

PAPER • OPEN ACCESS

Reengineering of agricultural production based on digital technologies

To cite this article: Sergey Yekimov *et al* 2022 *IOP Conf. Ser.: Earth Environ. Sci.* **981** 032005

View the [article online](#) for updates and enhancements.

You may also like

- [Opportunities for process reengineering in Bulgarian bread production \(a case study\)](#)
Magdalena Damyanova-Bakardzhieva
- [Algorithm for business process reengineering in industrial enterprises](#)
T B Gigova and N S Geshanova
- [Use of Reengineering in Construction](#)
Sergei Sborshchikov, Natalia Lazareva and Elizaveta Kochenkova



The Electrochemical Society
Advancing solid state & electrochemical science & technology

242nd ECS Meeting

Oct 9 – 13, 2022 • Atlanta, GA, US

Abstract submission deadline: **April 8, 2022**

Connect. Engage. Champion. Empower. Accelerate.

MOVE SCIENCE FORWARD



Submit your abstract



Reengineering of agricultural production based on digital technologies

Sergey Yekimov^{1*}, Oksana Prodius², Tetiana Chelombitko³, Anastasiia Poltorak⁴, Natalia Sirenko⁴, Alla Dudnyk⁵ and Vladimir Chernyak⁵

¹Publishing House “Education and Science” s.r.o., Olstynska 607/1, Praha 8, 18100, Czech Republic

²Odesa National Polytechnic University, Odessa, Ukraine

³International Education Institute for Study and Research of V.N. Karazin Kharkiv National University, Kharkiv, Ukraine

⁴Mykolayiv National Agrarian University, Mykolayiv, Ukraine

⁵Dnipro University of Technology, Dnipro, Ukraine

E-mail: rusnauka@email.cz

Abstract. Digital technologies allow automating the processing of large amounts of data and information flows. This creates conditions for making automatic management decisions and makes it possible to more effectively manage the financial and economic activities of an agricultural enterprise. The use of information technologies makes it possible to reduce the costs of producing services and goods, establishes closer relationships between consumers and producers of agricultural products. Digital technologies make it possible to train, train and retrain employees and organize their joint work activities. The reengineering of state support for the agricultural sector should primarily be aimed at the introduction of digital information technologies in agriculture. This will create conditions for improving the efficiency of the agricultural sector, increase its competitiveness and reduce the need for state support.

1. Introduction

The production of agricultural products largely depends on natural and climatic conditions. In this regard, the return on investment in the agricultural sector of the economy is associated with a high degree of risk. The efficiency of agricultural production is lower than most sectors of the economy, and therefore agriculture needs state support for its successful functioning.

In many CIS countries, the state of the agricultural sector of the economy is in the process of reform. The use of agricultural land does not fully meet the conditions of sustainable development. The size of plowing of agricultural land reaches 70-90%, degraded and unproductive types of land resources are involved in agricultural production, the land is subject to pollution due to the activities of industrial enterprises. Meanwhile, the state's food security largely depends on the efficiency of the functioning of the agricultural sector of the economy.

According to [1], the following conditions are necessary for the successful functioning of the agricultural industry (Figure 1).

The importance of state regulation of agriculture is dynamically changing. The mechanisms, forms, methods and directions of the state's influence on the agricultural sector are also subject to change. At



the same time, there is an evolutionary change in state and public priorities, clarification of state functions regarding the functioning of agriculture.

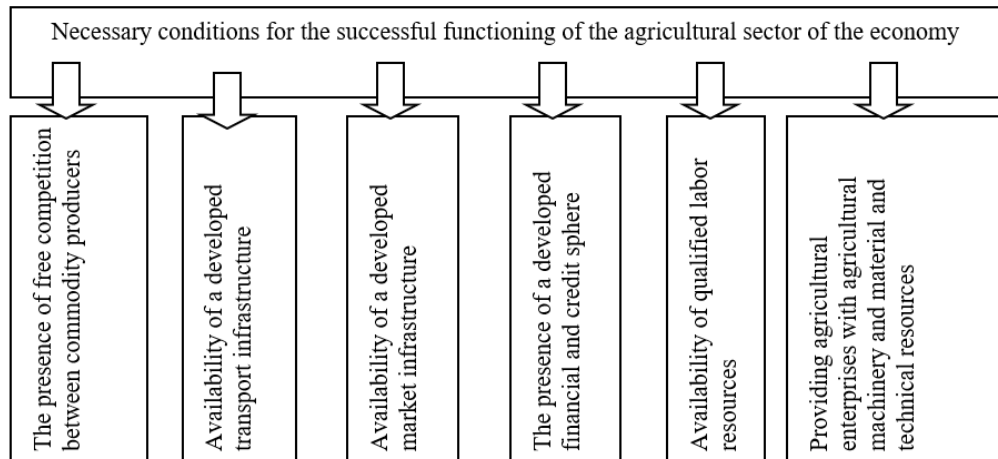


Figure 1. Necessary conditions for the successful functioning of the agricultural sector of the economy

According to [2], modern agriculture is not able to function effectively without state regulation. Creating conditions for stable economic development of the agricultural sector of the economy is possible only if the state and market regulation of the agricultural sector interact effectively.

