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Digital Communication Platform for the Agro-Industrial Complex

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***Abstract*—The author presents the concept of a digital communication platform for enterprises of the agro-industrial complex. The urgency of creating such a tool is justified by the problems that have accumulated in the industry. Modern theoretical and practical approaches to addressing the issue of digitization of industry infrastructure have been investigated, and the potential functionality of the digital platform has been disclosed for all system participants.**

Keywords—digital platform; agro-industrial complex; concept; functional; the participants

I. INTRODUCTION

At the present stage of growing urbanization, Russia is no exception. The share of urban residents is 74% of the total population, the share of rural residents is 26% [1]. In the Republic of Bashkortostan, the share of rural residents is still prevailing - 48% of the total population of the republic. At the same time, it is becoming more and more difficult to keep young people in the village. One of the main reasons for the outflow of youth to the cities is the low standard of living in rural areas and difficult working conditions. For example, the average wage in rural areas of the Republic of Bashkortostan is 1.7 times lower than the average wage in the whole republic.

Severe working conditions are related:

- with the need to maintain personal subsidiary farming as a self-employment to maintain the average standard of living in the absence of a sufficient number of jobs;
- with high wear of machines and mechanisms;
- with the deterioration of the infrastructure of agricultural enterprises in general;
- with underdeveloped and outdated road infrastructure areas.

However, the lack of due attention to the problems of rural residents in particular and to agriculture in general, reduces the level of food security of the country. Indicators of food security are self-reliance indicators. For example, in 2017 in the Republic of Bashkortostan, the level of self-sufficiency in meat is 81.8%, eggs - 78.5%, vegetables and food melon crops - 87%.

For the period from 2013 to 2017 at the federal, regional and municipal levels, a number of steps have been taken in the legal field to regulate the activities and development of the agro-industrial complex, namely developed [2]:

Strategy of socio-economic development of the Republic of Bashkortostan until;

- Strategic plan for the development of the agro-industrial complex of the Republic of Bashkortostan for 2016-2020;
- Federal target program "Sustainable development of rural areas for 2014-2017 and for the period up to 2020";
- State program "Development of agriculture and regulation of agricultural products, raw materials and food in the Republic of Belarus";
- Republican grant programs: "Family Livestock Farms", "Novice Farmer";
- Municipal programs aimed at developing cooperation and support for entrepreneurs [3].

The proposed measures of support for the AIC have some results. For example, in the Republic of Bashkortostan, the annual production volumes of agricultural products for 2015-

2017 increased by 13%. In 2017, the republic took the first place in Russia in beef production. For the first 9 months of 2018, exports of products of the agro-industrial complex were increased by 2.8 times compared to the same period last year. Over the past three years, the number of individual entrepreneurs has increased (by 3.3%). However, the monitoring of the socio-economic development of municipal districts of the Republic of Bashkortostan, conducted in July 2018 selectively in five municipal districts, revealed a number of unresolved problems in the real sector of the economy common to all municipalities:

- high seasonal volatility of purchase prices for crop products [4];
- lack of regulation of the area of sowing in crop production, which leads to overproduction and a corresponding drop in prices for these crops, and, as a result, to farmers' losses;
- low business activity of the population [5];
- low investment activity areas, which is to some extent linked to the lack of awareness of potential investors on municipal areas and specific investment projects;
- monomanufacture focused on production of raw;
- weak diversification of areas of activity of agricultural enterprises;
- low level of labor productivity in industry and productivity in agriculture;
- lack of stable distribution channels for agricultural products; weak institutional support for the investment process;
- “zero” innovation activity of enterprises.

The task of increasing the information openness of municipal territories is to a certain extent solved by placing investment passports of municipal districts and large investment projects on the information portal “Development Corporations of the Republic of Bashkortostan”.

At the same time, the creation of such information portals is only the first step towards solving the problems of rural areas through the opportunities offered by modern digital technologies [19].

