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ANALYSIS OF USERS' ATTITUDES TOWARDS THE USE OF MOBILE TECHNOLOGIES IN REPUBLIC OF SERBIA

Abstract: The increasing use of mobile devices and wireless internet connections has led to their utilization, not only for communication purposes, but also for various other activities, such as mobile commerce (m-commerce). Contemporary trends have enabled m-commerce to become a business model with the potential to transform entire industries. Alongside technological advancements, there is an evolution of models explaining consumer behavior in the domain of technology acceptance. The original TAM model and its extensions, although providing useful insights, do not encompass all relevant determinants, prompting practitioners to increasingly turn to more contemporary models in order to understand the acceptance and usage of mobile technologies in today's digital environment. UTAUT2 model is considered an improved version of the original UTAUT model, making it one of the most used models. Considering the above-mentioned, the research aims to measure users' attitudes towards various aspects of mobile commerce usage. In this context, consumers' attitudes towards performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, and habit in using m-commerce will be examined. Additionally, the aim of the study is to analyze the attitudes of different consumer segments, based on two criteria - gender and age. The sample consists of 210 respondents. The research was conducted in the territory of Central Serbia, from April to May 2023. Descriptive statistical analysis, reliability analysis, and t test for two independent samples were applied in the research. The research findings can be useful to mobile commerce service providers in adjusting loyalty programs to different segments, providing added value, and shaping the overall user experience that appeals to various consumer segments. Given that previous research, especially in domestic literature, has been based on some of the previously established models such as TAM or UTAUT, the originality of this study lies in the use of the contemporary UTAUT2 model. Additionally, the originality is contributed by the comparative analysis of different segments of m-commerce service users.

Keywords: mobile commerce, UTAUT2, performance expectancy, effort expectancy

1. INTRODUCTION

The eighties are widely recognized as the era when personal computers gained prominence, followed by the nineties which saw the emergence of the internet and e-commerce. The early 21st century witnessed the ascent of mobile computing and mobile commerce. Mobile commerce, or m-commerce, specifically refers to financial transactions conducted via mobile networks, while in a broader sense, it encompasses all applications and services supported by mobile devices and networks (Urbaczewski et al., 2003). Today, with the ubiquity of mobile devices and wireless internet connections, m-commerce is reshaping industries and becoming a prevalent mode of conducting business (Chong, 2013).

Presently, nearly 7 billion individuals own smartphones, roughly accounting for 80% of the global population. The popularity of e-commerce as a method for purchasing goods and services is on the rise among the citizens of the Republic of Serbia. There is an undeniable increase in the number of internet users in the country day by day. This trend

is expected, considering that owning a smartphone is nearly obligatory nowadays, and the previous barriers to its usage, whether financial or technical, have largely disappeared (MasIT, 2021). The mobile phone usage in Serbia stands at 95.5% and continues to rise, with the elderly population being the primary demographic without mobile devices. Serbia surpasses the global average in terms of mobile device ownership, boasting a penetration rate of 123.9%, meaning there are 123 mobile devices per hundred inhabitants (Statistical Office of the Republic of Serbia, 2022), with the elderly population being the main demographic lacking mobile devices.

The largest e-commerce markets include China (52%), the USA (12%), the United Kingdom (4.8%), and Japan (3%) (Business.com). Serbia reflects these global e-commerce trends, with experts forecasting over 20% growth in internet shoppers. Presently, around four million consumers in Serbia make online purchases, indicating significant potential for e-commerce development (PlutonLogistics). According to the Statistical Office of the Republic of Serbia (2023), 42.3% of users bought a product online in the last three months, while 39% of the population has never engaged in online purchases. Globally, 79% of smartphone users have made purchases through their mobile devices, and it is projected that mobile commerce will constitute 42.9% of total e-commerce (Oberlo, 2022; eMarketer, 2023).

