

Role of Information Technologies in the Agro Industrial Complex Development

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Abstract:

The development of digitalization in all sectors of the economy is truly a key and significant development vector. Serious attention from the Russian state is also directed to the agricultural sector of the economy. In connection with such new trends of politics in Russia, the project "Digital Agriculture" was developed, the main directions of which should certainly give positive results. A similar hypothesis is built not on assumptions, but on the existing foreign experience of developed countries, which confirms the special socio-economic importance of digital technologies. Among the main areas where blockchain technologies are successfully practiced are: infrastructure, human capital, economic sectors and public services. In Russia, despite the fact that the official state course was taken only in 2017 by signing the relevant Presidential Decree, the history of the information technologies development began long before that, from the second half of the 20th century. Given the problematic, but national importance of the agricultural sector of the economy, the paper considers the main advantages of moving to a new level of innovative development and interaction between subjects of the agro-industrial complex by introducing a modern digital platform with the main tools of action within the framework of the state project on digitalization of agriculture.

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I. Introduction

The current stage of economic development focuses on innovative formats. In this regard, the issues related to informatization are becoming the most topical; as experience shows, they are a powerful lever of influence not only on the economy, but also on the policies of individual business entities, as well as individual regions and states.

In the Russian Federation, the process of developing the economy of all industries based on the use of digital technologies was launched relatively recently (in 2017). The only goal that the Government of the Russian Federation provides is the creation of a single information space based on relevant databases

of various indicators and issues that form and make up internal and external information and telecommunication systems.

Based on the fact that digitalization tools, as is dictated by the supreme power of the state, should cover all sectors, it is important to consider the problems and opportunities, as well as the essential significance of the digital economy for the agro-industrial complex of Russia. In this regard, it should be noted that even in the Soviet period of time in Russia there was an informatization of the main sectors of the agro-industrial complex. However, a series of definitely negative events of those years (1998) contributed to the emergence of a

deep economic crisis, which contributed to a sharp decrease in state support to farmers and the complete absence of subsidization of informatization issues in agriculture and the agro-industrial complex. We can fully feel the negativity of this phenomenon today on the backwardness of development in the agricultural sectors of the Russian economy. But meanwhile, one should speak about the existing initiative of the heads of economic entities, which, through their own efforts, form local information resources independent of state administration. Of course, this has its

advantages, but there is a flip side to such self-regulation, in particular, which is the inability of the state to influence, regulate and manage agricultural business. First of all, this significantly reduces the effectiveness of state investments, subsidies and subventions that have a special purpose in accordance with the State Program for the Development of Agriculture (Medennikov et al, 2017).

The modern agro-industrial complex is forced to develop today under the harsh conditions of the influence of negative factors (Table 1).

Table 1. The negative impact of factors on the development of the domestic agro-industrial complex *

Name of the factor	Area of impact / impact result
1. Overproduction	- imbalance in food markets.
2. Food underproduction	- local food shortages in the food market
3. The use of GMO technologies and GMO raw materials in the import of raw materials for processing industries	- environmental imbalance; - the presence of unsafe food products in food markets.
4. Promotion of healthy nutrition and consumption of organic (clean) products	- the inability to fully satisfy consumer demand, which gives rise to a speculative attitude to the saturation of food markets; - the impossibility of economic and technical and technological complete reorientation of agricultural production to environmentally friendly, organic production; - socio-economic (price-based) inaccessibility for the majority of the population.
5. Profit maximization	- unreliability of the food product composition and information about manufacturers and place of production.
6. Point-wise development of digital platforms as part of the development in all agro-industrial complex areas	- unfair competition; - differentiated distribution of budget subventions; - discrimination of small business patterns.

- The table is compiled by the author using materials from sources (Gerasimov et al, 2018; Gerasimov et al, 2016; Yarkova, 2019)

The negative impact factors outlined in Table 1 above can be minimized or completely eliminated by normalizing the information environment in the Russian agro-industrial complex.

