

# Features and Competitive Advantages of Contactless Mobile Payment Systems on the Russian Market

Ludmila Viacheslavovna Goloshchapova  
Plekhanov Russian University of Economics,  
Moscow, Russia  
cool.lvg2012@yandex.ru

Ludmila Anatolevna Ivanova  
Kursk state University,  
Kursk, Russia  
ivaviser46@yandex.ru

Natalia Pavlovna Savina  
Olga Viktorovna Romanchenko  
Plekhanov Russian University of Economics, Moscow, Russia  
natalia.tikhonova@mail.ru

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## *Abstract:*

The purpose of the article is to study the technology of contactless mobile payments, previously unavailable in our country and rapidly gaining popularity due to the sale and implementation of it in the functionality of most smartphones. The main systems used in banking and financial services, such as Apple Pay, Samsung Pay, Google Pay and Garmin Pay, were also reviewed.

In the process of writing were used: the method of content analysis, analysis of documents and observations, as well as methods of strategic analysis.

The article reveals the mechanism of mobile payment systems, their features and competitive advantages, as well as the prerequisites for further development in the Russian market, notes the problems and risks of fraud in the use of mobile applications, analyzes the time of arrival of international systems in the region.

Highlighted in the research process, features of primary implementation and further development of contactless mobile payment systems and their accounting are practically important for improving the national payment system Mir and for users who faced for the first time with a variety of services.

**Keywords:** *contactless payment; payment systems; mobile payment systems; NFC; smartphones.*

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## **Introduction**

Each progressive technology in time acquires a new functionality, scope of application and appears in new forms. Thus, due to innovative solutions that simplify household procedures, smartphones have become convenient for performing basic everyday tasks and quickly obtaining relevant information.

Contactless mobile payments are a big step

towards simplifying the life of the population. Despite the study of contactless payment technology abroad since 2002, this topic was practically not touched among domestic scientists until 2015, and 59% of Russian respondents did not know about MasterCard PayPass technology [12, p.44-45]. Due to the robust introduction of smartphones and the interest of banks, the technology of contactless

payments came to our country relatively quickly and is no longer perceived as a rare phenomenon. The prospects of banking sector include improvement of security and reliability of transactions, optimization of cardholder identification systems, provision of services remotely, complete exclusion of cash payments [10, 2016, p. 25].

Foreign researchers point out that the introduction of mobile payments represents not only a measure of improving the efficiency of existing networks, but also creating a level of user experience to consolidate the close connection between online brands and everyday consumers. The new role of smartphone as a financial device was approved, uplifting the user experience of people with bank accounts to a new level as part of payment [13, p. 357].

#### Analysis of the hardware component of mobile payments

Technologies for contactless payments, for example, MasterCard Contactless or Visa payWave, have made the process of paying for daily small purchases easier and more convenient for the buyer and seller [12, p. 127]. Despite the great popularity of NFC-technology, contactless payment in practice can be carried out by other

methods. For example, the standard among Chinese payment methods via WeChat Pay and Alipay do not require the presence of a hardware NFC module in payment platforms, their technology is tied to reading special QR codes that are displayed on the screen and can be read by special terminals or other devices. For Russia, the consideration of such diversity can become significant in the development of its own national payment system Mir.

Note that since 2017 in Russia there has been a boom in sales of smartphones with NFC module. Retailers and analysts attribute this fact to the growing interest in the payment method itself, as well as the launch and active advertising promotion of payment systems Samsung Pay, Apple Pay and Google Pay.

There is an assumption that in Russia the appearance of smartphones with NFC and the growth of their sales were influenced not by consumer demand, but by the installation of such modules by all manufacturers by default regardless of the above factors. However, this is questionable due to the fact that these modules began to be built in and function in smartphones long ago, but were not used often. We list this functionality in the table (see Table 1).

**Table 1. Methods of using NFC in mobile devices in chronological order**

Month/ year	The usage of NFC in mobile devices
12.2010	Google Inc. released its second smartphone, the Nexus S based on Android 2.3 Gingerbread, which became the first smartphone in the world using NFC at the software and hardware level. The first function with this module was reading and writing passive tags (read mode).
09.2011	On September 19, 2011, Google released the Google Wallet app. It allows you to pay for purchases in the store from a smartphone on Android with NFC module. After 4 years, there was a launch of a new payment service Android Pay, which improved the achievements of the previous system and opened for the rest of the countries.
10.2011	Together with the release of the new version of Android 4.0, ICS Google introduced the Android Beam technology, which allows you to quickly transfer web bookmarks, contact details, routes on the map and other information in P2P mode between smartphones by touching the back covers of the devices where the NFC module was located.
06.2012	In October, Sony released its own Sony SmartTags, which work with its smartphones through the Smart Connect app. Tags allow you to automatically switch wireless connections, adjust the sound and other settings of the device when it is brought to one of the tags. Four months earlier, Samsung launched the sale of TecTiles stickers with a built-in NFC tag.

