Digital Platforms as a Business Engine in Smart Space

Valentina V. Poliakova, Sona L. Sumbatyan, and Ester A. Hakobyan

Abstract The article deals with digital platforms as a phenomenon that emerged at the turn of the century in the conditions of digital transformation. With the help of digital technologies in all sectors of the economy there is a transition to a new format of relationships. The appearance of digital platforms expands the opportunities for cooperation, increases the productivity of business processes, accelerates the interaction between different subjects of ecosystems, erasing borders and time zones, transforms the structure of traditional markets in the smart space. The purpose of the study is to define the concept of a digital platform, as well as the peculiarities of the formation of international and national platform solutions. Definitions of digital platform, platform business model, platform ecosystem are given. Classification features of digital platforms are considered. The strategic analysis of digital platforms activity is carried out, experience of foreign and national platform business models is considered. An overview of key ecosystem indicators implementing digital platforms is provided. Segmentally large Russian digital platforms have the potential to enter the global digital market and offer competitive digital solutions in the near future. In order to strengthen Russia's position in the global digital space, the government needs to take effective measures to support the development of digital technologies and address the global problem of confidentiality of personal data collected and processed by the platforms.

Keywords Digital platform · Digital transformation · Digital economy · Ecosystem · Smart space

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1 Introduction

With the digital transformation of economic principles of society, global trends in the popularization of digital devices, universal accessibility of mobile Internet, there is a continuous development of various digital technologies. The future of ecosystems is shaped today by the introduction of artificial intelligence, the Internet of things, blockchain, Big Data and other information technologies. The unique features of digital platforms as a tool for the digitalization process allow to transform traditional business into platform business models. Platform solutions in the form of new disruptive innovations create the prerequisites for the transition to the smart space, providing the relationship among customers, partners, software developers and applications.

Transformation of the traditional business model into a platform model allows to achieve sustainable market growth and increase business competitiveness.

Digital platforms are developing in parallel with the ongoing global digital transformation of society. Initially, the creation of a communication platform for participants in a certain market segment, the availability of its basic services allows to start the process of optimizing transactions and expenses of its users. Manufacturers get access to a conventionally free way to attract consumers through multi-channel marketing (Facebook, Instagram, Telegram, etc.), but the platform is not seen as a competitor or a threat to business and it is easily admitted into its added value creation process. The margin of the business is constantly growing, due to the absence of intermediaries, the growth of active members of the network, and the gradual transfer of all participants to the platform model.

With all the positive effects for smart space participants, digital platforms carry serious risks and threats to society: possession of confidential personal information, monopoly on digital infrastructure, manipulation of platform participants. Ultimately, platform owners begin to control the market and influence the business environment not only at the industry level, but also at the level of governments.

2 Methodology

At the moment there is no unified methodological approach to defining digital platforms in the scientific community, but the research interest of different scientific schools and concepts is focused on identifying the essential characteristics of platform architecture, approaches to their classification, management, competition and many other problems.

The purpose of this study is to determine the role and place of digital platforms in the global smart space, identifying the features and prospects of national and global platform solutions.

In the process of the study methods of system analysis, comparison, description, generalization, systematization, formalization and SWOT-analysis and other methods of scientific research were used.

3 Results

In the information technology system, the term "platform" means a complex (hardware or software) that serves as a basis for the development of computer systems. In the conditions of digitalization, the digital platform is understood as a business model of digital business, built on a wide involvement of participants and users.

The business built on a digital platform creates value through external resources of digital partners and user communities. Based on the experience of DBO companies (digital-born organizations), the market capitalization of businesses operating in the digital ecosystem is about 3 trillion dollars [1].

Having considered the principles of doing business in a traditional format and taking into account the specifics of digital platforms, we can highlight the characteristic transitions of the traditional model to the digital one:

Firstly, the inherent linear value addition that reflects the supply chain in the digital ecosystem is transformed into a non-linear format;
Secondly, in the traditional model, control is concentrated in the supply chain, and digital format allows control of the entire ecosystem;
Thirdly, with the implementation of the digital platform, economies of scale are shifting from supply to demand, and value is growing with more consumers than suppliers;
Fourthly, the digital model delivers impact as the network effect of the digital ecosystem develops [2].

Digital platform as any product goes through the life cycle of formation and development.

Figure 1 shows 3 phases of the digital platform life cycle, the transition to the next stage depends on the number of users, which is a direct factor of platform capitalization growth.

Digital platform users are suppliers, asset owners and consumers. Digital platforms have different forms of user interaction reflecting the relationship of needs to resources: people-to-people, people-to-machines, machines-to-machines. The digital platform includes the technology design, the platform business model and the ecosystem created [3].

The technological design of the digital platform, as opposed to classical traders and intermediaries, has no direct interaction between the parties and vertical integration of the companies of one party. Examples of such business models are platform solutions for sharing different assets: sharing platforms, peer-to-peer platforms [4].

