New technologies in commerce and sharing economy

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Abstract

Research objectives of this paper are to present different models of e-commerce and m-commerce, with emphasis on sharing economy as the opportunity, and to see if there is a correlation between certain factors of technological development and commerce in selected countries. Qualitative desk research and quantitative data analysis (data correlation for slected countries) in order to have better understanding of market trends, customer behavior and new business models.

New technologies in e-commerce and m-commerce are shaping the modern retail industry and the way consumers buy and make decisions on products and services. It will be shown that e-commerce development and diffusion depend on many factors, not just technological infrastructure and investments. Data analysis for selected countries will show the market trends and paper conclusions will be oriented to the future of commerce and sharing economy supported by new technologies. Data from developed countries and Serbia were analyzed and compared.

Keywords
new technology; e-commerce; m-commerce; sharing economy

1. Introduction

Today's marketplace is characterized by shorter innovation and product life cycles, rapid growth of information technologies and electronic communication that puts pressure on companies to innovate constantly. Rapid technology development in the last few decades posed significant challenges for companies which want to stay competitive. Application of new ideas in order to commercialize new technologies is a challenge that contemporary organizations face in different industries. Innovativeness based on new technologies is not a characteristic of manufacturing industries, as the development of services is under the influence modern ICT that enable more efficient and effective approaches in providing existing services and also in the emergence of entirely new services. There is a very wide range of changes brought by new technologies in the past. For example, in banking industry, they led to increased service quality and service delivery (Joseph, McClure, & Joseph, 1999), higher level of efficiency (Hasan & Marton, 2003), introduction of online banking (Pikkarainen, et al., 2004), and many others.

Electronic commerce (e-commerce) is one of the fastest growing branches in whole Europe as Internet enables companies to reach far wider groups of customers and to increase their sales area. Still, the e-commerce growth is not equally spread over the European Union and national growth rates tend to differ. Highest growth rates are recorded in the Eastern Europe, namely countries which have recently become members of European Union. One of the explanations offered for this trend is that these economies are in a transitional phase, their markets are not as saturated as those in the Western Europe, and there is more space for expansion (Ecommerce News Europe, 2014). While growth rates are significantly higher in Eastern Europe (in Romania the recorded growth rate of e-commerce was 30%), the total value of the profits made in the e-commerce sector is still significantly smaller in these countries (Ecommerce News Europe, 2014). While European market is often seen as relatively homogenous, there are still quite distinctive national characteristics, cultural, economic, societal and political, relevant to business sphere.

Consumer market is evolving and new core groups of customers with rising economic power are emerging. Today's customers are always trying to find the best solution for their needs and wants. Bad customer experience will make them turn easily to some other option. The dynamics of customer segment is changing and becoming unsteady. One of the facts which supports this statement is that among the members of the generation Y 40% of young men and 33% of young women would completely switch to online shopping if that were possible, while only 50% of retailers and service providers offer this option (Patel, 2015). Mobile commerce is one-third of global e-commerce, while secure mobile payments technology is crucial for the further development. Mobile-only strategy will allow companies to focus more on 3G technology, 3D touch, and mobile payments. That will help them to lower marketing costs since mobile enables push notifications and possibility to locate the devices and segment customers more easily.

The sharing economy is also a technological phenomenon. The sharing economy kept some traditional sectors and modernized the process and created completely new sectors and sources of revenue. Technological development enabled and simplified the transfer of both physical and non-physical goods and services. The main concept of sharing economy is to have an efficient use of resources, and technological development helped it spread through different sectors – peer-to-peer lending and crowd funding, online shopping, peer-to-peer accommodation, car sharing, music and video sharing, equipment rental, etc.

2. Business Models in E-commerce and M-commerce

E-commerce and m-commerce are considered as the most promising applications of information technology in the last decade. New technologies embeded in business models brought changes in supply-chains, retail, manufacturing and service operations in different industries.

2.1. E-commerce models

Business–to–Business (B2B) refers to conducting transaction and collaboration with business partners over electronic channels. The examples for this business model are Square, Amazon Supply and Grainger.

