

IMPROVING THE TECHNOLOGY OF MOBILE PAYMENTS CONTRIBUTES TO THE DEVELOPMENT OF E-COMMERCE

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Abstract: *The purpose of the article is to study new ways of using the achievements of technological progress for the development of e-commerce. The relevance of the research topic is due to the high significance of reducing the terms of payments in domestic and international trade, which is the most important indicator of increasing the speed of capital turnover and objectively contributes to increasing the profitability of trade operations.*

Data and methods: *The research is based on the use of methods of a systematic approach, analysis and synthesis, methods of empirical research, as well as economic and mathematical methods, graphical and tabular methods.*

Results. *The article presents an empirical analysis of statistical data and identifies structural changes in the use of payment instruments that allow for mobile payments using mobile electronic*

information transfer devices. It is proved that the dynamics of mobile payments has a direct correlation with the level of income per capita in countries where e-commerce is most developed. The results of the study show that the use of money transfers from debit cards, without direct contact with the buyer's bank, is growing. For customers, this means moving from using cash to digital payments without Internet access, creating a new segment of payments for the purchase of goods, as well as eliminating the use of bank cards to process purchase and sale transactions. This can serve as a new and quite strong incentive for the purchase of mobile electronic devices (smartphones, smart watches and tablets) for their use in the purchase and sale operations in electronic commerce. Information technology companies are making intensive efforts to develop and implement new payment methods for goods.

Keywords: *electronic commerce, decline in the role of cash payments, bank cards, mobile payments, mobile electronic devices for data transmission.*

JEL codes: *E 27, F 14, O 30.*

1. Introduction

The implementation of trade operations in international commodity exchange is based on the use of the achievements of scientific and technological progress (Dolgov, et al., 2019). In addition to ensuring the quality and conditions of shipment of the goods, an important place is occupied by ensuring payment for the delivered goods. One of the tasks in this area is to speed up payment transactions, since this contributes to the acceleration of capital turnover, which objectively contributes to the increase in the profitability of trading operations.

Electronic payment methods developed and implemented in recent years involve the transfer of funds and information about payments made in electronic form, rather than the physical exchange of paper funds (cash, cheques, demand bills, vouchers, etc.). Electronic payments can be made directly from home or from the office using computers (including mobile devices). At the same time, along with the use of conventional payment tools directly through banks, credit cards began to be used, and then mobile information transfer devices – smartphones. As a result, there was a term – "mobile payment", carried out with the help of wearable electronic devices.

Mobile payment refers to any e-financial transactions that are conducted using a mobile device: smartphones, smart watches, and tablets. Electronic payment methods help reduce transaction costs by eliminating distance factors and time costs in the payment process, as well as providing a high degree of payment automation for the trader, customs and banks.

Although from an economic point of view, it was the desire to reduce the speed of execution of trading operations that was at the heart of the process, the transition itself became

possible only on the basis of technical solutions, namely the introduction of NFC - Near Field Communication technology, that is, "near field communication". NFC operates at a distance of no more than 10 cm between the devices, and the maximum data transfer rate is a modest 424 kbit / s by current standards.

The use of digital payments made through mobile information transfer devices is booming and is changing radically in the context of the Covid-19 pandemic. The crisis has affected the way people think about payments and financial services, as many countries have seen a decline in the use of cash and an increase in the number of "contactless" ones. This shift to a cashless society has an impact on all participants: retailers, merchants, consumers, governments, financial institutions, service providers.

