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# **A general overview of usage of smartphones and mobile applications by young consumers in Poland, Croatia and Serbia**

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## **Abstract:**

Emergence of smartphones with strong wireless networking capabilities has set the field for foundation of a various mobile commerce services. The improving access to wireless communication technologies is bringing mobile commerce to the focus of marketers and retailers as a new marketing and retail channel in the context of multichannel retailing. Research studies deal with the level of adoption and factors influencing adoption of mobile commerce within various groups of consumers in different markets. However, there is a scarcity of research studies explaining level of mobile commerce adoption in Central and Eastern Europe. The main goals of the paper are to explain the level of adoption in three countries in this region and to describe patterns of usage of smartphones and mobile applications as shopping tools within the population of young consumers in those markets. This paper, based on secondary data, explains the state of the art of smartphone usage in Poland, Croatia and Serbia. Furthermore, based on a primary quantitative survey on student population, the paper brings valuable data on smartphone and mobile application among young customers in mentioned markets. The primary research was conducted on more than 450 examinees in Poland, Croatia and Serbia and in this paper basic descriptive statistical analysis was conducted in order to discuss types of activities and some basics characteristics of young consumers regarding mobile commerce in general.

**Keywords:** mobile commerce, smartphones, mobile applications, Central and Eastern Europe, millennials  
**JEL codes:** L8, L81, L86, M31, M15

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## 1. INTRODUCTION

Smartphones created its users opportunity to be online every time and everywhere. This tool delivers them much more satisfaction than any PC or tablets previously- they let satisfy a different types of needs: to be closer with other people, to entertain, to educate or develop social and cultural life every moment users want. Access to all offered through this type of mobile devices products and services created new opportunities for telecommunications companies and communication services. As a result telecommunication infrastructure in developing countries grew respectively in last decade. This provided new possibilities to marketers and retailers who started to redefine their communication and approach with potential and existing customers (see Yadav et al, 2016).

Smartphones generate tremendous flow of data, contributing to the big data phenomenon (McAfee and Brynjolfsson, 2012). In addition, marketers can reach student population through smartphones. Placing information about the products and services online is the key for success for many retailers even in the situation when customers are not willing to buy online. Omni channel strategy become dominant in the last several years and its significance will grow in the future.

There are numerous studies dealing with technological aspect of mobile commerce (for instance: Lembke, 2002, Lee et al, 2007, Chong, 2013), in addition a bunch of studies explains adoption and behavioral aspects of mobile commerce in various consumer groups and various countries (for instance: Choi et al., 2008, Chan et al, 2013, Hamkaa F., Bouvman H., de Reuvera M., Kroesena M., 2014, Thakur, Srivastava, 2013; Kucharska 2015; Molina-Castillo, López-Nicolas, Bouvman 2008 ). However, there is a scarcity of comparative studies of various aspects of mobile commerce across countries, especially in post-communist markets, except few examples which touched the problem of usage of smartphones in that part of the world (Ponder and Markova 2002 ). Lovreta, Stojkovic (2014) and Sojkovic et al. (2016) explain the role and position of electronic commerce in multichannel strategy of retail chains in Serbia, but they are not dealing with mobile commerce as a channel which is bringing new challenges and potentials to the retail market. Knezevic et al (2014) explain how students are using Internet as a source of purchasing information not addressing the issue of mobile commerce usage in Croatia. But Knezevic et al (2015) have dealt with potential of smartphones and mobile applications as shopping tools in Croatia, while Duzevic et al (2016) explained loyalty factors of mobile commerce in young customers' population. Up to our knowledge there is no study explaining phenomenon by comparing more Central and Eastern European countries. There are also few examples of research in Poland – the authors analyzed the attitude of customers toward m-commerce and types of opportunities it creates for companies (Frąckiewicz 2015; Lewicki 2015; Borusiak and Szymkowiak 2014).

Some researchers concentrate on the attitude of younger customers. The generation Y differs from the older generation because it is technologically highly aware and willing to use digital tools in all spheres of life (Howe and Strauss 2001; Worley

2011; Archana and Heejin, 2008; Lazarevic, 2012; Rahman and Azar, 2011), thus it is worthwhile to research how students, as a waste part of generation Y, are using wireless technologies in everyday life and as a source of purchasing information. Kumar and Lim discovered that the mobile service quality attributes are important to Generation Y users and baby boomers, but their study also showed significant differences between the two groups in terms of the effects of perceived economic and emotional value on satisfaction (2008). There are still some gaps in knowledge on so called Millennials and their attitude and shopping behaviour toward m-commerce.

As a result the primary research was design to answer following research questions:

1. Do young consumers in Central and Eastern Europe express characteristics of “handset generation” as described by Turban et al (2012, p. 279)?
2. What is the pattern of their activities regarding mobile applications?
3. Is culture of freebies present among young consumers in Central and Eastern Europe?
4. Do young consumers use mobile commerce for shopping?