Business–to–Consumer (B2C) includes Amazon, Wallmart, Barnes and Noble. B2C e-commerce is mass customized today, as the biggest retail chains make a personalized experience for consumers by providing personal recommendations and notifications based on purchase history. Print on Demand is one of the technologies that are shaping the online retail. Amazons Create Space for publishing is the most famous example. 3D printing also brought revolution to e – commerce and helped companies create customized products. Ebay Exact users were able to choose from wide range of materials, colors and options and create their personalized product. Robotic Warehouse Management is best described on Amazon example as they have days in the year when customers order 426 items per second and during the busy periods 80,000 workers are employed temporarily, so it is really hard to manage the system without a solution like robots. Data show that B2C e-commerce in the United States totaled $531.8 billion in 2012 and by 2016 were expected to grow to $554.81 billion. Compared to the United States, B2C e-commerce in Europe is expected to be $458.98 billion in 2016. That is lower than in the United States, but the growth throughout years is following the similar trend.

Consumer to Consumer (C2C) is presented by the biggest C2C websites eBay, Craigslist, and Taobao. Craigslist has 20 million page views per month and is well-known for buying, selling and trading goods and services. Unlike eBay it doesn't facilitate payments, just connects one side with another and facilitates the relationships. (Hom, 2013)

Consumer to Business (C2B) is the model in which the individuals are the ones offering the products to companies and the companies pay them. An example can be Priceline.com. Usually, it is a blog, paid advertisement and similar consumer's website for writing reviews.

2.2. M-commerce development

The rapid development of modern wireless communication technology, coupled with the increasingly high penetration rate of the Internet, is promoting mobile commerce. Forrester predicts that mobile will be 54% of the United States e-commerce sales by 2018. However, mobile is still not that huge as expected because many users still prefer web versions of their favorite retailers and just in case of Amazon, eBay and Apple time spent on the mobile app is above 50%. For retailers such as Macys and Etsy Mobile Web is still dominant. These results are not illogical at all since mobile storage is limited and people usually download up to three apps of their favorite retailers. Some of the most successful models in m-commerce are E-Shop, E-auctions, third party marketplace, information brokerage, trust services, process outsourcing model.

Leading mobile e-retailers in 2014 ranked by mobile commerce sales are Amazon, Apple, Jingdong Mall, Google Play, Wallmart, etc. In Japan it is above 50 %, followed by South Korea and the United Kingdom. In the United States mobile share is 29%. Surprisingly or nor, fashion and luxury retailers have the highest share of mobile transactions, above 30%. M-commerce couldn't be imagined without a wireless payment mechanism. When it comes to

wireless payment, it is about mobile banking, e-wallets, money transfer, loyalty programs, in-app payments, bitcoin, etc. The most popular mobile wallets in 2015 are developed by Google, Starbucks, Gyft, PayPal, Passbook. Apple seems to be the most secure for mobile payments so far because new models of iPhone can be unlocked just with fingertips (Edwards, 2014). Biometrics is a technology that is entering the payments space. This type of technology would enhance user security and user experience and provide a safe background for 800 million transactions annually in 2020. Not all of the transactions will be secured by biometrics, a great amount of them will be downloaded as apps, but anyhow it will be a huge improvement in mobile payments technology. Companies that are among the most successful and most innovative in m-commerce are Starbucks, McDonalds, Square Wallet, REI.

3. Sharing Economy

Sharing Economy is an economic system based on sharing underused assets or services, for free or for a fee, directly from individuals. According to Belk (2014) many of the sharing and collaborative consumption organizations that currently exist benefitted from the economic collapse that began in 2008 that caused some consumers to lose their homes, cars, and investments and made most everyone more price sensitive. The term sharing economy is relatively new, although it began to appear in the mid-2000s and is defined as a system of collaborative consumption based on used or pre-owned goods being passed from one side to another. One of the most popular terms is peer to peer marketplace. In the United States this type of economy is widely spread. American see it as a win-win situation because a consumer can get a high-value item at a fraction of a retail cost, while the business can offer sustainable inventory items over and over again. (Fallon, 2014) There are so many different types of these companies from different industries and the focus will be more on the ones from e-commerce and m-commerce sector. The Sharing economy grew so rapidly and became popular due to emerging technology, the Internet and smartphones.