Use and adoption-related issues have been continually scrutinized because the new technologies are developing constantly and finding their place both in society and organization, finding their roles within society and organizations, and the persistent high failure rate of information systems (Dwivedi et al., 2015). Understanding the adoption of new technologies is complex and influenced by various factors. Studies, particularly those related to mobile commerce adoption, often employ intention-based models rooted in cognitive psychology. One such contemporary model is the UTAUT 2 model (Unified Theory of Acceptance and Use of Technology) (Venkatesh, 2013), which forms the basis of this paper.

The significance of the UTAUT 2 model is indicated by a large number of studies in the field of m-commerce (Farzin et al. 2021; Kalinić et al. 2019; Shaw & Sergueeva, 2019; Chimborazo et al. 2021), e-commerce (Zhou et al. 2021; Dutta & Shivani, 2020) and m-banking (Farzin et al. 2021; Alalwan et al. 2017; Alalwan et al. 2018).

Given the significance of mobile commerce in the contemporary environment, the aim of the paper is to measure users' attitudes towards the use of mobile commerce. Within this framework, consumers' attitudes towards performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, and habit in using m-commerce will be examined. Furthermore, the aim of the study is to analyze the attitudes of different consumer segments, based on two criteria - gender and age. The sample consists of 210 respondents. The research was conducted in the territory of Central Serbia, from April to May 2023. Descriptive statistical analysis, reliability analysis, and t test for two independent samples were applied in the research process.

The paper is structured into several parts. After the introductory section, the second part of the paper covers the evolutionary development of the technology acceptance model, with a focus on the UTAUT2 model. The third part of the paper includes an explanation of the research methodology used, while the fourth part presents the results of the conducted research. The conclusion discusses the theoretical and practical implications and highlights the limitations and directions for further research.

2. TECHNOLOGY ACCEPTANCE MODELS

Due to consistent effort to understand issues related to adoption and diffusion, numerous theories have been developed, adapted or adopted in modern literature to describe acceptance and use of technology in several contexts (Morosan, 2014; Dwivedi, et al. 2015). One of the most commonly used models in research is the Technology Acceptance Model (TAM), introduced by Davis and colleagues (Davis, 1989; Davis et al. 1989), which is based on the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980). The TAM model is employed to model the acceptance of information systems by users. The primary goal of this model is to track the influence of external factors on internal beliefs. According to TAM, two key determinants - perceived usefulness and ease of use - are of paramount importance for the acceptance of a new system or technology, defined as the feeling of favorability or unfavorability (Min, Ji & Qu, 2008).

While TAM has been extensively employed in early studies, it possesses inherent limitations, notably its inability to comprehensively explain the adoption and utilization of mobile technology (Molina-Castillo, López-Nicolás & Bouwman, 2008). Moreover, the model accounts for only 40% of the variance in information system usage and overlooks several crucial factors pivotal in technology acceptance (Chong, 2013).

The technology acceptance model (TAM) serves as the basis (Bakhsh et al., 2017) for later versions (TAM 2 and TAM 3) (Venkatesh & Davis, 2000; Venkatesh & Bala, 2007), which extend TAM by incorporating numerous variables to explain perceived usefulness (e.g. image, job relevance and subjective norm) and perceived ease of use (e.g. computer anxiety, self-efficacy and playfulness), respectively (Pipitwanichakarn, & Wongtada, 2019).

Venkatesh (2003) presented the Unified Theory of Acceptance and Use of Technology (UTAUT) model, aiming to provide a more nuanced understanding of technology adoption by merging eight theories in this domain. Where performance expectancy posits benefits to a user of using a technology, effort expectancy posits the ease to use the technology by a user, social influence posits the significance of people (such as friends and relatives) who are important to a user while using a technology and facilitating conditions refer to the resources and support system accessible to a user using a technology (Chhonker et al. 2017). The theory also provides the four moderators namely: age, gender, experience and voluntariness of use (Venkatesh, 2003). The UTAUT approach is particularly valuable for two reasons.

