ANALYSYS OF MOBILE BANKING IN EAST SERBIA

Radmila Janković
Mathematical Institute of the
Serbian Academy of Sciences and Arts
Kneza Mihaila 36, 11000 Belgrade, Serbia

Darko Brodić
Technical Faculty in Bor
University of Belgrade
V.J. 12, 19210 Bor, Serbia

Abstract

Internet and mobile phones are technological components that represent a significant part of modern life, either in business or in private use. Today, many classic types of business operations are transformed into electronic or mobile variants. After electronic banking, which spreads due to the wide use of desktop and laptop computers, the banks found a way to transfer banking services to be used on mobile phones. Recently, the mobile banking has experienced a huge widespread and mass deployment. This study considers the impact of various factors on the use of mobile banking in East Serbia. The detailed analysis is followed by a discussion of the potential development directions concerning mobile banking in Serbia.

Keywords: demographic elements, m-banking, statistical analysis.

INTRODUCTION

Changes in business processes have led to the development of a new important technology, which includes easy to use and manipulate transactions as mobile banking. The purpose of mobile banking is that transactions and banking activities need to be performed: (i) quickly, (ii) easily, (iii) anywhere, and (iv) all the time (24/7). Hence, it is possible to pay bills or change currency from the comfort of home, office, on the move or from any other place. Accordingly, mobile banking allows people to perform bank transactions anytime and anywhere [1].

Donner and Tellez explain that the terms m-something like: (i) m-banking, (ii) m-payments, (iii) m-transfers, (iv) m-payments, and (v) m-finance refers collectively to a set of applications that enable people to use their mobile phones to: (i) manipulate their bank accounts, (ii) store value in an account linked to their handsets, (iii) transfer funds, or (iv) access credit or insurance products [2].

The users' trust is an essential variable for mobile banking service providers [1]. The banks need to provide customers with good arguments to establish trust and, in that way, to allow them practical, easy and secure use of mobile banking [3]. Various factors can affect mobile banking, such as: (i) geopolitical factors, (ii) economic factors, (iii) social factors, and (iv) technological factors. The complexity of the use of mobile banking services is reflected in the understanding of technology and innovation by their user. Essentially, the mobile banking is mainly prevalent in big cities. Still, the technology spreading allows distribution of its use also in rural areas, too.

Also, the target group of mobile banking services are predominantly young people, because of their technological literacy and wide-spreading of mobile phones use. To encourage further development and spreading of the mobile banking use, the banks need to embrace a stronger marketing approach. Also, the mobile banking popularity could be associated with the ability to launch a variety of financial services over a wider geographical area [4], [5].

This paper will give a broader picture of the current state of the mobile banking in the East Serbia. The current study is essential because the banks can increase adoption of the mobile banking and improve their services only if they understand the factors that affect user adoption of mobile banking services.

The paper is organized as follows. Section 2 explains the experiment. Section 3 shows the results of the experiment and makes discussion. The last section draws conclusions.

EXPERIMENT

The experiment consists of a two-part questionnaire. The first part includes the demographic questions that determine demographic characteristics of respondents and usage patterns in mobile banking. The second part is linked to the acceptance of mobile banking in East Serbia. Fig. 1 shows the questions that are adopted from previous research on mobile banking and adapted for this study.

Construct	Corresponding Items	Item Sources
Usefulness	(U1) I need to manage my account anytime anywhere. (U2) I need to transfer money anytime anywhere. (U3) The functions of mobile banking fully meet my payment needs. (U4) I often use mobile banking to make payments. (U5) I often use mobile banking to check my account. (U6) I have the necessary information to use mobile banking.	[6] [7]
Complexity	(C1) Mobile banking requires technical skills. (C2) Mobile banking can be frustrating.	[8]
Satisfaction	(S1) In helping complete my payment tasks, the functions of mobile banking are enough. (S2) Mobile banking lets me make payments more quickly. (S3) I feel mobile banking is useful. (S4) Using mobile banking is understandable.	[6] [7] [9]
Safety	(SF1) I am worried about my personal information when using the application for mobile banking. (SF2) I am worried that the PIN codes will end up in wrong hands.	[8] [9]

Fig. 1. *Constructs and corresponding items*

The survey consisted of 24 questions. The items were measured on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).