Source: [17].

Statistics from the report of General Director of Visa in Russia Catherine Petelina, according to which Russia at the end of 2017 ranks first in the world in the number of Visa cards tied to the Android Pay system, stands in opposition to this theory [20]. This indicates the adoption of innovations by the population of the

country.

### Position of mobile payment systems on the Russian market

Consider all contactless mobile payment systems existing in Russia and understand their features (see Table 2).

**Table 2.** Comparative characteristics of contactless mobile payment systems in Russia in the order of appearance on the market

Items	Samsung Pay	Apple Pay	Google Pay	Alipay	Garmin Pay	WeChat Pay
Release date in the Russian Federation	29.09.16	04.10.16	23.05.17	14.07.17	19.12.17	09.07.18
The number of banks supported in Russia	48	62	74	Не уточняется	27	Не уточняется
Type of device	Smartwatches; smartphones		All		Smartwatches	All
Compatibility	Samsung onAndroid	iOS	Android 5.0+	Only for tourists from China	iOS, Android	Only for tourists from China
Principle of operation	NFC + MST	NFC		Reading QR codes	NFC	Reading QR codes
Cheapsmartphone	Galaxy J5 (2017): 12 990 ₺	iPhone SE: 18 490 ₺	BQ 5001L Contact: 5 490 ₺	-	-	-
The cheapestdevice		Watch S1: 16 490 ₺			vivoactive 3: 25 790 ₺	

**Source:** according to data from resources (Samsung RU; Apple; Google; Garmin Russia)

A feature of Samsung Pay is support for the payment method using MST, a technology that uses an electromagnetic field to make the terminal without the support of contactless payments think that it was a real card. Due to this, at least 90% of all terminals are supported. In 2016, Samsung announced Pay Mini, an application that supports Android phones without NFC, intended only for online payments. Owners of Samsung NFC devices are not limited to the company's own service, as well as consumers of other Android smartphones can use Google Pay.

Apple uses Touch ID (fingerprint sensor) and Face ID( starting with the iPhone X) as proof of payment when you pay with your iPhone. Also the company, just like Samsung, allows you to make contactless payments from Apple Watch,

which only require double tapping on them. The payment service, according to Vedomosti sources, charges a fee from banks for each transaction, «in addition, the bank must pay 45₺ per year for each card connected to the service» [1], but this does not apply to regular Samsung Pay users and Apple Pay.

The search giant Google is increasingly providing support in Russia for services that previously operated only in the US and among other countries - last summer Google Assistant in Russian and Google Lens (Objective) became available. Due to the absence of binding to its own devices, the payment platform is available on an impressive number of devices with Android-based NFC. In February 2018, the corporation completed the process of combining Android Pay

and Google Wallet under the Google Play brand.

Other payment systems mentioned above can be classified as niche. The advantages of Chinese Alipay and WeChat Pay include payment technology through scanning the QR-code displayed by the smartphone. The main problem of both systems is the impossibility of work for Russians - only Chinese citizens can pay for it. The partners explain this by focusing on Chinese tourists and Chinese citizens living in Russia.

An example of successful development and embedding of own payment system into the product is shown by the manufacturer of sports watches Garmin. The company has expanded the range up to 10 models, and as of September 12, 2018, the payment service is supported by 27 banks [27].

The process of connecting and using the contactless payment service is simple: for most systems, it is required to enter the payment card data and confirm it with a one-time SMS code from the bank. Confirmation of transactions by authentication varies from password to the scanner of eye retina or face. On the security side, these services have drawbacks. For example, a magnetic stripe signal on plastic cards can be intercepted by a special device, the skimmer [11]. Also, smartphones with open root-rights (extended user rights that allow manipulation of system files) are exposed to attacks, since attackers, using fake applications or found system vulnerabilities, can

access data from banking applications to transfer money to their accounts.

Most mobile payment services support payment in online stores. In Russia, there are cases of cash loss due to fraudulent tricks through the Internet channels. According to the estimates of «AlfaStrakhovanie», the rate of unauthorized withdrawals from bank card holders increased 5.5 times in the country from July 2015 to June 2016, 93% of which came from Internet banking. [14, p. 50].