It requires the creation of information infrastructure for the interaction of agricultural organizations, farms, individual entrepreneurs, wholesalers and buyers, investors on a regular basis in order to increase business activity in the industry and, as a result, the efficiency of the agro-industrial complex [6].

II. Degree Of Processing Problems From The Point Of View Of Methodology And Practical Implementation

The study of the role of information, the information society and the information infrastructure, including from the point of view of territorial development, is reflected in the studies of L. Shade, C. Atherton, M. Moinov, E. Monteiro, J. Raidenburg, A.I. Rakitova, S.Yu. Glazyev, D.I. Blumenau, V. Drake, S. Mora, P. Samuelson, S. Fisher, L. Heath [17].

In the field of system analysis, artificial intelligence, the works of A. Newell, G. Simon, M. Minsky, J. McCarthy, C. Shannon, A. Turing, M. Andrew, and others are widely known [18].

Domestic scientists made a significant contribution to the development of this area: VB Tarasov (virtual enterprises), E.V. Popov (expert systems), D.A. Pospelov (theoretical foundations of knowledge engineering and artificial intelligence, situational management), M.L. Tsetlin (training of finite automata), T.A. Gavrilova (cognitive maps), V.F. Khoroshevsky (database mining).

The development of management theory in the Republic of Bashkortostan is associated with the names of I.Yu. Yusupova, N.I. Yusupova, B.G. Ilyasova, V.I. Vasilyeva, L.R. Chernyakhovskaya.

Studying the problems of increasing the region's competitiveness in the context of socio-economic development dedicated to a number of economists, such as A.I. Tatarkin, B.S. Zhikharevich, G.V. Dvas, M.A. Gusakov, V.E. Rokhchin, A.G. Aganbegyan, R.A. Fatkhutdinov, V.M. Khodachek, E.V. Pilipenko, V.V. Yanovsky, L.I. Abalkin, T. Hagerstrand, and others.

The main studies in the field of the theory and methodology of innovation, as well as the innovation economy in general, are the works of P. Drucker, E. Toffler, D. Quinn, R. Reich, T. Sakaya, G. Chesbrough, M. Porter, F. Mahlup, M Porat, F. Fukuyama, P. Romer, B.K. Zlobin, V.L. Inozemtsev, N.D. Kondratieva, S.V. Pirogov, E.A. Tkachenko, T.S. Khachaturova, S.S. Shatalina, V.V. Platonov, A.M. Warsaw, E.M. Rogovoy, A.V. Gorshkova, V.L. Makarova, A.G. Fonotova.

Nevertheless, the analysis of scientific research revealed an insufficient degree of development of a number of methodological issues in the formation of the information infrastructure of the economy of the industry [4]. The main reason is the relative novelty of the idea. In this regard, the conceptual issues of creating a digital platform require.

Modern IT developments for the agro-industrial complex are aimed primarily at solving actual production problems, such as adaptation to climate change, increasing crop yields and productivity in animal husbandry, automation of production processes, reducing risks associated with the specifics of the industry [7,8].

Modern digital platforms can be conventionally classified according to their functionality, purpose and scale of use.

Functional classification allows distinguishing the following types of platforms:

- transport and logistics platforms (Uber, Gett, Yandex);
- trading platforms торговые платформы (Alibaba, Ebay, Amazon) [15];
- social platforms (Facebook, Instagram, VKontakte, LinkedIn) [11];
- virtualization platforms (Amazon Web Services, Microsoft Azure) [16];
- investment platforms (Kickstarter);
- recruitment platforms (HeadHunter, SuperJob);

– learning platforms (Edx, Khan Academy, Coursera, Stepic, TED).

The scale of use of digital platforms can be divided into the following types:

– global (PayPall, Facebook, Instagram) [13];
– regional (Yandex Taxi, Classmates);
– national (Qiwi) [14].

By destination digital platforms are instrumental, infrastructure and application.

Currently there is no information on the implementation of an applied digital platform for the agricultural industry.

III. Potential Functional Digital Platform

The purpose of the research of the authors is to develop the concept of creating a digital platform for the agro-industrial complex.