Those questions results from limited knowledge on young customers from Eastern Europe who use smartphones. But as the same time the market of m-commerce is still growing and has high dynamics of growth so the aim of the authors is to check if the description of Turban et al (2012, p. 279) fits to young consumers from other countries.

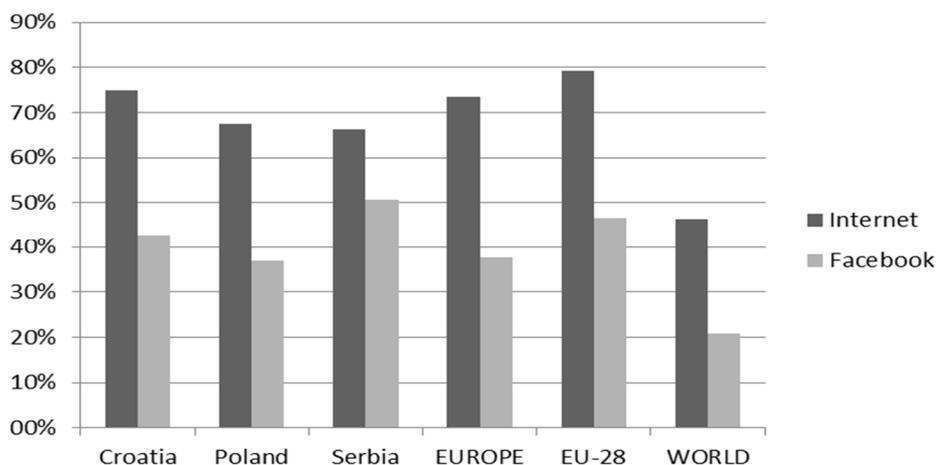
More than 450 students from Poland, Croatia and Serbia took part in this research and research was taken anonymously in written form and online in the controlled environment. For the purpose of this paper simple descriptive statistical analysis was conducted. Descriptive statistical methods were applied to describe the structure of the sample and attitudes on the sample level, and data was scrutinized and discussed among countries as well.

The paper is divided in two main parts. In the first part definitions and main characteristics of mobile commerce are given together with the state of the art regarding Internet and smartphone (as primary mobile device) usage in Poland, Croatia and Serbia is described. In second part primary research is described starting from methodology and sample description towards discussion of results. Discussion of results includes following topics (a) Young consumers in Central and Eastern Europe as “handset generation”, (b) Patterns of young customers activities regarding mobile applications, (c) the culture of freebies and (d) usage of smartphones as shopping tools.

## **2. DEFINITION OF MOBILE COMMERCE AND ADOPTION OF INTERNET AND SMARTPHONES IN POLAND, CROATIA AND SERBIA**

Chaffey (2007, p. 132) defines mobile commerce as electronic transactions and communications conducted by using different mobile devices and typically with a wireless connection. Even though, mobile commerce is considered as a relatively new phenomenon (Yadav et al, 2016) fully enabled throughout wireless technology and handheld devices such as PDAs (personal digital assistants), palmtop computers and mobile phones, Chaffey (2007, p.132) states that mobile technologies are not only technology that enables mobile commerce because, for many years it was possible to

access to networks via laptop and modems from locations outside company. But, Laundon and Traver (2007, p. 84) emphasize wireless as the main characteristic of mobile commerce and they claim that the major advantage of m-commerce is possibility to access Internet by anyone, from anywhere using wireless devices. Similarly, Turban et al (2008, p. 8) define mobile commerce as electronic commerce transactions and activities conducted in full or in part in a wireless environment. Another important emphasis was made by Laundon and Traver (2007, p. 17) who claim that conducted transactions are commercial in their nature. M-commerce is often considered as an extension of e-commerce eco-system which is extended by wireless technology and mobile devices application (Zhang et al, 2012). Therefore, the first approximation of e-commerce and m-commerce potential of the mobile commerce can be based on penetration rate of Internet and Facebook. In Figure 1 data are shown for Croatia, Poland and Serbia together with average rates in Europe, European Union (EU-28) and for World. According Figure 1, in Croatia 75% of population use Internet, in Poland 67,5%, and in Serbia 66,2%. Regarding social networks, in Croatia 42,6% of population uses Facebook, in Poland 36,8% and in Serbia 50,6%.