The system of contactless payments via mobile information transfer devices has taken an important place in the daily life of customers. It is a fast-growing payment services market and a means of payment supported by banks. Digital payments in the form of cards or mobile wallets are becoming the norm. The Covid-19 pandemic has helped spur the use of contactless payments. In the past, such uses have raised certain concerns, such as concerns about data security and confidentiality, or problems with the distribution of value among trading participants. In an effort to limit the spread of the virus through contactless technologies, governments and regulators are encouraging the use of contactless payments

In retail, a new phenomenon in the development of electronic payments has become the active use of electronic gadgets – smartphones for payment ([Molina-Castillo, F. J.](#) et al. 2020). This gave rise to the widespread use of a new term – "mobile money". Payments of this kind are intensively executed in both domestic and international trade. Mobile contactless payments are made via a mobile device in the store or at points of sale with technologies implementing wireless payments (NFC), such as Apple Pay or Samsung Pay. In some cases, the term "contactless" payments are used as a synonym, meaning that the payer and the seller do not touch the money themselves.

2. Methodology and data

The research is based on the use of methods of a systematic approach, analysis and synthesis, methods of empirical research, as well as economic and mathematical methods, graphical and tabular methods, etc. Together, these methods made it possible to ensure the reliability of the economic analysis and the validity of the conclusions.

To achieve the set goals and objectives, the following methods were used:

- Comparative analysis that allows you to compare the characteristic features of e-commerce in Russia and the world;
- Didactic analysis that reveals the essence of the types of e-commerce that are typical for the world, and in particular for Russia
- The method of historical research, allowed revealing the features of the stages of development and formation of electronic business.

New means of payment provide an incentive for the development of e-commerce. The mobile payment system, which appeared in 2012, has taken an important place in the daily lives of buyers in many countries. This was followed by contactless mobile payment, which allows you to make transactions using a mobile phone. This is a rapidly developing means of payment that is supported by banks. We combine under the name "mobile contactless payment" three ways of conducting a transaction:

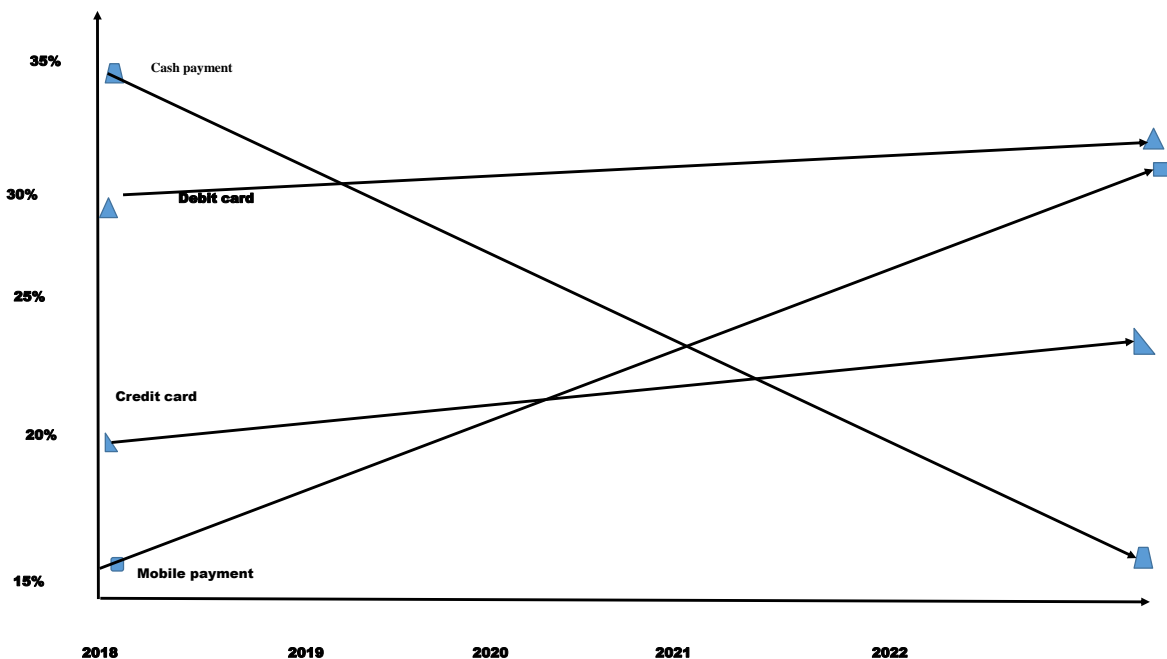
- When a customer purchases an item via their smartphone or tablet on an e-commerce company's website or marketplace;
- When transferring a sum of money from one mobile phone to another;
- When a customer makes purchases in a store using a smartphone to connect it (as with a contactless bank card) to an electronic payment terminal.