Today, this significant element of the economy, in particular in the agro-industrial complex, has an ineffective “appearance”, “state” and “action”, which leads to a significant increase in transaction costs in the production of agricultural raw materials and food, and therefore affects the financial condition and the weak level of their socio-

economic availability for consumers. Manufacturers of the agro-industrial sector certainly find solutions to such situations, but in most cases this leads to a decrease in the competitiveness of manufactured products compared to the food products imported from abroad.

In general, it is necessary to rely on three main aspects, proclaiming the importance of information resources for the economy, including the agricultural one. The first aspect is to change the sectoral structure and the formation of new competition

rules. The second aspect is focused on the creation of new types and varieties of business, and the third aspect is focused on the creation of competitive advantages due to increased productivity and quality of products (Plotnikov, 2019).

Numerous scientific developments and works of scientists, economists, agrarians testify to the presence of historical trends in the development of informatization and digitalization in the agro-industrial complex (Fig.1).

Based on the current stage of digitalization development, it is important to note its significance in general, which consists in increasing the efficiency of economic activity due to the possibility

of storing data in electronic (digital) form, timely processing and updating of large flows of information, as well as the ability to receive objective analytical reports for a short period time to optimize business processes (Semin et al, 2018).

It should also be clarified that the beginning of the modern stage of digitalization development is based on the Presidential Decree No. 203 dated 05/09/2017 "On the strategy for the development of the information society in the Russian Federation for 2017-2030." This document provides a solution to the most pressing problems concerning the modern development of the economy in all industries and fields of activity:

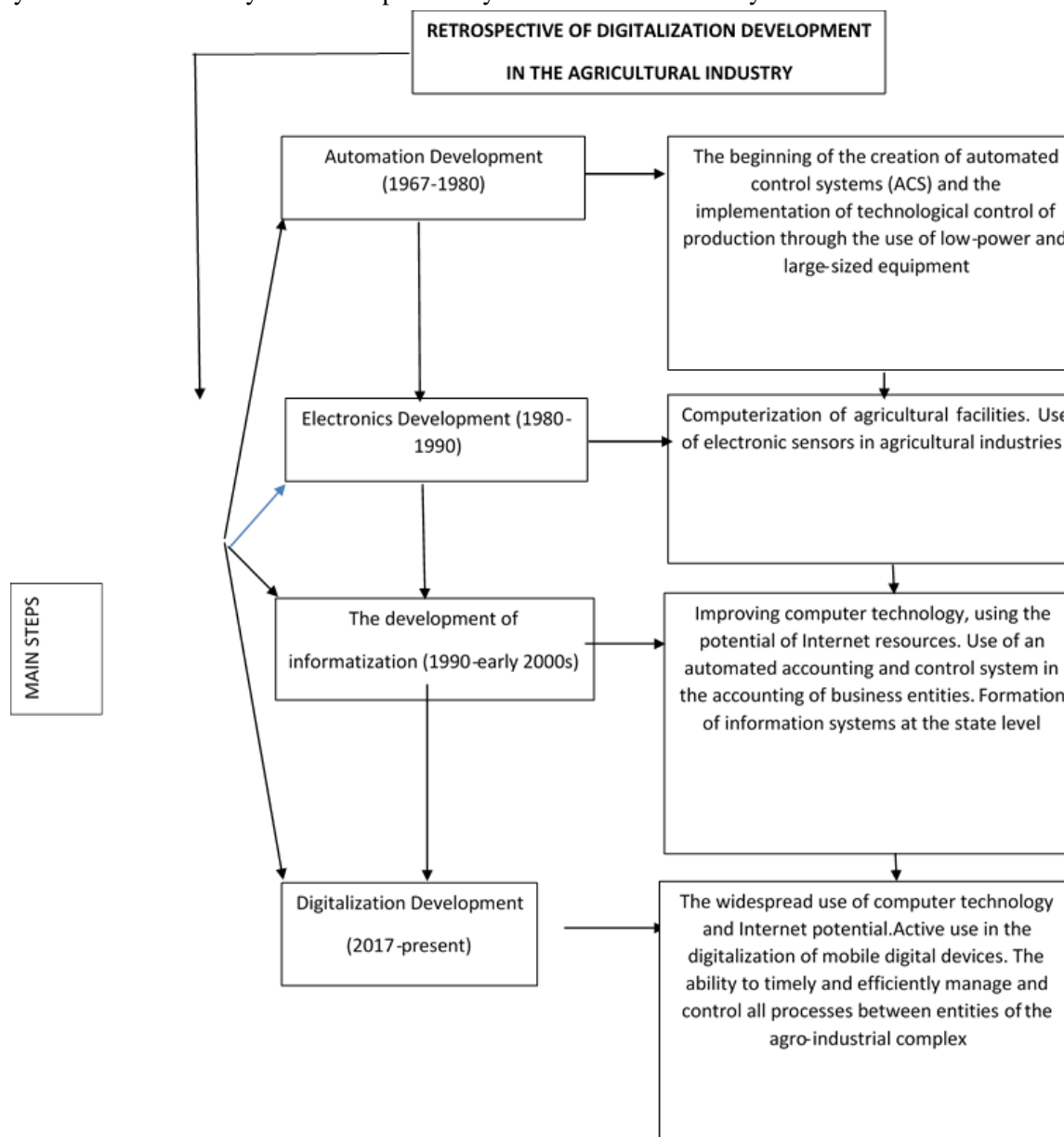


Figure 1. The informatization and digitalization development in Russia

- firstly, guided digitalization;
- secondly, the formation of a centralized management, where all stages are regulated at the regulatory, legislative and methodological levels and are controlled by state structures;
- thirdly, the possibility of spontaneous self-organization, with a social orientation and contributing to the activation of interest among the population to develop entrepreneurial activity.

To solve the tasks outlined in the abovementioned Strategy, it is necessary to create and put into practice an information and communication system.

The basic elements of its implementation should be:

- Vocational training for persons who form, maintain and implement this system;

- Complete database of information resources;
- Transformation into interactive communities of all entities of the System;
- Formation and implementation of business platforms at an interactive level;
- Others.

The use of such elements within the digitalization system will allow the formation, transformation and integration of various subject-oriented formations. For example, in agriculture it is possible to form effective industry clusters (Aletdinova, 2017).

Speaking about the importance of digitalization of the economy in the agricultural sector of the country, the foreign experience of blockchain technologies should be mentioned (tab.2).

Table 2.The development of key areas of the digital economy abroad

Country	Key Direction / Project	Performers / Management	Area of implementation			
			infrastructure	human capital	sectors of the economy	public services
South Korea	Creative economy	Ministry of Science, Technology and Information and Computer Technology; committees; regional innovation centres	+	+	+	+
New Zealand	Digital transformation	Each Ministry is responsible for initiatives on its topic.	+	+	+	+
Denmark	Digital Denmark - Stronger and More Secure	Digitalization Agency (since 2016 - under the Ministry of Innovation of the public sector, before 2016 - Ministry of Finance)	+	+	-	+
Canada	Creation of Information Technology in Toronto	Formation of a hub led by the Government of Canada	+	+	+	-
Singapore	A smart economy driven by information and computer technology	Information and computer technology department - the official body for information and computer technology management	+	+	+	+
China	Internet Plus:	In each direction, a	+	+	+	+

	Integration with Traditional Industries	responsible group of ministries and departments is assigned				
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* The table is compiled by the author according to the source (Zhartay, 2018).

The given example for six countries of the world with a developed economy fully proves the need, significance and importance of using digital technologies in completely different areas of socio-economic development. Information and digital technologies are used most widely in such countries as South Korea, New Zealand, Singapore and China. Along with this, we can give an example of Israel, where digital technologies have shown themselves positively in the agricultural sector of the economy, which is reflected in the growth of elementary performance indicators - productivity and profitability. Meanwhile, in this country, only 20% of all land is suitable for agricultural activities. Compensation for adverse climatic factors is manifested through the use of innovative technologies based on digitalization. In particular, the project of "smart" farms has proven itself in this country, within the framework of which it was possible to increase milk production to 40%.