Airbnb is commonly mentioned when talking about sharing economy. Airbnb has similarities with sites like Etsy in terms that people who hold ownership of apartments and houses want to offer them to people who need them, but rent them for money, not permanently sell it like on Etsy. Blablacar connect people who offer a ride with people who need to travel. Service is currently available in 17 countries and is growing rapidly. Blablacar grew from 1 million to 20 million users in two years and came to Serbia in March 2015, when it was announced in the national newspaper that the most popular ridesharing app arrived. Uber is a very popular technology platform that connects driver-partners with riders through smartphone applications. Nowdays, sites like eBay allow anyone to become a retailer, sharing sites let anyone become a taxi service, boutique hotel, hairdresser, etc. The concept is useful for expensive items that were not easily reachable for consumers and were not fully used by their owners. Experts believe that with the sharing economy will be like with e-commerce that started in the United States 15 years ago (Economist, 2013).

Just two years before the appearance of many worldwide famous startups, in 2013, Forbes estimated that revenue coming from the sharing economy and going directly to people's wallets will surpass $3.5 billion. Also, the rise has expected to have a huge societal impact. The sharing economy is a technological phenomenon. Without the Internet, smartphones, apps, etc. collaborative consumption wouldn't be possible in an online space and transfer from one side to another would be possible through the traditional methods.

4. E-commerce, M-commerce and Sharing Ecomomy in Serbia

According to Statista, Serbia generated the e-commerce revenue of $264.5 million in 2015, which is much lower than in the leading e-commerce countries by revenue – United States, China, Japan, UK, etc. United States has generated $287,392.2 million.The average revenue per user in e-commerce market in Serbia in 2015 was $105.23 and the number of e-commerce users is expected to be 3.7 million by 2020. The market largest segment is consumer electronics and physical media. The growth of e-commerce in Serbia is influenced by many factors such as population, GDP per capita, Internet and smartphone penetration. When talking about demographic indicators, mostly people between the age of 25 and 34 are e-commerce users, 0.7 million belong to that group. In that number, there are more male than female users.

Diffusion of e-commerce in Serbia is possible when the certain conditions are met. Pyramidal model of EC suggests that traffic infrastructure is the most basic layer. Also, sellers can put a different type of products online, but after sales process is much more complicated and is usually followed by long term and short term contracts with delivery services companies. In Serbian market DHL, FedEx and UPS are present, a national railroad company and Serbian Post that play a role at delivery. Serbian Post provides door-to-door delivery and delivery of goods via air traffic is carried by AirSerbia, former JAT Airways. For water transport, the most important river is the Danube, which flows through 10 countries.

Telecommunication facilities are also necessary for the diffusion of e-commerce. In 2013, the number of Internet users in Serbia was just 51.5 % of the total population. Developed countries such as the United States have 84% of their population. The statistics also shows that 89% of daily Internet users in Serbia in 2014 were between the ages of 25 and 34. Many European countries have over 90% of Internet users (Denmark, Sweden, Norway, Luxembourg, Finland, Monaco).

For developing the strong relationships between buyers and sellers Serbia needs to implement software solutions. Foreign vendors of software solutions are companies such as Microsoft, Adobe, Autodesk, IBM, Oracle, etc. These vendors offer web development services in B2B and B2C segment. Thanks to many successful companies Serbia has the strong software industry. Microsoft invested in Microsoft Development Center where many professional contribute to the development of new solutions and ComTrade, a domestic company, is one of the leading companies from the field of information and communication technologies in Southeastern Europe (Siepa, 2012). Serbian software industry has challenges but is one of the fastest growing in Serbia. Revenue generators in Serbian IT industry are mostly ERP and CRM, while E-commerce takes 7%.

