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INTEGRATION OF INNOVATION AND INFORMATION AND COMMUNICATION TECHNOLOGIES AS A SOURCE OF ECONOMIC TRANSFORMATION

Abstract. *One of the most important strategic directions of the development of the Republic of Uzbekistan is the digital transformation of the country's economy, which implies successful innovative activity in all sectors of the economy. The article reveals the role of digital transformation processes as the most important condition for ensuring competitive advantages and increasing the pace of economic growth by using the entire set of elements of resource potential, taking into account the requirements of the external environment and the need for active digital transformations, the result of which is the production of innovative products. The analysis of the problems of the introduction of information and communication technologies and innovative development in the digital economy is carried out. It is concluded that the indicators of the effectiveness of digital transformation in the conditions of increasing innovation activity of structures are economic indicators, while the technological basis for the implementation of digital transformation is broadband Internet, as one of the most important conditions for active interaction of participants in the innovation process.*

Keywords: *digitalization, digital economy, digital transformation, innovation, information and communication technologies.*

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ИНТЕГРАЦИЯ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТИ И ИНФОРМАЦИОННО - КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ КАК ИСТОЧНИК ТРАНСФОРМАЦИИ ЭКОНОМИКИ

Аннотация. *Одним из важнейших стратегических направлений развития Республики Узбекистан является цифровая трансформация*

экономики страны, что подразумевает успешную инновационную деятельность во всех отраслях экономики. В статье раскрывается роль некоторых процессов цифровой трансформации как важнейшего условия обеспечения конкурентных преимуществ и наращивания темпов экономического роста за счет задействования всей совокупности элементов ресурсного потенциала, учета требований внешней среды и необходимости проведения активных цифровых преобразований, результатом которых выступает производство инновационной продукции. Проведен анализ проблем внедрения информационно коммуникационных технологий и инновационного развития в цифровой экономике. Сделаны выводы, что индикаторами эффективности цифровой трансформации в условиях повышения инновационной активности структур выступают экономические показатели, при этом технологической базой реализации цифровой трансформации выступает широкополосный интернет, как одно из важнейших условий активного взаимодействия участников инновационного процесса.

Ключевые слова: цифровизация, цифровая экономика, цифровая трансформация, инновационная деятельность, информационно-коммуникационные технологии.

Introduction

Digital transformation, which requires renewable information, and automation of internal operational processes will allow the organization to gain significant advantages. Digitalization is becoming a necessary tool for remote work of employees of organizations, which will reduce costs and increase the efficiency of all business processes [1,2,3,4].

Accelerating scientific and technological progress leads to the emergence and rapid spread of new information technologies in society - the so-called digitalization of society. The economic systems of many countries are in search of effective ways to use the achievements of digitalization of society for economic growth. One of the strategic goals of the Republic of Uzbekistan is the development of the digital economy, which is characterized by an increase in the economic efficiency of economic activity of subjects through the use of the achievements of digitalization of society. Thanks to the state policy, Uzbekistan has made significant progress in building an information society and E-government [5,6,7,8,9].

The state program "Digital Uzbekistan-2030" aims to obtain social effects through information technology development, and the goal of the state program is economic growth. The basis for the development of the digital economy has been created for several decades. To date, the widespread spread and use of information technology (IT) and the Internet has led to the formation of an information technology paradigm of a new quality society. There was a unification of information resources and technologies into a set, where a lot of IT forms uniform properties for various economic entities. For example, in the context of the COVID-19 coronavirus pandemic, digital educational platforms connect thousands of online course providers and millions of online listeners around the world. This was

followed by a radical transformation of business relations into digital ones, carried out in an electronic environment due to the constant processing of digital data in real time. Increasingly, the search and selection of market offers by the client takes place on a digital Internet platform, displacing e-mail, online stores and telephony from business communications.

Analysis and results.

The purpose and objectives of the study. The formation of the digital economy requires transformation in all directions, the transition to a systematic approach to innovation. In this regard, in order to implement an integrated approach to innovative development, it is necessary to establish the ratio of a certain type of innovation and a certain basic guideline of the organization corresponding to various properties of the external environment.

