

Digital Platforms as a Base for Forming a Digital Economy

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ABSTRACT

The paper discusses the essence of digital platforms, their types and properties due to their functioning. The subject of this research is to study the impact of digital platforms and platform technologies on the formation and development of the digital economy. The purpose of the study is to reveal the features and areas of application of digital platforms in the digital economy. In the course of the study, methods of scientific analysis were used, including methods of analogies for generalization and comparative analysis for typing digital platforms. The result of the study is a description of the structure of the business model used by platform companies to involve the main participants in the business process (business partners, potential customers, developers, etc.). As a conclusion, it should be noted that digital platforms are actively used in traditional fields of activity and contribute to the development of innovations that lead to a change in the boundaries and composition of industry markets and the rules of competition in them.

Keywords: *digitalization, digital economy, digital transformation, digital platforms, platform business model*

1. INTRODUCTION

In recent decades, modern society has been actively introducing digital technologies into the processes of its life. The innovative development of information and telecommunication technologies, the provision of electronic services, the emergence of “smart” technology - all this has made our life better and more comfortable.

At the moment, almost all economic and social processes are undergoing digital transformation, which affects the development of all sectors of the economy and affects the way of people’s life, thereby contributing to the formation of new conditions for the digitalization of the economy and society. An integral part of these changes are digital platforms that accelerate this process and become the contour of the formation of the digital economy.

Recently, there has been a massive development of digital platforms around the world, affecting many different business processes: by ensuring fast and constant communication between companies, platforms lead to higher productivity and lower total costs, help to strengthen partnerships by eliminating territorial boundaries and overcoming time zones, and also contribute to strengthening competitiveness in national markets [1].

However, like any process in our life, digital transformation can also have a negative impact on the formation of new economic conditions. This is primarily due to the protection of commercial information and personal data, protection of consumer rights, the ability to compete fairly and openly in the commodity markets, etc. As a result, there is a need to adapt state regulation of socio-economic processes and legislation to the new digital reality, which will significantly reduce the existing

risks when interacting between economic agents within digital platforms [2].

Many scholars note that platforms become a kind of “building blocks” of the digital economy, since they “attract” external resources, investments and innovations from other companies to develop complementary products and services. At the same time, the platforms go beyond the boundaries of an individual company, forming a special form of doing business as a dynamically developing community of its various participants creating new values in the process of both interaction and competition.

Nowadays, we are witnessing how informatization penetrates into the physical essence of phenomena in all aspects of our life by merging various digital platforms with such high-tech manifestations as the Internet of Things and augmented reality. This stage of development of the digital economy needs to attract large digital capacities and breakthrough digital technologies, providing for a radical revision of the principles of organizing production processes, managing them and their economy.

2. RESEARCH METHODS

Analyzing foreign and Russian experience in the development of digital technologies, including theoretical studies, it should be noted that usually the basis of the digital transformation of socio-economic systems is digital platforms that combine all economic, social and technological processes, and create conditions for the formation and the development of the digital economy.

The question arises: what is meant by a digital platform?

Intel experts now define a “platform” as “a complex set of components that support intended use patterns, expand existing markets and create new ones, and also provide users with far more benefits than the sum of the parts. The platform includes hardware, software and services” [3]. The European Commission also defines digital platforms through their functionality as “search engines, social networks, e-commerce platforms, app purchase stores, price comparison sites” [4].

According to renowned marketing expert Idris Muti, “platform technology should:

- perform one or more critical functions in a particular area;
- define some “standards” and influence the overall architecture of solutions/products;
- be open or semi-open to others in order to rely on development opportunities through network partnerships;
- to allow both complementary companies (suppliers of complementary goods and services) and competitors to participate in the development of the platform” [5].

However, from the author's point of view, a digital platform can be characterized as an integrated system that manages the functioning of basic tools and their interaction in social and economic processes. The essence of the digital platform is the technological integration of a set of services, the content of which is: interface; storage solutions; authentication system; an automated billing system for all services that the client receives on the platform; analytics, cybersecurity and network security.

The importance of digital platforms is determined by the following positive effects: reduction of costs for information technology; increased cybersecurity; fast, safe and easy development of new applications; creation of open ecosystems; the possibility of advanced analytics for “big data”; optimized use of data, etc. Among the main economic advantages of using digital platforms are: the formation of new sources of income; reduction in production costs; supporting collaboration and innovation through service networks in order to create new products; accelerated process of product distribution in target markets; expansion of the assortment due to service by the organization.