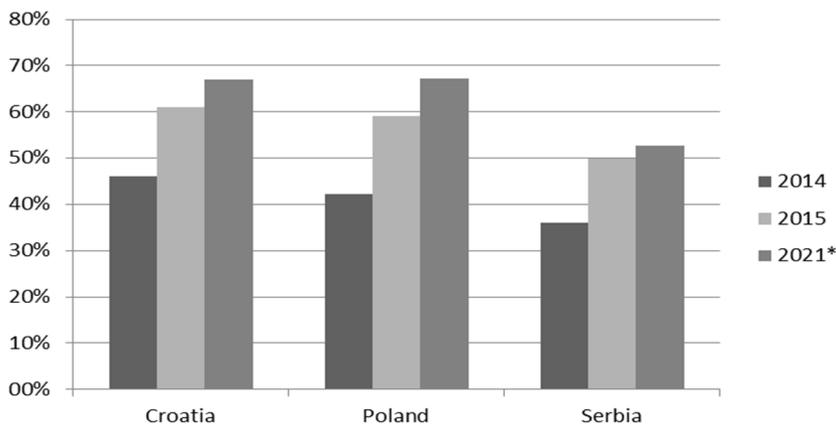
**Figure 1.** Internet and Facebook usage in total population

Source: own compilation according to <http://www.internetworldstats.com/stats9.htm> (accessed on 27th September 2016).

However, as it can be observed, all three countries are significantly above world averages, but when we make comparison with European or EU averages the situation is different. Croatian Internet penetration rate (75%) is in line with the European average (73,5%), but below EU-28 average (79,3%). Only data for Facebook usage in Serbia (50,6%) is above both European averages (Europe 37,7%; EU-28 46,5%). All other indicators for all three countries are below European averages. Therefore, we can conclude that situation can be improved in the near future.

Another important indicator, when discussing mobile commerce potential, is the adoption of smartphone devices within the population. In 2013 the number of mobile

phone users in Central and Eastern Europe was almost 284 mln. According to forecasts in 2019 number of mobile phone users in that region will account 314,2 mln. The penetration rate will increase from 65,9% in 2013 to 72,1% in 2019 (Worldwide Internet And Mobile Users Report... 2015). According to Mason Group opinion, smartphones will account for at least 75% of handsets in all CEE countries except Ukraine by 2019 (Iacopino, Bailey and Hare 2014). Figure 2 shows trend of growth of smartphone usage. In all three observed countries in 2015 number of smartphone users exceeded 50% of the population, in Croatia it is above 60%.



**Figure 2.** Smartphone usage in total population

Note: \* 2021 – forecasted value.

Source: own compilation according to <https://www.statista.com/statistics/347221> (accessed on 26th September 2016).

Till 2021 it is estimated that growth trend will continue and that in Poland and Croatia there will be more than 65% smartphone users within population, while for Serbia predictions are around 53%. Therefore, based on the presented data on Internet and Facebook adoption, and based on smartphone usage growth trend, we can conclude that companies in observed markets have to consider Internet, Facebook and smartphones as communication and distribution channel with a huge potential for direct and continuous commercial communication with customers (for illustration see studies: Pejic Bach et al., 2010; Knezevic et al, 2011).

Comparing to e-commerce, Turban et al. (2012, p. 432) emphasize several value-added attributes of m-commerce: ubiquity, convenience, interactivity and personalization. Ubiquity refers to accessibility of information from any location in a real time. Convenience refers to ease of use of mobile devices in comparison to desktop devices which are smaller and thus more usable for information access on the move. Mobile devices improve interactivity because users are able to communicate, search for information and use services in a real time.

Moreover, the individual usage of mobile devices enables a high level of personalization according needs and requests of an individual user which gives a business opportunity for delivering personalized information, products and services. The knowledge on users' physical locations in a real time creates a business opportunity to offer location-based information, services and products. This aspects are investigated and proved as benefits or influential factors of m-commerce adoption in studies such as: Choi et al. (2008), Chan et al (2013), Chong et al (2013), Zhang et al (2012), Thakur and Srivastava (2013), Yadav et al (2016) etc.

### 3. PRIMARY RESEARCH RESULTS

#### Methodology and sample

In this research the survey was taken on student population. A paper and an online questionnaire were formed and it included 26 questions of different types: 17 one choice questions; 1 multiple choice, 8 Likert scale ranking questions. The questionnaire was structured on the basis of previous research studies mentioned in the previous part. Questions were divided into several groups:

1. Socio-demographic characteristics.
2. Experience in online purchasing (questions were adapted according to Ling, Chai and Piew 2010).
3. Smartphone and mobile application usage (questions were adapted according adapted according to Laundon and Traver 2007, Iacopino, Bailey and Hare 2014, Knezevic et al 2015).
4. Impulsive vs. planned purchasing (questions were adapted according to Ling, Chai and Piew 2010).
5. Motivation and issues in mobile purchasing (questions were adapted according to Choi et al. 2008, Turban et al. 2012, Chan et al 2013, Knezevic et al 2015).
6. Usability and effectiveness of mobile purchasing (questions were adapted according to Thakur and Srivastava 2013, Yadav et al, 2016).