The normal state of the environment implies maintaining the dynamic balance of the organization, which can certainly be achieved when generating product innovations. Such a property of the external environment as a lack of resources causes efficiency as a basic guideline, to ensure high values of which process innovations are necessarily necessary, related, like product innovations, to technological ones. The diversity of the environment causes such a basic guideline as the freedom of action of the organization in the market, which is promoted by marketing innovations [10,11].

The variability of the environment corresponds to such a basic guideline as security, the achievement of which will be facilitated by organizational innovations. Organizational innovations imply the implementation of new business models, including digital ones, modern methods of organizing activities and external corporate relations, new forms of cooperation and the development of new ways of interacting with the external environment [12,13].

Adaptability acts as a basic guideline for changes in the composition of the environment. To remain viable and resilient, the system must be able to respond to threats or adapt to the latter before they have the opportunity to cause serious damage. Considering the development process from the standpoint of the life cycle, the concept of correcting business models focuses on the presence of a controlled adaptation of the system to the external environment.

Managerial innovations, which represent changes in the management system of an organization in order to increase the efficiency of its functioning and adaptability to changes in the composition of its environment, are implemented through changes in the technology and organization of the management process, in particular, the decision-making process. The focus on the flow structure aims management innovations at overcoming intra-organizational boundaries in order to adapt to changes in the external environment.

Consistency determines that management has a pronounced cyclical character and that, in turn, affects the generation of managerial innovations. A systematic approach to management innovations allows the manager to more productively implement his main functions: forecasting, planning, organization, decision-making and control.

The basic guideline of an organization with such a property of the external environment as other organizations is coexistence. Organizations operating in an uncertain market environment, rather fierce competition, should have as complete an information base as possible for timely operational management decisions that improve the company's image and financial results.

In this regard, there is a justification for the existence of such a concept as "information innovations", although information technologies are used to implement all other types of innovations.

Information stands out as an independent resource in the study of innovation, because it is here that new knowledge becomes the main factor in the management process.

The complexity and dynamism of modern technological processes, information flows, a significant amount of work on the collection and processing of information cause an increase in the requirements for the organization of the management of the enterprise as a whole, for the availability of analytical competencies of managers [14,15,16].

Research methodology. To analyze the indicators of innovation activity in the economy, it is necessary to refer to the materials of official statistics. It should be noted that in general, the dynamics over twenty years of innovative activity of domestic organizations and the implementation of technological innovations has a positive trend.

A comparative analysis of the costs of various types of innovations shows that in organizations in the extractive and processing industries, in the production and distribution of electricity and water, process ones are in the first place, and product ones are in the second.

In organizations in the field of communications and activities related to the use of computing and information technology, on the contrary, the costs of process innovations are significantly less than the costs of product innovations.

At the same time, the costs of marketing and organizational innovations are minimal in all areas. However, as already noted, marketing innovations play a huge role with such a basic guideline as the freedom of action of an organization in the market, corresponding to the property of the external environment - diversity.

Organizational innovations involving the implementation of new business models, including digital ones, modern methods of organizing activities and external corporate relations, new forms of cooperation and the development of new ways of interacting with the external environment contribute to the achievement of such a basic guideline as security with the property of the external environment - variability.

These statistics also include managerial innovations, the almost complete absence of which does not contribute to achieving such a basic guideline of the organization as adaptability to changes in the composition of the external environment. If we talk about information innovations, their lack limits coexistence with other organizations in the market and does not contribute to winning the competition.

The results obtained. The Republic of Uzbekistan, which has not yet reached significant economic milestones in the global competition, nevertheless, should set itself the goal of occupying a worthy place in the emerging digital economy.

New business models of development based on information and digital technologies will allow to achieve the optimum of any organization faster, solve the minimax problem, maximize profits and minimize the costs of the company, while achieving equilibrium in both production and consumption, while ensuring Pareto-optimality in the economy as a whole [17,18].