Conducting an empirical study of digital platforms that exist in the world, we present the Russian version of the typology, which was proposed by the developers of the program “Digital Economy of the Russian Federation” under the leadership of B.M. Glazkov [6]:

1. Digital tool platform is used for developing software products and hardware and software solutions that result in an innovative product used as a tool for processing big data. This type of platform includes Android OS, iOS, Intel x86, Bitrix, Amazon Web Services, and others.
2. Digital infrastructure platform is necessary for providing it services, as well as processing and using information for decision-making by business entities in the process of functioning. Examples of this type of platform are General Electric Predix, ESRI ArcGIS, ESIA, and so on.
3. Applied digital platform is intended for forming and exchanging the results of economic activity on commodity

markets, including when concluding and implementing a transaction between economic entities. The most popular platforms of this type are Uber, AirBnB, Aliexpress, Booking.com and others that make people's living conditions more comfortable.

The Program was developed with the aim of developing and actively using modern information technologies in the most significant industries, healthcare, science, culture, and the social sphere. For the successful development of these areas, it is necessary to use advanced fundamental research focused on the development and improvement of methods for the formation of highly intelligent digital platforms, technologies for accumulating knowledge and increasing the level of competence of intelligent systems [7].

According to the classification of The Center for Global Enterprise, made on the basis of a study of 176 platforms from different countries, four categories of digital platforms were identified in accordance with the nature of the created value [8]:

1. Innovative platforms are used to attract a large number of independent developers who are engaged in creating innovative products and services. This type of platform includes Apple Inc. 's iOS and Google' s Android, which have been used to create major innovative application ecosystems for their mobile devices.
2. Transactional platforms create conditions for close interaction between different users, which can significantly save time on search and commercial transactions. The best examples of this type of platform are the e-Commerce platforms Amazon and eBay, as well as the on-demand platforms Uber, Zipcar and Airbnb, which allow the exchange of goods and services between individuals.
3. Integration platforms are a combination of several large platform companies, such as Apple and Google, which provide opportunities for development of innovative platforms, which then become available in their transactional paid forms.
4. Investment platforms are the product of holding companies that manage the investment portfolio of platform companies, such as the Priceline Group, which organizes online travel and related services, including Priceline, Kayak, and Open Table.

Studying the foreign experience of companies developing digital platforms, it should be noted that their diversity is based on the creation and use of certain business models. Based on the subsequent clarification of the characteristics of the business models of platform companies, V.D. Makarova offers the following types of platforms [9]:

- 1) internal platforms based on the “digital twin” model. This type of platform is actively developing in the production sector, replacing the traditional model of production outsourcing within the supply chain;
- 2) integration platforms, often called two-way markets, organize the interaction of two types of users to solve the problem of matching supply and demand in a particular market, such as limited access for consumers (Coursera educational platform), redundancy of participants in the supply chain (Uber, online stores), help find resources for

projects, cheap tickets, accommodation, travel companions, etc.;

3) multilateral platforms - platforms that provide multi-sided interaction of users (independent developers, partners, clients) for the exchange of information and values, leading to a reduction in overall transaction costs, optimization of business processes, and improvement of the efficiency of the supply chain of goods and services.

Thus, despite the existing variety of digital platforms that differ in their functionality, most of them have the same properties:

- 1) versatility that allows interaction and coordination between different groups of users, such as buyers and sellers, developers and manufacturers;
- 2) the presence of special applications that represent the main software, and regulators that facilitate close contact of users on these applications;
- 3) the level of openness that allows developers to use software interfaces and tools in an open and accessible way.

3. RESEARCH RESULTS

As a result of the widespread dissemination of modular digital platforms and the use of platform technologies, processes are actively taking place that affect changes in the structure and organization of markets for goods and services, as well as the digital transformation of business models. In this case, digital platforms act as the basis for the innovative stage of socio-economic evolution, on the basis of which the digital transformation of all sectors of the economy and the behavior of society as a whole takes place.

The essence and direction of digital transformation is explained by modern conditions pushing for the

development, selection and use of digital platforms: improving the quality of the data provided; the need to search for new directions for business development or its broader specialization; request to improve the efficiency of the platform functionality; expanding the ways of interaction between market participants, etc.

In the new conditions of the formation and development of the digital economy, digital platforms and a modern economic model of joint consumption, the basis of which is the need for more detailed interaction with the consumer, hold a key place. As a result, businesses that target a specific consumer through a variety of reimbursable and gratuitous schemes will be more successful and efficient than those companies that have failed to accept the new realities created by the digital economy. At the same time, the modern business model is expanding its capabilities, using a personal approach to its customers, offering products and services on individual requests. The effectiveness of such business operation becomes real in the process of integrating its own and third-party digital platforms for the involvement and use of information resources and digital technologies that implement individual target needs.

