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Introduction of digital platforms by industrial companies as a source of competitive advantages

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Abstract

This paper examines the impact of digital platforms on the development of industrial companies, their role for the development and formation of sustainable competitive advantages by industrial enterprises. It is investigated how digital platforms affect efficiency and what negative network effects industrial companies experience. As a method of empirical research, the case method of eight Russian industrial companies is used, the number of which varies from 38 to 996 people. All the industrial companies included in the sample have been working on digital platforms for more than 5 years. The results of the study were the conclusions that digital platforms are used as an opportunity to enter foreign markets only by small industrial companies, large and medium-sized companies use other sources of internationalisation; digital platforms are not used as a source of innovative development. Digital platforms serve as an ecosystem to create a better offer for customers. Digital platforms are also a source of sustainable competitive advantages due to the formation of relationships with partners and obtaining information about consumers and markets.

Keywords: industrial enterprises, digital platforms, competitiveness, network effects, access to foreign markets, innovative development, ecosystem.

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采用数字平台作为工业企业竞争优势的来源

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摘要

本文章研究了数字平台对工业企业发展的影响，它们在工业企业发展和形成独特竞争优势中的作用。作者调查了数字平台如何影响效率和工业公司经历的负面网络效应。采用的实证研究方法是对8家俄罗斯工业公司进行案例研究法，这些公司的规模从38人到996人不等。所有被抽中的工业公司都在数字平台上运营了5年以上。研究结论是，数字平台只被小型工业公司用作进入外国市场的机会。大中型公司使用其他国际化方法，他们不使用数字平台作为创新的来源。数字平台是一个创造更好的客户主张的商业生态系统。通过与合作伙伴建立关系并深入了解消费者和市场，数字平台也是独一无二的竞争优势的一个来源。

关键词：工业企业、数字平台、竞争力、网络效应、进入国际市场、创新发展、商业生态系统。

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Introduction

Modern research digital platforms are considered as one of the key factors of competitiveness [Evans, 2008], which not only has a significant impact on the formation of partnerships and the search for new customers but also makes it possible to create new value for customers [Evans, Schmalensee, 2007]. For example, according to a study [Best practices.., 2010], interactions between companies within a platform create more value than traditional interactions between a seller and a buyer [Gawer, Cusumano, 2012] by reducing the costs of market research, searching the market for business partners, suppliers and buyers. They reduce transaction costs, which are shared by all user groups when participating in a platform business model.

Platforms provide the contacts and information needed to operate in the market and to secure new contracts and funding. Digital platforms are particularly important for small industrial enterprises, which, due to limited resources and lack of market power, are forced to rely more on digital platforms and personal contacts in the course of their activities [Hagiu, Wright, 2011]. In addition, by participating in the platform business model, industrial companies receive benefits that they could not otherwise achieve (e.g. access to information, the ability to establish business relationships with people, communities or companies of interest to the user). Ultimately, the consumer receives more value at a lower cost. For this reason, management issues related to the organisation and management of platforms are considered by many to be one of the most important and highly-demanded new areas of research in economics and management [Roson, 2005; Evans, 2008; Hagiu, Wright, 2011].

Significantly, the platform business model is not a completely new phenomenon. The first studies in the field of multilateral platforms appeared in the early 2000s in the works of European and American researchers (for example, in the works of Tyrol, Parker, Eisenman, Rochelle, Van Alstayan). They mainly aimed to studying pricing issues for users of platform solutions, for example [Rochet, Tirole, 2006], success strategies, such as [Eisenmann et al., 2008], recruitment of a critical mass of users necessary for the platform to function, as in the work of Rochelle and Tyrol.

The second wave of research on platforms is related to their digitisation and use of the Internet and mobile networks. Research on digital platforms has two directions: the first is what benefits and advantages actors can find for successful operation; the second is how digital platform providers can strengthen their position and respond to threats.

In recent years, studies have begun to play an important role in addressing issues related to the strategic management of digital platforms: pricing, description and measurement of the added value created by this type of intermediation, quality management in a digital platform, etc.

This study aims to identify how digital platforms can help Russian industrial companies to compete and develop.

1. Theoretical overview

Significantly, there are many definitions of platforms. The existence of a platform requires the existence of a multilateral market and the presence of two or more groups of users served by the organisation. At the same time, a multilateral market is understood as 'the presence of two or more participants (users), the presence of an intermediary to ensure the interaction of the participants, the increase in value for the users with the increase in the number of these users. Participants are typically permanent members who transact with other multilateral market participants' [Brynjolfsson, McAfee, 2014].

In the work of A. Hugo and J. White, a platform is defined as 'an organisation that generates profit primarily by providing direct interaction between two or more different types of affiliated groups of participants' [Hagiu, Wright, 2011]. T.K. Koh and M. Fishman define digital platforms as 'a multilateral network... that facilitates interaction between different but interdependent groups of users, such as buyers and suppliers' [Koh, Fichman, 2014].

Table 1 describes two approaches to platform research and provides their definitions.