The introduction of new payment instruments into circulation leads to structural changes in payment transactions. China remains the most prominent digital payments market in the world, with 49% of the global market share by 2023. E-commerce giant Alibaba and gaming group Tencent have taken advantage of the country's widespread smartphone ownership and helped spark a massive shift among Chinese consumers away from paper banknotes in favor of digital payments, initially using plastic cards, and then using payment apps on the phone. As it was mentioned (Jastra Ilic, 2020), Chinese companies receive digital payments and use them as an entry point to offer consumers a range of both offline and online products and services. In many developing countries, there may be a situation where consumers switch to mobile payments immediately from cash, bypassing the stage of using a plastic card.

It was stressed out (E-commerce Payment Methods, 2021) that in 2018, approximately 48% of U.S. consumers had adopted a non-bank payment account such as PayPal, while 60% had adopted mobile apps or online accounts such as Apple Pay (Federal Reserve Bank of Atlanta). Adoption and use of digital wallets is highest among younger individuals.

Among payment instruments, bank cards retain a leading position, but the share of mobile payments will reach 28% by 2022, compared to 15% in 2018. The continued primacy of bank cards is understandable, given the availability of salary and pension cards - and the wide range of loyalty programs that banks are making more attractive and personalized in the competition. This tendency is reflected by Figure 1.

Fig. 1. Global share of point-of-sale payment methods, 2018-2022 (in %)



Calculated by: Amazing Stats Demonstrating The Unstoppable Rise of Mobile Payments Globally // <https://www.merchantsavvy.co.uk/mobile-payment-stats-trends/>

In the last few years, e-commerce (mcommerce or m-commerce) has developed rapidly. According to a report by the consulting company App Annie Mobile (The State of Mobile 2019. App Annie State of Mobile, 2019), the total time spent by mobile users in shopping apps in 2018 was 18 billion hours and "Cyber Monday" alone brought in \$ 2 billion to shopping companies, more than half of which came from mobile devices.

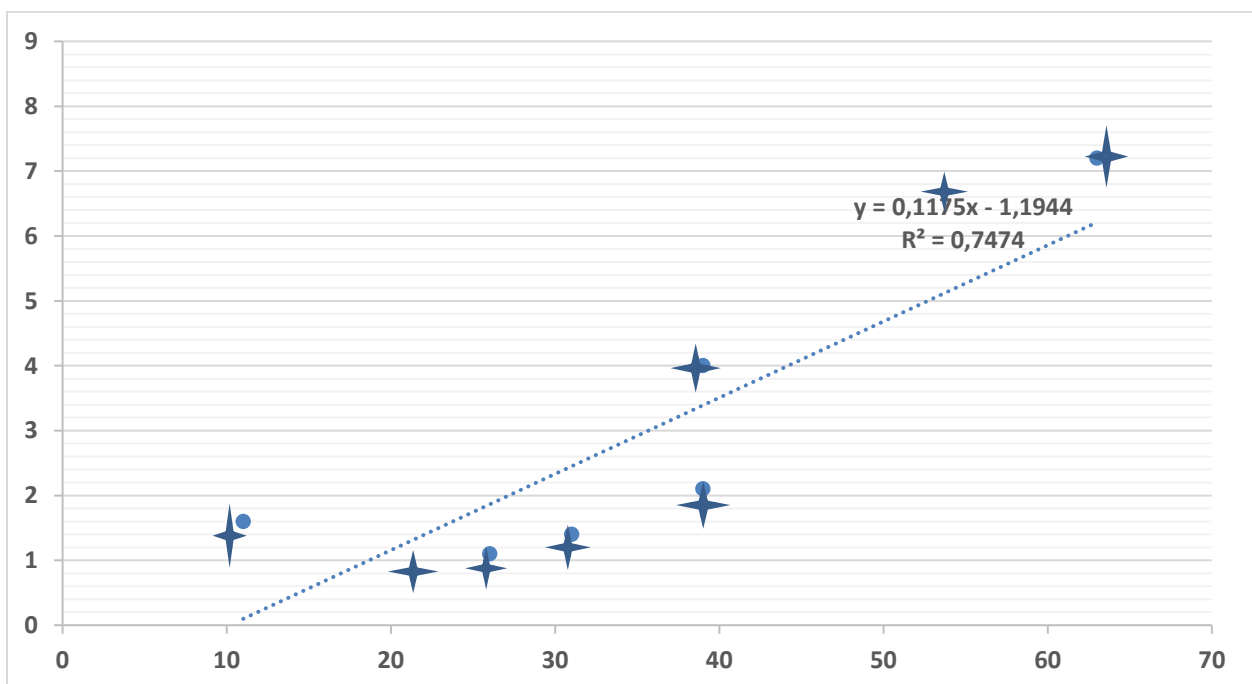
The analysis of the age structure of buyers using mobile payment shows a tendency to increase the role of a relatively young segment of the population. In a survey conducted by the consulting firm Square, it was found that among American buyers aged 18 to 34 years (this stratum of the population is called millennials), almost half use payment using a mobile device,