The scale items were translated to Serbian language. The target population of this study was adult user resident in East Serbia. Data was collected via an online survey on Google documents from April, 1 to April 15, 2016. A total of 158 responds were collected. Collected answers were checked for completeness, after which 150 responses remained as complete ones. These data represent an input for statistical analysis using SPSS program. The factor analysis was computed to determine which factors have the most impact on the mobile banking use in East Serbia.

RESULTS AND DISCUSSION

The demographic characteristics of 150 respondents who used mobile banking services are shown in Fig. 2.

Variable	Options	N	%
Gender	Male	46	30.7
	Female	104	69.3
Age	18-24	21	14
	25-29	44	29.3
	30-39	29	19.3
	40-49	42	28
	50-59	11	7.3
	Above 60	3	2
Education	High school	82	54.7
	Diploma	30	20
	Bachelor	26	17.3
	Master	11	7.3
	Ph.D	1	0.7
Occupation	Student	8	5.3
	Worker	88	58.7
	Unemployeed	52	34.7
	Retiree	2	1.3
Experience in using mobile banking	Less than 6 months	43	28.7
	6 to 12 months	68	45.3
	12 to 24 months	20	13.3
	More than 2 years	19	12.7
Monthly usage of mobile banking	1 to 5 times/month	71	47.3
	6 to 10 times/month	49	32.7
	11 to 20 times/month	20	13.3
	More than 20 times/month	10	6.7
Name of the bank that users have an account in	Telenor Banka	41	27.3
	Banka Intesa	34	22.7
	AIK Banka	32	21.3
	Alpha Banka	6	4
	Komercijalna Banka	33	22
	Other	4	2.7
Which OS users have on their phones	Android	130	86.7
	Windows	7	4.7
	iOS	13	8.7
How would users rate their satisfaction with the mobile banking services	Very dissatisfied	0	0
	Dissatisfied	0	0
	Neither satisfied nor dissatisfied	69	46
	Somewhat satisfied	64	42.7
	Very satisfied	17	11.3
What do users think it's the best that the application contains?	Fingerprint scanning	37	24.7
	Iris scanning	34	22.7
	Face detection	29	19.3
	None of the above	50	33.3

Fig. 2. *Demographic characteristics of respondents*

30.7% of participants are male, while the rest 69.3% participants are female. The large part of users are relatively young – 29.3% are aged between 25 and 29 years. Approximately 59% of mobile banking users are workers.

Most users – 45.3% of them, are using mobile banking from six to twelve months; while the monthly usage of this service ranges mostly between 1 to 5 times per month; 27.3 % of the users have a mobile banking account in Telenor Banka. Most users are using 24.7% of respondents answered they would like fingerprint scanning, 22.7% answered iris scanning, 19.3% said face detection, while 33.3% agreed with none of the above. The most interesting is satisfaction with mobile banking services – none of the respondents are very dissatisfied or dissatisfied with the service, while most of them – 46% are neither satisfied nor dissatisfied and 42.7% said they are somewhat satisfied with the mobile banking services.

The items from this study were tested for reliability. Using Cronbach's Alpha, internal consistency was computed. It is shown in Table 1.

Table 1. Cronbach's Alpha

Dimension	No of items	Chronbach's Alpha
Usefulness	6	0.902
Complexity	2	0.702
Dissatisfaction	4	0.870
Safety	2	0.856

The coefficient ranged from 0.702 (acceptable level) to 0.902 (excellent). All coefficients are above the value of 0.6, which indicates that all items in this study are reliable measures [10].

Next, factor analysis was performed to determine relevant factors that influence the usage of mobile banking in East Serbia. Principal Component Analysis with Oblimin Rotation with Kaiser Normalization was conducted to determine the structure of items regarding the usage of mobile banking.

First, the Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy were used to validate factor analysis. Table 2 shows the results.

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.809
Bartlett's Test of Sphericity	Approx. Chi-Square	1770.935
	df	91
	Sig.	.000

Table 2 indicates that the value of KMO test is 0.809 so the sample is adequate and we can proceed with the Factor Analysis [11]. Bartlett's Test of Sphericity is highly significant, because p < 0.001, so factor analysis can be conducted [11]. Since p < α we reject the H0 hypothesis and accept the H1 hypothesis that there may be statistically significant relationship between variables.

Based on eigenvalues, the first four factors are meaningful as they have Eigenvalues higher than 1. Factors 1, 2, 3 and 4 explain 50.22%, 11.91%, 10.58% and 7.81% of the variance respectively. Therefore, 80.52% of the variance in our items was explained by the four extracted components. Table 3 shows these results.

