Globalization has produced a growing uncertainty, but also a decrease in the probability of outcome the events caused by changes. The changes have brought about technical progress and competition. The condition for implementing change is the ability to master and understand. The use of smartphones with the possibility of Internet access is increasing exponentially, and thus the popularity of electronic payment for goods and services. Consumers are willing to absorb the information technology as well as to take the certain risks using the mobile applications. The theory of acceptance, use of technology and innovation is offered to the consumers around the world in the form of e-wallets. That is why it is said that the innovation is not one-time action, but a process.

Keywords: e-wallet, digitalization, changes, e-business

INTRODUCTION

In addition to the traditional method of payment, consumers around the world use the modern technology and innovations. The synergy of electronic business and applications on smartphones has conditioned the emergence and development the new ways of mobile business. The business platform Statista.com states that in 2018, about 1.8 billion people worldwide will buy goods via the Internet. Namely, the global sales in e-retail, during the same year, amounted to 2.8 billion US dollars. In 2019, the online trade worldwide amounted to 3.53 billion US dollars, with a tendency to grow by 2022 to 6.54 billion dollars. The three largest global online stores: Alibaba.com, Amazon and Ebay had a turnover of almost 100 billion US dollars in 2017. Modern technology and Internet are the main drivers of the new payment methods in e-commerce. Mobile technologies offer a number of alternative electronic payment methods thanks to the technology and distribution channels they use. The interconnectedness of e-commerce and e-payment offers numerous benefits to the consumers making e-commerce more enjoyable compared to the traditional ones. Globally, the number of transactions performed using the mobile devices has increased.

According to the eMarketer 2019 Global Ecommerce Forecast, it is estimated that the global trade will increase to 20 billion dollars by 2021. Globally, the Asia-Pacific region expects e-commerce growth of 25% or $ 2.227 billion, accounting for 64.3% of
global e-commerce use. The Latin America and Middle East/Africa region will have a growth rate of around 21.3% while the North America with 14.5% and Western Europe with 10.2% will be below the global average of 20.7% [1]. Also, it should be noted that the six of ten countries with the fastest growing e-commerce in 2019 are India 31.9% and the Philippines with growth over 31% as well as China 27.3%, Malaysia 22.4%, Indonesia 20.6 % and South Korea 18.1%. Mexico, 35%, Argentina with 18.8%, Canada with 21.1% or 49.8 billion dollars and Russia with 18.7% are also in a group of ten countries with the e-commerce growth.

In 2019, China was the largest e-commerce market with revenue of $ 1.935 billion, or three times that of the United States, which had $ 586.92 billion in e-payment transactions. Thus, China represents 54.7% of the global e-commerce market. Of the European countries, the United Kingdom leads with 141.93 billion dollars, Germany with 81.85 billion dollars and France with 69.43 billion dollars.

The first part of this paper contains data on the global market related to e-commerce. The second section explains the mobile wallet system, ranking of the use of mobile wallets, the advantages offered by this method of digital shopping and the difficulties for its adoption. Also, the paper presents the architecture of e-wallet with application components.

1 E-WALLET

A new method of e-payment is the e-wallet, which includes a business vision, project requirements, platform selection and design.[2] The trend of mobile phone payments has become common in everyday transactions. The use of mobile phones to use this technology is logical due to a large use of mobile phones and possibility of installing a large number of applications (Pasquet, Reynaud, Rosenberg, 2008). The mobile wallet service allows the user to install applications on smartphones and use them for payments and purchases over the Internet, which facilitates purchases without entering details from the card or without the physical use of a payment card. An e-wallet is defined as an online prepaid account into which money can be replenished and transactions can be performed offline and online via a computer or smartphone (Pahwas, 2017). E-wallets can be used to perform the various financial transactions: money transfers, payment of bills, payment of goods and services, payment of e-commerce, etc. A mobile wallet is considered a useful way to pay via mobile devices because it improves the overall performance of users (Amoroso and Magnier-Watanabe, 2012). Google Wallet, the first digital wallet, was created in 2011 and provided payments in retail and online shopping using the so-called NFC technology. Google Wallet (GW) is the first functional "digital wallet" created by Google. The idea of GW was to take an advantage of growing potential of smartphones with the integrated NFC readers and growing diffusion of contactless POS terminals based on the PayWave and PayPass solutions.[3]

Leading mobile wallet services are provided by: Alipay, WeChat Pay, Paytm, PhonePe, LINE Pay, Rakuten Pay, GOPAY, Apple Pay, Google Pay, Samsung Pay and others.