The user's participation in the platform must be accompanied by his affiliation to it: the participant himself must decide to join the platform and be aware of how and with whom he will have to interact. Awareness is also expressed by the participant's willingness to pay for membership (e.g. entry fee, registration on the site, etc.). Such a requirement makes it possible to avoid the erroneous attribution to platforms of suppliers of trading platforms, equipment and services that are not related to the business processes of the functioning of the platform. In order to distinguish the platform from intermediary organisations that buy goods or services and then resell them to the final consumer, the researchers proposed to classify only those organisations that allow participants to communicate directly with each other while retaining control over the basic conditions of the joint activities of the participants.

The basis of a digital platform is a digital network: a computer network, a network of mobile devices, etc. Users of the network join it to interact with each other.

According to the consulting agency 'Accenture', digital platforms are 'a set of technologies that are used as a basis for creating a specific and specialised system of digital interaction'[1].

The Massachusetts Institute of Technology offers a definition that a digital platform is 'a high-tech business model that creates value by facilitating exchanges between two or more interdependent groups of participants'[2].

[1] https://www.accenture.com/_acnmedia/PDF-80/Accenture-Winning-Digital-Platforms.pdf.
[2] http://ebusiness.mit.edu/research/papers/296_parker_vanalstyne_adigitalpostalplatformdefinitionsandaroadmap.pdf.

ANO 'Digital Economy', created by leading high-tech companies in Russia with the support of the Administration of the President of the Russian Federation and the Government of the Russian Federation, presented its approach to the definition of digital platforms as part of the implementation of the National Digital Economy Project. According to it, 'a digital platform is a system of algorithmic mutually beneficial relationships between a significant number of independent participants in an economic sector (or field of activity) carried out in a single information environment. It leads to a reduction in transaction costs through the use of a package of digital technologies for working with data and changes in the division of labour system'[3].

Digital platforms consist of several components: hardware and services, the World Wide Web, content users, content creators (developers). The architecture of digital platforms depends on their size. Typically, digital platforms are modular architectures that include core and plug-in modules and associated management [De Reuver et al., 2018]. The architecture of digital platforms is based on networks of data centres or data processing centres (DPCs) [Tiwana, 2014)]. The platform architecture allows organisations to achieve both scalability, by centralising and integrating common functions in core modules, and evolvability, by reconfiguring pluggable modules [Wareham et al., 2014]. In particular, platform users can share and use common resources and knowledge, while exploiting unique resources by creating new complementary modules.

The classification of platforms is described in many studies [Katz, Shapiro, 1986; Shapiro, Varian, 1999; Roson, 2005; Rochet, Tirole, 2006; Rysman, 2009; Anderson, 2010; Evans, Schmalensee, 2010; Eisenmann et al., 2011; Evans, 2011].

Table 1
Definitions of digital platforms in foreign literature

Approach	The definition of a digital platform	Authors
Technical (platform as a software environment)	A building block that performs the entire function of a technology system and enables the development of complementary products, technologies or services.	[Spagnoletti et al., 2015, p. 364]
	A set of components common to the entire product family, whose functionality can be extended by applications.	[Ceccagnoli et al., 2012, p. 263]
	The extensible code base of a software system that provides the core functionality, the common modules that interact with it, and the interfaces through which they interact.	[Tiwana et al., 2010, p. 676; Ghazawneh, Henfridsson, 2013, p. 3]
	A set of subsystems and interfaces that form a common framework for which derivative applications can be developed and distributed	[Xu et al., 2010, p. 1305]
Non-technical (platform as an intermediary in the provision of economic transactions)	A commercial network of suppliers, manufacturers, intermediaries, customers and producers of complementary products and services, called complements, linked by a formal contract and/or interdependence.	[Tan et al., 2015, p. 249]
	Multilateral networks that facilitate interaction between different but interdependent user groups, such as buyers and suppliers.	[Koh, Fichman, 2014, p. 977]
	A multi-stakeholder platform exists when a company brings together two or more different groups of customers (parties) who need each other in one way or another, and when a company creates an infrastructure (platform) that creates value by reducing the costs of finding, distributing and executing transactions together.	[Pagani, 2013, p. 625]
	Value created by facilitating interaction between two or more interdependent groups of customers	[Ye et al., 2012, p. 211]

Source: compiled by the authors.

[3] https://files.data-economy.ru/digital_platforms.pdf.

Participants in the implementation of the Digital Economy of the Russian Federation Programme led by B.M. Glazkov also propose a classification that identifies three types of digital platforms:

1. Instrumental digital platform, which is based on a software or hardware-software complex that can be used to create applied software solutions. The users of the digital platform are the developers of these solutions. Examples of this type of platform are Java, Apple iOS, Android, MS Azure, etc.
2. The main function of the infrastructure digital platform is to provide IT services and information for decision-making in business activities. The purpose of this type of digital platform is to support the accelerated market introduction of solutions for automating the activities of various consumers. Examples: Era Glonass, Public Services, CoBrain.
3. The applied digital platform ensures the implementation of market transactions between various market entities, as well as the exchange of certain values. Examples: Yandex.Taxi, Booking.com, Avito, etc.

