Development of Digital Systems of Enterprises of Agriculture and Water Management

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Abstract- **This article discusses the issues of maintaining and applying digital systems of agricultural and water management enterprises. Recommendations for improving the financial condition and targeted amounts of effective investments with the use of digital technologies in enterprises of agriculture and water management, taking into account industry characteristics, are given.**

***Keywords*:** Agriculture and water economy, digital technologies, economics, industry, management, efficiency ratio, financial condition, block chain.

I. INTRODUCTION

One of the most important problems of national agricultural producers is increasing their competitiveness. It is possible to organize successful management of the competitive position of an agricultural enterprise by changing approaches to organizing production and management. The basis of such approaches is the introduction of integrated digital systems based on computer systems for enterprise management. Such systems are a program for the implementation of methodologies based on popular management standards worldwide. Moreover, by the management standard it is necessary to understand the standard of functional consideration of processes (production, logistics, finance, and marketing) and their results in conjunction. These standards make it possible to streamline and synchronize processes in real time.

II. ANALYSIS AND RESULTS

As we know, the digital economy is a digital-based paradigm related to e-business and e-commerce, and the digital goods and services they produce and market. Payments for services and goods of the digital economy are often made by electronic money in digital currency. In this regard, the opportunities of the digital economy and blockchain in Uzbekistan are assessed as very promising. In Uzbekistan, dated September 2, 2018, the free activity of companies in the field of turnover of crypto assets and blockchain technologies was launched. Moreover, these technologies are being introduced into the public sector on the basis of public-private partnerships. Also, the Digital Trust Fund was created, whose tasks include attracting investments, implementing promising projects in the field of digital economy development, including those related to the implementation of blockchain technologies, namely: in the field of an automated registry system for the State Center for Expertise and Standardization of Medicines , medical devices and medical equipment (PMU) [1].

The need to introduce digital technology based on modern management standards is obvious. However, in most enterprises insufficient attention is paid to this issue. Those same enterprises that are introducing automated control systems at home, and there are more and more of them, are proving with their successful economic activity the need to develop digital technologies in other enterprises.

For the first time, scientifically based recommendations for optimizing the distribution and use of resources were given in 1939 by L. Kantorovich (Mathematical methods of organizing production planning. Publishing house of Leningrad State University.-1939.). [2] Subsequently, many scientists made a great contribution to the development of automated control systems. Their work has allowed the successful use of automation for enterprise management. With the transition to market relations, the old information systems need serious development, at the same time, digital technologies around the world have gone far ahead. Therefore, the work of many scientists is mainly aimed at the use of proven internationally accepted management standards in digital systems. The recommendations of many scientists are practically focused on the problems of implementation and operation of digital control systems. The issues of evaluating their economic efficiency have faded into the background, despite the fact that traditional methods of evaluating the economic efficiency of digital control systems have serious

limitations. Therefore, scientific research devoted to the resolution of this complex problem is of high relevance [3].

Recently, there has been a tendency to combine various types of digital technologies into a single integrated complex. A special place in it belongs to methodologies that reflect management functions implemented in the software of information systems. Such systems can be called digital control systems (CSB). CSBs are designed as a complex information technology and software complex. It supports a single way of presenting data, provides information and computing needs of specialists. Theoretical analysis made it possible to clarify the definition of CSB. A digital control system (CSB) of an enterprise is an information system based on an electronic computer complex, integrated into the enterprise's business processes and managing a certain set of resources (production capacities, financial assets, personnel, MTS, etc.) of an enterprise. CSB, therefore, the system is a transformation of information into a production resource.[4]

An analysis of the level of development of the country's digital technologies shows that the volume of production in the main industries using software products is small compared to other developed countries. Accordingly, national companies have less funds that they can invest in the purchase of software products. In addition, in the economy, the demand for computer programs that help increase productivity is limited by the fact that productivity growth in many industries does not lead to increased profitability or market success. In general, there are few high-performing enterprises in the economy. As a result, companies invest a disproportionately small share of their revenue in the acquisition of software products and design services.[5]

To analyze the state of development of digital systems in our country, the activity of many enterprises of various ownership forms, diverse in size and scale of activity in various industries over the past five years, has been studied. Analysis and assessment of their condition made it possible to identify trends and patterns in the development of information management systems in enterprises, the basis of which is the state of the industries. Table 1 presents brief characteristics of the state of the CSO of enterprises by industry.