An e-commerce payment system facilitates the acceptance of electronic payment for online transactions. Today there are several of methods for online payment – Google Wallet, PayPal, Mobile Money Wallet, Net Banking and Bitcoin. E-commerce is possible thanks to e-banking and payments systems although payment systems include not only retail money transfer systems used by businesses and consumers for commercial purposes but also large-value interbank funds transfer systems. Banks issue payment cards, examine account changes, review transactions and pay duties by payment orders. By a number of transactions, Serbia is behind some countries in the region because it takes time for people to adapt to the new payment system. Data provided by The Payment System Department of NBS for 2014 show the number of banks clients by e-banking payment services used (NBS, 2015)

Table 1: Number of banks clients[1)] by payment services use

QUARTER	I	II	III	IV
Total number of clients[2)]	8,517,231	8,561,581	8,671,761	8,811,973
SERVICE				
Internet banking[3)]	1,019,637	1,061,917	1,085,998	1,153,611
Phone banking	82,260	88,806	87,778	98,901
Mobile banking	103,212	110,721	137,157	179,724
Standing order	258,220	270,024	270,127	279,006
Internet banking - payment card[4)]	1,902,405	1,935,622	1,977,729	2,046,054
Internet banking - Internet card[5)]	70,197	72,326	76,070	80,074

Source: National Bank of Serbia

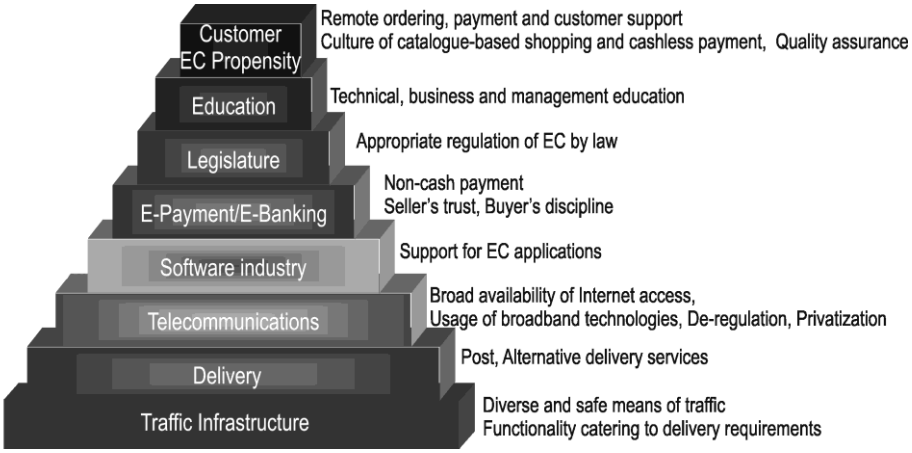
1) Number of clients who agreed to use these services with the bank;
2) Total number of clients holding accounts with banks. A client having more than one account with the same bank is counted once in the total number of the clients of the bank, while a client having accounts with more than one bank is counted with each bank separately;
3) Service accessible via Internet or PC banking applications (e-banking).
4) Buying goods or services over the Internet by using payment card.
5) Buying goods or services over the Internet by using "Internet" payment card

Data from the year 2014 show that there is slight increase in the number of bank clients (0.97%), which is followed by increase in the number of users of e-banking services during the year. For the purpose of this study, most interesting data concern popularity of three standard channels of e-banking: Internet banking, phone banking and mobile banking. The increase of number of users of internet banking expressed in percentage terms is 0.88%, phone banking 0.83% and mobile banking 0.57%. Total number of users of these services at the end of the fourth quarter shows that the most popular e-banking channel is Internet banking with 13,09 % of clients using it, mobile banking is used by 2,04% , while the least number of users use services of phone banking, only 1,12%. It also shows popularity of Internet use for the purpose e-commerce with 32,54% of clients using payment cards for payment over Internet. These results show that the pace of adopting e-banking services is slow and that there is large space available for increase.

Legal infrastructure should be corresponding to international standards and EU legislature. Legislation includes Digital Signature Law (adopted in 2004), E-commerce law (arrival of PayPal), Law on Telecommunication (signed in 2003), Intellectual Property Protection, Protection of personal data (signed in 1998, but not in compliance with EU law), Protection of consumers (signed in 2002), Public Access to Information (adopted in 2004), Amended Criminal Code, Convention on Cyber-crime (signed in 2005)., adoption of guidance of the National Bank of Serbia and organization of public workshops.