Today in the Russian Federation there are not enough measures to solve this problem. For example, in Yandex.Browser the interface of the original site of electronic settlement system for providing card data changes to dark gray. However, this does not apply to all sites that have a security certificate, due to the nature of the browser and its white list. Mobile payment services reduce the risk of fraud through direct communication with online stores. The user immediately sees the amount to be paid, which eliminates unexpected unnecessary debiting, and the tokenization system ensures data security, because instead of the owner's name, card number and CVV / CVC code, a token and a crypto program are transmitted that act as a one-time code [5].

Consider the launch duration of contactless payment systems in Russia (see Table 3).

**Table 3.** Comparative characteristics of the main contactless mobile payment systems in Russia since the first launch in the world

First run (#1 in the list)		The first country in Europe			Launch in Russia	
Country	Release date	Country	Release date	In the list	Release date	In the list
<b>Apple Pay</b>						
United States	20.10.2014	Great Britain	14.07.2015	#2	04.10.2016	#10
<b>Samsung Pay</b>						
South Korea	20.08.2015	Spain	02.06.2016	#4	29.09.2016	#8
<b>Google (Android) Pay</b>						
United States	11.09.2015	Great Britain	18.05.2016	#2	23.05.2017	#11
<b>Garmin Pay</b>						
United States	31.08.2017	Switzerland	06.12.2017	#3	19.12.2017	#4

*Source: compiled by the authors on the dates given by the companies for the launch of payment systems in the respective countries*

Samsung Pay and Google (Android) Pay are presented at the same time, but Samsung released the system to the Russian market earlier;

Garmin Pay is the only service launched in Russia in the same year as at home.

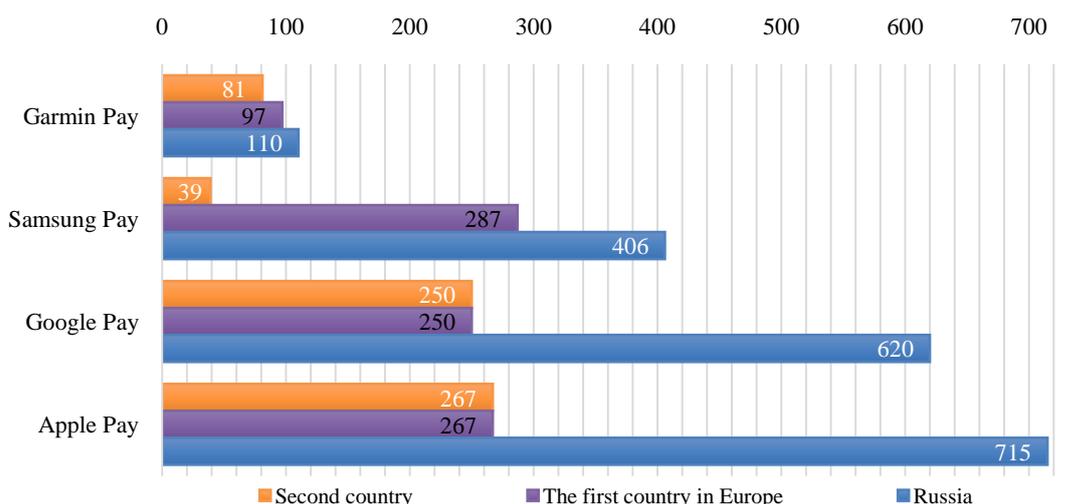


Fig. 2. Time intervals from the release of technology in the home country of the company and until its opening in other countries, in days

Source: compiled by the authors on the basis of data from table 3.

Apple launched its payment system in Russia 2.68 times longer than in Europe, but, as sales of the company's products have showed, this factor for an ordinary buyer is not decisive in choosing a smartphone. According to Telecom Daily data for November 2017, Apple occupied a share of 43.1% of the Russian smartphone market in monetary terms (first place), which is a record figure for the iPhone in Russia since 2010 [3].

Samsung ranks second in terms of money with a 25% share. The figure shows that the system Samsung Pay got to Russia the fastest. A comparison of number of supported banks and the number of days before the launch in Russia, suggests a direct link between these indicators, but there are facts that reject the possibility of constructing a linear regression:

1) Incorrect comparison of the current number of banks with the number of days before launch in Russia, since the latter value remains constant;

2) Google began the first interaction with banks in 2011 with the launch of Google Wallet application in the US, which indirectly explains the numerical advantage over other payment systems, and excludes the system from the sample for regression;

3) Small number of regression parameters (3-4 systems) in relation to the number of factors (2), which leads to a high standard error of regression and the rejection of any links [16];

4) The number of supported banks is a disputed value in the direct comparison of systems due to incomplete support of all cards within the bank; even within the same MasterCard or VISA system, there is partial support for issued cards.