Firstly, it consolidates theoretically and empirically relevant variables from various models to describe users' acceptance (Venkatesh et al., 2003). Secondly, it offers flexibility in conceptualizing mobile commerce acceptance by incorporating additional factors into the technology acceptance framework (Hino, 2015). Despite providing a detailed explanation of technology acceptance and use, even the UTAUT model has its limitations (Negahban & Chung, 2014). In response, Venkatesh et al. (2012) proposed the Extended Unified Theory of Acceptance and Use of Technology – UTAUT 2. This model introduces seven variables, expanding upon the original UTAUT model (Venkatesh et al., 2003) to include hedonic motivation, price value, and habit. By integrating these factors, the model became more consumer-oriented compared to UTAUT (Tak & Panawar). Price value holds significance for consumers in service usage, habit plays a fundamental role in the adoption of new technology based on prior research, and hedonic value has been extensively examined in previous studies (Kim & Malhotra, 2005), as emotions such as enjoyment and satisfaction play a part in the process of adopting new technologies (Kulviwat, 2009). In compare to UTUAT, UTAUT2 have shown a considerable change in variance, as variance explained in behavioral intention improved from 56% to 74% and variance explained in technology use improved from 40% to 52% (Chang, 2012). Taking all of the above into account, the UTAUT2 model has become the benchmark in technology acceptance (AlAwadhi & Morris, 2008; Imtiaz, 2018).

3. RESEARCH METHODOLOGY AND SAMPLE STRUCTURE

The research was conducted in the territory of Central Serbia from May 5th to May 15th, 2023. The sample consisted of 210 participants, segmented based on: gender, age, level of education, employment status, and income level. The research was conducted electronically via a Google Form survey. Respondents expressed their level of agreement with statements on a five-point Likert scale ((ranging from 1 - strongly disagree to 5 - strongly agree). The questionnaire included 25 statements, sourced from relevant studies, grouped into 7 factors. To ensure representativeness, the sample's gender and employment distributions roughly mirrored those used in the Statistical Office of the Republic of Serbia's analysis of mobile commerce users (2022). Out of the 210 respondents, 53,81% are female and 46,19% are male. Respondents are predominantly aged 18 to 24 (35.71%), with monthly earnings ranging from 40,000 to 80,000 RSD (36.67%). Regarding educational background, the highest proportion of respondents held a university degree (44.76%). Data processing was conducted using the statistical software SPSS v20. The software was used to carry out appropriate statistical analyses. First, measures of descriptive statistics (mean and standard deviation) were employed to determine the favorability and homogeneity of respondents' attitudes regarding the statements from the questionnaire. The reliability of research variables was determined through reliability analysis.

4. RESEARCH RESULTS

Based on the results of descriptive statistics presented in Table 1, it can be concluded that there is the highest degree of agreement regarding the statement: "Mobile commerce is easy to use" (highest mean value - 4.25), and the lowest when it comes to the statement: "I am one of the first to try mobile commerce" (lowest mean value - 3.08). Respondents' attitudes are most homogeneous for the statement "Mobile commerce systems deliver on their promises." (lowest standard deviation value - 0.94), and most heterogeneous in the case of the statements "Mobile commerce is useful to me in everyday life" and "Using mobile commerce helps me quickly complete transactions" (highest standard deviation value for both statements - 1.24).

