

DIGITALIZATION AS A FACTOR IN ENSURING SUSTAINABLE DEVELOPMENT OF AGRICULTURE

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Abstract

In modern conditions, it is difficult to imagine the development of the economy without digitalization, without the implementation of digital transformation. Digital transformation is A process that an organization applies to embed digital technologies in all areas of its business, fundamentally changing the potential of its services for customers. The article reveals the need for the use of digital technologies in agriculture and the content of the processes taking place in the republic in this direction.

Keywords: agriculture, digitalization, digital technologies, yield, efficiency.

Introduction

As is known, in the course of large-scale reforms carried out in recent years in agriculture of Uzbekistan, the main attention is paid to the rational use of water and land resources, the active introduction of modern technologies into production, strengthening the material and technical base and human resources of farms and enterprises. "In particular, priority is given to reducing the cost of production by 30-35 percent through the introduction of resource-saving innovative technologies, bringing areas using water-saving technologies to 1 million 500 thousand hectares, increasing the number of high-quality and high-yielding varieties, increasing the number of pedigree livestock, and growing environmentally friendly products." [2]

In modern conditions, these tasks can be implemented by directing efforts to the introduction of digital technologies, including the introduction of production automation systems, the use of remote monitoring and control, the introduction of modern means of communication and information exchange, as well as the development of electronic platforms for agricultural enterprises and farmers. The main tools of the digital economy are the Internet of Things, artificial intelligence, big data, machine learning, blockchain, monitoring systems, robotics, virtual reality, cloud computing, and many others. [5]

Materials and methods of research

The theoretical and methodological basis of the research is the scientific works of domestic and foreign scientists on the problem under study, the developments of research

institutions. The regulatory framework of the study is the legislative and regulatory acts of the government bodies of the Republic of Uzbekistan on the development of agriculture and the digital economy.

Analysis and results

To date, the Government of the Republic of Uzbekistan pays special attention to the development of ICT and its mass introduction in all spheres of society. Since it is the indicators of the functioning of the ICT industry that have a direct impact on the level of efficiency of the development of the digital economy and the national economy as a whole.

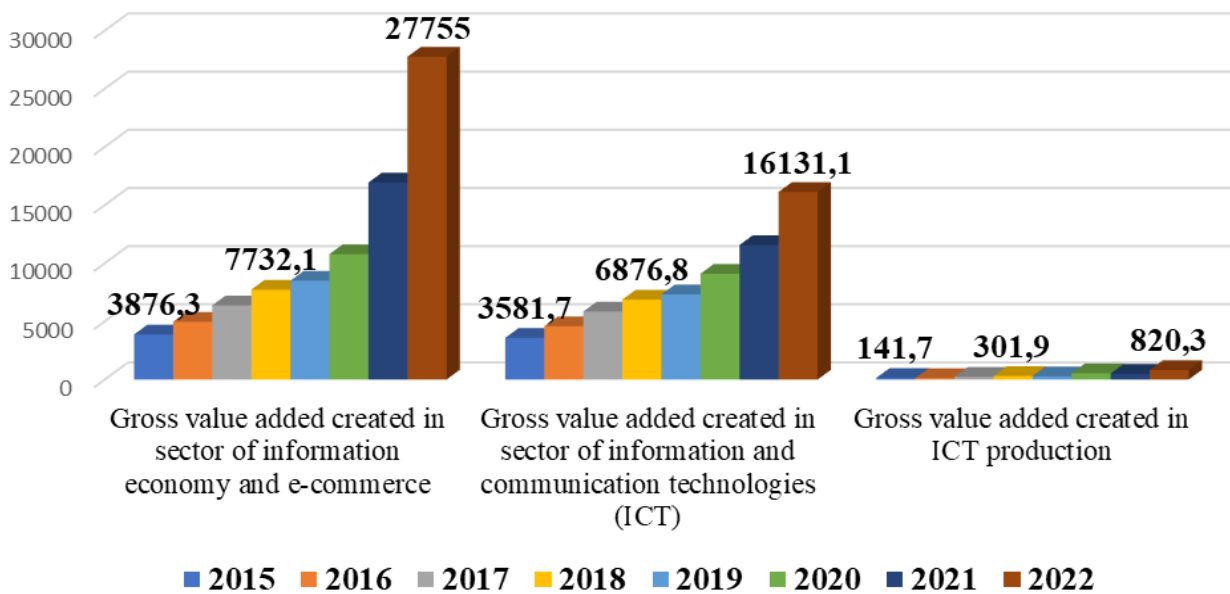


Figure 1. Main indicators of the ICT industry, billion soums [6]