The identification of these types of digital platforms is based on several characteristics: (1) the main activity of the digital platform, (2) the result of the platform's activity, (3) the level of information processing, (4) the main beneficiaries and their requirements.

Based on the definitions discussed above, we conclude that digital platforms serve as an evolutionary form of markets, where the interaction between the seller and the buyer is ensured and benefits such as reduced transaction costs, increased consumer awareness of existing products and increased trade intensity are achieved. Digital platforms contribute to the intensification of economic relations between agents by improving the main mechanism of traditional marketplaces. Digital platforms link the two sides of the market into a single network, making it easier to find, match and conduct transactions using online tools, and increasing the efficiency of the market by coordinating supply and demand. At the same time, the concept of a digital platform can encompass both a technological design, a business model and an ecosystem.

At the same time, digital platforms have unique characteristics that clearly distinguish them from traditional trading platforms. There are two main characteristics of platforms [Tiwana et al., 2010].

The first feature is that multilateral platforms favour direct interaction between two or more types of economic actors, which improves the situation of all users. From this point of view, they act as intermediaries, providing a common (real or virtual) meeting place for organisations to carry out transactions or other operations. As an example, four different types of two-way platforms (the simplest form of multi-sided platforms) can be mentioned: exchanges for relevant activities (e.g. dating services, employment services and e-commerce sites such as Avito), advertising-supported media (magazines, newspapers, free TV, etc.), software platforms (video games) and transaction systems (e.g. payment methods such as Google Pay).

The second feature is that most multi-party platforms are also characterised by cross-group network effects or cross-group externalities between two or more groups of customers participating in the platform. A cross-group network effect means that the utility of users in at least one group depends on the number of users in another group that join the platform. In most cases, cross-network externalities are positive, but negative network effects can occur. Negative network effects can manifest themselves in the number and quality of other users of the platform. For example, the number of advertisers on the platform may negatively affect user satisfaction. In another case, a decrease in the overall quality of users of the platform can affect its usefulness for other users.

In Russia today, conditions are being created for the development of digital platforms and the expansion of their user base. It should be noted that significant progress has been made in the physical and virtual factors of digital technology use. There has been a steady increase in the proportion of households and the population using the Internet for both commercial transactions and government and municipal services. Thus, according to data provided by the All-Russian Gfk Omnibus [De Marc et al., 2019], in 2019 the number of Internet users in Russia over the age of 16 was 90 million people/, or 75.4% of the adult population. Compared to the previous year, the number of users increased by 3 million people.

In the context of the dissemination of COVID-19, an increasing number of businesses and citizens began to actively use digital platforms. It is particularly noticeable that in a number of areas digital platforms have become the dominant participants in economic relations, leading to the transformation of industries, a change in the configuration of economic actors and the creation of potential for economic growth. A striking example is the growth in demand for the services of companies using digital platforms. For example, the work of taxi aggregators in 2019 showed that Moscow residents made 324 million trips, in terms of value, their total revenue amounted to 157.3 billion rubles. At the same time, according to analysts, without the use of aggregators, these figures could be 72 million trips and 36.2 billion rubles[4].

Platforms implemented by government agencies, especially e-government services, have also shown strong results in recent years. Such e-government services as a Unified Portal of State and Municipal Services (gosuslugi.ru), the system of interdepartmental electronic interaction (IEIS 3.0), the

[4] The pandemic and the transition of companies to remote work. Index of digitalisation of small and medium-sized businesses. A joint study by NAFI, Otkritie Bank and the Moscow School of Management Skolkovo. https://nafi.ru/analytics/pandemiya-i-perekhod-kompaniy-na-udalenku-indeks-tsifrovizatsii-malogo-i-srednego-biznesa/.

unified identification and authentication system, and the interdepartmental electronic document management system have been actively developed. According to a UN study on the quality of digital government services, in 2020 Russia will be ranked 39th with a 'very high level of development of e-government'[5].

At the same time, articles on the 'mortality' of digital platforms and the crises that accompany them are increasingly appearing in foreign publications. In this context, the life cycle of digital platforms in Russia will be further considered.

2. The impact of digital platforms on the development and competitiveness of Russian industrial enterprises

Digital platforms play a very important role in the process of business creation and development, as well as in the creation of unique competitive advantages, including for Russian industrial enterprises.

Faced daily with new sanctions and restrictions, specific challenges from the external environment, constant changes in legislation and relatively underdeveloped institutions, industrial companies are forced to rely on personal contacts and relationships to survive and grow.

Despite the fact that digital platforms can have a huge impact on business development, there is reason to believe that not all the opportunities of digital platforms can be used by Russian industrial enterprises.

2.1. Research methodology

In order to answer the questions, the method of case analysis was used, with eight Russian industrial enterprises as objects, of which three are small enterprises, two are medium enterprises with up to 250 employees, and three are large industrial enterprises with more than 500 employees, all of them having experience with digital platforms for more than five years.