Digital transformation involves the informatization of both horizontal and vertical business processes, which will contribute to the creation of a new competitive environment in which the time factor will play one of the most important roles.

The fifth and sixth nonlinear models of the innovation process correspond to the digital economy. The fifth information network model assumes such key concepts as: feedback, network integration, strategic management and marketing, information exchange, databases, IT technologies and information systems, automatic control systems [19,20].

The main groups of management system functions are:

- decision—making functions - information content transformation functions;
- routine information processing functions;
- information exchange functions.

Decision-making functions are expressed in the creation of new information during planning, analysis and operational management.

This group of functions is the main one, since it provides the development of information effects to keep the system in the appropriate position or transfer the system to a new state. The remaining functions, thanks to information technology, become an automatic platform for the implementation of the main function.

The sixth model of "rapid learning" is based on: feedback, strategic management and marketing, knowledge exchange, market changes, knowledge base and intelligent management systems.

The sixth model raises the issue of analytical competencies of employees, however, companies often suffer from a lack of analytics specialists, which reduces operational efficiency and makes it difficult to make optimal decisions. This, in turn, requires building direct links between the decision-making process and the design of intelligent systems.

Intelligent management requires significant consideration of specific accumulated knowledge and is more critical to changing information in the decision-making process. Intelligent management arises where information is interpreted as a quantitatively undetectable set of data and relationships between them in a semantically clear context of their current interpretation.

The most important component of the intellectual system are knowledge bases, the most famous class of them are expert systems that are designed to find ways to solve problems from any subject area, based on the implementation of analytical competencies [21,22,23].

At the same time, we need to talk about the information and communication technology development index. The 2017 study presents data on the ICT Development Index in 176 countries of the world at the end of 2016. Uzbekistan ranked 95th in the world in this Index, with a value of 4.90. Iceland ranks first with an index of 8.98, and Eritrea ranks last with a value of 0.98.

According to the data of the State Statistics Committee of Uzbekistan, the share of the digital economy in GDP is 2.2%. At the same time, the average optimal indicator is 7-8%, for example, in the UK it is 12.4%, South Korea – 8%, China – 6.9%, India – 5.6%, at the same time in Russia – 2.8%, Kazakhstan – 3.9%. In accordance with the draft Concept for the development of the Electronic Government system of the Republic of Uzbekistan, it is planned to increase the share of ICT services in GDP to 5.0% by 2025, and to 10% by 2030.

In accordance with the Presidential Decree of January 8, 2019 "On additional measures to ensure the further development of the economy and increase the effectiveness of economic policy", the Strategy for the Development of the national digital economy "Digital Uzbekistan-2030" was prepared and approved, which will form the main tasks for accelerating the development of the digital economy and the widespread introduction of digital technologies in the spheres of life the population of the country. The development of the digital economy is directly related to the level of development of information and communication technologies (ICT), which is usually assessed by the following indicators:

- the digital economy's share of GDP;
- the size of investments in the ICT industry;
- the speed of the Internet, the extent of its coverage of the country's territory and accessibility for use by the population;
- development of electronic commerce;
- provision of organizations with specialists in the field of ICT.

The main and most important condition for the consistent development of the digital economy is the creation of a modern ICT infrastructure. In this regard, a number of major projects are being implemented in Uzbekistan. So, in 2020, the total length of fiber-optic communication lines was 68.6 thousand kilometers, then in the first quarter of 2021 this figure was brought to 81.7 thousand kilometers. By the end of this year, it is planned to bring this figure to 118.6 thousand kilometers. Currently, one million broadband ports are installed, and thus their total number is three million units. And by the end of 2021, this figure has been brought to 3.9 million units. In connection with the completion of the main part of the work on this project, starting from January 1, 2021, the rental price for communication channels was halved. If in 2020 the total number of mobile base stations was 31.7 thousand units, then in the first quarter of 2021 945 new stations were commissioned, and thus their total number was brought to 32.68 thousand. In order to create amenities for the population, work is currently underway to lower prices for mobile Internet services. As a result of a significant increase in technical capacities, tariffs for the rental of international switching packages for 1 Mbit/s were halved and until recently amounted to 40 thousand soums. This, in turn, allowed us to expand the activities of operators and providers in remote regions of our republic. The work carried out in

this direction has also earned high appreciation abroad. For example, recently the British portal Cable.co.uk published at prices for Internet services in the world. According to them, Uzbekistan ranked 21st in the world among 230 countries among the countries with the cheapest Internet. During the year, our country improved its position by 33 positions.