Education plays a great role in the diffusion of e-commerce in Serbia. The English language is mandatory and higher institutions recognized the importance of education experts for e-business. There are more and more universities in Serbia that are teaching software engineering, Web Development, Information and Communication technologies and basics of E-commerce. The Internet also took an important role in the education system in Serbia and students have new methods of learning, sharing content, presenting (Jošanov, 2008).

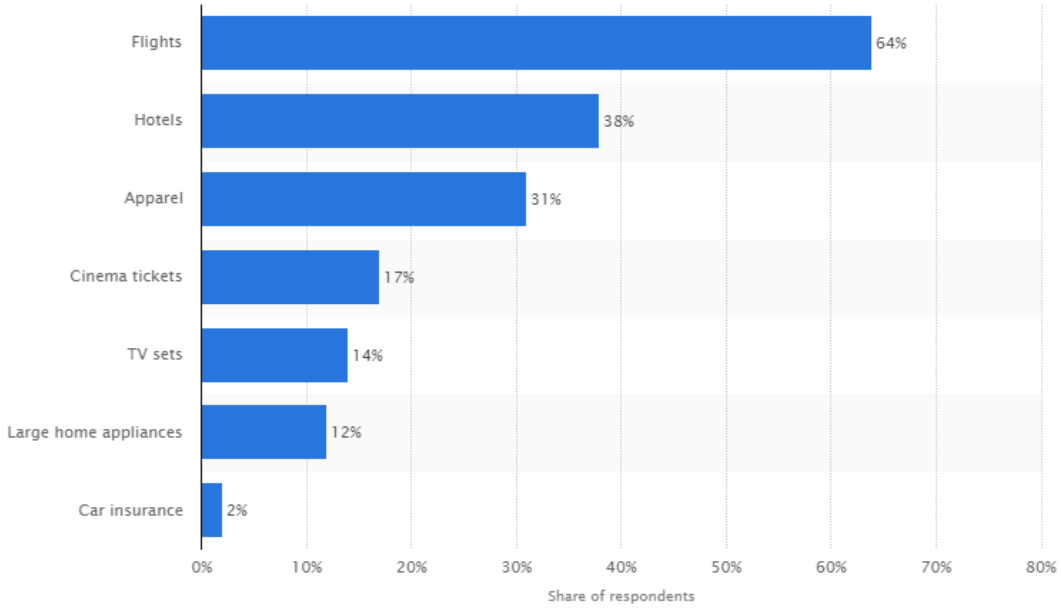
Figure 1: The state and development of e-commerce in Serbia



Source: Jošanov, 2008

In the end, without customer readiness, e-commerce can have a fast diffusion even if the other factors are full filed. Cultural aspects and buying habits shape this industry. Typical Serbian customer prefers in store shopping, interaction with the product and is not so easily oriented to changes. He/she prefers stability and familiar ways of shopping. Serbian citizens buy online flight tickets, hotel rooms, apparel, cinema tickets, etc. The statistics from 2014 shows that flight tickets are the most common, more than 60% of the total number of goods bought over the Internet.

Figure 2: Most recently online purchased product categories in Serbia in 2014



Source: http://www.statista.com/

On the other hand, in Germany, Japan, China, Russia, people buy electronics, home appliances, home furnishing, beauty products, fashion, toys, groceries, etc. This means that they have more trust in buying a different type of products online and have moved away from a traditional way of shopping things directly from the store. Serbia still hasn't moved away from in-store shopping. In most European countries technology changes changed the

consumer buying behavior. For example, in the United Kingdom 38% of respondents said that they shop in a wide variety of different shops/websites, and 30% said that their shopping habits have changed. They also do the shopping more frequently than they used to since the buying process is easier now.