The design of our research assumes that the empirical study will be based on an inductive approach involving the description of reality and the interpretation of the results obtained. The case analysis method will allow us not only to collect the necessary data, but also to 'examine information that is independent of existing theories' [Sutton, 1997]. Moreover, according to [Kwark et al., 2017], it is also very useful for collecting sensitive information and establishing relationships between the level of perception of top managers and the decision-making process.

As mentioned earlier, the empirical analysis was conducted on the basis of eight Russian industrial companies, each of which has been operating on digital platforms for more than five years. All of them are industrial companies and represent different industries: food production, machinery and equipment production, footwear production, clothing production, printing production, toy production, furniture production.

The cases were selected from a wider database of 23 industrial companies that participated in this study. However, 15 of them were not included in the final sample for two reasons: either the company did not belong to the industrial sector, or it had no experience with digital platforms for more than five years.

All selected companies are registered in Moscow, St Petersburg and the Moscow region.

Data collection took place from March to July 2022. Semi-structured interviews, informal communication with employees and top managers of the companies, questionnaires, the analysis of company materials and documents were used as a method of collecting information. The interviews lasted from one to one and a half hours and were conducted both offline and online using the Zoom service.

Data collection took place in two stages. In the first stage, an idea was developed about the formation and implementation of the company's development strategy, as well as the reasons and processes for companies to enter digital platforms. In addition, archival and financial documents were studied in order to understand how working on digital platforms affected the financial performance of the company.

The second stage of information collection involved conducting a series of interviews on the role of digital platforms in developing and creating non-copyable competitive advantages, as well as the disadvantages that companies see in working on digital platforms.

The data analysis was carried out using the traditional grounded theory approach, which allows for a consistent comparison of the available data with the emerging theoretical construction.

We identified three key questions regarding the role of digital platforms in developing and maintaining competitiveness:

1) Why are digital platforms important for the development of industrial firms?
2) How do industrial firms create non-copyable competitive advantages with digital platforms?
3) How do digital platforms affect the performance parameters of companies and what negative network effects do they experience when working on digital platforms?

The data analysis procedure consisted of three stages. In the first stage, the main strategic goals in the development of the companies were highlighted, including the reasons for the decision to work on digital platforms.

In the second phase of data analysis, some common features were identified in terms of how business leaders approach digital platforms and how they use them to develop and create a competitive advantage. The disadvantages of working on digital platforms were also identified. These characteristics

[5] http://www.insme.org/insme-newsletter/2014/file-e-allegati/newsletter_documents/Integrating_SMEs.pdf.

Table 2
Characteristics of the sample companies

	Size	Staff number	Activity	Work on Russian digital platforms	Work on foreign digital platforms	Average monthly sales volume on the digital platform (thousand rubles)
Company 1	Small	38	Production of indoor footwear and felt boots	Wildberries Yandex Market (Take-it) Ozon Lamoda SberMegaMarket Livemaster	Tmall/Aliexpress Joom	1500
Company 2	Small	84	Production of printed products	Wildberries Yandex Market (Take-it) Ozon SberMegaMarket	—	3000
Company 3	Large	996	Production of jewellery	Wildberries Ozon SberMegaMarket Yandex Market (Take-it)	Tmall/Aliexpress	50 000
Company 4	Medium	189	Production of moonshine stills	MegaOpt24 Yandex Market (Take-it) Ozon SberMegaMarket	Tmall/Aliexpress	20 000
Company 5	Small	84	Production of per supplies	Wildberries Yandex Market (Take-it) Ozon Robo.market SberMegaMarket	Tmall/Aliexpress	8000
Company 6	Medium	178	Candy manufacturing	Yandex Market (Take-it) Ozon Robo.market SberMegaMarket Flowwow	Tmall/Aliexpress	1000
Company 7	Large	670	Manufacture of home and office furniture	Leroy Merlin Lot-online Yandex Market (Take-it) Ozon Berito SberMegaMarket	—	45 000
Company 8	Large	530	Manufacture of wearing apparel and household textiles	Wildberries Ozon Lamoda MegaOpt24 Berito SberMegaMarket B2B-Center	Tmall/Aliexpress Joom	35 000

Source: compiled by the authors.

later served as a framework for the case analysis. The third step was to identify key events in the development of companies in relation to the role of digital platforms.

2.2. Case analysis

All eight selected companies had worked with digital platforms for more than five years. The reasons for entering digital marketplaces varied, but the idea of working with digital platforms was driven in all companies by top managers who believed that working with platforms would expand sales markets, strengthen brand image, enter foreign markets, use marketplace logistics and improve the results of their activities. The characteristics of the sample companies are presented in Table. 2.

All the companies studied are active on several digital platforms. They all started from the same platform - Wildberries or Ozon, as they have the largest number of consumers. For most of the companies in question, entering digital platforms is a continuation of their business strategies to develop online sales channels. All companies have started to work on digital platforms in order to expand the sales market and attract new customers.