According to the GATE (Global Acceptance Transaction Engine) data, in 2019, 2.07 billion consumers worldwide will use the e-wallet services for shopping. Also, the GLOBE NEWSWIRE in the report "The Global Digital Payment Forecasts 2019-2022" predicts that the e-wallets will take over a half of all e-commerce transactions from payment cards by 2022.

The development of e-wallet applications is continuous thanks to the significant role of applications such as AliPay, PayUMoney and Momoe. Interaction between the mobile phone and applications, such as adding or downloading the personal data from the card or when making a purchase, is possible after verifying the user card confirming the PIN number or verifying the fingerprint. The system enables the initialization of a card with personal data, credit accounts, the manage-

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ment of credit card transactions as well as a system for tracking cards that may have been lost or stolen.

The e-wallet enables the initiation of transactions on mobile devices at points of sale that have the POS\(^1\) terminals with NFC (Near Field Communication) short-field technology based on RFID (Radio Frequency Identification) two-way communication or Magnetic Secure Transmission (MST) - security magnetic transmission. RFID establishes automatic identification and transmission of data by the electromagnetic waves and contains an active reader that is powered by energy and a passive receiver that is connected to the active reader by magnetic induction (Burkard, 2011). The RFID receiver contains an antenna for receiving and transmitting a radio signal and an integrated circuit for processing and storing the information and adjusting the signal. The NFC chip is built into mobile telephones that are very small in size.

1.1 E-wallet Models

Today, there are five different e-wallet models that use the different platforms, processes, and security tools:[4]

1. Mobile proximity wallet aimed at the device,
2. Wallet in the device-oriented application,
3. Filesystem,
4. Wallet with QR code,
5. Digital billing wallet.

• The first model of e-wallet is considered an open wallet because it accepts all credit and debit cards of any financial institution that is in the e-Wallet system, and can be used at any point of sale that has a POS or MST terminal.

Also, it should be noted that the e-Wallet applications in the mobile phone are integrated with a device operating system (IOS or Android), his type of e-wallet supports the "EMV Payment Tokenization Specification - Technical Framework." (Tokenization specification for the EMV payment-technical framework) in which the payment application in a wallet generates a dynamic cryptogram that is with the token until the end of the entire transaction.

• An in-app mobile wallet aimed at a device without a card in a mobile store, using the EMV payment tokenization and an issuer ID&V for payments using the application.

• The file system uses previously stored consumer payment data and allows the consumer to make the subsequent or automatic payments without re-entering the payment creditor. Consumers who use this type of e-wallet must open an account with the merchant and enter the necessary data from the payment card that will be used for the future purchases. For security reasons, the consumer is required to create a username and password, but also to select and create answers to security questions tailored to the consumer for verification and additional authentication.

• A wallet with a QR code works by connecting the application to a customer bank account or credit card, so that the customer can pay for goods or services with their phone and by scanning the QR code. Initiating such a flow is similar to the requesting regular payments but further specifies the e-wallet application that the customer will use for the transaction. In that way, the transaction is directed to the terminal so that the customer can scan the QR code and check the payment.

• Cloud-Based Wallets - a wallet for digital billing.