The platform ecosystem is formed by the communities of different participants in the digital platform, the value created by interaction and competition on the platform,

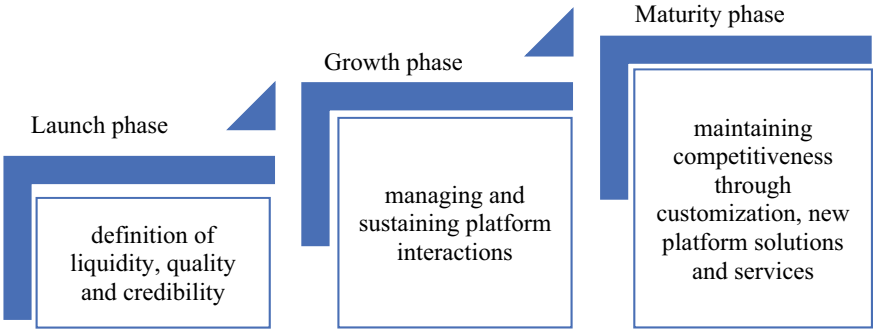

Fig. 1 Digital platform life cycle

and the system of relationships. The functioning of the platform ecosystem uses not only self-governance mechanisms, but also management mechanisms aimed at ensuring the necessary level of control and motivation of participants.

Within the smart space there are three main models of digital platforms: decentralized, centralized and hybrid. The main criteria for this classification are asset ownership and pricing [5].

In the decentralized model, the owners (suppliers) of an asset offer it directly to the user on their terms, while the digital platform connects agents and facilitates their transactions for a small fee. Start-up capital investments are low because the platform must guarantee to attract suppliers to maintain an optimum supply level. An example of a decentralized model is the digital platform AirBnB and other accommodation booking systems.

In a centralized model, asset ownership and pricing are the functions of the platform. The digital platform of this model receives a significant share of the transaction cost for quality control and standardization, but also the cost of scaling increases, which in turn affects the amount of advanced capital. The use of a centralized model provides a higher level of efficiency in the use of the digital platform, as shown by the example of Zipcar, Rent the Runway.

In a hybrid model, the digital platform sets the prices and standards at which asset owners offer their service. Decentralization is about ownership and risk, while centralization is about standardization and service levels. The similarities with the decentralized model are low initial costs and the critical importance of suppliers, while the similarities with the centralized model are high levels of control. A successful example of a hybrid model is the Uber digital platform.

In the global smart space, all digital platforms can be divided in scale: global (PayPall, Facebook, Instagram, Telegram), regional (Yandex, VKontakte, GLONASS) and national (Qiwi).

There is no uniform classification of digital platforms in international practice. According to the researchers of The Center for Global Enterprise, the classification criterion is the functionality of the platform, based on which four groups are distinguished: operational, innovative, integrated and investment.

Deloitte University experts similarly divide digital platforms by functionality, but the groups they have formed are different from the interpretation of The Center for Global Enterprise: aggregated, social, mobilization and training platforms [6].

To date, Russia has adopted a national program "Digital Economy of the Russian Federation", whose participants classify digital platforms into three types: instrumental, infrastructure and applied [7].

Instrumental digital platforms are realized in the sphere of software solutions development, the final product of which is a tool—a product for information processing. The processing of the information accumulated on the platform is only at the level of technological operations. On this platform the key participant is the developer of application software or software-hardware solutions, setting technical requirements to other participants of the platform. The instrumental platforms include such digital platforms as Java, Android OS, iOS, Intel x86, Amazon Web Services and others.

Digital platforms involved in decision-making through the provision of IT services and information are referred to as infrastructure type. The IT service owner sets functional requirements for the platform users in terms of the composition of the information that is subsequently processed. The result of the platform's operation is the information necessary for the user to make decisions. Digital platforms GE Predix, ESRI ArcGIS, CoBrain-Analytics, ERA-GLONASS, etc. can be regarded as infrastructure platforms.

The applied digital platform serves as a platform for the exchange of certain economic values in the established markets, which results in a transaction between the platform participants. The information processed on the platform includes data on conclusion and execution of a transaction among several participants. This platform solves the business tasks of the end-user. Digital application platforms include Uber, AirBnB, Aliexpress, Booking.com, Avito, Apple AppStore, Aviasales, Facebook, Alibaba, etc.

The approaches considered to classifying digital platforms are rather general in nature, since assigning a particular platform to one type or another faces the difficulty of defining its essence and performing simultaneously many tasks in the smart space.

One of the criteria for grouping digital platforms can be the basic business model. Table 1 shows the types of digital platforms with an indication of the business model.

The business constructed on the platform solution, has a number of advantages, the main of which consists in reduction of transactional, operational, time and other expenses for business. On the example of the passenger transportation market, according to the results of PricewaterhouseCoopers, about 60% of passenger transportation users choose the digital platform (Uber, Lyft, Zipcar, etc.) because of the best price, wide choice and convenience of services [4].