However, in this paper we will focus only on question groups 1, 2 and 3 on which we will apply the basic descriptive statistics methods in order to compare relative frequencies on smartphone experience and usage in Poland, Croatia and Serbia. The gathered poll consisted of 454 answered and validated questionnaires form Poland, Croatia and Serbia. The structure of the sample according to demographic and economic criteria is shown in Table 1. The gender structure of the sample was in the accordance to the student population within faculties of economics and business in Eastern Europe. On average, there were 67,4% of female and 32,16% of male students at the sample and distribution by age is similar in all three countries. The largest proportion of students (on average, 82,16%) is old between 20 and 25 years, 11,45% of them have more than 25 years and only 6,39% are less than 20 years old. Nonetheless, distribution by age differs between countries.

Due to differences in average wages and in order to avoid misunderstanding among currencies, instead of typical question on incomes, we decided to ask examinees to evaluate their economic situation on scales from 1 – very bad to 5 – very good. In Table 1 average grades are shown together with the median and modal values and standard deviations. In Polish case, economic situation is evaluated as good (4). The views of Serbian and Croatian respondents are summed up with a median of 3, which can be described as an average perception. Respondents are not negative in general which is also connected with their age and student status.

**Table 1.** Characteristics of the sample

<b>Country of origin</b>				
	Poland	Croatia	Serbia	Total
Number of respondents	157	163	134	454
Frequency in %	34,6	35,9	29,5	100
<b>Frequencies in %</b>				
<b>Gender</b>	Poland	Croatia	Serbia	Total
Males	39,5	28,8	27,6	32,2
Females	60,5	71,2	72,4	67,8
Total	100	100	100	100
<b>Frequencies in %</b>				
<b>Age</b>	Poland	Croatia	Serbia	Total
less than 20	8,3	0,6	11,2	6,4
20-25	89,8	74,9	82,1	82,2
more than 25	1,9	24,5	6,7	11,4
Total	100	100	100	100
<b>Perception on economic situation (1-very bad, 5-very good)</b>				
Statistical values	Poland	Croatia	Serbia	Total
Mean	3,6	3,23	3,13	3,33
Median	4	3	3	3
Modal value	4	3	3	3
Standard deviation	0,62	0,76	0,74	0,74

Source: own research.

## Discussion of results

### Young consumers in Central and Eastern Europeas “handset generation”

Table 2 illustrates a worldwide omnipresent phenomenon, which is the increasing use of smartphones as primary devices. About 95% of the respondents are using smartphone as a primary device. This aspect shows the significance of smartphones in the daily lives of all respondents. The number is noticeably higher than in the whole population, so it confirms that Millennials are much stronger oriented on using mobile devices than other segments.

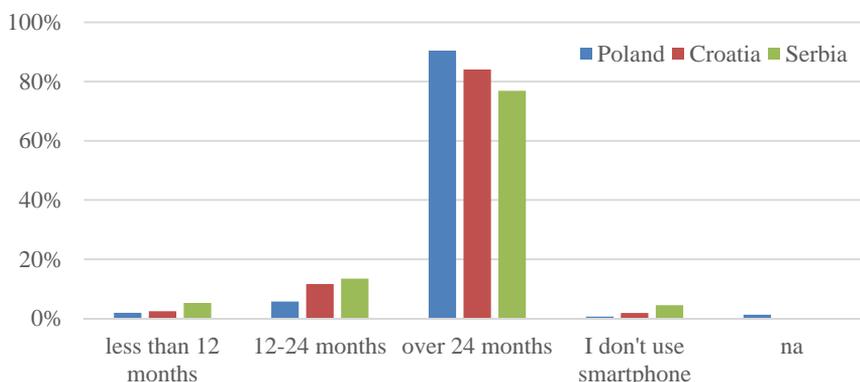
When it comes to the respondents' experience in smartphones usage (see Figure 3), the majority has at least two years of experience (more than 24 months). This group is mostly presented by Polish respondents (about 91%) and – to

a smaller extent – by Croatian (84%) and Serbian respondents (78%). However, this data show that most of the respondents are experienced smartphone users.

**Table 2.** Smartphone as primary device

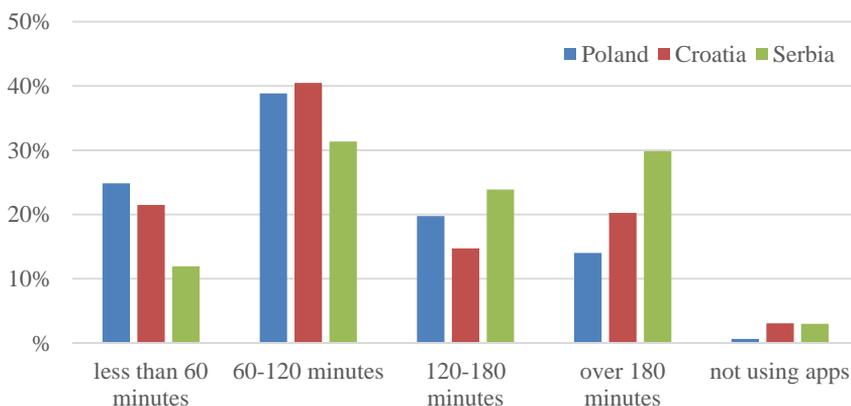
	Relative frequencies in %			
	Poland	Croatia	Serbia	Total
Yes	95.5	96.9	94.8	95.8
No	3.2	3.1	5.2	3.7
n/a	1.3	0.0	0.0	0.4
Total	100	100	100	100

Source: own research.