Table 1: Results of descriptive statistical analysis

Statements	Mean	SD
1. Mobile commerce is useful to me in everyday life.	3.87	1.24
2. Using mobile commerce helps me quickly complete transactions.	4.09	1.24
3. Using mobile commerce enhances my productivity.	3.81	1.22
4. It is easy to learn how to use mobile commerce.	4.24	1.04
5. Mobile commerce is easy to use.	4.25	1.05
6. The use of mobile commerce is clear and understandable.	4.15	1.04
7. Skills in using mobile commerce are easily acquired.	4.20	1.02
8. People who influence my behavior think I should continue to use mobile commerce.	3.63	1.15
9. My friends think I should continue to use mobile commerce.	3.76	1.08
10. Mass media influences me to use mobile commerce.	3.36	1.29
11. I have the resources necessary to use mobile commerce.	4.20	1.10
12. I have the knowledge necessary to use mobile commerce.	4.17	1.12
13. Using mobile commerce is compatible with other technologies I use.	4.12	1.04
14. I can rely on others' help when I have difficulty using mobile commerce.	4.02	1.01
15. I trust mobile commerce systems.	3.83	0.97

16. Mobile commerce systems provide services in my interest.	3.99	0.96
17. Mobile commerce systems deliver on their promises.	4.04	0.95
18. Information provided through mobile commerce systems is reliable.	3.86	1.05
19. I am one of the first to try mobile commerce.	3.08	1.38
20. I like to try new technologies.	3.82	1.23
21. I enjoy learning about new technologies.	3.89	1.20
22. Friends often ask me for advice on using new technologies.	3.53	1.30

Source: Authors' research

In order to determine customers' attitudes, the statements were grouped into factors based on similarity, followed by a reliability analysis, as shown in Table 2. Based on the values of the Cronbach's alpha coefficient, it can be concluded that all factors are reliable, as the coefficient value for each factor exceeds 0.7 (Nunnally, 1978). The highest degree of internal consistency of statements is observed in the "Effort Expectancy" factor (highest Cronbach's alpha coefficient value - 0.957), while the lowest degree of internal consistency occurs in the case of the "Social Influence" factor (lowest Cronbach's alpha coefficient value - 0.837).

Table 2: Reliability analysis

Factors	Mean	SD	Cronbach's alpha
Performance expectancy	3.92	1.13	0.906
Effort expectancy	4.21	0.98	0.957
Social influence	3.58	1.02	0.837
Facilitating conditions	4.13	0.88	0.839
Hedonic motivation	3.73	1.03	0.913
Price value	3.91	0.88	0.895
Habit	3.32	1.13	0.833

Source: Authors` research

To ascertain if there are statistically significant differences in respondents' attitudes regarding the given variables, an independent samples t test for two independent samples was conducted. The criterion by which respondents' attitudes were grouped is their gender and age.

Table 3: T test for Two Independent Samples

Factors	Sig.	Mean	St. deviation	Gender
Performance expectancy	0.051	3.970	0.096	female
		3.856	0.131	male
Effort expectancy	0.09	4.344	0.077	female
		4.028	0.118	male

Source: Authors` research

Based on the results of the analysis shown in Table 3, a statistically significant difference exists in respondents' attitudes concerning two factors: Performance expectancy ($p = 0.051 < 0.1$) and Effort expectancy ($p = 0.09 < 0.1$). In both instances, the attitudes of female respondents were notably more favorable, as indicated by the mean values.

Table 4: T test for Two Independent Samples

Factors	Sig.	Mean	St. deviation	Gender
Performance expectancy	0.096	3.946	1.069	younger
		3.885	1.233	older
Effort expectancy	0.026	4.295	0.872	younger
		4.080	1.120	older

*Younger respondents (18-45 years of age); older respondents (45 and older)

Source: Authors` research

When it comes to respondents' age, based on the results of the t test for two independent samples shown in Table 4, a statistically significant difference exists in respondents' attitudes concerning two factors: Performance expectancy ($p = 0.096 < 0.1$) and Effort expectancy ($p = 0.026 < 0.1$), where in both cases (considering the mean value), the attitudes younger employees are more favorable.

