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DIGITALIZATION OF THE ECONOMY: CONCEPTS, PROBLEMS AND IMPLEMENTATION STRATEGY

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Abstract
This article analyzes the concept of the digital economy. The concept of regional digital economy is formulated. The essence of the scenario of digital transformation of the market is investigated. In particular, the problems of production and business of the regional economy are disclosed, some key terms and expressions are clarified from the standpoint of the research topic.

Keywords: digital economy, regional digital economy, digital platform, digital transformation of the market, innovative business models of IT Park, IT certificate.

Introduction:

In the context of the globalization of the world economy, modern new digital technologies, innovative business models penetrate into all spheres of the economic life of society, influencing the very essence of the economy, forming quantitative and qualitative structural changes in it. As a result, a digital economy is being formed as a subsystem of the traditional economy, characterized by the active use of digital technologies and the circulation of specific electronic products.

The level of development of the digital economy is closely correlated with the country's competitiveness, which requires special attention of the state and business to its development. The digital economy (DE) is a trend in the economic development of all developed and developing countries of the world. Uzbekistan is also no exception, but it should be noted that the theoretical and practical successes in this industry are still not sufficiently developed in our country. Suffice it to say that the platform principle of organizing the US economy has already

covered more than 15% of production and business. In Uzbekistan, this figure is still less than 2% [1].

The program for the development of the digital economy of Uzbekistan was adopted by the Decree of the President of Uzbekistan "On measures for the widespread introduction of the digital economy and e-government" No. PP-4699, April 28, 2020. This document highlights topical issues related to the widespread introduction of digital technologies in the work of domestic enterprises and government services, the training of IT specialists, comprehensive support for IT entrepreneurship, and many others, and its main provisions are currently being actively translated into practice. In this program, digital economic data presented in digital form is a key factor in production.

As President Sh.M. Mirziyoyev , one of the priorities of the consistent socio-economic development of Uzbekistan is the widespread introduction of information, communication and digital technologies. It is digital technologies that are the effective tool that can ensure the qualitative reform of economic sectors and spheres of public life.

In the Address of the President Sh.M. Mirziyoyev to the Parliament and people of Uzbekistan in 2020, the issues of digital development were given. It is also symbolic that 2020 in Uzbekistan was declared the Year of the Development of Science, Education and the Digital Economy. It was during this period that the fundamental documents were adopted that laid the legal foundation for further digital reforms.

The logical continuation of these works was the Decree of the President of the Republic of Uzbekistan dated October 5, 2020 "On approval of the Strategy "Digital Uzbekistan - 2030" and measures for its effective implementation". This policy document includes road maps for the digital transformation of priority economic sectors and regions.

In recent years, even in the context of the COVID-19 pandemic, large-scale digital reforms have been carried out in the country. And, importantly, today, at such a difficult stage for the country and all of humanity, the importance of measures for the widespread introduction of digital technologies in the field of public administration, public services, and trade has been clearly demonstrated.

Literature Review

We are aware of a number of publications by foreign scientists, economists and experts who have been studying the digital economy and methodological aspects of the digital transformation of business processes for many years. Of interest are the works of N. Hanna[1], M. Pratt[2], D. Sparapani, N. Fenwick[3], R. Kinzyabulatov [4]and others. They outline the

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theoretical foundations and practical experience in the field of the digital economy, as well as the digital transformation of business processes of enterprises and organizations in Europe, Asia and Russia.

Questions regarding the digital transformation of business processes of enterprises and organizations are described in detail in the joint research work of S. Kraus[5], P. Jones, N. Cuyler, A. Weinmann, N. Chaparro-Banegas, N. Roig-Tierno.

Also, the research of domestic scientists is devoted to increasing the competitiveness of the national economy of the Republic of Uzbekistan in the digital economy, improving the theoretical and practical aspects of the digital economy, as well as the introduction of digital technologies in public administration. Research related to the use of information technology in the economy of Uzbekistan was carried out by such scientists as S.S. Gulyamov, T.S. Kuchkarov, A.T.Kenjabaev, A.T. Shermukhamedov, Sh.Sh. Shokhazamiy, V.K. Kabulov, R.Kh. Ayupov, A.A. Musaliev, A.M. Abduvokhidov, Y.A. Abdullaev, A.B. Bobozhonov, N.M. Makhmudov, I.K. Mirzaev, Sh.G. Odilov, D.M. Rasulev, B.T. Salimov, Z.Kh. Toshmatov, N.Kh. Khaidarov, G.R. Baltabaeva, R.A. Dadabaeva, I.E. Zhukovskaya, T.Sh. Chodiev and others.