while only 26% of older people do the same. This high level of mobile payment usage among millennials is a good indicator of where the future of mobile banking in the US is heading. In European countries, according to Visa, customers between the ages of 55 and 64 use mobile banking more often than their American counterparts. Among Europeans, the residents of the United Kingdom are leading: statistics on the use of mobile banking in the UK show that 74% of the country's residents use smartphones and mobile banking applications to manage their finances. It was pointed out (Luke V., 2021), that between 2020 and 2027, mobile payments will grow by an average of 29.0% per year, and by 2027 they will reach \$ 8.94 trillion.

Contactless technologies are becoming the new normal. Governments have taken initiatives to encourage non-cash growth, which has led to an increase in the limit of contactless payments in many countries (France, Germany, Morocco, the United Arab Emirates, the United Kingdom), but despite technical advances in the dynamics of payments, much is determined by the level of income of buyers, or rather by the value of GDP per capita. The correlation of these indicators for the leading countries where e-commerce is intensively developing is presented below.

The results of calculations using the least squares method allow us to establish a linear correlation linking per capita income with the use of mobile payments in e-commerce.

Fig. 2. The dependence of the cost of mobile payments in individual countries on the GDP per capita



On the abscissa axis - the level of GDP per capita in thousands of dollars, on the ordinate axis - the value of mobile payments in the country per user of a mobile device in dollars.

Calculated by List of Countries by GDP (nominal) per capita// [https://statisticstimes.com/economy/countries-by-gdp-capita.php%;](https://statisticstimes.com/economy/countries-by-gdp-capita.php%) List of countries by number of Internet users// [https://en.wikipedia.org/wiki/List_of_countries_by_number_of_Internet_users;](https://en.wikipedia.org/wiki/List_of_countries_by_number_of_Internet_users) Уровень распространения мобильных платежей по странам мира // [https://zen.yandex.ru/media/pstat/uroven-rasprostraneniia-mobilnyh-platejei-po-stranam-mira-5f2d5a7048d9f7514cdbc0c0;](https://zen.yandex.ru/media/pstat/uroven-rasprostraneniia-mobilnyh-platejei-po-stranam-mira-5f2d5a7048d9f7514cdbc0c0) Amazing Stats Demonstrating The Unstoppable Rise of Mobile Payments Globally // Updated February 2020 // <https://www.merchantsavvy.co.uk/mobile-payment-stats-trends/>

3. Results obtained and discussion

Increasing demand for self-service and personalized products and services is driving the growth of the mobile payment market. Technological advances are leading to a number of useful features: real-time customer assistance, a user-friendly interface, and immediate transactions. But there are some opinions that the use of mobile banking in recent years show a significant disadvantage – namely, the low security of the network infrastructure, and this slows down the expansion of this market for services.