Access to foreign platforms was mainly used to attract consumers from neighbouring countries who have a good knowledge of Russian and are familiar with the companies' products. Six of the eight companies surveyed operate on foreign digital platforms and have foreign customers. These companies export between 1 and 10% of their turnover.

The data on the companies' work on digital platforms are presented in Table. 3.

The analysis shows that not only universal platforms, but also niche platforms are becoming popular among industrial companies. For example, a furniture manufacturer considers Leroy Merlin to be the most important platform for it, as it does not have to compete 'on all fronts' with the market giants, but can focus on a segment of consumers and offer them the best prices and services compared to universal digital platforms. The same opinion is shared by the clothing and textiles manufacturer which lists Lamoda as its most important platform, and the confectionery manufacturer which prioritises the Flowwow platform for itself.

3. Research findings

3.1. Digital platforms as a source of development for an industrial company

The impact of digital platforms on internationalisation. It seems that internationalisation through digital platforms depends on the nature of the company's product. If a company sells a product associated with a particular culture, it is likely to be in demand by expatriate communities. For example, according to the manufacturer of home shoes and felt boots, felt boots are considered an integral part of Russian costume, Russian lifestyle and Russian winter, therefore this category of goods was not successful on foreign digital platforms and for its promotion the company used not only the marketing tools offered by the platform but also social networks to search for immigrant communities. Similarly, a manufacturer of confectionery products found that promoting its products in foreign markets was only possible among immigrant communities that knew the product well. In order to increase sales through social networks, contacts were made with the owners of Russian shops abroad.

It can be assumed that the more specific the company's products are, the less suitable digital platforms are for internationalisation, and vice versa, the more versatile the product is, the more suitable digital platforms are for internationalisation.

Many companies working for Tmall/Aliexpress also try to establish personal contacts with product sellers through the messaging system, to learn from them the potential market capacity and to find new partners. The company, a manufacturer of clothing and textile products working on the Tmall/Aliexpress platform, found wholesale buyers from more than 5 countries (the Tmall/Aliexpress platform itself covers more than 200 countries and works in 18 languages). To meet the needs of foreign consumers, the garment and textile manufacturer had to expand its existing capacity, which, according to the company owner, it was not prepared to do.

At the same time, companies note that not only working on foreign digital platforms but also on Russian ones helps internationalisation. For example, a jewellery manufacturer working on the Ozon platform found two foreign wholesalers – consumers from neighbouring countries (Belarus and Kazakhstan), and on the Wildberries platform – consumers from Israel, Germany and Slovakia.

An obstacle for small companies to find partners in foreign markets is the difficulty associated with the lack of language skills and the inability to employ a suitable specialist in the company.

Digital platforms as a source of innovation. As mentioned above, digital platforms are considered as a source of open innovation. However, all the company representatives interviewed said that the main disadvantage of working on digital platforms is the lack of communication with the consumer. For example, a confectionery company believes that the consumer is part of the brand and a source of additional innovation, but there is no connection with the consumer on digital platforms. Moreover, the reviews that consumers leave on the site under the product are in most cases related to shortcomings of the platform work itself and not of a specific product (for example 'We ordered chocolate, they brought sweets', which is not the fault of the manufacturer). A similar opinion is shared by the company-manufacturer of clothing and textile products. It also sees the disadvantage of working on digital platforms in the inability

Table 3
Reasons for starting work on a digital platform and choosing a launch site

	Reasons for going digital	Things to consider when planning for digital platforms	What mistakes has your company made when entering digital platforms?	How digital platforms were chosen for launch	Which of the digital platforms is a priority for the company?
Company 1	Minimum investment to start a business	The cost of working with the marketplace	Placement of the entire range without taking into account the needs of consumers in a specific market	The working model offered by the platform (DBS, FBS, FBY, Express) was evaluated and the platforms that best fit the company's business model were selected	Wildberries Ozon
Company 2	Expanding the market, attracting new customers	Evaluate your product, niche and payment system	Did not use marketplace sales analytics	Selected the most popular sites (for the current date)	Wildberries Ozon
Company 3	Development of omnichannel sales	Use of tools to promote products	Did not develop our own online store. Transferred all sales to the marketplace.	Considered brands that operate on the site and sell a similar product. We chose sites with the least number of such brands, as there is less competition.	Ozon Tmall/Aliexpress
Company 4	Enter new markets and use the platform's logistics capabilities. No need to create your own online store	Ways to meet market demands	Tried to occupy the niche where competition is too fierce and there is a surplus of goods.	Calculated the commission the platform would have to pay, determined the price for storage and delivery, additional payments for illiquid goods, and selected sites with the most favourable policies.	Yandex Market (Take-it) Ozon
Company 5	Winning new customers Solving logistics and warehousing problems	The costs associated with the creation, storage and transmission of product content	Formed an LLC, not an individual entrepreneurship, and at the first stages, taxes took all the profits	Made a list of universal and niche platforms. Developed a strategy for working on both universal and niche platforms	Wildberries Ozon
Company 6	Market expansion	Where does the production take place?	Poorly filled product cards, blurred photos	Did not choose a specific platform, but implemented a strategy of working on as many platforms as possible, considering each as an additional source of sales	Flowwow Ozon SberMegaMarket
Company 7	Development of own online store and new sales channels	Transport options and costs	Ignoring the advertising opportunities of the marketplace and incorrectly setting up an advertising campaign	So far all platforms are universal, we have chosen the most popular ones. Today these are Wildberries and Ozon	Lot-online Leroy Merlin Yandex Market (Take-it) Ozon
Company 8	Find new customers and enter foreign markets. Low cost distribution channel	Company production facilities	Lack of customer feedback (not responding to consumer reviews and questions). We didn't follow the charts of promotions and sales on certain marketplaces.	Used analytics services to analyse the marketplaces and chose a platform where there was demand and a minimum level of competition.	B2B-Center Lamoda Tmall/Aliexpress Ozon Wildberries