It should be noted that the organizations of the business sector are not yet leaders in the use of information and communication technologies, which is a negative moment for the formation of the digital economy in the country. However, it is possible to name the factors that ensure the possibility of rapid formation of the digital economy in Uzbekistan.

The factors of economic growth supply, in addition to the quantity and quality of labor, natural and investment resources, include the level of technology, the volume and quality of information. Supply factors provide a potential opportunity for economic growth [24]. If the first three types of resources dominated in the conditions of the first three types of revolutions in the economy, then the fourth type of industrial revolution, in addition to the first types of resources, necessarily implies the presence of effective technological resources, including information.

For enterprises to function successfully in the digital environment and win the competition in time when introducing innovations, they must become intelligent organizations that extract information, build conclusions and generate new knowledge in order to develop an innovation strategy.

An effective tool for implementing acts of intelligent management on a hard real-time scale is a class of temporal models based on knowledge and capable of operating with information having a dynamic and fuzzy nature. For the case when information cannot be evaluated numerically, but is determined by inaccurate knowledge expressed in natural language and based on intuition, the experience of decision makers, this approach has an obvious advantage over traditional models using clear estimates.

A person is faced with two types of uncertainty: physical, due to the inaccuracy of measurements and the randomness of events, and linguistic, which is fundamental, since it underlies the human way of describing the world through qualitative assessments.

So, for example, in addition to quantitative characteristics, great attention should be paid to the qualitative composition of the personnel potential of an innovative enterprise based on digital technologies, and in addition to quantitative, qualitative assessments should also be given to it, which may be even more important. In this regard, the issue of analytical competencies of employees, as already mentioned, comes to the forefront.

The success of digital transformation will depend to a greater extent on the personnel potential of the enterprise, on the analytical abilities of employees. In this regard, it is necessary to create conditions for the formation of a digital culture in the team so that employees can work effectively in a dynamic digital environment. In this paradigm, we are talking about an enterprise as a self-developing interactive system that has feedback both within business processes and with the external environment.

Conclusion and suggestions.

Advanced countries have already set themselves the task of forming a new digital economy, which involves the digital transformation of enterprises. National business should also prepare for the introduction of new digital business models, for adaptation in a new competitive digital environment. There are factors that provide a potential opportunity for the formation of a digital economy in Uzbekistan, but the question remains about their effective implementation, that is, demand and distribution factors, as well as institutional factors remain the main "pain points" in the country's economy.

It should be noted that an integrated approach to innovation activities, the implementation of various types of innovations is simply necessary in the dynamic conditions of the existence of economic management systems.

Building a digital economy, digital transformation in the market, and the application of new digital business models is impossible without a systematic approach to the innovation activities of organizations in all fields of activity. The diversity of the environment causes such a basic guideline as the freedom of action of the organization in the market, which is promoted by marketing innovations.

The variability of the environment corresponds to such a basic guideline as security, the achievement of which will be facilitated by organizational innovations. Organizational innovations imply the implementation of new business models, including digital ones, modern methods of organizing activities and external corporate relations, new forms of cooperation and the development of new ways of interacting with the external environment.

Speaking about the transformation of the digital economy in Uzbekistan, further research should address the problem of creating conditions for the rapid introduction of new business models of development based on information and digital technologies.

It is required in further scientific research to pay attention to the ways of effective implementation of the fifth and sixth models of the innovation process.

In addition, since, as already noted, the success of digital transformation will depend more on the personnel potential of the enterprise, the problem of training modern personnel for the digital economy is on the agenda.

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