Online shopping in Serbia has shown growth, 41.2% of Internet users made an online purchase, and that number was about 1,160,000 in 2014. That number is still below the average, in European countries 60% of Internet users shop online. The key constraints are consumer distrust in e-commerce and lack of education and awareness when it comes to adopting new technologies. Social factors that affect the development of e-commerce in Serbia are internal and external. Internal factors are connected to the acceptance of Internet as a necessary tool for e-commerce and external factors are cultural patterns that influence our decisions (Lecic-Cvetkovic et al., 2013)

5. Correlations between the factors of technological development

Internet penetration rate shows the portion of the total population of a certain country that has access to the Internet. For the purpose of this research, it has been chosen United States, United Kingdom, Germany, China, Japan and Serbia. United States is chosen since it has already been mentioned in this paper many times as one of the leaders of technological development when it comes to e-commerce and m-commerce. The aim is to compare the results of United States and other countries that are technologically, socially, geographically different and in the end drive conclusions. United Kingdom is a technological leader in e-commerce in European market. Just behind United Kingdom in Europe is Germany. It is also very interesting to compare the data for the most developed countries in the world with the data available for Serbian market. This data can open many ideas for further research. China and Japan were put in this comparison because there are in Asia, they are culturally and technologically different than European and United States market and it was interesting to see how they compare to each other.

As factors that would best describe the technological development of e-commerce and m-commerce in a specific country, the following were selected: Internet penetration rate, smartphone penetration rate, e-commerce penetration rate and m-commerce penetration rate. Smartphone and m-commerce penetration rate are presented as a portion of a total population that own a smartphone and used a smartphone to buy product/service online. E-commerce penetration rate is presented as a portion of Internet users that bought product/service online.

Table 2: Penetration rates in selected countries

Country	Internet penetration rate	Smartphone penetration	e-commerce penetration	m-commerce penetration
United States	84.2%	50.1%	74.4%	26%
UK	89.8%	53.7%	88%	27%
Germany	86.2%	51.1%	81.6%	20%
China	47.9%	38.5%	52.2%	34%
Japan	54.2%	50.8%	79%	13%
Serbia	56%	40%	35.5%	

Source: http://www.statista.com

It can be seen how Internet penetration is correlated with e-commerce penetration. When calculated, the number is 0.698447169. This number shows that there is a strong positive correlation between the Internet penetration rate and e-commerce penetration rate. The more population has the access to Internet the more they will buy online. When calculated to see the correlation between the e-commerce penetration and m-commerce penetration Serbia was excluded, since the relevant data about m-commerce penetration rate was not available. The correlation is negative (-0.602331269), which is not illogical completely. That means that the more people buy online via desktop less they will buy via mobile and vice versa. In developed countries such as United States and United Kingdom big retailers have their own mobile apps and a lot of consumers probably got used to ordering more via mobile app than via desktop. The more time and money they spend ordering via mobile the less they have desktop and vice versa.

Internet penetration rate in Serbia is even slightly higher than the one in China and Japan. The reason for low Internet penetration rate in China is great amount of population living in rural areas of the country without access to Internet. Internet penetration rates are connected with e-commerce penetration rates. United Kingdom and Germany have the highest Internet and e-commerce penetration rates. Internet users in Serbia obviously don't use Internet for buying online in large percentage and this is due to many factors such as payment mechanisms that didn't even exist a couple of years ago, lack of trust in e-commerce websites, lack of knowledge and other cultural factors. The portion of m-commerce users in all these countries is still low. Even in UK that number is 27%. Statistics from 2015 shows that 73% of United Kingdom shoppers predict they will spend more on mobile and 40% feel that the mobile experience could be improved (Ratcliff, 2015). This part of e-retail certainly has a lot of space for growth in the following years.

Smartphone penetration is not high as it was expected but Serbia is following the similar trend as more developed countries, 40% in Serbia and about 50% in developed countries. To understand better the absolute number of Internet users there is a table below that presents the countries share of world population and countries share of Internet users, which are almost in perfect correlation (0.979978849). The larger share of world population the country has the larger share of internet users is. In relative numbers China had 47.9% Internet penetration rate, but its share of world Internet users was 21.97% in 2014.