Nowadays, the so-called business models of platform companies are playing a special role in shaping the digital economy, acting as an intermediary representing the interests of all participants in the business process.

According to the author, the structure of the business model used by platform companies to involve the main participants in the business process (business partners, potential customers, developers, etc.) should be built taking into account a number of parameters, the description of which is proposed in table 1.

Table 1 Description of the business model of platform companies

Parameter	Form of manifestation	Description
1. Structure of platform participants	Independent developers, partners, clients	When targeting a business to its customers, the main focus of platform owners should be on suppliers, partners and developers, i.e. on their network agents, without which the platform cannot function.
2. Value proposition for participants	Cooperation platform for partners; availability of access to tools and mechanisms of interaction between the parties	When interacting with the platform, potential customers gain access to the value created, tools and services that facilitate interaction and improve its quality. In turn, partners, when interacting with the platform, gain access to the market, and also to mechanisms and services that facilitate high-quality interaction between the parties.
3. Method of monetization	Commission from the supplier, transaction fee, subscription, additional service fee, franchise sale, etc.	Potential monetization creates value for all participants in the process of providing a platform company with a specific technology instead of traditional products and services.
4. Description of key resources	Aggregation of data on the activities of the main platform participants	Key resources are available assets and data that are shared through digital workspace or platform technology.
5. Description of key processes	Partner specialization and collaboration management	Collaboration management: coordination, rules, standards, way of participation, motivation, etc.
6. Description of innovations created within the platform	Technological innovation from specialized partners. Organizational and managerial innovations of the platform owner	We are talking about innovations developed by platform owners, as well as combinatorial innovations created by partners or independent developers by mixing different elements of the platform.

As an example of the use of such platform business models, one can name such well-known platforms as Uber - a driver call service, Airbnb - an apartment booking service, and Delimobil - a carsharing service. These business models have the following characteristic features: they are developed on a common platform base, which significantly reduces transaction costs in the interaction of key participants, reduces communication time and excludes intermediaries.

In the traditional business model, in order to create value for the provision of a service to a client, an intermediate link in the form of a call center was used, through which orders passed and feedback was carried out between the client and the direct executor (for example, a taxi driver). The platform business model was able to remove an intermediate link (call-center) from this chain and change it to a more effective tool - a mobile application that could significantly reduce time and financial costs and add value to all participants in these relationships.

Today, the economic effect of the development and use of digital platforms, which are the embodiment of the well-known principle of saving money and reducing costs due to scale, is becoming evident. Also, digital platforms have an additional quality, which makes it possible to reduce the cost of servicing a potential client both by attracting him to the production process and introducing "service properties" to traditional products, and by taking into account individual consumer requests. Thus, the transition to global digitalization will significantly improve interaction between the main participants in the business process, reduce total costs, and minimize the risks that exist in traditional organizational formats of the institutional environment.

4. DISCUSSION OF RESULTS

Digital platforms have played a special role in the global economy over the past few years. In 2017, the total value of platform-based companies with a market capitalization of more than \$ 100 million surpassed an estimated \$ 7 trillion, which is 67% more than in 2015. At the same time, the largest and most famous digital platforms were able to take a stable position in the target market areas. Thus, the world famous company "Google" has almost 90% of the market for Internet search engines. In turn, another well-known company "Facebook" owns 2/3 of the global social networking market, since its platform is considered the most popular among social networks in more than 90% of countries. About 40% of the world's

online retail sales go through Amazon's network, and its subsidiary "Amazon web services" accounts for nearly the same share of the global cloud infrastructure services market. In China, the popular communications network Vichat (owned by Tensent) has more than one billion active users, and its payment system, together with Alipay (owned by Alibaba), covers almost the entire Chinese market for payments made via cellular network. At the same time, according to analysts, the Alibaba company accounts for almost 60% of the Chinese e-commerce market [10].

Currently, various foreign multi-sided digital platforms play a significant role in the development of e-commerce, search engines, social networks and advertising platforms in Russia. So, in 2018, the Russian e-commerce market was estimated at \$ 23.7 billion [11]. At the same time, the share of foreign e-commerce companies in turnover was almost 40% (about \$ 9.5 billion). The leading foreign platforms in this market are AliExpress, Amazon and eBay. In the development of search engines, the leading place is occupied by the Google digital platform, which is seriously competing with a Russian search engine like Yandex. Facebook Instagram, WhatsApp, YouTube, Twitter, etc. Instagram Facebook, WhatsApp, YouTube, Twitter, and other social media platforms are also active participants of Russian citizens today. However, the use of these foreign social media platforms shows much lower revenue in Russia compared to national platforms such as Vkontakte and Odnoklassniki. Advertising platforms in Russia are also represented by foreign platforms Google AdWords and Facebook Ads. In General, the market volume (revenue of companies) of these foreign digital platforms in Russia in 2018 was estimated at \$ 8 billion. Thus, if we calculate the total volume of the digital platform market in Russia based on their revenue, then it will be about \$ 25 billion, where the share of foreign companies will be about 30% [2].