Digital platforms provide businesses with access to global markets and participation in value chains. Examples include placing a mobile app on App Store or Google Play or offering products and services on Amazon, eBay.

Digital platforms can serve not only as a platform for large and medium-sized companies, but also as a catalyst for individual forms of business by reducing entry

Table 1 Business models for digital platforms

Business model	Digital platform type
Advertising	Search platforms Social platforms Knowledge platforms
Percentage from sales/posting fee/user identity trading	App stores Marketplace
Subscription	Media-platforms
Revenue in action (payment for clicks or registrations)	Partner platforms
Payment as consumption grows	Crowdsourcing platforms Infrastructure platforms

barriers. According to the results of the digital platform Etsy, about 45% of its participants first engaged in individual trading due to the created digital conditions [8].

Consumers of digital platforms recognize the advantage of online commerce over the traditional form by accessing a wider range of goods and services, and by reducing prices while reducing suppliers' overheads.

The platform business model allows using the digital platform's access resource to personal data of potential customers to individualize interaction with them.

With all its obvious advantages, digital platforms are associated with risks and threats.

The essential and primary problem is the threat of violation of confidentiality of personal data, as digital platforms accumulate and process large amounts of data about participants and their actions. Unscrupulous use of personal information can be dictated by unfair competition, manipulation of participants, markets and even states.

In terms of legislation, there is currently a lack of clarity and flexibility at the international and national levels in the regulation of both digital platforms and business based on the platform model, which is reflected in the ambiguity of court decisions in case of violations of laws. The problem of securing transactions is not the last one in the real smart space.

Platform profits are often maximized by applying a predatory pricing strategy to consumers as well as overcharging suppliers. Supplier activities are accompanied by the risk of revenue instability if the digital platform sets tariffs that are highly volatile. Suppliers also have to bear the cost of compliance with the platform's quality requirements and capital costs from their own sources.

Touching upon the remuneration aspect of the digital platform participants, they do not have rights, benefits or other social preferences because they do not act as full-time employees but are involved in the digital platform as independent performers [9].

When analyzing the global smart space, it is obvious that the platform business model is becoming a mass phenomenon. The number of platform companies has

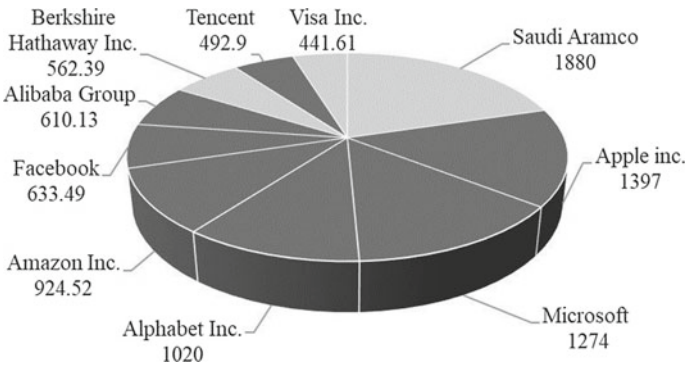

Fig. 2 Top 10 largest companies in the world with capitalization, billion dollars

changed dramatically over the past ten years. While in 2008 the list of the most capitalized companies in the world included only one Microsoft platform company, as of January 2020, 70% belong to platform companies (Fig. 2).

The platform companies represented are mainly based in the USA and China. The rapid growth of the presented platform companies is due to the increase in the size of smart space due to the increasing number of active Internet users [10].

In Russia, the distribution of digital platforms is observed in the format of social networks, messengers, search engines, marketplaces, tourism, passenger transportation, etc. In terms of capitalization, national digital platforms are significantly inferior to the raw materials and banking sectors of the Russian economy. According to the results of 2019, the Top 100 includes only two platform companies (Yandex, Mail.Ru Group), whose market capitalization is at the level of 14 and 5 billion dollars respectively [11].

In order to create favorable conditions for the development of digital platforms and digitalization of the Russian economy, the Russian Government is taking significant measures, in particular, a national project for the establishment of a digital economy, as well as measures to develop domestic digital platforms are reflected as one of the strategic objectives until 2024.

The digital platform is the engine of business growth, which has already passed the stage of automation and informatization and is on the verge of digital transformation. The main reason for the transition to digital platform format is the reduction of business costs and the ability to optimize management in the emerging smart space.

The basic technologies of the past stages of economic transformation are replaced by application solutions in the format of digital platforms, which accumulate a large number of users and business partners, forming entire ecosystems.

4 Conclusions

In the global context of digitalization of the economy, countries should not allow digital monopolization, as the introduction of digital platforms provides the preconditions for the previously unknown model of control of the digital segment of traditional business. Receiving digital benefits from the use of platforms at the moment, ecosystem actors take great strategic risks, losing control over operations and becoming dependent on the owners of digital platforms.

While supporting the model of digital transformation in different economic sectors, it is important to maintain an optimal balance between protection of national security and consumer interests, as well as to ensure that digital platforms penetrate all elements of the smart space.

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