment. The fact that the users give priority to self-organization and the ability to manage their own accounts over the expected benefits could be beneficial to the management of the banks if they want to expand the range of online services that can provide a higher level of so-called self-efficacy to their clients.

At the present moment, social norms exert very slight influence on the intended behaviour of the clients of Montenegrin banks. It is possible that the findings would be different if the level of adoption of internet banking was higher, which can certainly be investigated in some future research when internet banking in the country enters a more mature phase.

In theoretical terms, this paper contributed to the debate on e-banking adoption and diffusion and also supported the theoretical models based on which the factors to be ranked were identified.

In practical terms, the authors believe that the study yielded some useful information for managers of the banks, because thanks to the ranking of importance of the investigated factors, they might be able to define priorities when implementing the policies of their online presentation and operations.

The research encompassed all banks operating in Montenegro and the major limitation of this study is that the number of the banks, as compared to more developed market economies, is relatively small. Nevertheless, these findings may serve as useful input to a similar study to be done for other less developed countries.

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