Interaction of regional agribusiness entities in the transition to a digital economy

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Abstract. In 2017, the “Digital Economy of the Russian Federation” program was approved, which stated that the digitalization of the economy should become the main breakthrough direction in the country's development. In this paper, various definitions of the digital economy were considered, taking into account the inextricable connection of all sectors and spheres of the national economy with the use of digital technologies. The interaction of business entities in the transition to a digital economy should be based on the main provisions of the approved Program and its development levels. In order to improve the functioning of the regional agribusiness, several directions for introducing the digital economy are proposed, taking into account the readiness of economic entities to carry out activities in its conditions. As a result, a classification of participants in agribusiness was proposed in accordance with the criterion of having absolute and relative readiness, as well as those who are resistant and non-resistant to self-adaptation in the digital economy. A certain basis for communications of agricultural entities in the context of digitalization is the ability to use modern information and communication technologies, as well as a single information space within the framework of agricultural clusters. An algorithm for the formation of such an information space in the agricultural clusters of the Volgograd region and communication mechanism based on information technology were proposed.

1. Introduction

Nowadays, the growth and improvement of digital (electronic) technologies that allow you to quickly move both information and goods is a fundamental trend in the development of all sectors of the economy.

In 1995, the American computer scientist Nicholas Negroponte of the University of Massachusetts introduced the term “digital economy” and formulated its basic concept. In particular, he defined it as the economy of a new technological structure based on digital technologies.

The digital economy contributes to a manifold increase in the efficiency of both production and education, science, public service, medicine, etc. Workers in all these sectors are able to increase their labor productivity through the use of digital information and communication technologies (ICT).

At present, the essence of the digital economy can be defined both in a narrow (area limited by the production and sale of software products for the IT sector) and in a broad (the use of digital technologies in all industries and fields of activity) sense.

The main idea of the program for the development of the digital economy of Russia in the near future should be a set of measures to stimulate the creation of digital platforms in all industries, including the agricultural sector.
The program approved in July 2017 provides for the following levels of the digital economy development:
- markets and sectors of the economy (fields of activity), where specific entities (suppliers and consumers of goods, works and services) interact;
- platforms and technologies, where competencies for the development of markets and sectors of the economy (fields of activity) are formed;
- environment of the development of platforms and technologies and effective interaction of market entities and sectors of the economy (fields of activity), which covers regulation, information infrastructure, human resources and information security.

Only the presence of developed platforms, technologies, institutions and infrastructures is able to enable the effective development of markets and industries in the digital economy, so the last two levels are the basis for the implementation of the Program of the Digital Economy of the Russian Federation.

However, when conducting research in the field of the digital economy in the agricultural sector, in addition to the second and third levels, the first one, which has its own specifics of manifestation, should be taken into account.

2. Materials and methods
The study was conducted using data on agricultural enterprises of the Volgograd region, with varying degrees of readiness for activities in the digital economy. The following were used as research methods: the dialectical method, which has a general scientific character; logical methods of economic research, which play a crucial role in economic cognition; qualitative method of economic analysis.

3. Results
The development of the digital economy presupposes a new revolutionary stage in the active use of the achievements of scientific and technological progress in all sectors and fields of social and economic activity, as well as in the foreign and domestic policies of the state. In this regard, it is necessary to pay attention to the specifics of the integration of various industries and fields of activity in the digital economy, as well as the adaptation and willingness of their participants to its formation and development [1].

In the agricultural sector, the following main directions of the formation of a digital economy based on automation can be distinguished (Figure 1):
- production and technological processes;
- management systems;
- work places;
- logistics;
- interactions of agribusiness entities with environmental entities.
Figure 1. The scheme of the digital economy formation in the regional agricultural sector.

If we look at the readiness of the regional agribusiness entities to function in the digital economy, it is necessary to divide them into groups (Figure 2).

Firstly, these are enterprises and organizations with absolute readiness, at the disposal of which there are already the most advanced technologies [2]. Such agribusiness entities try to keep up with the achievements of scientific and technological progress and apply all the most advanced technologies in their activities. At the same time, the share of this group of agribusiness entities of the Volgograd region is very small and amounts to about 2%.