Table 3. Eigenvalues

	λ [a]	A [b]	B [c]
1	7.031	50.219	50.219
2	1.667	11.909	62.128
3	1.480	10.574	72.702
4	1.094	7.814	80.516

[a] eigenvalue
[b] Percentage of variance
[c] Cumulative %

Fig. 3 shows the Rotated Component Matrix, which are the factor loadings for each variable. Based on factor analysis, it can be observed that there are four factors that influence the usage of mobile banking systems in Serbia: (i) Usefulness, (ii) Complexity, (iii) Dissatisfaction, and (iv) Safety. Mobile banking users need to manage their accounts anytime and anywhere, they think mobile banking can be frustrating and requires technical skills, and are very worried about their personal information when using mobile banking. It is worth noting that Fig. 3 gives the factors and their corresponding items, which is of great importance.

CONCLUSION

This study has identified the factors that contribute to successful usage of mobile banking in East Serbia. The results indicated that customers have the need to manage their accounts anytime and anywhere, the functions of mobile banking need to fully meet their needs, and they need to transfer money anytime and anywhere. They agree that mobile

	1	2	3	4
I need to manage my account anytime anywhere. (U1)	0.948			
The functions of mobile banking fully meet my payment needs. (U2)	0.883			
In helping complete my payment tasks, the functions of mobile banking are enough. (S1)			-0.319	
I need to transfer money anytime anywhere. (U3)	0.711			
I often use mobile banking to make payments. (U4)	0.441			
Mobile banking requires technical skills. (C1)		0.879		
Using mobile banking can be frustrating. (C2)		0.862		
Mobile banking lets me make payments more quickly. (S2)			-0.956	
Using mobile banking is understandable. (S3)			-0.834	
I feel mobile banking is useful. (S4)			-0.784	
I often use mobile banking to check my account. (U5)	0.328			
I am worried about my personal information when using the application for mobile banking. (SF1)				0.858
I am worried that the PIN codes will end up in wrong hands. (SF2)				0.782
I have the necessary information to use mobile banking. (U6)	0.307			

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Fig. 3. *Component matrix*

banking requires technical skills and can be frustrating sometimes. They can be dissatisfied with mobile banking if they cannot make payments more quickly, if they don't understand mobile banking or if they don't find mobile banking useful. Security also represents an issue. The users of mobile banking are worried about their personal information when using mobile banking and about their PIN codes. Consequently, four factors were found: usefulness, complexity, dissatisfaction and safety.

ACKNOWLEDGEMENT

REFERENCE

[1] T. Zhou, Understanding users' initial trust in mobile banking: an elaboration likelihood perspective, Computers in Human Behavior, pp. 1518-1525, 2012.

[2] J. Donner and C. Telles, Mobile banking and economic development: Linking adoption, impact and use, Asian Journal of Communication, 18(4), pp. 318-322, 2008.

[3] R. Malaquias and Y. Hwang, An empirical study on trust in mobile banking: A developing country perspective, Computers in Human Behavior, 54, pp. 453-461, 2016.

[4] A. Alalwan, Y. Dwivedi, N. Rana and M. Williams, Consumer adoption of mobile banking in Jordan, Journal of Enterprise Information Management, 29(1), pp. 118-139, 2016.

[5] L. Wessels and J. Drennan, An investigation of consumer acceptance of m-banking, International Journal of Bank Marketing, том 28(7), pp. 547-568, 2010.

[6] T. Zhou, Y. Lu and B. Wang, Integrating TTF and UTAUT to explain mobile banking user adoption, Computers in Human Behavior, 26(4), pp. 760-767, 2010.

[7] V. Venkatesh, M. Morris, G. Davis and F. Davis, User acceptance of information technology: Toward a unified view, MIS quarterly, pp. 425-478, 2003.

[8] Al-Jabri, I. M., & Sohail, M. S. (2012). Mobile banking adoption: Application of diffusion of innovation theory.

[9] P. Cruz and T. M. P. Luakkanen, Exploring the factors behind the resistance to mobile banking in Portugal, International Journal of E-Services and Mobile Applications, 1(4), pp. 16-35, 2009.

[10] J. Nunnally and I. Bernstein, Psychometric theory, 3rd ed., New York: McGrawHill, 1994.

[11] G. Morgan, K. Barrett and N. Leech, IBM SPSS For Intermediate Statistics: Use and Interpretation, New York: Taylor & Fransis group, 2011.