The main indicators of the functioning of the ICT industry in Uzbekistan, adopted according to the standards of national statistical accounting and reporting, are presented in Figure 1, which shows that the gross value added created in the information economy and e-commerce sector in 2023 amounted to 27755 billion soums, which is 7.1 times more compared to 2015, the gross value added created in the information and communication technologies (ICT) sector amounted to 16131.1 billion soums, compared to 2015 more by 4.5 times, gross value added created in the field of ICT production is 820.3 billion soums, compared to 2015 more by 5.8 times.

The services of the ICT industry include software publishing services, the volume of which in 2023 amounted to 1248.5 billion soums; telecommunication services (17619.2 billion soums); computer programming services, consulting and other related services (7505.4 billion UZS); services for data processing, placement and related services, web portals (2679.1 billion soums); services for the repair of computers and communication equipment (1511.3 billion soums) (Fig. 2).

Name of indicators of the alternative sets	Volume, <i>in billion soums</i>	Specific weight in total volume, <i>in %</i>
Total	33 738,0	100,0
including:		
ICT services sector	30 563,5	90,6
including:		
Software publishing services	1 248,5	4,1
Telecommunication services	17 619,2	57,6
Computer programming, consulting and other related services	7 505,4	24,6
Data processing, hosting and related services; web portals	2 679,1	8,8
Computer and communications equipment repair services	1 511,3	4,9

Figure 2. An alternative mix of ICT services in 2023 [6]

The use of information technology in agriculture is not only the use of computers. Digital technologies make it possible to control the full cycle of crop or livestock production – "smart" devices measure and transmit the parameters of soil, plants, microclimate, etc. To determine the favorable time for planting or harvesting, calculate the fertilizer scheme, predict the harvest and much more, farmers use mobile or online applications. All data from sensors, drones and other equipment are analyzed by special programs. [3]

One of the important aspects of the digitalization of agriculture is improving the efficiency of production and resource management. As noted, modern digitalization solutions provide conservation land use, accurate management of the processes of crop cultivation, harvesting and storage. As a rule, digital technologies self-monitor the quality of technological operations taking into account changing landscape conditions and optimize the use of all types of resources. With the help of modern digital technologies, farmers and other agricultural producers can carry out more accurate crop planning, optimize the use of fertilizers and water, and improve monitoring systems for weather conditions and plant diseases (Fig. 3). This allows you to increase the yield and quality of agricultural products, reduce costs and improve the competitiveness of the industry.