Along with foreign experience, examples of effective development in the agrarian and industrial complex of Russia can be given. Thus, due to the introduction of digital technologies in the Moscow region at a meat processing plant, in just one month of testing, it was possible to reduce labour costs by 30% and general production costs have been decreased by 10%. In Russia, modern methods of control over the use of combustible lubricants at motor transport enterprises and others are also used, which allows to reduce fuel costs by 20% (Afonina, 2018).

If we evaluate the already existing contribution of Russia to the digital economy in a relatively short period of time, then it can be represented in the following figures:

- 1) The impact of Runet on the economy allows us to get an additional 2.8% of GDP, mainly based on the functioning of Internet markets;
- 2) As a result of achieving the results of item 1, we additionally receive 19% of GDP within the framework of the functioning of dependent markets;

3) 2.5 million employees of all fields of activity have got advanced training for the implementation of digital technologies in the country (Lovchikova et al, 2017);

4) 2 trillion roubles were allocated from the budget to improve infrastructure and software;

5) 171 billion roubles were allocated for the implementation of marketing and advertising of digital technologies;

6) Digital content required 63 billion roubles;

7) e-commerce development is estimated at 1.2 trillion roubles.

Since the beginning of 2019, the implementation of the "Digital Agriculture" project has been planned in the agro-industrial complex; it is managed by the Ministry of Agriculture of the Russian Federation (Fig.2).

Let's consider the essence and practical significance of each direction presented in Figure 2.

So, "Effective hectare" involves the creation of a single base for the characterization of agricultural land and its current state and use.

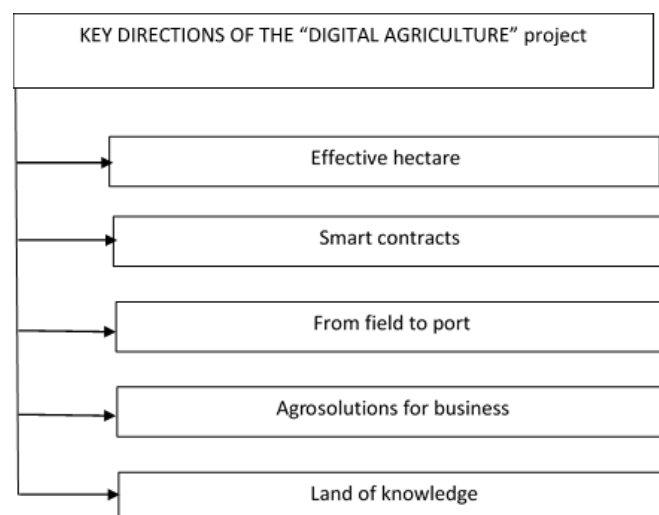


Figure 2. The main digitalization directions within the framework of the state (national) project "Digital Agriculture"

With regard to Smart Contracts, it is possible to create personal accounts of users of electronic

resources who wish to participate in public procurement and receive targeted government subsidies.

The direction “From the field to the port” has the ability to efficiently export manufactured agricultural products. The basis of this model is the forecast of gross yields, taking into account productivity, traffic congestions, and the effectiveness of the transport and logistics system.

“Agrosolutions for business” contribute to the creation of favourable conditions for the introduction of innovations in the production processes of the agro-industrial complex.

The project “Land of Knowledge” contributes to the improvement of the process of agro-education and retraining of personnel in the agro-industrial complex.

In general, it can be noted that, with proper organization, the above directions of the national project should give definitely positive results.

For the greatest efficiency of the economy digitalization, in the agrarian-industrial complex of Russia there should be created digital platforms everywhere, which are more focused on obtaining operational information by all entities of the agro-industrial complex (Afonina, 2018). Such an approach will facilitate their coherent and effective interaction. The positive effect will be guaranteed by reducing the margin of intermediaries in the implementation of commercial operations.

Also, the ability to owners of economic entities to take the only correct business decisions and minimize possible risks and threats in the light of receiving timely, relevant and all necessary information will have an important effect.

Such a platform should also be targeted at direct consumers of agricultural raw materials and food, which will create transparency in all transactions and information on the current state and competitiveness of any agro-industrial complex entity.

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