5. CONCLUSION

Undoubtedly, today all forms of electronic commerce are becoming increasingly popular and slowly threatening to surpass traditional shopping methods. With the growing use of mobile devices, mobile commerce is becoming the preferred means of conducting electronic transactions. Presently, the popularity of e-commerce is increasing among the citizens of the Republic of Serbia as the number of internet users continues to grow steadily. The widespread use of smartphones contributes to this trend, as owning a smartphone is almost mandatory nowadays, with previous barriers to usage largely disappearing. In line with these rising trends, there is an evolution of models that explain consumer behavior in the realm of adopting new technologies. One of the most commonly used models, emerging as a result of integrating numerous preceding ones, is the UTAUT2 model, which became the benchmark in technology acceptance. Besides traditional models, the UTAUT 2 model stands out, which, unlike the previous ones, includes the highest number of variables and primarily focuses on consumers. This ensures a more comprehensive understanding of user behavior and attitudes in mobile commerce contexts.

The paper aims to examine consumers' attitudes towards performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, and habit in using m-commerce. Additionally, the aim of the study is to analyze the attitudes of different consumer segments, based on two criteria - gender and age. What sets this paper apart is its utilization of the UTAUT 2 model, known for its contemporary relevance and broader scope, incorporating additional variables compared to the traditional UTAUT or TAM models.

The conducted research has the following theoretical and practical implications. Primarily, it enables the expansion of existing knowledge regarding users' attitudes towards mobile commerce usage. The contribution of the conducted research is reflected in the following practical implications. Considering that respondents' attitudes are least favorable when it comes to the habit of using mobile commerce, it is important to transform occasional usage of mobile commerce into a habit. This can be achieved through loyalty programs where certain benefits apply only for purchases made through the installed application on the phone, thereby stimulating consumers to use mobile commerce more regularly compared to traditional shopping. Social influence can be particularly encouraged in the initial stages of adopting new technologies when users lack personal experience and rely on the opinions of others. To encourage users to use mobile commerce more, it is desirable to promote positive word-of-mouth from friends and acquaintances. Users' attitudes towards importance of hedonic motivation can be increased through their involvement in the product presentation process (e.g., a special section on the page that pulls images from social media platforms where the user tagged the company). When it comes to price value, the consumers' attitudes companies can offer free delivery, loyal customer discounts, and loyalty programs to boost purchases, along with personalized offers and early access to discounted products. In order to improve positive attitudes towards perceived performance of m-commerce services, companies could emphasize the benefits of mobile commerce compared to other types of commerce through extensive marketing efforts. Facilitating conditions, crucial for user satisfaction, involve necessary knowledge, resources, and compatibility with existing technologies. M-commerce service providers should offer user-friendly software that integrates seamlessly with other solutions. The most positive attitudes of users occur when it comes to effort expectancy in using mobile commerce technologies. However, considering their influence on usage intention, it is possible to further facilitate usage by providing text or video instructions for performing mobile commerce, which will enable users to more easily master the use of this technology.

Based on the obtained results, it can be concluded that there are differences in attitudes between men and women regarding performance expectancy and effort expectancy. To improve male attitudes towards performance expectancy end effort expectancy it is possible to highlight the advantages of using mobile commerce through campaigns that explain the benefits and functionalities of m-commerce platforms with a focus on simplified purchasing of products/services commonly used by men.

When it comes to the attitudes of respondents belonging to different age groups, it can be concluded that younger participants exhibit more positive attitudes compared to older ones. The obtained results are consistent with the fact that despite the growing number of mobile device users, the least represented segment consists of older users. Comparing traditional shopping with mobile shopping by providing detailed instructions, as well as offering benefits for retirees, can contribute to more positive attitudes among older users. The conducted research has several limitations. The primary limitation stems from the size and structure of the sample, which is not sufficiently representative, as the study was conducted only in the territory of Central Serbia and includes a relatively small number of participants. Second, the study included only the variables of the UTAUT 2 model. Therefore, future research could include one or more dependent variables such as the intention of future use, or customer satisfaction or loyalty in order to determine their behavior. Future research could also involve participants from neighboring countries to compare with this study. Additionally, it is possible to use more segmentation criteria such as level of income or educational background.

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