These studies of domestic scientists have made a huge contribution to the development of the digital economy. However, the introduction of the digital economy in the regions is not covered enough, in particular, the lack of knowledge of the activities of local authorities requires research in this area and determines the relevance of the research topic.

Methods and Analysis

Access to digital technologies changes everything: it improves the quality of life of people, makes industrial enterprises and agriculture more efficient, helps small and medium-sized businesses to contact customers, simplifies access to information, incl. to the media, and allows you to completely change the model of the relationship between the citizen and the state, and even develop new forms of democracy, such as electronic parliamentary elections. Approved and provided:

- programs for the digital transformation of regions in 2020-2022;
-programs for the digital transformation of industries in 2020-2022.

In particular, the implementation of over 220 priority projects has begun, providing for the improvement of the e-government system, the further development of the domestic market for software products and information technologies, the organization of IT parks in all regions of the republic, and the provision of this area with qualified personnel.

An indispensable condition for digital development is the creation of a modern telecommunications base. In this regard, large-scale work has been done in the republic over the past five years to modernize and expand communication networks. So, if in 2020 a total of 41.0 thousand km were laid in the republic. fiber-column cables, then by the end of 2022 this

Transformation: An Overview of the Current State of the Art of Research ," SAGE Open , vol. 11(3), pages 21582440211, September.

figure increased to 70.0 thousand kilometers. Until 2030, it is planned to lay fiber-column lines and thereby bring their total length to 250.0 thousand kilometers.

The availability of high-speed Internet connection is growing through the installation of broadband access ports. The total number of installed ports in 2020 has already reached 3 million units. By 2023, it is planned to bring this figure to 5.8 million units.

The development of fiber optic infrastructure, in turn, contributed to an increase in the throughput of communication channels. The total bandwidth of Internet channels at the end of 2020 increased to 1,800 Gbps, and in 2023 to 4,500 Gbps. The task was also set to increase the total capacity of backbone communication channels between regions to 800 Gbit/s by 2023.

An important factor in increasing the availability of the Internet for the population is the consistent reduction in prices for communication services. Over the course of five years, the cost of tariffs for Internet services of external channels for providers decreased 10 times: from $30.3 in 2016 to $3 (32,000 UZS) in 2021 . According to the rating of the British portal Cable.co.uk, Uzbekistan ranked 21st among 230 countries with the cheapest internet.

As part of the digital development of the republic, special emphasis is placed on providing social facilities with high-speed Internet connections. At present, 97% of general education schools, 82% of mahalla gatherings of citizens, 56% of police stations, as well as 100 percent of preschool educational and medical institutions are connected to a high-speed Internet network. The task was set to fully provide all social facilities with high-speed Internet communications by the end of this year.

It should be noted that if earlier the expansion of mobile networks was carried out on the basis of 2G technologies, today projects based on 3G/4G technologies are being implemented. Thus, last year 3.6 thousand base stations were upgraded on the basis of 3G/4G technologies. Work is underway to develop 5G technology in Uzbekistan. In the future, it is also planned to deploy a 5G network in regional centers.

At the same time, the needs of the telecommunications infrastructure for sufficient resources for processing and storing data are also growing. To this end, in 2020, a Data Processing Center with a capacity of 5 petabytes was put into operation in the republic. In the future, it is planned to launch additional data centers with a total capacity of more than 25 petabytes.[9]

The development of the e-government system in Uzbekistan is considered as one of the priority areas of digital reforms, which will allow to qualitatively reform the activities of public authorities and administration. Large-scale reforms in the public sector cover all spheres of activity without exception with the broad involvement of ministries and departments.