The developed digital platform is an organizational and technical system operating on the principles of a virtual organization uniting enterprises, organizations, individual entrepreneurs, communities and government bodies directly related to the agro-industrial complex (Fig. 1).

Fig. 1. Network of interaction of agro-industrial enterprises within the digital platform

The software will be implemented as a special web portal on the Internet, containing a classifier by type of objects, full-text search, description of objects with photos, video materials and reviews, statistics of the most important socio-economic indicators.

When the enterprise registers on a web portal of the digital platform it will receive a unique user name and password for further identification in a network.

The main difference between the digital platforms proposed by the authors is that the concept is based on the functionality to solve both the production and economic problems of the agro-industrial sector of the economy through communications between the subjects of the system.

The functionality of the system will be aimed at ensuring user interaction for solving the following production tasks:

– search for labor resources for seasonal work;
– hiring specialists with specified competences of the agro-industrial sector (agronomists, zootechnicians, veterinarians, etc.);
– providing agricultural producers with special equipment on a competitive basis;
– planning of sown areas for specific crops based on pre-signed agreements with purchasers (planning elements through self-regulation industry);
– providing livestock farms with the necessary material resources (hay and forage);
– provision of crop farms with high-quality seed stock, fertilizers, etc.;
– sharing of best practices;
– investor search.

The functionality of the system will provide opportunities for the commercial promotion of farm products.

At present, the state is promoting, based on foreign experience, cooperation in agriculture, in particular, raw material processing cooperatives and consumer marketing cooperatives. Despite the financial support of the state in creating such cooperatives, the return is weak. Farmers do not rush to unite. There are two reasons for this.

The first is confidence in the cooperative participants to the effectiveness of tools; the second is weak institutional support for the process.

In this regard, the digital platform will help increase participants' confidence in each other by increasing business transparency, increasing trust in the cooperation tool by speeding up the results; provide organizational support by building a technological chain from the producer of raw materials to the producer of finished products and further to the consumer [10].

The digital platform will create conditions for participants to interact not only at the B2B level (business to business), but also at the B2C level (business to consumer) [9]. This area of interaction is particularly relevant in light of the growing interest on the part of consumers to farm products.

In general, the virtual platform will increase business activity in the industry, investment activity, create new tools for the interaction of business, business and government, business and credit organizations, will allow, without additional costs on the part of producers of goods and services, improve the standard of living of rural residents, the competitiveness of Russian producers by optimizing costs (optimizing suppliers, reducing the chain of intermediaries, outsourcing supporting processes) [12].

Secondary for farmers, but paramount for government, will be the functionality of the platform, which will allow implementing certain functions of management and marketing of the territory.

It will consist in the automated collection of the necessary information, data analysis, and management decisions, bringing them to the performers and implementation in

practice. At the same time, unlike the traditional way of collecting data through statistical bodies, electronic information exchange will provide the necessary efficiency and relevance of the data. Companies registered on the site will participate in surveys, collecting statistics. Depending on the values of the collected indicators, they will be included in one or another state program, carry out government procurement, subsidies, and grant development grants.

Thus, the republican authorities, based on the adjustment of the republican and municipal legislation in the developed information environment, will carry out soft regulation of the industry and commodity markets to achieve the best socio-economic indicators of agriculture in the region.

From the point of view of territory marketing, consolidation of information about various sub-sectors of the agro-industrial complex and the resources of the Republic of Bashkortostan in the virtual environment, presenting them in the global information network will increase the investment attractiveness of the republic and create conditions for producers to enter new markets.

Each enterprise, object, resource will have its representation on the portal. Subjects of the system will post information about themselves, including links to their own sites and other information resources [20]. The digital platform will provide them with information service, the opportunity to advertise and present the enterprise at the national level and outside the republic.

Remaining legally independent, enterprises will be incorporated into a virtual organization, which, through the implementation of the principle of self-regulation, will ensure the coordination of the activities of the participants in the direction of maximum efficiency for the agricultural sector and the Republic as a whole.

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