Enterprises with absolute readiness to use modern digital technologies include Sady Pridonya OJSC, Megamix LLC, Cargill Novoanninsky LLC, and Helio-Pax LLC. Already today they are successfully using the most advanced innovations in technology and organization of production, in management, in marketing activities, in logistics and other fields.

Secondly, these are agribusiness entities with relative readiness, which include stable operating and profitable enterprises in the second and third areas of agribusiness. In the Volgograd region, these
include poultry farms, Agrofirm Vostok JSC and Fregat-Yug LLC, Delta-Agro OJSC and VAPK LLC agricultural enterprises, Elansky MSC OJSC butter and cheese complex.

Thirdly, these are business entities non-resistant to adaptation - this includes large and medium-sized agricultural enterprises that have at their disposal material and financial resources for using modern information technologies [3]. The workforce does not have qualified specialists in the field of IT-technologies. The number of such agricultural organizations in the Volgograd region is at least 65–75% of the total.

Fourth, it is resistant to independent adaptation, mainly small and medium-sized enterprises, whose share in the total number of agricultural organizations in the region is 20–25%. An example of such entities is the small peasant farms and private subsidiary plots. So, in the Volgograd region in 2017–2018, there were 10.9-10.3 thousand peasant farms and 266-281 thousand private subsidiary plots. These business entities need outside assistance in adapting to the digital economy. It requires not only teaching computer literacy to producers, but also purchasing digital equipment.

In the context of the formation and development of the digital economy, communications of economic and other entities will become increasingly important. Each branch of the economy and field of activity has its own specifics, so management at all levels needs to pay special attention to improving the interaction of business entities [4].

The specifics of the communicative relationships of agribusiness entities is due to such features of agriculture as:
- territorial dispersion of production;
- technological features of production;
- mismatch between the production period and the working period;
- limited transportability and perishable properties of products.

Communications in the agricultural sector are carried out in the form of cooperation and agro-industrial integration:
- horizontally (within one industry);
- vertically (technological interaction of related industries);
- diagonally (technologically unrelated subjects of the agricultural cluster);
- on contractual terms (participation in the management of the organization based on a share in the authorized capital);
- when selling products and making mutual settlements, investing financial resources and providing services;
when consulting commodity producers, submitting accounting and tax reporting, training and advanced training of personnel, etc.

All interactions of agribusiness entities are based on information and communication relationships. They cover all areas of activity, acting in the form of information interactions between organizations of all three areas of agribusiness. Providing organizations with relevant information, which plays an important role in managerial decision-making, contributes to the innovative development of the entire agricultural sector [5].

The system of interaction of agribusiness organizations through information and communication connections involves the use of a single information space of the agricultural cluster. At the same time, it is necessary to ensure compliance with such principles as consistency, flexibility, mutually beneficial information exchange, adaptability, information security, etc.

The State Program for the Development of Agriculture and the regulation of agricultural products, raw materials and food markets for 2013-2020 sets the main goal of ensuring the effective activity of state authorities in the agricultural sector and the regulation of agricultural markets, as well as raw materials and food.

This document defines the main tasks related to the formation of the digital economy:

- creation of state information resources in the areas of food security and agribusiness management;
- creation of a unified federal information system on agricultural lands.

The solution of the proposed tasks should provide state bodies of government and agricultural producers with equal access to information on the state of the domestic agricultural sector. These data will help form the necessary level of food security in Russia [6].

The formation of a single information space of agribusiness is an urgent task of the state, for which serious funds are allocated from the federal budget. So, for the implementation of the program “Formation of state information resources in the areas of food security and agribusiness management” in 2018–2020, it is planned to allocate budget funds in the amount of 780 million rubles. The Ministry of Agriculture of the Russian Federation together with the Russian Federal State Statistics Service (Rosstat) act as the responsible bodies, which are responsible for collecting statistical information on the state of agribusiness and for its analysis.

Today, the main source of statistical information is Rosstat. However, the list of presented indicators characterizing the agricultural organizations is not large. And considering the information on agricultural tractor and machine-building enterprises, only generalized data on the production of machinery for agriculture can be seen. However, the target indicators of technical and technological modernization and innovative development is the indicator of the number of units of new modern agricultural equipment (tractors, combines) sold by organizations of the first sphere of the agricultural sector to producers of the second sphere. The situation with other indicators is similar and makes thinking about where to get information reflecting the actual state of affairs in the agricultural sector in order to avoid distortion of the actual situation and assess the real effectiveness of the implementation of the State program.