According to [3], domestic support and export subsidies are important for agriculture.

Internal support for agricultural enterprises primarily concerns the development of rural transport infrastructure, the laying of power lines, assistance in the event of natural disasters, the creation of drainage and irrigation systems, training, environmental protection, subsidizing agricultural producers, if necessary, to sell their products to the state at low purchase prices , state participation in agricultural insurance and credit programs.

According to [4], to ensure the sustainable development of the agricultural sector of the economy, it is necessary:

- Sustainable development of rural settlements.
- The existence of state programs aimed at restoring and preserving the fertility of agricultural land.
- State financing of housing construction and socio-cultural facilities in rural areas.
- Legislative regulation of water, forest and environmental legislation.
- Improving the quality of life in rural areas.
- Ensuring legal protection of the rights of agricultural producers.
- State regulation of the food market.
- Creating the possibility of preferential lending for the purchase of high-performance agricultural machinery.

According to [5], for the effective functioning of agriculture, its state support is necessary in the following areas (Figure 2):

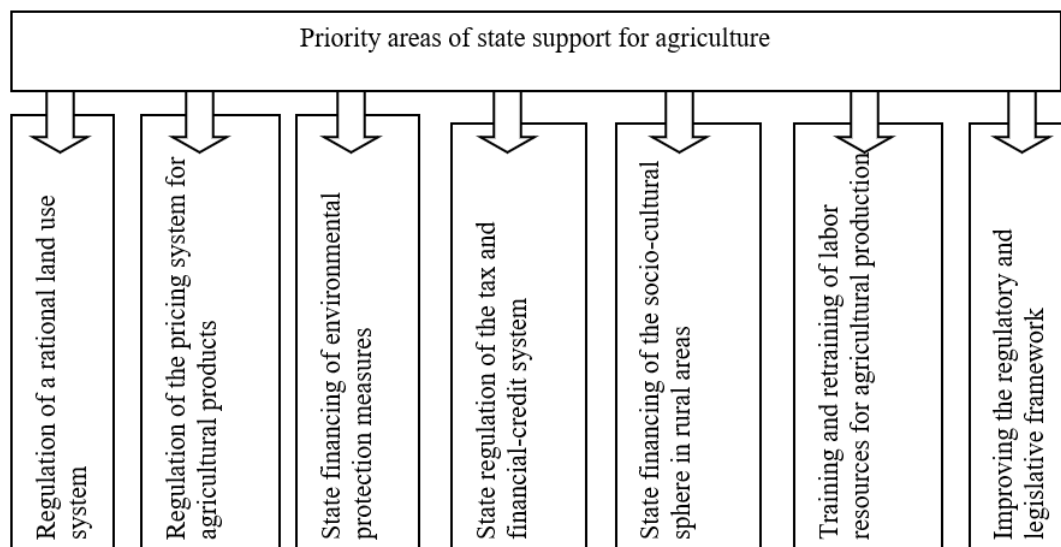


Figure 2. Priority areas of state support for agriculture

According to [6], the digital economy is an economy in which the most important production factors are network transactions and digital data, using them as a resource allows creating conditions for increasing labor productivity and reducing the cost of manufactured goods and services. The use of digital technologies in enterprises provides for the use of electronic and digital systems and devices in the production process of the enterprise that allow for interaction between the virtual and real world.

According to [7], for the effective development of enterprises at the present stage, it is necessary to implement a digital transformation strategy on them.

State support for the digital development of the economy will allow:

- 1) To assist in increasing the competitiveness of various sectors of the economy.
- 2) Create conditions for the creation of high-tech industries
- 3) Increase the level of the population through innovative transformations in medicine, education and transport.

According to [8], effective digitalization of the economy should be accompanied by the elimination of institutional, legislative and tax obstacles that hinder it. This will create additional incentives and motivations for enterprises to use digital technologies.

According to [9], the state should promote the development of digital infrastructure and increase the digital competencies of the population.