**Figure 3.** Experience in smartphone usage

Source: own research.



**Figure 4.** Daily usage of mobile applications

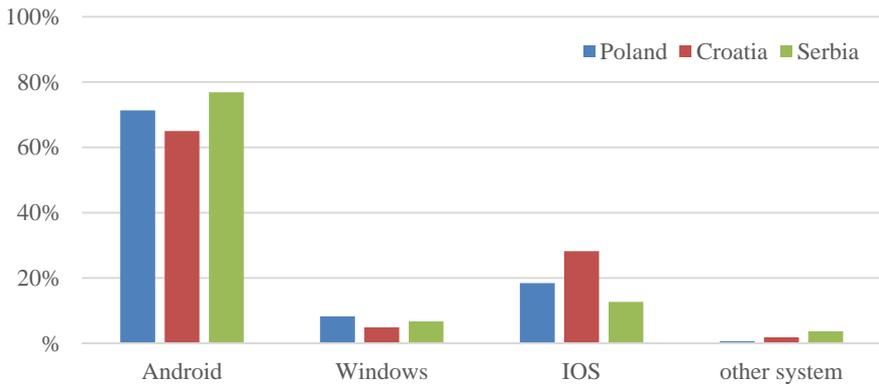
Source: own research.

Regarding the first research question, all above mentioned facts bring us to the conclusion that in all three countries we are dealing with experienced and heavily smartphone-oriented users which confirms Turban’s claim that contemporary young consumers are so called “handset generation” (Turban et al, 2012, p 279). In order to adjust to this new generation of consumers, retailers and marketers should pay more attention on changes in shopping behaviour provoked by extensive use of smartphones in their everyday life.

**Patterns of young customers activities regarding mobile applications**

First of all, design, availability and application market used for application download hardly depends on operation system used on mobile device. In Poland, Croatia and Serbia predominant operation system used on mobile devices in Android (see Figure 5).

IOS ranks number 2 with a much smaller percentage than Android. Nonetheless, in Croatia number of users of iOS is respectively high comparing to other two countries (almost 30%). Therefore, peculiarities of this operation system should be addressed more carefully when designing mobile applications and providing mobile services. Windows appears to be the least used operation system among the respondents (less than 10%).

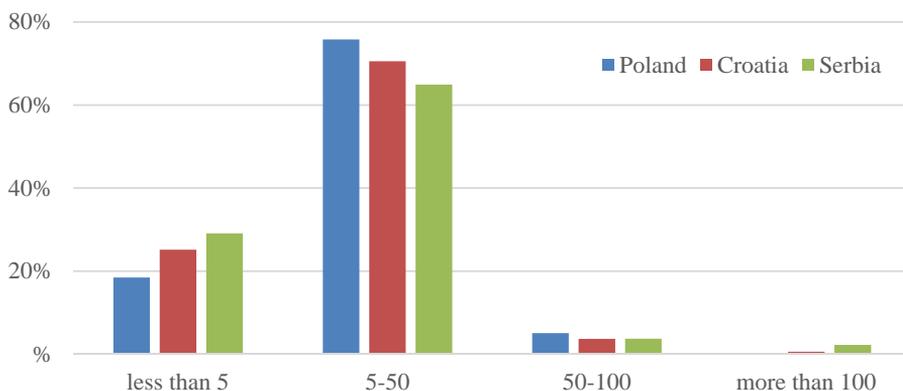


**Figure 5.** Operation system  
Source: own research.

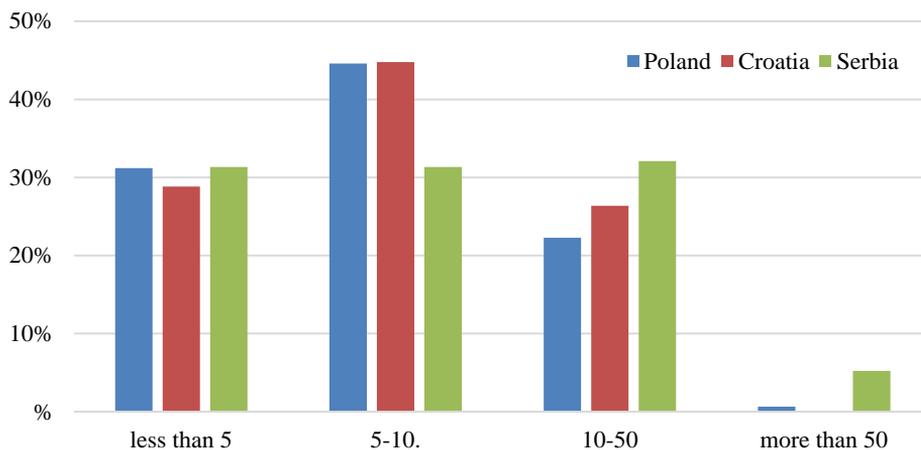
Figure 6 show that most respondents download 5 to 50 apps a year (65% to 75%). Only a few seem to be downloading more than 50 apps a year, which shows that 50 is the limit. Still, such a wide span (5 to 50) is not favourable for a more precise analysis, which prevents us from drawing further conclusions. But, Figure 7 illustrates how many apps are being uninstalled per year. Despite the fact that Croatian and Polish respondents download 5 to 50 apps a year, most of them (about 45%) delete only 5 to 10 of their downloaded apps.