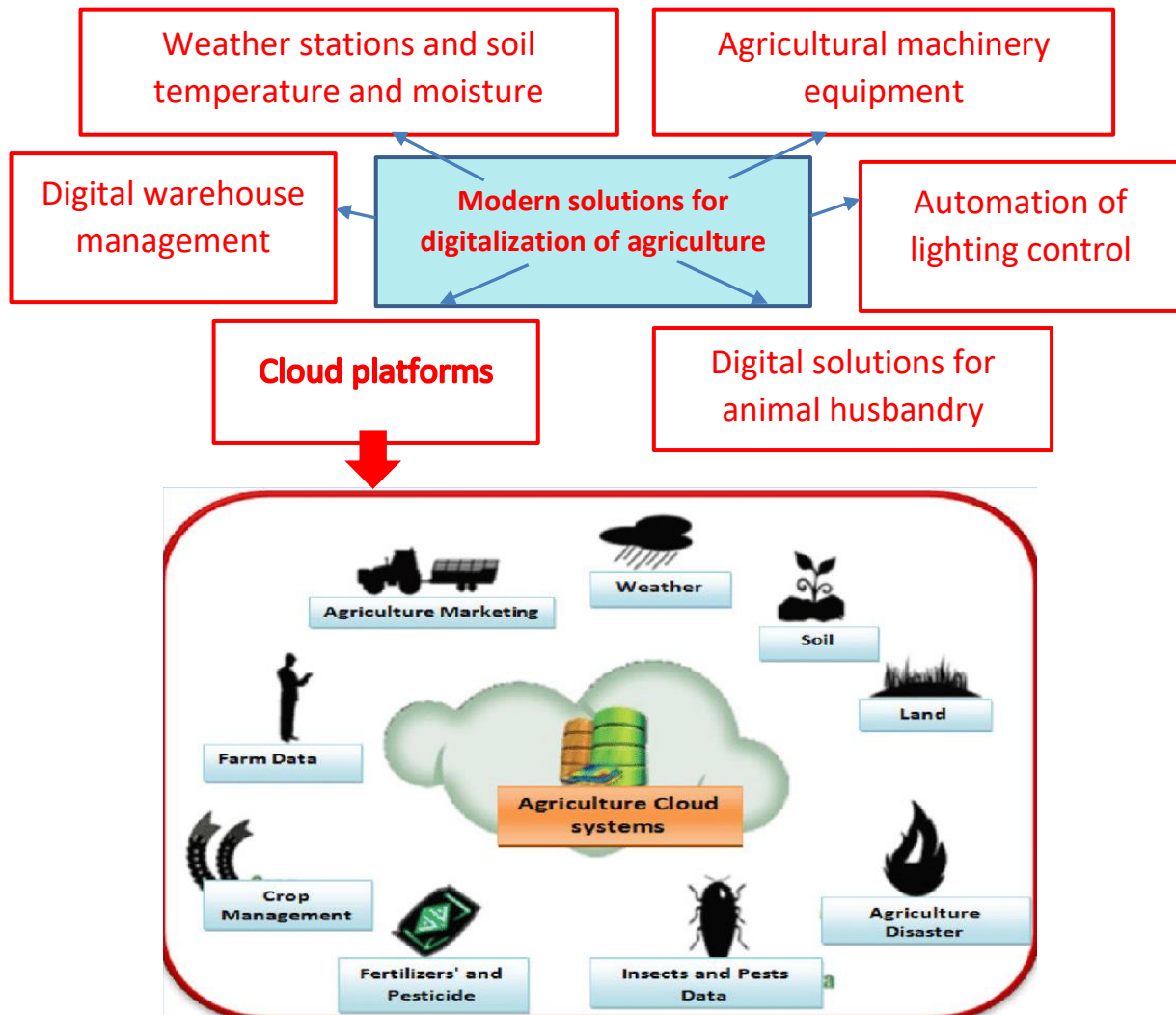


Figure 3. Modern solutions for the digitalization of agriculture

In addition, digitalization opens up new opportunities for the development of the agricultural market and exports. The creation of electronic trading platforms and digital markets simplifies the processes of trading agricultural products, improves access to new markets and increases the transparency and efficiency of trade transactions.

Despite the high importance of agriculture for the economy of Uzbekistan, the digital transformation of this industry is at the initial stage of its development, primarily due to the need to implement an effective investment policy. It is known that agricultural products in the country are mainly produced by farms and dehqan farms that do not have the opportunity to invest in innovations farmers to banking services and receive agricultural subsidies and loans for their activities. In particular, in accordance with the Presidential Resolution "On Measures to Introduce Advanced Digital Technologies in the Field of Agriculture" [1], the Agroplatform information system has been introduced as part of the single integrated Digital Agriculture platform, which is currently operating in test mode.

Thanks to the introduction of this system, information on all agrotechnical measures (from sowing to harvesting) will be in the information system. At the same time, in the system it will be possible to conveniently arrange the allocation of preferential loans for agricultural producers, risk insurance, conclude contracts in electronic format and lease equipment. The Agroplatform information system, integrated with databases and information systems of commercial banks and companies, cadastral, tax and justice authorities, will not only put an end to the "paper routine", but also increase the transparency of financing all processes. To date, 1,830 farmers have been registered in the system using electronic digital signature keys and the boundaries of more than 50 thousand hectares of their farms have been determined. In addition, the system considers the placement of crops and the conclusion of futures contracts in electronic form.

Despite the growth and development of the field of informatization and communication, the main problems of the introduction of ICT in agriculture include the slow process of introducing electronic services, the lack of mechanisms for transferring documents from paper to electronic form, the presence of technical and organizational shortcomings, the difference in generations and social status (not all agricultural workers can equally use electronic services), and the conservatism of farms. To make a difference, agricultural enterprises need to have employees with relevant expertise, agreements with leading technology providers and the use of the most up-to-date and efficient software developments. [4]

In conclusion, it can be concluded that the effective innovative development of national agricultural production in the context of digitalization of the economy will be possible thanks to the efforts and interaction of government agencies (creation of favorable economic conditions and direct support for innovations), the development of science, advanced technologies, education (training and retraining of special personnel) and investments in business innovations.

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