Figure 1 shows the dynamics of capitalization of the largest Russian Internet companies in 2015-2018. The chart shows that the leading place among the selected Russian platforms by capitalization is occupied by such companies as Yandex and Mail.ru, which demonstrate high results and rapid growth. This result can be explained by the presence of foreign platform companies in the Russian market, competition with which leads to the successful development of the digital platform market in Russia.

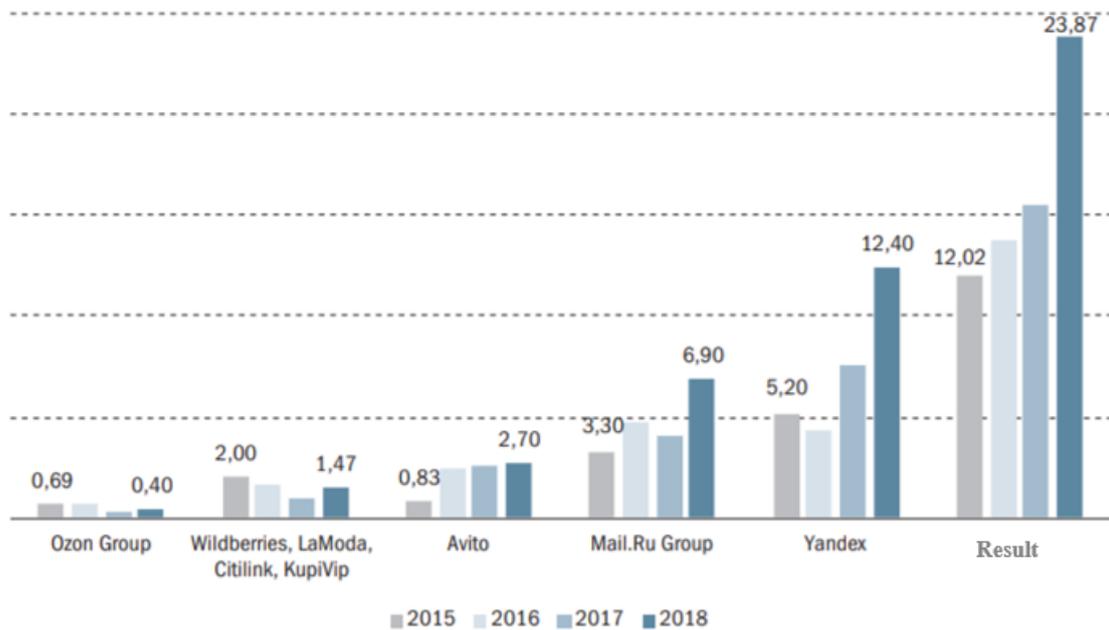


Figure 1 Capitalization of the largest Russian Internet companies 2015–2018, USD billion [2]

However, major international platforms such as YouTube, Instagram, and WhatsApp have consistently maintained their leading positions in terms of both the number of users and revenue generated, which is a competitive challenge for Russian platform companies to develop new value-creating services and expand their reach.

5. CONCLUSIONS

Nowadays, it is difficult to imagine the prospects for the development of the national digital economy without the active use of platform business models that form new conditions for the interaction of participants in business processes in order to create value on common global digital platforms and improve the standard of living of society. The widespread use of digital platforms

contributes to the development of innovations, under the influence of which the composition and structure of industry markets and the rules of competition in them are transformed. As a result, markets with a traditional business model are being replaced by markets with a more sophisticated platform model that allows for new organization and management of business processes. Globally, digital platforms are forming new markets and new forms of interaction for its participants, expanding the base of potential customers and improving the ways of connecting with them. Thus, the active use of digital platforms in the digital economy accelerates and reduces the cost of production and exchange processes, removes unnecessary intermediaries, which leads to a sharp increase in the efficiency of markets and labor productivity.

REFERENCES

[1] Competition in the digital age: strategic challenges for the Russian Federation. Report on the development of the digital economy in Russia, September 2018, Washington, DC: World Bank., pp. 52–71. <http://documents.worldbank.org/curated/en/848071539115489168/Competing-in-the-Digital-Age-PolicyImplications-for-the-Russian-Federation-Russia-Digital-Economy-Report>

[2] Ya.Y. Eferin, K.M. Rossotto, Yu.E. Khokhlov, Digital platforms in Russia: competition between national and foreign multilateral platforms stimulates economic growth and innovation, in: Information society, vol. 1-2, Moscow, 2019, pp. 16–34.