Serbian respondents are equally represented in all three categories. This brings us to the conclusion that users are actively updating their smartphones during the year by application uninstallation.

Despite a huge amount of downloaded apps (5 to 50) most respondents appear to use frequently three to ten apps per week.



**Figure 6.** Apps downloads per year  
Source: own research.

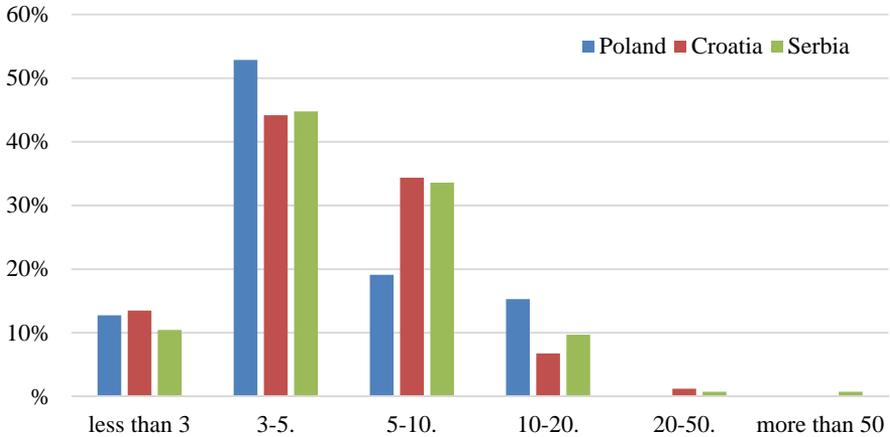


**Figure 7.** Apps uninstall per year  
Source: own research.

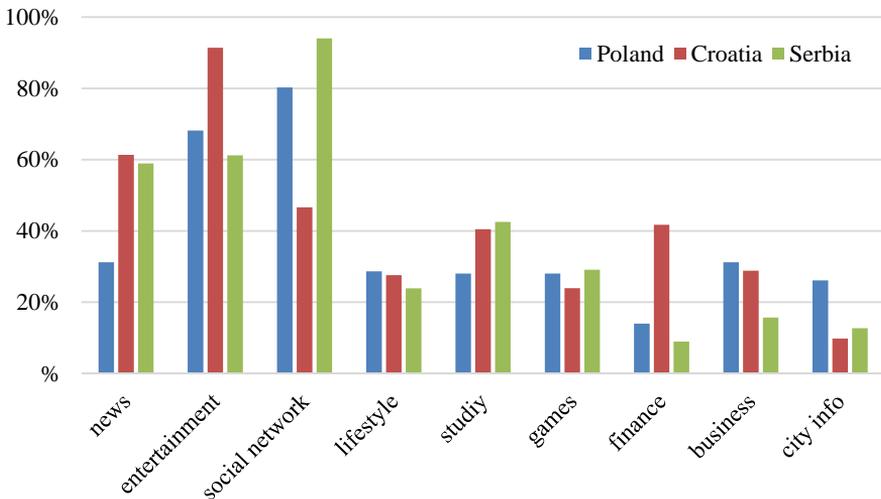
More than a half of all Polish respondents use 3 to 5 apps per week and about 33% of all Croatian and Serbian respondents frequently use 5 to 10 apps per week (see Figure 8). These numbers are moderate compared to the number of downloaded apps.

When it comes to choosing types of applications, there are a lot of similarities between the three groups of respondents (see Figure 9). Social networking plays an important role especially for Serbian and Polish respondents. Downloading apps for entertainment purposes is popular among all of the respondents (notably

Croatian). Serbian and Croatian participants do also download apps that inform them about the latest news. Business usage is the lowest in Serbia and highest in Poland. Probably it results from the fact, which respondents who are students are not fully active on market and are not employed, so they concentrate on developing social relations and entertain. What is noticeable is that Croatian respondents distinguish from other in the category of finance – which confirms they interest in that area. After entertainment and social network following news is the most marked answer. So it confirms their interest in all around situation.