### Improvement of technologies for contactless payments

The improvement of current and provision of new payment instruments is a dynamic one, however, regulatory and legislative regulation of payment systems is lagging behind the implementation of technical and organizational improvements. In order to stimulate consumers, domestic companies are working on payment benefits, increased cashback, promotion with mobile contactless payments [24].

For example, in August 2018, Yandex announced the addition to the Yandex.Taxi service of opportunity to pay for trips through the Google Pay payment system, reducing the cost of the first 10 trips paid through this system to users by 100 Pof each of them [28]. Banks do not stand aside: last July Sovcombank announced that it introduced 3-4 times increased cashback for purchases made using contactless payment from smartphones or smart watches on Apple Pay, Google Pay and Samsung Pay [18, 30].

At the beginning of 2018, the Chinese company Huawei announced that it was entering the international market with its payment system

Huawei Pay, which previously operated only in China [6]. Despite its importance, such a service will not be in great demand in our country due to the application's operation with China UnionPay bank cards, which are not popular among Russians.

It is necessary to mention some applications in which the function of contactless payment was not the main functionality and was added later:

1) Bank applications or electronic payment services, for example, Tinkoff and Yandex.Money– online payments". They act as a "mobile Bank" with the ability to display the balance on the card. Users are also provided with opportunity to link non-system cards (Visa, MasterCard, Maestro, World) without displaying the balance.

2) Applications that are virtual wallets, such as «Wallet. Discount and bonus cards» from CardsMobile. Initially, the service allowed us to store photographic prints of discount and gift cards of stores and generate a bar code that acts at the checkout and eliminates the need to carry cards. In 2015, contactless MasterCard technology was introduced into the application. The disadvantage is the lack of support for other cards (Visa or Mir) and a small number of supported banks (MTS Bank, Russian Standard, St. Petersburg, Moscow Industrial Bank).

In the spring of 2018, the national payment system Mir announced work on creating its own world-free contactless payment service, Mir Pay, scheduled for autumn [15]. Note that as of October 2018, World cards are not supported by Google Pay and Apple Pay. From December 2017, Samsung Pay has been the only option to use mobile contactless payments. The general director of the company announced possible options for implementing the service - SIM-cards with Bluetooth technology. The problem with the forced transfer to Mir payment system of state employees, some of which are immediately transferred to Visa / MasterCard cards or cashed, is explained by the established habits and barriers in people's heads [21].

In its current form Mir has noticeable flaws: implementation not in all Russian online stores, a small list of countries of operation, the

impossibility of making purchases abroad without a combined cobading card (with two payment systems), and the lack of basic services in banks with Visa and MasterCard cards.

Another situation is related to the fact that Visa and MasterCard payment systems have long been supported by the 3-D Secure protocol, which provides additional protection for online transactions and the possibility of challenging the operation by the issuing bank and returning funds to the cardholder. Mir cards as a temporary measure were launched with the payment security system MirAccept 1.0, based on the 3-D Secure solution from Visa, and since August 2017 there has been added a security platform - MirAccept 2.0, based on the specifications of the International Association for Electronic Payment Technologies EMVCo. The platform allows paying for services through browsers, mobile applications, and customer identification can be carried out without entering an SMS password using biometric data [26, p. 9; 29].

The development of studied technology is accompanied by the introduction of biometric authentication, the purpose of which is the complete elimination of cash payments, plastic cards and gadgets. Payment will be made by scanners that read the veins on the user's fingers. The method is as safe as possible since the probability of coincidence of the location of veins for two people is 1 to 3.4 billion. [4, p. 357].

Innovations introduced by Huawei with a focus on the Chinese market can be useful for developing the Mir system. In July 2018 the company announced the release of NFC tags with One Touch technology, the principle of which is the ability to pay from phone to tag. The user is required to enter necessary amount and confirm payment by any of the authentication methods. This technology should reduce the financial burden on sellers of goods and services, because they will not have to acquire POS-terminals and QR-code scanners [7].

## Conclusion

Russia has demonstrated its readiness for innovative technologies in its market, the performance of 4 out of 5 mobile contactless systems proves this at once. The fifth system is

Fitbit Pay (an American company producing electronics for fitness), which operates in 17 countries but does not currently have a representative office in Russia. At the present time mobile devices serve as a kind of engine of technical progress and cause more interest and attractiveness for the average consumer than any other electronics on the market with its innovations. Despite the extensive functionality provided by NFC modules since 2010, in Russia, smartphones with these modules have become more often acquired precisely against the background of the release of contactless mobile systems that are dynamically developing and reducing the number of user-familiar actions when making purchases. Taking over the experience of foreign companies in the implementation of mobile payments can help in the development and improvement of the national payment system Mir. Services do not stand still, and therefore the list of supported banks and applications for Russian users is expanding.

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