\(^1\) POS terminal (Point Of Sale) - A terminal that allows payment for goods and services. It is equipped with software for processing transactions with payment cards (reading card data, forwarding to the accepting bank and accepting the response of the issuing bank, based on when the payment for the purchase of goods is made). It is used in service and trade shops.
The e-wallet in the cloud stores payment information on a secure and remote server and not in a phone memory. Prestored payment letters of credit are used to activate a payment transaction authorization. The e-wallet from the server sends only tokens or authorizations to the phone to initiate and approve the transaction. In order for the transaction to be performed, an Internet connection is required, either mobile (GSM) or WiFi. After the transaction, you will receive a payment notification via e-mail or text messages. For merchants, services paid via mobile devices that use a server may be more flexible as this avoids some of the restrictions imposed by the POS terminals.

The applied technology and processes determine a design of an e-wallet to be used for transactions and how the credentials will be stored. The choice of wallet application includes: method of interaction for payment, storage of payment letters of credit, payment options (application, proximity to the store, remote e-commerce), method of accepting the card, use of confidential payment data.

1.2 E-wallet Architecture

The e-wallet system uses the J2EE platform, which is a set of standard specifications that describe the application components. The J2EE applications consist of components such as JavaServer Pages (JSP), Java servlets, and the Enterprise JavaBeans (EJB) module. These components provide software developers with the ability to create the large distributed application applications.

The J2EE platform provides service for applications including:
- Naming — this naming and directory service binds objects to the names. A J2EE application can locate an object searching its Java Naming and interface name (JNDI).
- Security—Java Authorization Contract for Containers (JACC) is a set of security agreements defined for the J2EE containers. Based on the customer identities, the containers may restrict access to the container resources and services.
- Transaction management - a transfer of funds between the bank accounts is a transaction.
- Messaging services communicate with each other by exchanging the messages using the Java Message Service (JMS). The JMC is an integrated part of the J2EE platform and facilitates the use of integrating heterogeneous business applications.

The Java servlets technology allows you to easily extend the functionality of a web server with a variety of applications. The Java provides the interaction of important components with the smart card readers in the following way: the smart card runs a Java application - applets (small Java programs) associated with the HTML page developed by IBM. The information from the smart card is transferred to the Java Virtual Machine to become functional.

2 NFC TECHNOLOGY

The NFC is a standard wireless communication protocol that operates on 13.56 MHz radio frequency technology enabling the exchange of data between the devices up to 424 kbps in a few centimeters (Grassie, 2007). The NFC payment transactions between the mobile devices and POS terminals use the same ISO / IEC 14443 standard communication protocol used by the contactless credit and debit cards. Based on this
protocol, the mobile device is allowed to simulate a contactless card.

The Host Card Emulation (HCE) is a payment card emulation software solution that allows a mobile phone application to communicate using an NCF controller to send the payment card credentials or payment symbols to a contactless NCF POS terminal or reader. The Host Card Emulation (HCE) redirects requests for NFC transactions to the mobile application.

3 BENEFITS OF E-WALLET

We all have a number of cards in our classic wallet. If we lose our wallet, we need to contact several banks to secure our money and identity. With an e-wallet, we only need one call to deactivate. An e-wallet eliminates the need for more cards. The user chooses which card he/she wants to use for the e-wallet shopping application. The e-wallet provides a number of security features, increased security measures and comfort that make this project useful.

The e-wallet has a stored value function, which eliminates the need to carry cash. It means like carrying real money in your wallet. This is the so-called the whole value that represents the monetary amount. The entire value can be transferred from the cardholder to the merchant absolutely as a real cash. Also, the cardholder can constantly add an overall value.

The identification subsystem is in charge of the security of information on the identification card and enables that information to be viewed by several people on special request. The system is designed so that any change to the card requires some kind of authentication. The electronic wallet provides all the functions from a smart card eliminating the need for multiple cards. The e-wallet provides a host of security features that are not available to the regular wallet operators. Namely, an identification is required during every credit card transaction and the smart card is equipped with a disabling system if the card is misused. All these increased security measures and convenience make this process useful.

Paying with the help of a mobile phone is very simple and practical and saves time. In addition to this, it is also possible to pay at payment terminals, pay and buy at the WEB-shop stores, transfer money to another e-wallet, transfer funds via e-mail, SMS, withdraw cash at the bank and ATMs.