**Figure 8.** Number of applications in frequent use per week  
Source: own research.

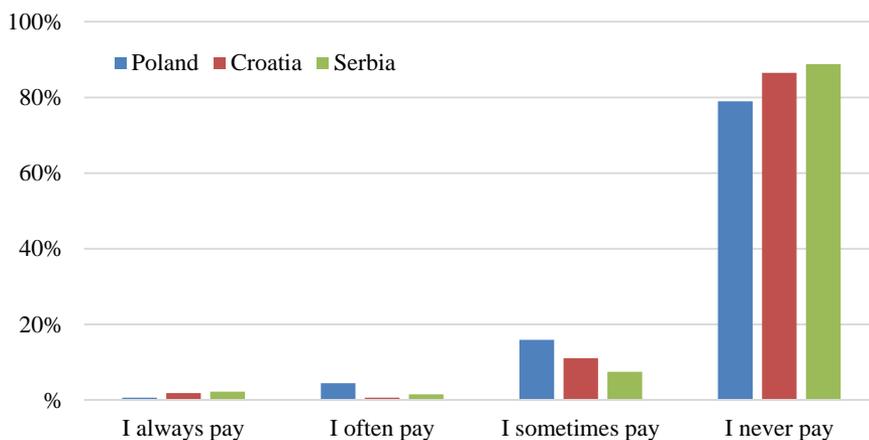


**Figure 9.** Types of applications (activities) on smartphones  
Source: own research.

Applications are being used as learning tools as well. Among Polish respondents, applications are most frequently used to keep in touch with professors and students. Respondents say that they also use apps to obtain information for their classes. Croatian respondents use apps to stay in touch with their professors and other students as well as to get information about schedules and exams. Serbian respondents use apps as learning tools most frequently to acquire information about schedules and exams. They frequently use them to contact professors and other students. Distance learning is not common among Serbian respondents.

### Is culture of freebies present among young consumers in Central and Eastern Europe?

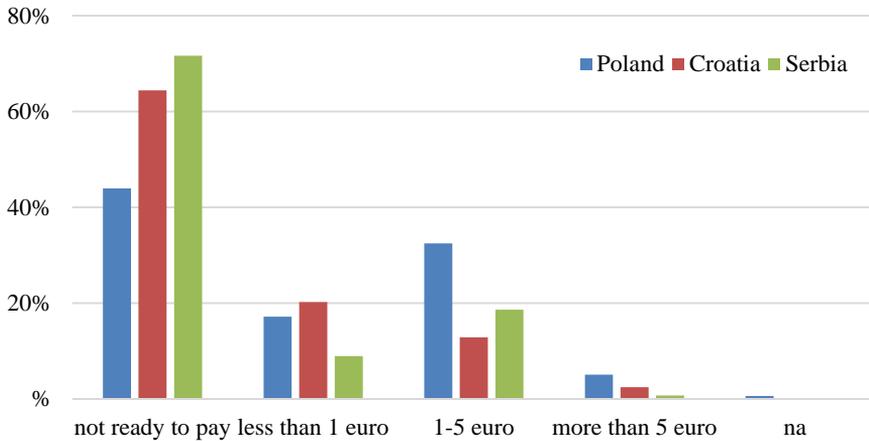
One of the most interesting cases for businesses is the willingness to pay for apps. The Figure 10 clearly illustrates that most participants (80% to 90%) are not willing to pay for applications. Approximately 15% of all Polish respondents pay sometimes, in Croatia this proportion is 11% while in Serbia below 10%. The lack of willingness to pay for such products as applications can certainly be attributed to the economic standards in a country as well as habits to get online services for free. This may be far-fetched but there is a positive relation between the perception of the economic situation and the willingness to buy apps. Moreover, Figure 11 expresses the willingness to pay for apps in monetary value. Apart from the fact that Croatian and Serbian respondents are not ready to pay at all (over 60 and over 70% respectively), Polish respondents admit to be willing to pay between 1 to 5 EUR.



**Figure 10.** Willingness to pay for apps

Source: own research.

On the basis of data shown in Figures 11 and 12 we can conclude that in young generation we are facing the phenomenon of freebies culture regarding mobile applications and mobile commerce and with this conclusion we have answered **the third research question.**

