

# Some Aspects of Digital Tendencies in the Construction Economy

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**Abstract**— Digital transformation is currently affecting all countries of the world. The scope of the digitalization process is not only a specific industry, but also the formation of a new model for the development of the state, business and society. Within the framework of the experience of advanced countries, the issues of implementing the possibilities of integrating digital technologies to improve the processes of construction, expertise and management of real estate objects are widely covered.

**Keywords**— Digital economy, digital transformation, "IT park", Internet, platform, intelligent software equipment, digital modeling, information technology, e-commerce.

## I. INTRODUCTION

Today, digitalization in all sectors of the economy is the key to the development of society and the transition to a new, high-tech level.

The development of mankind today is in many ways directly related to the pace of development of information technology.

The digital economy is a system of economic, social and cultural communication using digital technologies, for example, online services, distance learning, electronic payments, online sales of goods and services.

At the end of the twentieth century, with the penetration of the Internet into various spheres of society, terms such as "e-government", "e-commerce", "digital economy" appeared.

The term "digital economy" was first coined in 1995 by Nicholas Negroponte, an American computer scientist at the University of Massachusetts, in a lecture to his colleagues on the superiority of an economy based on modern information and communication technologies over the old economy.

The digital economy, which has many advantages over the traditional economy, has become popular in a short period of time, first in developed countries and then around the world.

Today, the leaders among the "digital" countries are Norway, Sweden and Switzerland. The top 10 countries in this regard are the United States, Great Britain, Denmark, Finland, Singapore and South Korea.

The Decree of the President of the Republic of Uzbekistan dated February 19, 2018 "On measures to further develop the field of information technology and communications" and the Decree of July 3, 2018 "On measures to develop the digital economy in the Republic of Uzbekistan" can be included in these measures. As a result of these measures, electronic document management has been introduced, electronic payments are being developed and the regulatory framework in the field of e-commerce is being improved.

Undoubtedly, the digitization of the economic sector will create opportunities to reduce costs associated with the production of goods and services, improve product quality, dramatically increase volume and competitiveness, and save time.

In recent years, digital technologies have been used in Uzbekistan in the banking system, retail, transport, energy, education, health and other areas.

The next Address of the President to the Parliament also sets a number of goals to digitize many aspects of our lives. Including full digitization of construction, energy, agriculture and water management, transport, geology, cadastre, health, education, archives. It is planned to comprehensively address all organizational and institutional issues of the e-government system, establish IT-parks in Nukus, Bukhara, Namangan, Samarkand, Gulistan and Urgench, and continue the One Million Programmer project with foreign partners. It is also instructed to provide all villages and mahallas with high-speed Internet in the next two years, to connect 12,000 institutions to high-speed Internet, to complete the development of the program "Digital Uzbekistan - 2030" within two months.

These initiatives of our President are a guarantee that today Uzbekistan is entering a new stage of development, that in the near future the quality of relations between the state and citizens will radically improve, and cooperation between different social and economic systems will develop.

**Objective:** To analyze the possibilities of integrating digital technologies to improve the processes of construction, examination and management of real estate in the framework of external and internal experience.

## II. MATERIALS AND METHODS

Research materials and methods. The digital transformation is affecting all countries of the world today. Serious work is being done in our country to prevent it from affecting leadership and risk perception. The scope of the digitalization process is to shape a new model for the development of the state, business and society, rather than a specific network.

Innovation will change the world in a few years, signaling the transition to the next stage of economic dynamics. The Internet, modern gadgets, and artificial intelligence can divide life into "before" and "after". "The rapid spread of innovation reduces the cost of goods and services to the consumer, as well as production costs. As a result, it reduces the value

added to the growth rate of consumption, which slows down the dynamics of GDP growth.

The results of the analysis show that modern production projects are being actively implemented in China and the United States, which requires Europeans to accelerate it. Uzbekistan pays great attention to the importance of using the experience of developed countries in its efforts to increase competitiveness and implement joint initiatives.

Today, the most developed countries in the digital economy are the United States and China, and the blockchain worldwide holds 75 patents for technology.

Blockchain technology is a technology that allows the parties to execute transactions safely, reliably, without any intermediaries. Although many know it as a cryptocurrency technology, in fact the blockchain can be used as a digital identification, protection of property and property rights, a payment system. Open blockchain platforms such as Ethereum allow you to make transactions on any assets, provide banking services without traditional legal processes. Currently, the blockchain system is used in various countries around the world in the fields of financial technology, land management, construction, transport, health, education. The blockchain system increases the level of transparency of any industry, serves to reduce the incidence of corruption.

Also, today, there are positive achievements of advanced skills in the implementation of the program "Industry 4.0". For example, the United States has created an industrial Internet consortium. The People's Republic of China, meanwhile, has set up the China Manufacturing 2025 industrial idea, with the goal of raising it to "industry 3.0" and by 2025 to achieve the fourth industrial order.