The introduction of digital technologies requires employees who possess information and communication competencies. This, in turn, requires a reform of the vocational education system aimed at creating conditions for training specialists who are able to carry out their professional activities in the era of high-tech information technologies.

According to [10], for the effective introduction of digital technologies in production activities, it is necessary:

- Develop a business plan for the digital transformation of business processes in the enterprise.
- Analyze the costs of implementing information technologies at enterprises and the economic effect obtained from this implementation
- Determine the need to improve the digital competencies of the company's personnel
- If necessary, reengineering of business processes at the enterprise
- To monitor and analyze the effectiveness of digital transformation of production processes at the enterprise.

- Take measures aimed at ensuring the protection of information resources of the enterprise from cybernetic threats.
- If necessary, review the staffing table of the enterprise.

2. Methods

As part of this study, the authors used an analytical method. This made it possible to study the affected problems in their development, interrelation and unity. Taking into account the tasks and goals of the study, structural-functional and systematic methods of carrying out the study were used.

This made it possible to study a number of problems related to the reengineering of agricultural production based on digital technologies.

3. Results

In our opinion, the reengineering of agricultural production, first of all, should provide for the introduction of digital innovative technologies based on the use of digital platforms, automation, as well as smart technologies.

In crop production, digital technologies allow you to create electronic maps of fields, make an operational test for the presence of water and nutrients. Digital technologies based on the use of drones can be effective in monitoring the infestation of fields with pests and the contamination of crops.

The use of GPS collar navigators can be used in animal husbandry to monitor herds of farm animals.

Autonomous meteorological stations can be used for rapid recording of weather data. In real-time conditions, this information can be transmitted to agricultural enterprises.

Modern information technologies can improve the efficiency of production processes in agriculture. For their accelerated implementation, state support is needed aimed at training employees of agricultural enterprises who will be able to introduce digital technologies into production and manage them. The introduction of digital information technologies in agriculture will create an institutional environment that would meet modern realities and requirements, as well as reduce the costs of agricultural production and increase its efficiency.

Digital technologies will allow agricultural enterprises to accept orders for their products not only from local consumers, but also from consumers located at a considerable distance from the agricultural enterprise.

4. Discussion

The digital economy is characterized by the division of the components of the economic system into information and material. The digital economy is characterized by the processing of large amounts of data and information flows.

Data processing systems make it possible to implement automatic management decision-making and analyze the financial and economic activities of the enterprise more effectively.

Digital technologies make it possible to reduce production costs, improve its quality and increase production volumes.

Digital technologies contribute to the establishment of closer ties between producers and consumers of goods and services.

Internet platforms allow using digital technologies to search for business partners, sales markets for finished products and production resources.

Digital technologies make it possible to train employees and organize their team professional activities.

5. Conclusions

The reengineering of state support for the agricultural sector of the economy should, first of all, be focused on the introduction of digital information technologies. This will make it possible to increase the efficiency of the functioning of the agricultural sector of the economy and reduce the need for state support for agriculture.

References

- [1] Salamin O 2021 State Regulation Of Agriculture In Ukraine *Economic scope* **168** 10.32782/2224-6282/168-7.
- [2] Alimkulova E and Aitmukhanbetova D 2020 State Regulation Of Agricultural Sector *Problems of AgriMarket* **4** 47-53. 10.46666/2020-4-2708-9991.05.
- [3] Gayduk V 2021 Improving State Regulation of Agricultural Production *Revista Gestão Inovação e Tecnologias* **11** 576-95 10.47059/revistageintec.v11i4.2130.
- [4] Kynditskyj O and Kuzyk O 2021 On The Question Of Instruments Of State Regulation Of Agriculture *Efektivna ekonomika* **6** 10.32702/2307-2105-2021.6.3.
- [5] Poperechnyi S and Tarnavska O 2019 Problems of state regulation of agriculture of Ukraine *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies* **21** 42-6 10.32718/nvlvet-e9309.
- [6] Ravenelle A 2021 The Digital Economy *Contemporary Sociology: A Journal of Reviews* **50** 416-7 10.1177/00943061211036051m.
- [7] Øverby H and Audestad J 2021 *The Digital Economy* (Springer, Cham) 10.1007/978-3-030-78237-5_1.
- [8] Budzinskaya O 2021 *Competences for Digital Economy* (Springer, Cham) 10.1007/978-3-030-80485-5_28.
- [9] Campbell L 2021 Regulating the Digital Economy *Journal of Telecommunications and the Digital Economy* **9** iii-vii. 10.18080/jtde.v9n2.425.
- [10] Sledziowska K and Włoch R 2021 *The foundations of the digital economy* (Springer, Cham) 10.4324/9781003144359-1.