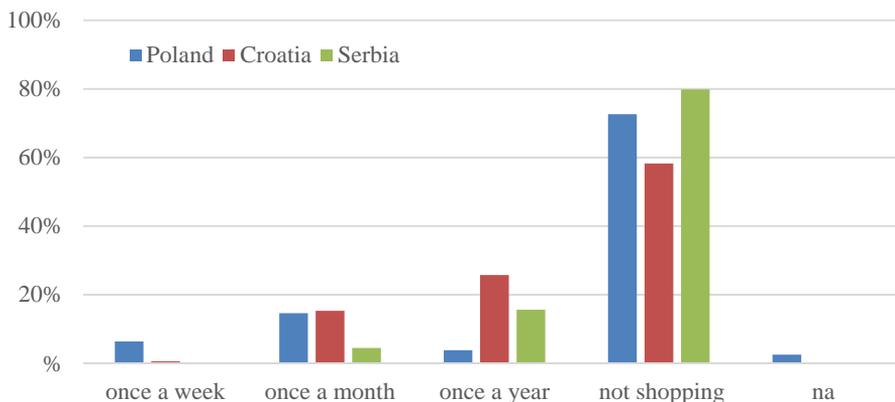


**Figure 11.** Readiness to pay for apps (in monetary value)  
 Source: own research.

On the basis of existence of culture of freebies among young population, the challenging question for retailers in near future will be: “Whether the culture of gratuity and freebies move into other sales channels when this young generation will become even more active as consumers?”

**Do young consumers use mobile commerce for shopping?**

Figure 12 shows that over 70% of Polish respondents and 80% Serbian respondents do not shop via mobile phone at all. This is very high percentage and it shows that mobile market is undeveloped in these countries. It is in the same time the sign that there is no significant offer and it shows that these markets are interesting for new marketers. Croatian respondents favour m-shopping compared to the other participants. Almost one third shops via mobile phone at least once a week and more than 25% shops at least once a year. This can be explained by taking into account well developed ticketing services suitable for mobile devices that are found extremely well accepted by Croatian customers according to Knezevic et al (2014) who explored online buying behaviour and found out that tickets for cinemas, theatres and other events are the most significant product category purchased online. Another explanation is high adoption of online and mobile services by largest domestic owned retail chain, but this fact should be more explored in the future. It is worth to add that in Poland many transactions starts via smartphones, but are finished by means of PC or laptops (E-commerce w Polsce dopiero rozkwitnie, 2014). Customers don't want to share the personal information with retailers, they are afraid to take a financial risk.



**Figure 12.** M-shopping frequency

Source: own research.

#### 4. CONCLUSIONS

Mobile commerce adoption in Central and Eastern European countries is rapidly increasing in last decade. This brings new opportunities and challenges to businesses who have to adapt to the new – “handset generation” of shoppers with a habit of freebies usage which is the common behaviour in mobile commerce world.

In this paper, based on primary research conducted in Poland, Croatia and Serbia, we answered four research questions: (1) Do young consumers in Eastern Europe express characteristics of “handset generation”? (2) What is the pattern of their activities regarding mobile applications? (3) Is culture of freebies present among young consumers in Eastern Europe? and (4) Do young consumers use mobile commerce for shopping?

Although in many situations answers for presented questions are similar, we may observe some crucial differences, which confirms, that for each market strategy of communication and offering product and services has to adopted to local conditions and stage of development of telecommunication industry. There are some interesting and noticeable conclusions which should be considered by retailers who want to use this channel of communication with younger generation. First of all, research results show that smartphones are very present in student population in three observed countries. Over 95% of students have smartphone and more than three quarter has been using it over 2 years. This result is consistent for all observed countries. However, students in Croatia are much more willing to buy goods and services using smartphones than their counterparts in Poland and Serbia. Our research confirms Turban’s claim that contemporary young consumers are so-called “handset generation” (Turban et al, 2012, p. 279). In all three countries we are dealing with customers who are very experienced and heavily smartphone-oriented users. It has strong managerial implications – retailers and generally marketers should

pay more attention on communication through mobile devices, especially in creating more personalized messages and sales promotion offers.

Our research also indicates that smartphone shopping behavior does not depend only on economic development of the country which has to be proven by deeper research study in future. A lot of other factors should be taken into considerations such as: e-commerce offer, financial infrastructure, customer's readiness to buy online, security issues etc. Students have used to get things for free on the Internet and it is not easy to persuade them to pay for applications. These results implicate that smartphones are the tool that can help marketers to get information about student population. According to our research, there is probability which should be a topic of future research, that exists a positive relation between the perception of the economic situation and the willingness to buy apps.

Another interesting conclusion is, that in all three countries shopping via mobile phones is not popular, except in Croatia due to access to applications which are popular among students. But it confirms the need to develop retail sales to online offer and make it available in easy and safe way.

To sum up, there is a strong need to continue research to learn more about young customers' attitude and their shopping behaviour in the nearby future. Most retailers are preparing or already implemented applications to simplify shopping online via mobile devices. So the next step is to learn more about individual predispositions of customers in order to prepare more targeted offer – to make it more attractive and shorten process of shopping. In authors opinion it's necessary to continue research and create both psychographic profile of mobile phone young users, recognize process of shopping and create new or modify existing models of sales.

## 5. LIMITATIONS

There are some limitations in our research, which has to be considered in interpretation of results. First of all, our research was conducted among students, who are only a part of Millennials generations. We can't generalize our conclusions to the whole population, however they may reflect students attitude toward mobile devices. The sample was not randomly selected and this also create some limitations in generalization of our conclusions.

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