In Germany, according to the principle of "Industry 4.0" in 2021-2022, companies can increase the activity of labor resources in the country by an average of 18%.

The development of the digital economy is of a wavy nature and has a significant impact on engineering processes and production management technologies. For example, the project is expected to increase production efficiency by an average of about 30% and increase Russian exports of machinery and equipment from 8% to 13%. Digitization in all sectors of the economy opens up opportunities for small and medium-sized businesses, innovative startups, including construction.

### III. DISCUSSION

The role of business and science is institutionalized, which is reflected in the program management structure. Autonomous NGO "Digital economy" should define its needs in these areas, there should be interdependence in these areas. For this organization, it will be a platform for effective collaboration between business, the expert community and the government.

In addition, stakeholders - representatives of government, business and the scientific community - participate in the work of competence centers and working groups.

We now understand that the main focus in global selection is on human capital and there will be strong competition for talent. We strive to create the most attractive conditions for

attracting talented scientists and specialists from developed and developing countries. Our goal is to be competitive in this area.

Today, fifth generation (5G) mobile technology is being implemented in developed countries. In addition to the quality of communication and high data transfer rates, energy efficiency is not harmful to human health, this technology gives users new opportunities. For example, Internet products expand access to broadband media services, allowing communication even in areas of natural disasters.

The developed program should include initiatives that meet the requirements of our digital education system. Such practices should be developed at all levels — from school to vocational retraining. Professionals need to develop all-round skills in three areas for successful development and self-realization in the digital world: these are soft skills, skilled skills, and digital skills.

The technology is being actively and successfully implemented in world practice. In the future, it is expected to be improved at every stage from the construction exhibition to the sales office to use the universal program. This opens up a wide range of prospects for small businesses in the development of specialized software.

This also helps to automate it for effective management in construction. It provides for the purchase and cost of materials, the use of modern construction equipment, as well as control over the reduction of working hours. At the same time, one of the innovations is the introduction of control over the movements, health and workload of workers through the bracelets of special construction workers. This allows for more effective control and normalization of the software construction process.

As in all areas, the construction system is being gradually reformed. The process of building housing for citizens, from obtaining a plot of land for doing business, to the registration of cadastral documents, to the state registration is being streamlined. For example, the introduction of smart cards instead of cadastral books is a sign that the system is digitizing.

Information technology and specialized software are increasingly used in modern construction. These include CAD and GIS systems, project document management systems, and predictive software. Budget systems provide a project estimate for the project in terms of work, cost, and overall resource requirements (for the project we refer to as an investment object), but do not provide such important information for successful project work schedule, resource requirements table, and calendar cost profile.

There is a high need for special software for calendar planning in construction complex organizations. Finding the best way to implement a project on time and use resources as efficiently as possible are key success factors, and as competition grows day by day, they are the key to an organization's survival.

Among the requirements of such software packages and construction companies, the following points almost always appear:

Develop job production schedules using different levels of

hierarchies;

Creating a schedule of resource requirements, a schedule of spending money on the project as a whole and for a particular type of work, resource-planning resource provision;

Ability to plan a wide range of resources: executors and mechanisms (renewable resources) and materials (spent resources);

Play different scheduling options - under strict time constraints and with limited resources. A variety of these methods will help you find the most successful compromise: "faster-cheaper";

Optimizing the economic features of the project in the implementation of the project at different times, finding the option to implement the most "economic" project by attracting other resources;

Analysis of cost distribution for object elements for different types of construction works according to the composition of cost items;

Ability to import and export data to corporate information systems integration (CIS), construction estimates, warehousing, billing software.

To solve such problems, a special class of software - a project implementation planning and monitoring system, or in other words, a project management system (CMS) - is used later.

Thus, these systems support the basic processes of time and resource planning and management based on network planning algorithms, critical path method (some even resource-critical), mastered volume method, and so on.

Today, an increasing number of construction companies in Russia are starting to use calendar planning systems to increase their work efficiency.

The use of project management systems in the construction industry at different stages of the investment process can be divided into the following stages.

This project is the initial investment phase. However, it is characterized by a lack of clear and detailed information about the project. This may include a general project concept, the estimated time for its implementation, the feasibility study, the initial cost estimate and other aggregate indicators should be clear. Therefore, the functions that can be used from this are also common in nature:

- Comprehensive assessment of time and cost parameters of the project;
- assessment of its feasibility and efficiency;
- development of an indicative concept for the construction of an investment object;

In this case, it is a handy tool that allows you to focus on the project. For large-scale calculations, the value and time parameters of similar investment objects are often used, so the potential for information use from existing projects is very attractive. However, project management systems can be integrated with other software, such as cost estimates.