Source: compiled by the authors.

to build relationships with customers and involve them in product improvement, so it only uses its own online shop as a source of joint improvement and product creation with consumers. However, there are still unresolved issues for the manufacturer: for example, an item that was not sold and liked by the consumers of the online store. It was decided to remove it from the range and replace it with a new product. This was not done, however, as it was also the first or second best seller on the Wildberries platform. As there is no link with the consumer, it is impossible to understand what exactly attracts the consumer to this product.

Moreover, all the manufacturers interviewed confirmed that they did not involve other companies operating in this niche as co-innovators. They considered them only as competitors and considering them for collaboration in the process of creating a new product.

Thus, we did not see any evidence of the use of such digital platforms as a source of innovation for companies.

Digital platforms as an ecosystem for creating better value for consumers. As shown above, many researchers describe digital platforms as ecosystems for creating the best offer for a consumer. Most of the companies surveyed confirm

Table 4
The impact of digital platforms on the development of Russian industrial companies

	Digital platforms as a source of internationalisation	Digital platforms as a source of innovation	Digital platforms as an ecosystem for creating better value for consumers
Company 1	Used, but the volume of foreign operations and consumers is small	Not used	Exploiting the logistical opportunities of digital platforms
Company 2	Not used	Not used	Exploiting the logistical opportunities of platforms
Company 3	Used by foreign consumers from both near and far abroad	Не используется	Используются возможности логистики и оплаты частями
Company 4	Used. Overseas sales by CPU - 10-15% of total sales	Not used	The opportunity to create a set together with partners is used, the service of logistics and payment in parts is used
Company 5	Used, but the volume of sales abroad is small, around 1% of total sales	Not used	Opportunities of logistics and payment in installments are used
Company 6	Used, sales abroad are small, mainly to European countries with large communities of Russian emigrants.	Not used	Logistics opportunities are used
Company 7	Not used	Not used	Opportunities of logistics and payment by installments are used
Company 8	Used, consumers are mostly from neighbouring countries, sales abroad from digital platform are about 4-6% of total sales	Not used	The opportunity to create a set together with partners is used, the service of logistics and payment in parts is used

Source: compiled by the authors.

that they have created the best logistics in collaboration with the platform. For example, a confectionery company uses the logistics of digital platforms and is confident of the shortest delivery time for goods. The furniture manufacturer considers it important to cooperate with the platform for the sale of goods in instalments. According to the company's representatives, when the buyer sees that he can pay for the purchase in equal instalments without overpaying, his confidence increases and he becomes more loyal. In addition, the opportunity to pay for goods in instalments on the website allowed the company to increase the average sales by 1.5-2.5 times. Other companies surveyed also find the instalment payment option beneficial for themselves and their customers. According to the respondents, it increases the average purchase size by 20-30% and increases sales by 30-50%.

However, only two companies have created a value proposition with other partner companies. One, a manufacturer of moonshine stills, used the kit creation feature in conjunction with other companies operating on this digital platform. The company offered a common kit: moonshine, yeast, aromatic additives, coals and wood chips. As in-house production has the advantage of reducing costs by 20%, we were able to agree with our partners to reduce the price of the whole kit by 10%. This increased sales to around 2,000 per month. Subsequently, the company continued to expand production and opened its own online store, and then a wholesale department for other online stores.

Similarly, a clothing and textile company was able to negotiate with partners – manufacturers of accessories (belts, bags) – to complement the image and reduce the price per set by 1-3%. It also influenced consumer loyalty to the brand and increased sales by 5-7%. Two other companies, a printing company and a jewellery manufacturer, took advantage of the opportunity to create kits, but only with products from their own range.

It can therefore be assumed that the larger the company is, the more likely it is to look for partners to create a joint offer for customers. Other companies use the platform's capabilities to create a better offer for customers: in most cases, the companies surveyed used logistics services for fast delivery and instalment services, which allowed them to increase sales.

A generalised analysis of the impact of digital platforms on the development is presented in Table 4.