The most important role in the development of the E- gov system is assigned to the Unified Portal of Interactive Public Services (SPIS), through which a wide range of services for the population is provided. In the first half of this year, over 2.3 million services were provided through the SPSI, which saved citizens' funds in the amount of more than 18 billion soums . To date, about 300 types of public services are provided through the SPIGU. In order to create even greater convenience for citizens, a mobile version of the SPIGU has been launched, through which more than 50 types of electronic public services are provided today,

including about 20 types without prior registration. In the future, it is planned to increase their number to 100 species.

Among the important advantages of the Single Portal is a preferential 10% discount for users. Conveniences have been created for making electronic transactions in the SPIS system by linking a subscriber's bank card to the PaySys payment system .

Further development of the e-government system implies the improvement of existing e-service systems and the greatest possible involvement of the number of citizens in digital processes. In this regard, one of the significant e-government projects is the Unified Identification System for Citizens OneID(https://id.gov.uz/).

With its help, citizens get access to various electronic resources of the government, including through the issuance of ID-cards with the automatic creation of an owner account. To date, more than 80 information systems and resources of state bodies and organizations have been integrated in this system. The number of users of this system is 1.5 million people.

One of the priority tasks in the framework of the development of the e-government system is the creation of an effective mechanism for interaction between the authorities and the population with the widespread use of digital technologies.

A number of important projects have been implemented aimed at developing a public dialogue between citizens and the government: a virtual reception of the President of the Republic of Uzbekistan for appeals from citizens on any issues (pm.gov.uz), a virtual reception of the Prime Minister of the Republic of Uzbekistan for consideration of applications from entrepreneurs (“business.gov .uz”), the portal of collective appeals “ Mening fikrim " - "My opinion" (meningfikrim.uz), a system for assessing the impact of legislative acts - (regulation.gov.uz).

As the figures clearly demonstrate, the digitalization of the public sector has made it possible to increase the efficiency of government agencies . The following successes have been achieved:

- thanks to the introduction of the "Electronic work book" system, about 3.0 billion soums were saved ;
- more than 200.0 thousand people were provided with jobs through the National database of vacancies;
- through the system of the Unified Register of Social Protection, social assistance was issued to more than 1 million families;
- through the information system "Electronic passport" more than 2.0 million certificates were digitized;

Digital technologies are also being actively introduced into the private sector. Thus, thanks to the introduction of the "Digital Bank" system, the number of Internet banking users has grown to 20.0 million people. and the number of online cards has reached about 30 million units.

The mobile payment sector is developing dynamically, incl. the share of transactions through mobile applications of banks is also growing. So, in 2022, individuals conducted online conversion operations in the amount of more than 7.0 trillion. soums , online microloans of 3.5 trillion. soums and online deposits of about 10 trillion. soums .

The wide-ranging e-government reforms have been welcomed by the international community. So, in the rating of open data (Open Data Inventory - ODIN) this year, Uzbekistan with a score of 66 points rose to 40th place in the world, and retained 1st place in Central Asia [3].

One of the most important factors in the digital development of Uzbekistan is highly qualified IT personnel. In this regard, school education plays a special role.

The foundation of school ICT education was laid with the creation of the Specialized School for the Advanced Study of Information and Communication Technologies named after Muhammad al- Khwarizmi in 2017. The modern building of the school meets the latest technological requirements, and advanced teaching methods are used here with the involvement of qualified foreign and domestic specialists . Education at the school is conducted from the 5th grade, and upon admission, candidates undergo a rigorous competitive selection.

Since the interest of young people in ICT, especially among schoolchildren, is constantly growing, it was decided to expand the scale of school IT education. To this end, Decree of the President of the Republic of Uzbekistan dated October 6, 2020 No. PP-4851 “On measures to further improve the education system in the field of information technology, development and integration of scientific research with the IT industry” was adopted, in accordance with which in 2020 14 specialized basic schools were created with in-depth study of computer science and information technology. In 2021-2023 it is planned to open 205 such schools throughout the republic.

In turn, the school curriculum will be enriched with relevant ICT areas. Thus, the subject "Informatics" taught from the 5th grade will be enriched with disciplines from the "One Million Programmers" project. And starting from the 8th and 9th grades, students will learn programming and design, from the 10th grade - robotics.