Nevertheless thanks to the dramatic increase in the use of Internet services and the widespread growth in smartphone sales, improved interoperability and new business models, customers can now choose from a set of specialized payment tools. For the first time in 2019, digital transactions accounted for the majority of mobile money flows. For customers, this means moving from cash to digital payments — for school services, e-commerce, international money transfers, savings. The development of trade in the mobile payment service looks like a platform, that is, as the basis for the transformation of many different business schemes, it pays off in the course of its use in various commodity and service markets.

The consulting company Juniper Research reports that by 2024, the number of contactless payments worldwide will triple to \$ 6 trillion, compared with \$ 2 trillion in 2020, as the number of transactions using mobile wallets linked to a phone number increases, and banks expand the use of cards that allow you to withdraw money from the customer's account linked to the phone number.

Some experts (Mukherjee, Sahadev, 2017) point out that although there are many facilities on e-commerce system but above all it can't able to give 100% security to the customer. There are lots of security systems to keep attention. According to the merchants' online transaction are safer than use money directly. Actually, for vendors it is less dangerous, if the store meet with any type of accident like looted or burned etc. Since experts argues that the transactions using e-commerce is safer than ordinary card buying, but it is difficult is in getting customers to believe.

Electronic commerce has extended quickly throughout the decade and is expected to further expand at this speed or faster. In the forthcoming period, the limits amid "conventional" and "electronic" trade will become progressively distorted as more and more companies transfer segments of their operations online (Taher, 2021). With all these, one could say (Adeyeye, 008) That a web merchant or someone that wants to start an e-commerce website can decide on which payment gateway to use and what kind of debit card should be allowed on his website. A one-stop solution will begin to emerge sooner has a bank and a payment gateway may decide to render dependable services. That is, a web merchant who decides to use a particular payment gateway invariably has to use a matching debit card system alongside. This has been implemented in developed countries. Public awareness on benefit of getting our local stores online should be encouraged. It should be emphasized that getting online does not stop the traditional or conventional sales but rather an alternative way of generating more income.

As it is stressed out (Išoraitė, Miniotienė, 2018) mostonline retailers are cheaper than the same products offered in regular stores. This is the main reason why today's online stores are gaining market share. Some online stores have exceptional conditions where you do not have to pay for delivery at home for a certain amount. When trading online, less time is spent on paperwork, as in the e-commerce sales, as reports are automated. It is convenient for small businesses to go online because they can easily compete with bigger ones. Also, online sales are cost-saving - there is no need to rent an outlet to the store, and warehousing is not always necessary. It is much easier to access foreign markets on the Internet.

4. Conclusion

As more and more mobile payment applications are used to accept payments, it is expected that in the coming years, the dynamics of increasing the volume of mobile payments will continue to grow with a high average annual increase (on average 26%). Mobile payments are projected to reach \$ 4.6 trillion by 2023. This represents a cumulative annual growth of

33.8% compared to 2017. At the heart of this dynamic is the development of e-commerce - global sales of goods through e-commerce channels have tripled over the past four years from just under \$ 1 trillion in 2016 to almost \$ 3 trillion in 2020. According to published forecast (eMarketer's, forecast 2020), global mobile e-commerce sales are expected to reach 3.6 trillion in 2021. In 2025, they will exceed \$ 4 trillion. The results revealed by the market analysis lead to structural changes in the use of payment instruments in electronic commerce. In recent years, the pace of development of e-commerce and, consequently, mobile payments has grown rapidly. As a result, the ratio of digital to cash transactions has increased by almost 50 percent since 2017, and the total amount of non-bank payments in mobile e-commerce has exceeded \$ 1 billion. The results revealed by the market analysis lead to structural changes in the use of payment instruments in electronic commerce. In recent years, the pace of development of e-commerce and, consequently, mobile payments has grown rapidly. As a result, the ratio of digital to cash transactions has increased by almost 50 percent since 2017, and the total amount of non-bank payments in mobile e-commerce has exceeded \$ 1 billion. As it was noted (Vu Luke, 2021), the use of mobile payments in trade will continue to grow and in 2022 will become the second most common payment method after debit cards.