3.2. Digital platforms as a source of non-copyable competitive advantages

Digital platforms as a source of information. Almost all the companies surveyed use digital platforms to obtain information about competing companies, their products and services, and to formulate their value proposition. Analytical services provided by digital platforms allow you to identify niches and characteristics of the target audience, develop strategies to optimise work on the digital platform. For example, a company producing clothing and textiles uses popular goods analytics tools, which allow you to follow the graph of the dynamics of goods in categories, analyse the brand, sales and comments. This makes it possible to select the most popular niches and products for work on digital platforms. A jewellery company uses a comprehensive tool for analysing work data on all platforms to effectively manage sales and find new niches. For example, thanks to analytics, it became clear that the best-selling product on digital platforms was silver jewellery with sitalls. As a result, the company expanded a range of products in this category and began to produce some types of gold jewellery in the same design in silver. At the same time, the company decided to sell most of its gold products on its own website and silver jewellery of similar design on digital platforms. This business model is based on the fact that, according to company representatives, the categories of consumers on the digital platform and in their own online store are different and do not overlap. Digital platform consumers are customers who are willing to look at many products and browse through a large number of product pages. They tend to buy jewellery and focus on a lower price. They go to an online shop to buy products from a particular manufacturer and are prepared to pay a higher price for quality.

All other respondents also use digital platforms as a source of information that allows them to create a competitive business model, predict prices, analyse brands, niches, SKUs and product positions, and thus create the best value proposition for customers.

With caution, based on the analysis of only eight cases, it can be argued that the larger the company is, the more diverse the business intelligence services it uses. In our case, large companies used not only information on niches, sales, orders and product balances of their own products but also the analysis of competitors' sales, sales geography, price and profitability monitoring. In addition, the use of advanced analytics requires recruiting specialists, which in most cases small companies cannot afford.

Digital platforms as a source for finding and interacting with partners. According to the majority of representatives of large and medium-sized companies, they look for wholesale buyers on the platforms. For example, a company producing clothing and home textiles managed to find ten partner companies on the platforms: eight of them are wholesale buyers in Russia and abroad, two others are manufacturers of complementary goods (belts, bags, shoes) to create a consumer image and increase brand loyalty. To find Russian suppliers, the company used the B2B Centre business platform.

The company, a manufacturer of moonshine stills, also managed to find partners to create sets of goods. The company, a furniture manufacturer, uses the digital platform 'Lot-online' to find partners for the supply of fittings, wood-based panels and other materials necessary for the production of furniture. The company also uses commercial sites to seek tenders for the supply of its products for office spaces.

It can be assumed that large and medium-sized companies use digital platforms to find partners while small companies prefer personal contacts and social networks.

Digital platforms as a source of unique resources. Almost all interviewees admitted that in order to create unique resources, formal relationships need to be reinforced by informal interaction. For example, in a company producing moonshine stills there are usually only formal relationships at the beginning which gradually turn into friendly relationships. It was a friendly relationship established with one of its suppliers that allowed the company to expand its product range sales by adding hot smoking barrels and stew autoclaves. It increased the number of visits to the shop site and sales.

The company, a furniture manufacturer, believes that it was a friendly relationship that helped them find land in the Moscow region at a low price and open their own production. It was also thanks to friendly relations that we found suppliers, who were willing to give large discounts. However, such searches were not conducted within digital platforms.

For a clothing and textile manufacturer, friendly relations helped to find a unique clothing designer and not only to produce universal clothing, but also to create its own clothing collections, which gave the company a unique competitive advantage. This search also took place outside the digital platform.

However, there are exceptions, such as a company that makes indoor footware and felt boots. The Fair of Masters platform was used to find unique craftsmen who make felt boots using ancient technologies.

The company, a manufacturer of confectionery products, is aware of the difficulty of establishing friendly relations among migrants from Russia. According to the owner of the company, former immigrants from the CIS countries or Russia are not interested in establishing friendly, honest and transparent relations, they are only interested in making a quick profit, sometimes even using deceptive interaction schemes. The same thesis is confirmed by the company, a manufacturer of indoor footware and felt boots. Former compatriots in Poland tried to sell fabrics for sewing house shoes at an artificially high price.

Another way to create unique competitive advantages with unique resources is to employ people who live in other countries. For example, one clothing and textile manufacturer managed to hire a sourcing specialist in Italy. This has enabled the company to find unique stock positions of fabrics in small quantities (ensuring the exclusivity of the items produced) and at prices lower than similar fabrics from China to create clothing collections.

The jewellery company has hired two managers from Germany and Slovakia to set up their own online stores in these countries, work on local digital platforms and ensure the necessary level of trust from European partners. However, the digital platforms were ineffective in finding such employees.

Thus, we did not find evidence of the importance of digital platforms as a source of unique resources; for most companies, they do not matter much, as companies rely on personal connections rather than platforms to find unique resources.

A generalised analysis of the impact of digital platforms on the creation of non-copyable competitive advantages is presented in Table 5.

3.3. Impact of digital platforms on efficiency and negative network effects

As shown above, most researchers associate the efficiency of work on digital platforms with the presence of network effects. However, firms can experience both positive and negative network effects.