Currently, the training of IT personnel is carried out by six academic lyceums at the Tashkent University of Information Technologies. Muhammad al-Khwarizmi.

In order to further improve the system of training personnel in the field of information and communication technologies, specialized IT technical schools will be created throughout the republic. To date, there are already three technical schools. It is planned to open 11 more technical schools.

Serious innovations are also taking place in the framework of higher education in the field of ICT. Currently, three domestic universities are training personnel for the ICT sector: the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, as well as branches of the Inha and Amiti universities in Tashkent. For many years, TUIT has been the leading university for the training of communication specialists in the region. Currently, over 15 thousand students study at TUIT and its regional branches. Today, qualitative changes are taking place in the university [10]. So, in the 2020-2021 academic year. TUIT opened a new undergraduate area - "Digital Economy", as well as 8 new areas of the master's program. In May this year . the sixth branch of TUIT was opened in Nurafshan. Work is underway to organize the Digital University together with the leading international educational organizations Coursera, EPAM and Open university Malaysia.

One of the significant events in the framework of the development of interuniversity cooperation was the opening in 2019 of the Joint Faculty of Information Technology of TUIT and the Belarusian State University of Informatics and Radioelectronics. Students of the joint faculty study under the "2 + 2" program - the first two years of study are held at TUIT and its regional branches, and the next two at BSUIR. After training, graduates receive two diplomas at once, and the best of them - the possibility of employment in the Republic of Belarus.

Since October 2014, a branch of one of the leading universities of the Republic of Korea, Inha University, has been operating in Tashkent . The university regularly tops the lists of the most prestigious educational institutions in the country. And since September 2019, the list of IT universities has been replenished with one more - a branch of Amity University, one of the largest universities in India, has opened in Tashkent, which has representative offices around the world.

Thanks to the efforts of the Government, the domestic IT market is growing at a dynamic pace. Accordingly, the demand for qualified IT specialists is growing. Taking this into account, comprehensive measures are being taken aimed at broad training of IT specialists throughout the republic. One of the most significant projects in this direction is the One Million Programmers megaproject (One Million Uzbek Coders), implemented by the Ministry of ICT in cooperation with the Dubai Future Foundation " (UAE). The main goal of the megaproject is a wide distance education of the population and youth in relevant IT specialties. Currently, over 700 thousand participants have registered on the project website (uzbekcoders.uz). Of these, more than 300,000 have already successfully completed courses and received certificates.

In addition to the fact that the participants of the megaproject can learn relevant and in-demand professions for free, the best of them can also get the opportunity to take a training course under the Udacity program Nanodegree and get a Nanodegree diploma (nanodegree). This diploma is recognized when applying for a job in large international IT companies (Google, AT&T, Autodesk, Cloudera, Salesforce and others). To date, 250 of the best participants have received the opportunity to study under this program.

The results of the first year of the megaproject were recognized as successful, and therefore it was decided to expand the age group of participants by localizing the courses of the world-famous Code.org platform for teaching programming to children aged 4 to 18.

Digital training centers also contribute to the training of IT specialists. These centers are being created in accordance with the third of five important initiatives put forward by the Head of the Republic - the organization of effective use of computer technologies and the Internet by the population and youth. In them, local youth learn the basics of web programming, computer design, mobile technologies, and robotics. At the same time, managers and employees of local executive authorities, state and economic management bodies improve their skills in the field of ICT. Today, there are already 148 such centers in the republic, where more than 40.2 thousand students have been trained. This year it is planned to increase the number of IT Centers to 205.

In order to support girls and women and create the necessary conditions for them to master relevant professions, special IT courses were organized - TechBika and ITWomen.Uz . Among

the important government initiatives, one can also note the resolution of the Cabinet of Ministers "On measures to support young professionals who hold international IT certificates." According to it, starting from June 1, 2021, a procedure for reimbursement of up to 50% of the costs of obtaining an international IT certificate will be introduced. One of the main qualitative indicators of the development of a particular area is the level of development of the industry market, and therefore creating maximum opportunities for IT entrepreneurs.