[3] The Intel platform approach, in: BYTE/Russia, vol. 5(93), Moscow, 2006. <http://www.bytemag.ru/articles/detail.php?ID=8655>

[4] European commission: Internal Market, Industry, Entrepreneurship and SMEs, in: European commission, Bruxelles, 2018, pp. 17–27.

https://ec.europa.eu/growth/industry/policy/advanced-technologies_en

[5] I. Mootee, What's the difference between platform strategy vs. business strategy vs. product strategy?, in: Futurelab, Berlin, 2008.

<https://www.futurelab.net/blog/2008/05/whats-difference-between-platform-strategy-vs-business-strategy-vs-product-strategy>

[6] V. Mesropyan, Digital platforms – new market power, Moscow, 2018, pp. 11–13.

<https://www.econ.msu.ru/sys/raw.php?o=46781&p=attachment>

[7] A.A. Zatsarinny, Information technologies in the digital economy, in: The design of the future. Problems of digital reality: proceedings of the 1st International conference (February 8-9 2018), Moscow, 2018, pp. 29–35. <http://keldysh.ru/future/2018/5.pdf>

[8] P.C. Evans, A. Gawer, The rise of the platform enterprise: A global survey, in: The Emerging Platform Economy Series, vol. 1, New York, 2016, pp. 9–15. https://www.thecge.net/app/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf

[9] V.D. Markova, Business models of companies based on platforms, in: Economic portal, Moscow, 2019. <https://institutiones.com/general/3212-biznes-modeli-kompanii-na-baze-platform.html>

[10] Digital economy report 2019: Value creation and benefits: implications for developing countries, United Nations, Geneva, 2019, pp. 8-12.

https://unctad.org/system/files/official-document/der2019_overview_ru.pdf

[11] E-Commerce market in Russia: Results of the 1st half of 2020, in: Association of e-Commerce companies, Moscow, 2020, pp. 2–6.

[12] Russia has become the fifth country in terms of app downloads for the entire time of the App Store, in: App Annie, 2018. <https://vc.ru/41199-app-annie-rossiya-stalapyatoy-stranoy-po-zagruzkam-prilozheniy-za-vse-vremya-raboty-app-store>

[13] Dr. Raúl L. Katz, The Transformative Economic Impact of Digital Technology, in: United Nations conference on trade and development, Geneva, Switzerland, 2015, pp. 2–5.

https://unctad.org/system/files/non-official-document/ecn162015p09_Katz_en.pdf

[14] D. Shah, A Product at Every Price: A Review of MOOC Stats and Trends in 2017, in: EdSurge, Portland, 2018. <https://www.edsurge.com/news/2018-01-22-a-product-at-every-price-a-review-of-mooc-stats-and-trends-in-2017>

[15] A.A. Gretchenko, A.I. Gretchenko, O.G. Demenko, I.V. Gorokhova, Fostering Innovative Integrated Structures in Russian Higher Education Institutions, in: Revista Espacios Digital, vol. 38 (N40), Panama, 2017. <http://www.revistaespacios.com/a17v38n40/17384015.html>

[16] A.I. Gretchenko, E.F. Nikitskaya, A.A. Gretchenko., O.G. Demenko, Methodological Aspects of Forecasting Skilled Labor in Context of Innovation Transformations (of the Russian Economy), Journal of Advanced Research in Law and Economics. ASERS Publishing, vol. IX, 3(33) (2018) 481–489.

[17] A.I. Gretchenko, E.F. Nikitskaya, M.A. Valishvili, A.A. Gretchenko, Role of Higher Education Institutions in Developing HR Potential in a Forming Innovation Economy, in: Revista ESPACIOS, vol. 39 (N21), Panama, 2018. <https://www.revistaespacios.com/a18v39n21/18392113.html>

[18] A. Tracy, Apple Says iOS 9 Adoption Rate Is The Fastest Ever, Running On 50% of Devices, in: Forbes, New York, 2019. <http://www.forbes.com/sites/abigailtracy/2015/09/21/apple-says-ios-9-adoption-rate-is-the-fastest-ever/-53d242bf2727>

[19] I. Constantiou, A. Marton, V.K. Tuunainen, Four models of sharing economy platforms, in: MIS Quarterly Executive, vol. 16(4), Los Angeles, 2017. <https://aisel.aisnet.org/misqe/vol16/iss4/3/>