According to the NALED, in accordance with the above, the VISA estimates that the application of digital payment technologies (payment cards, internet and mobile phones) would bring a direct net benefit in Belgrade of 324.3 million dollars every year. Out of that, $ 27 million net to the consumers, $ 200 million to the companies (when the cost of infrastructure is deducted and $ 68 million to the state, through higher taxes and lower administration costs.

Taking into account all the advantages that this type of payment brings, a large number of countries from all over the world actively promote cashless payments, and for that purpose develop various forms of incentives and subsidies that try to make it more acceptable and profitable, both for businesses and citizens. Some of the most common models are the introduction of POS terminals in public institutions, the reduction of VAT, subsidizing the costs of setting up terminals and the purchase of mobile phones.

3.1 E-wallet Safety

Various researchers such as Varsha and Thulasiram’s study (2016) in their research on consumer behavior towards the e-wallet services indicate that the secured privacy and secure transactions are the main reasons for the progressive acceptance of said innovation.

There are other opinions, such as (Holland and Dyke, 2015) that consider security to be one of the main reasons for not using the mobile payments. (Abrazhevich, 2001) indicates that the consumers are reluctant to use the electronic payment methods due to the problems of trust, security and reliability. Back in 1989, Ram and Sheth claimed that an innovation was influenced by the functional and psychological barriers.
The ultimate goal should be a complete replacement of credit, debit, loyalty, prepaid and other cards, which users carry en masse in their wallets. (Coskun at all, 2014, p. 144).

4 E-COMMERCE IN THE REPUBLIC OF SERBIA

VISA listed Belgrade as the actual or potential “cities without cash” according to a research conducted for the period 2012-2015. Based on those researches, the non-cash trade brought Serbia 150 million euros. It is estimated that there is currently 10% of the non-cash economy in Serbia and that this trend will increase to 35% in a few years.

For many years, the system of online payments via computers and mobile phones has been functioning in Serbia. In recent times, the commercial banks, following modern trends and innovations, have applied a way to pay without cash and cards in stores, restaurants and other places.

There is a constant increase in the number of regular users of e-commerce in Serbia. It increased from 18% of the total number of Internet users in 2011 to 30.9% in 2018, the Ministry of Trade, Tourism and Telecommunications of the Republic of Serbia announced.

It is predicted that by 2030, more than 85% of companies will be engaged in the e-commerce globally, and that it is necessary for Serbia to develop this area in order to use all the technological potentials for economic progress. According to the ministry, the biggest challenge in strengthening e-commerce in Serbia is how to increase the trust of citizens in this form of buying and selling and prevent the gray economy in that trade.

According to the data of the Ministry of Labor, Employment, Veterans and Social Affairs of the Republic of Serbia, it is stated that in 2018, 1.8 million citizens bought over the Internet, which is 50% more than in 2015. Electronic commerce in 2018 of $317 million, an increase of about 9% over the previous year. The forecasts for 2019 say that the Internet sales will record a turnover of around 350 million dollars.

Serbia is becoming part of a group of countries that recognize the digital economy as one of the main generators of the entire economy development.

CONCLUSION

Mobile wallets are not widely accepted in many countries, but the use of technology and user features will lead to a greater acceptance. In order to increase the number of e-wallet users, it is necessary to point out their potential. It is estimated that over 1.7 billion adults (21% of the total world population) do not have access to a traditional bank account but about a billion residents have a mobile phone and may be potential users of mobile wallets.

The e-wallet shall become a global standard as consumer confidence in e-commerce grows. The mobile wallet is a benchmark for many international brands in mobile banking. The e-commerce enables the domestic economy to more easily place products in the country and on the global market. Using the e-wallet provides retailers with the greater efficiency, cost savings, and greater customer loyalty.

As more and more purchases are made remotely, the losses of online payment fraud are increasing. Thus, mobile biometrics will become popular for digital shopping due to its increased security.

REFERENCES