Table 3: Share of world Internet users and world population

Country	Countries share of world Internet users	Countries share of world population
China	21.97%	19.24%
Japan	3.74%	1.75%
Germany	2.46%	1.14%
UK	1.95%	0.88%
United States	9.58%	4.45%
Serbia	0.16%	0.13%

Source: http://www.statista.com

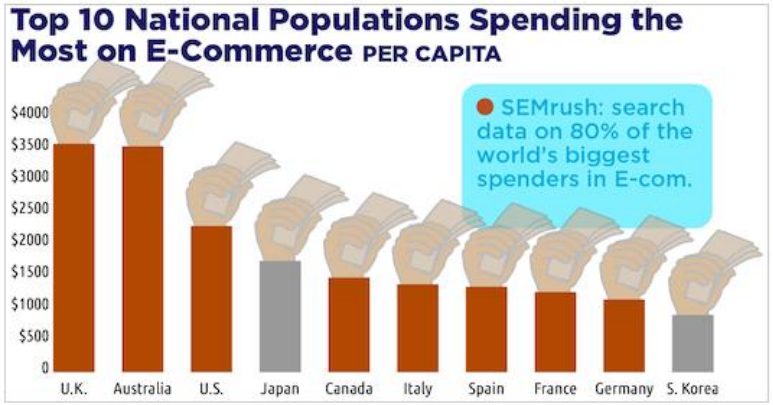
China is the biggest e-commerce market in terms of e-commerce sales. United States is just behind China and is followed by United Kingdom and Japan. However, countries share of e-commerce sales in total retail sales is 10% and lower, which means that e-commerce is not that big as it can be in future period.

Table 4: Share of e-commerce sales in total sales and average wages in selected countries in 2012 (US dollars)

Country	Share of e-commerce sales in total sales	Average yearly wages
United States	7.70%	3,263
Japan	4.90%	2,522
UK	11.60%	3,065
Germany	11.10%	2,720
China	10.10%	656
Serbia	-	1,058

Source: http://www.statista.com

Figure 3: E-commerce per capita



Source: Brooks, 2015

Countries with the highest e-commerce spending per capita are also those with the highest average wages. United Kingdom, United States, Japan and Germany are among top countries. China is far behind, its average wage is 656 and is not among top countries in e-commerce spending per capita.

6. Conclusion

Sharing economy is creating new ways for buying goods and services and it is directly connected to e-commerce and m-commerce. To understand better the industry it is necessary to learn more about factors that influence e-commerce development and diffusion. Factors that influence such as Internet penetration rate, smartphone penetration, m-commerce penetration are important in considerations. Purchase behavior, the impact of social media, investments in this industry are equally important.

During this research the importance of other markets for e-commerce besides United States was found and that is the reason it was chosen to present data for UK, Japan, Germany and China. These countries are leaders in world e-commerce sales. New applications for e-commerce and sharing economy are coming from cities like San Francisco, Palo Alto, Los Angeles, New York in United States and London and Berlin in Europe. Serbian has websites that are similar to those in more developed countries but so far there is just a few of them. Sharing economy is new for Serbian market and more time will pass before a high percetage

Serbian citizens start using taxi services like Uber, online food ordering, service bookings online, etc. It's a cultural thing and depends on trust. Data from previous years showed that Serbia has a solid Internet penetration rate, smartphone penetration and e-commerce penetration. Serbian customers still prefer in store shopping and want a contact with a product that is currently a barrier to e-commerce development in Serbia. E-payment system is not anymore a barrier, it used to be a couple of years ago. Cultural and psychological aspects can be researched about further through a form of questionnaire. The questionnaire could give more information about the reason Serbian citizens avoid using e-commerce websites, shared rides and payments online.

Recent data for countries mentioned showed that e-commerce is just about 10% of total retail sales in those countries and a bigger share can be expected in the upcoming years as it can also be noticed that: as the population grows, also the share of Internet users grow. Internet penetration is positively correlated with e-commerce penetration, meaning that in absolute numbers there will be more e-commerce users. Share of m-commerce users in total population in chosen countries is low and its rise is to be expected with the further development of retail apps, smartphones and Internet connection, but it is notknown if users are going to buy both via mobile or web and if mobile commerce will be eventually be bigger than e-commerce, especially in the most developed countries. For now it doesn't seem, m-commerce doesn't take a large portion of retail sales and is considered to be just one of the business models of e-commerce. Without any doubt m-commerce has its own opportunity and can have a rapid sales growth in the following period.

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