Direct positive network effects. Firstly, all the companies surveyed attributed high traffic to such effects. For example, according to Medianetology, in 2022 the average number of visitors per month on the Wildberries platform will be 27,600 thousand, OZON – 24,600 thousand, Yandex.Market – 12,000 thousand, Tiu – 11,400 thousand, Lamoda – 7950 thousand rubles.

This makes it possible to sell goods even if the brand of the company is not yet known. At the same time, the organic growth of the digital platform ensures the growth of the company itself. Most of the Russian digital platforms such as Wildberries, Yandex.Market (Beru), Ozon, SberMegaMarket allow you to sell products in all EAEU countries (RF, RB, Kazakhstan). At the same time, none of the companies we interviewed was able to create such a distribution channel on its own.

Direct negative network effects. Due to the high workload, the platform may confuse the delivered goods, supply them late, etc. while consumers perceive all shortcomings as poor performance of the manufacturing company.

Cross negative network effects. As platforms provide a highly dynamic sales system, sellers need to be as flexible as the platform itself. At the same time, participating in a large number of promotions, sales and discounts often leads to a negative margin on the company's products and significantly reduces net profit.

Table 5
The impact of digital platforms on the formation of non-copied competitive advantages by Russian industrial companies

	Digital platforms as a source of information	Digital platforms as a source for finding and interacting with partners	Digital platforms as a source of unique resources
Company 1	Analysing sales in the category and in the context of brands and individual products Analysing sales cards, search result positions, product reviews	Does not use	Search for unique masters - manufacturers of felt boots
Company 2	Finance, supply plan, general sales report	Does not use	Does not use
Company 3	ABC analysis, deliveries, balances, logistics, sales geography, product range, niche analysis and introduction of new products to the platform.	To find suppliers To search for foreign wholesalers To search for Russian wholesalers	Does not use
Company 4	Tracking the visibility of goods on the marketplace, planning supplies, searching for information on brands, creating comparative charts	To create a shared value proposition To search for wholesale consumers To find suppliers	Range extension
Company 5	Analysing fastest growing categories, identification of top categories and products, analysing fastest growing categories, tracking of stock levels	Does not use	Does not use
Company 6	Analysing competitors' sales, automatic planning of purchases according to a given period, analysing product ratings with details by category	Does not use	Does not use
Company 7	Calculating commission, potential income, margin, sales geography for specific categories and positions, dynamics of indicators, supply planning	To search for tenders To find suppliers To search for wholesale buyers	Does not use
Company 8	Comparing brands, analysing sales and redemption rates of goods, visibility of goods on the marketplace, niche analysis and introduction of new products to the platform	To create a shared value proposition To find suppliers To search for wholesale buyers abroad To search for wholesale buyers in Russia	Does not use

Source: compiled by the authors.

Table 6
Network effects of digital platforms

Direct effects		Cross-network effects		Component-driven network effects
Positive	**Negative**	**Positive**	**Negative**	
Large visitor traffic The growth of the platform has a direct impact on the growth of the company's sales	Shortcomings in the work of the platform due to workload are perceived by consumers as shortcomings of the company itself	Dynamic sales system Growth in sales due to a large number of promotions, sales and discounts Creation of a large number of promotion tools	Participation in sales and promotions leads to a negative margin of the company's products and significantly reduces net profit	Not available on Russian digital platforms On foreign platforms, there is the possibility of messaging between sellers and consumers

Source: compiled by the authors.

Component driven network effects. On Russian digital platforms, platforms often limit communication between sellers and consumers. The customer buys the product, but does so under the supervision of the marketplace. The seller can answer questions about the product, but cannot communicate with consumers outside the digital platforms. There are also restrictions on including company business cards in the package. Basically, Russian marketplaces focus on the fact that everything is decided by the service. Foreign platforms take a different approach. For example, Tmall/ Aliexpress help communication between the consumer and the producer, the buyer can ask not only questions to the producers of goods but also exchange messages (both on the platform resource and outside it). In this way, foreign platforms create component-driven network effects to a greater extent.

Conclusions

Thus, digital platforms are used for development components such as entering foreign markets, but their impact is insignificant for large and medium-sized companies – 1-3% of total turnover (with the exception of the production of moonshine distilleries), and has no impact on small industrial companies. Digital platforms are not used by the companies surveyed for innovative development and as a source of open innovation. As ecosystems for creating the best offer for customers, most of the companies surveyed use only logistics and instalment services on the platforms; only two companies have found partners within digital platforms to create a comprehensive offer.

For components of non-copyable competitive advantage, such as building relationships with partners, most of the companies surveyed used digital platforms to find suppliers, wholesalers and partners to create a value proposition for customers. All companies surveyed used digital platforms as a source of information. As a source of unique resources, digital platforms were practically not used by the companies, with the exception of one manufacturer of house shoes and felt boots, which used the Fair of Masters platform to find unique manufacturers of felt boots using old technologies.

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