Increasing the use of money transfers via mobile devices accelerates progress towards achieving the Sustainable Development Goals and contributes to the economic empowerment of individuals, groups and businesses. Improving the technology of electronic payments makes it easier for owners of electronic gadgets to use them for making purchases and payments on them, that is, it encourages electronic commerce both domestically and internationally.

References

- Alnoor A. E-Commerce: Advantages and Limitations// International Journal of Academic Research in Accounting Finance and Management Sciences · January 2021//
https://www.researchgate.net/publication/350235862_E-Commerce_Advantages_and_Limitations
- Adeyeye, Michael "e-Commerce, Business Methods and Evaluation of Payment Methods in Nigeria..The Electronic Journal Information Systems Evaluation Volume 11 Issue 1, July 2008, pp. 45 - 50, available online at www.ejise.com
- Amazing Stats Demonstrating The Unstoppable Rise of Mobile Payments Globally // <https://www.merchantsavvy.co.uk/mobile-payment-stats-trends/> (Date of access: 08.05.2021).
- Comment accepter les paiements électroniques dans le monde entier// <https://www.eurostartentreprises.com/fr/notre-blog-business/comment-accepter-les-paiements-electroniques-dans-le-monde-entier> (Date of access: 06.05.2021).
- Commodity dependence, growth and human development. Background document to the Commodities and Development. Geneva. Report 2017. 22p. (Date of access: 05.05.2021).
- Damjan Jugović Spajić Mobile Banking Statistics That Show Wallets Are a Thing of the Past// <https://dataprot.net/statistics/mobile-banking-statistics/> (Date of access: 21.03.2021).
- Dolgov, S.I., Savinov, Y.A., Taranovskaya, E.V., Sekerin, V.D., Gorokhova, A.E. (2019) Developing the export of Russian goods and services through online stores. International Journal of Innovative Technology and

Exploring Engineering. Vol. 8. Iss. 5. P. 981-986.

Innovation in business processes & e-payments in single window. Facilitation instruments and tools tools. Single-window. WCO. Part IV // <http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/single-window/compendium/swcompendiumvol2partiv.pdf> (Date of access: 27.04.2021).

Išoraitė M., Miniotienė N. Electronic Commerce: Theory and Practice (2018) // IJBE: Integrated Journal of Business and Economics. Volume 2 Issue 2, pp. 73-79, Date of Publication: 4 June 2018, Available Online at: <http://ijbe-research.com>

Jastra Ilic Digital Payments to Hit Record \$4.7trn in 2020 (2021) // <https://learnbonds.com/news/digital-payments-to-hit-record-4-7trn-in-2020/> (Date of access: 02.05.2021).

Luke Vu Insights from Trending mCommerce Statistics (2021) // <https://www.simicart.com/blog/m-commerce-statistics/> (Date of access: 07.05.2021).

Mukherjee M., Sahadev Roy E-Commerce and Online Payment in the Modern Era (2017) // International Journal of Advanced Engineering and Management.. May 2017. P. 1-5 // www.ijarcsse.com

Taher, G.. E-Commerce: Advantages and Limitations. International Journal of Academic Research in Accounting Finance and Management Sciences, · January 2021. 11(1), 153-165.

Molina-Castillo, F. J., Lopez-Nicolas, Carolina de Reuver, L.- N., de Reuver M. Mobile Payment: The Hiding Impact of Learning Costs on User Intentions. (2020) // Journal of theoretical and applied electronic commerce research. versión On-line ISSN 0718-1876 // https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-18762020000100102