The organizational mechanism for managing the formation of information and communication interconnections will contribute to the solution of the problem of forming a single information space of the agricultural sector. It will consist in establishing certain rules of communication between the participants of the agricultural sector for the collection and processing of source information, as well as the adoption of uniform rules and standards for the provision and use of data. The subjects of a single information space will have to bear personalized responsibility for the accuracy of the information entered into a single automated system.

Of great importance for the creation of a single information space is the determination of the necessary list of indicators that make it possible to give the most complete and reliable assessment to business entities and agribusiness sectors. It is very important to monitor the subprograms and, if necessary, make adjustments to the plans, including the implementation of the State program.

The creation and functioning of a single information space of the agricultural sector implies the entry into it of all economic entities of the regional agribusiness. In most regions, the share of small business
forms in agriculture is high. Thus, the agriculture of the Volgograd region is represented by 281 thousand private subsidiary farms and 10.3 thousand peasant farms. Their total share in the total volume of production is approximately 60% (in 2018) [7].

If we consider the economic component, the problem of forming a single information space of the agricultural sector is the lack of funds for many agricultural producers of this segment for computer equipment, the creation and maintenance of websites, the inability to pay IT specialists. The website of the Ministry of Agriculture of the Volgograd Region has a list of agricultural organizations (according to the annual reporting for 2018), but there are no links to the websites of these enterprises. An independent search on the Internet shows that often, even large manufacturers do not have their own websites. Of the nearly 600 agricultural organizations in the Volgograd region, less than 10% have their own sites. Therefore, we can conclude that the problem of informatization concerns agricultural producers of various forms of management.

In the Volgograd region, there are agricultural development programs that indirectly influence the formation of a single information space and regulate the interaction of producers in the information environment. So, in the State program “Development of agriculture and regulation of agricultural products, raw materials and food markets in the Volgograd region for 2014–2020”, measures aimed at information and advisory services to agriculture are indicated. As part of the events, it is planned to create an information resource for the analysis, forecasting and development of state policy in the field of land relations; technical equipment of local authorities with office equipment and maintenance of a unified information network, provision of information support services for peasant farms and other small businesses in agriculture [8]. These measures are implemented at the expense of the regional budget.

Considering the information interaction between agribusiness organizations and other interested structures, we can conclude that the Ministry of Agriculture of the Volgograd Region is the accumulator of information resources and should manage their formation.

The following algorithm is proposed for the formation of information and communication interactions in the agricultural sector, which involves measures to form a single information space of the agricultural sector with the expansion to the agricultural cluster and the preparation of its participants for effective interaction in the digital economy. For this, firstly, it is necessary to monitor information support in organizations (the availability of technical means for information exchange, a website, an enterprise’s information security policy, etc.). Secondly, based on the results obtained, to develop options for entering information according to the adopted list of indicators in a single automated system [9]. It is advisable to carry out through the information and consulting center of the agricultural sector as part of the provision of information support services to peasant farms and other small business entities in the field of agriculture. It is also possible to use the services of IT outsourcing. In this case, the regional authorities should provide financial assistance to pay for these services as part of program activities. Thirdly, it is necessary to develop instructions for the participants of a single information space of the agricultural sector on the provision, use of information resources, and keeping them up to date with personal responsibility for the accuracy of the information entered into the system. Fourth, in the light of recent world events, when information security reaches the level of economic and national security, it is necessary to develop in the agricultural sector a policy of information interaction of subjects in accordance with the Doctrine of Information Security of the Russian Federation aimed at improving the security of information infrastructure, including in order to ensure sustainable interaction of state bodies and business entities. The task for state bodies to develop and improve the information security system based on strengthening the management vertical and centralizing the information security forces at the federal, interregional, regional, municipal levels, as well as at the level of informatization facilities, information system operators and communication networks in the framework of their activities is designated [10].

4. Conclusion
Based on the results of the study, the following general conclusion can be drawn: the interaction of economic entities in the digital economy in order to increase production efficiency and product sales
should be based on modern achievements of scientific and technological progress, the use of information technologies, the formation of a single information space within agricultural clusters.

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