To this end, in July 2019, the Technological Park of Software Products and Information Technologies (IT Park) was created in Tashkent. During its creation, advanced foreign experience was studied, including by creating appropriate conditions for the IT business. IT Park provides its residents with legal, organizational and marketing assistance. In addition, they are exempt from all taxes and mandatory contributions to state trust funds until January 1, 2028, as well as from one-time social payments. They are also provided with modern office space, laboratories, a coworking area, a conference room.

Currently, over 500 enterprises are residents of IT Park , about 20 of which were created by foreign founders with foreign capital [4].

The creation of IT Park gave impetus to the development of the domestic IT market. So, if in 2019 the volume of services provided in the field of information technology in 2019 amounted to 529.1 billion soums, then by the end of 2020 this figure increased to 1 trillion soums. soums. For the first half of 2021, the volume of services provided in the field of information technology has already amounted to 650 billion soums. It is expected that by the end of this year this figure will reach 1.4 trillion. soums.

The volume of exports of IT products and services produced by IT Park residents is also consistently growing . So, if in 2019 the volume of their products amounted to 6.2 million dollars, then in 2020 it has already increased to 16.4 million dollars. According to the results of the first half of 2021, this figure has already amounted to 17 million dollars and , according to forecasts, by the end of this year it will be increased to 40 million dollars [9].

As the figures clearly demonstrate, the creation of IT Park is already producing a positive result in the development of IT entrepreneurship. With this in mind, it was decided to create branches of the technopark in the regions of the country. To date, IT Park branches have been opened in 8 large cities of the republic: Andijan (Digital city), Margilan, Gulistan, Jizzakh, Karshi, Samarkand, Bukhara, Navoi. In total, it is planned to open 14 IT Park branches in Uzbekistan (one in each region) to provide high-quality infrastructure and equal opportunities for IT specialists in the regions [9].

Among the key steps aimed at strengthening the position of the domestic IT business in the international market, one can note the opening of an IT Park representative office in the USA in August 2020. The creation of a representative office of the technopark abroad will allow representing the interests of domestic IT companies in the largest national market, will provide organizational and legal support, and act as a guarantor when concluding transactions [9].

In matters of digital development of the state, the most important role is given to artificial intelligence (AI) technologies, which allow scaling tasks and monitoring processes. AI technologies are increasingly being used in Uzbekistan today: a number of domestic enterprises are actively implementing M2M technologies (machine to machine) into

production and management processes. However, all these actions until recently were fragmented.

In February, the Presidential Decree “On measures to create conditions for the accelerated implementation of artificial intelligence technologies” (No. PP-4996, February 17, 2021) was adopted. This document laid the foundation for the further development of the AI industry and identified the main directions.

Conclusion

A comprehensive program of measures for the study and implementation of artificial intelligence technologies in 2021-2022 has been developed. In accordance with it, a list of pilot projects for the introduction of artificial intelligence technologies was approved, which will be implemented in 2021-2022 in agriculture, banking and finance, transport, healthcare, pharmaceuticals, energy, taxation and e-government. Importantly, these projects are planned to be implemented with the direct participation of IT Park residents. [9]

Since AI technology is a very knowledge-intensive industry that requires highly qualified personnel and sufficient material and technical resources, the Research Institute for the Development of Digital Technologies and Artificial Intelligence under the Ministry for the Development of Information Technology and Communications was established. In order to train qualified personnel in the field of AI, a list of higher educational institutions and scientific organizations has also been approved, where future specialists in this area will be trained. When digitalizing Uzbekistan, as in other countries, it is necessary to pay close attention to the main features of the digital economy, such as:

-creation of cyber-physical systems in which a person and a machine represent a single, harmoniously working organism.

-use of intellectual platforms in all spheres of social and economic activity.

-introduction of the Internet of people, the Internet of things, the Internet of services (along with the already well-mastered Internet of ideas).

- application of Big technologies Data (processing "big data").

- the use of modern information technologies, such as blockchain , providing transparency of transmission, reliability of data storage; Nadzh technologies that contribute to the promotion of products (goods and services) on the market.

In conclusion, we can say that the comprehensive digital reforms being carried out today in Uzbekistan are aimed at achieving the main goal - to become one of the leading states with a prosperous economy and a strong civil society.

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