Table 1 Brief characteristics of the development of digital technologies in economic sectors

Industry	**CSB development level**	**State park VT**
Aircraft industry	The enterprises use CSB	Retrofit of modern VT is required
Automotive	At enterprises, modern CSBs are being introduced	Most enterprises are equipped with a fairly modern VT
Light industry	Uneven level of development of CSB	Many enterprises require significant retrofit BT
Medical industry	Uneven development of CSB	Lack of VT in enterprises
Oil producing	At enterprises, the low level of AWP, it is necessary to introduce corporate CSB	Enterprises are equipped with modern VT
Food industry	At enterprises a low level of ARI, it is necessary to implement MRP II class systems	In some enterprises, sufficient equipment with modern PCs
Trade	The enterprises have a normal level of AWP, some of them use marketing systems and Internet tools	Many enterprises need retrofitting with modern BT and barcode reader systems
Chemical industry	The enterprises use modern CSB	Enterprises are not sufficiently equipped with modern VT
Energetics	The enterprises use modern CSB	BT in enterprises is not enough, they need updating
Agriculture and water	Not used by the CSB	BT equipment required

In the current economic conditions, the level of development of the enterprise's CSB depends on the general condition of the industry in which it operates. If the industry is in serious condition, then, as a rule, the enterprises of this industry do not have enough funds for the development of modern CSBs. Therefore, the basis of the development concept of CSBs must be based on a sectoral approach, and on optimality from the standpoint of "price - quality". That is, it is necessary to evaluate the financial capabilities of enterprises for the development of CSB and the necessary level of coverage of the enterprise resources system to ensure the most comprehensive management. Enterprises with different levels of security of material and financial resources operate in different industries in different ways. They have different scales of activity and different production cycles, which is why the development of information systems is at a different level. A quantitative assessment of the nature and form of influence of financial and economic indicators of enterprises and the level of development of information management systems, taking into account their industry specifics, can be determined on the basis of an equation of the form:

$$NA=A_0 + A_1 * OS + A_2*TP + A_3*B , \quad (1)$$

here **NA -** intangible assets (thousand soums); A_0 - free term of the equation that determines the effect of unaccounted factors; A_1, A_2, A_3 **–** cast factors; **OS**- fixed assets (thousand soums); **TP** – commercial products (thousand soums); **B –** enterprise assets.

Substituting the relevant financial indicators of a particular company in the equation of the corresponding group, we can conclude about the financial feasibility of implementing CSB.

To determine the economic efficiency of automated control systems at enterprises, the regression equation can be used, but the main emphasis must be placed not on intangible assets, but on indicators of the availability of digital technologies.

$$NU = A_0 + A_1* NA + A_2*OS + A_3*B , \quad (2)$$

here, **NU**- the presence of the CSB.

When calculating the normative efficiency coefficient (K) of an information system, it is necessary to calculate the average update period in years of personal computers and software, the frequency of training of personnel involved in the information system, and the price of these elements of the information system (Table 2).

Table 2 Updating the elements of the CSB

Expenditures	**Average renewal period, year**	**Average price, thousand soums.**	**Share of the total cost,%**
Personal Computer	2,25	829 902	59,3
Software	2,86	314 428	22,5
One person training	4,00	188 400	13,5
other expenses	0,08	66 645	4,7
Total		1 399 575	100

Based on the percentage of costs and average terms of updating the elements of the information system, it is possible to determine the average payback period (C = 2.522) and the efficiency coefficient of the information system (K = 0.397).

III. CONCLUSIONS

Thus, the identified trends and patterns in the development of digital control systems at enterprises make it possible to distinguish among them such enterprises where there are high-tech production facilities that facilitate the operational testing of modern CSBs and their further improvement. The characteristic industry features of enterprises and their relationship with the level of development of digital control systems are mainly in the technological equipment of the bulk of enterprises in this industry and the general financial and economic

condition of the industry. Therefore, the necessity of developing new approaches to assessing the necessary costs for the use of enterprise management information systems based on a comparison of economic efficiency indicators is predetermined. Then it is necessary to justify the normative coefficients of cost-effectiveness for the development of informative systems of enterprises that take into account both the cost structure of information systems and the differentiation of the payback periods of individual components of information systems. All this can help accelerate the implementation of CSBs and multiply the existing positive experience in using digital control systems at various water and agricultural enterprises. Based on this approach, it is possible to develop recommendations for improving the financial condition and oriented sizes of effective investments using digital technologies in agricultural and water enterprises, taking into account industry specifics.

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