At this stage, the project management system can be used by the investment developer, management company, technical customer and others.

The second is the tender stage. At this stage, the use of project management systems allows contractors to solve the

following tasks:

- development of an extended pilot schedule for product development;
- development of the initial financing schedule;
- Development of protocols of human and material resource requirements for inclusion in the set of tender documents.

The combination of flexible planning systems and detailed project data allows for the submission of an optimal tender proposal. In addition, the contractor may take into account the workload of the material and technical base of the company on other projects at this stage. In other words, in this context, the project management system becomes one of the tools for creating an order portfolio.

If a client (management company, etc.) also uses it, he will be able to quickly and accurately assess the reality of the submitted work schedule after receiving the project schedule in electronic form.

Project implementation phase. The most complete capabilities of project management systems will be revealed during the project implementation phase. This is not surprising, because it is designed for them - project management.

The project implementation phase is divided into two stages:

Construction management project development phase;

The stage of approval and monitoring of its implementation.

Approach to planning;

Detail level selection;

Selection of management model;

This stage is usually divided into two interrelated processes:

Project development process (planning) by the Construction Department;

Project implementation control and management process.

We will consider the tasks related to the project development process of the Construction Department:

Determining the scope of project work (based on analogues, estimates, etc.);

Development of code structures (WBS, ID, topological schemes), types, etc.;

Develop a structure for cost items, work calendars, and resource calendars;

Develop schedules, process sequences, and identify external factors. Influence on the sequence and duration of work (e.g.: flood, cold);

Determining duration, resources, their performance and costs, and so on.

It is necessary to calculate and optimize the timing of the planned project, taking into account the available resource constraints. If not optimized, the manager can easily lose the various options for project implementation.

In general, the construction company must have the initial data to solve the identified tasks, ie design estimates and design documents, technological maps of construction and installation work, parts of ready standard tables, documents for similar projects, production projects, customer technical

and technological requirements, terms of instruction, terms of contracts, restrictions on available resources, etc.

Also, another programmed robotics technique is used to destroy buildings everywhere, including in hazardous conditions for humans. Software-machines, sensors and artificial intelligence systems are co-bots of construction robots. Co-bots are robots that work with humans. Due to the effectiveness of new technologies, the narrow field of robotics has all the potential to become a large-scale robotized construction equipment. The use of self-propelled wheelchairs, production optimization and drone tracking of construction progress are being introduced.

3D printing: Cost-effective solutions are found and selected for implementation on a production network scale. Through this program, brick and concrete buildings are already being published in other countries, and other technological solutions are also available.

The integration of smart software equipment allows for efficient energy consumption and timely detection of utility status. Such automation significantly reduces operating costs and capital repair costs.

Currently, various countries are planning to switch to digital modeling (BIM) technology to effectively manage facilities throughout their life cycle.

The widespread development of digital technologies has contributed to the operation of new information systems. Their task is to include in the state system of pricing in construction and to monitor construction resources for the components of the state. Today, many countries use a new classifier of construction resources of about 69,000 items for materials, structures, machinery, equipment, etc. in the construction system.

The bright future of integrating information technology with the construction industry includes "smart" homes, cities, provinces and countries. This smart home includes a set of systems that allow efficient use of resources and increase the level of human comfort. Thanks to various sensors integrated by a single information platform, real-time monitoring of all systems allows data processing and analysis with minimal human involvement.

At present, it is unclear whether the regulations governing the use of information technology will be fully finalized due to the need to examine and test them in real conditions and coordinate with various research and development organizations.

Although digital data is a valuable economic resource, it will only benefit when it becomes digital thinking. With the advent of the digital economy, the challenges of creating digital platforms and analyzing rapidly growing digital data are emerging. In conclusion, it is necessary to develop the digital economy in all countries of the world, to accelerate the process of transition to the digital economy.

#### IV. CONCLUSION

The transition to a digital economy model of construction involves changing human life and culture, as well as the system of relations between society and the state and business. The new technological order offers many opportunities for Uzbekistan to become a world leader.

Today, there are no clear ways to assess the effectiveness of the digital economy that encompasses social impact. It should be based not only on quantitative indicators (GDP and labor productivity levels), but also on quality indicators that can make life more comfortable and of higher quality.

As a result of the "digital revolution" we are striving for, most of the socio-economic relations are carried out with the help of automated services. This, in turn, will significantly reduce human participation in the service of the population, significantly reduce bureaucracy, red tape and corruption, which for many years has slowed down the development of our country and negatively affected the quality and well-being of the population.

Although digital data is a valuable economic resource, it will only benefit when it becomes digital thinking. With the advent of the digital economy, the challenges of creating digital platforms and monetizing the rapidly growing digital data are emerging. At the same time, it is important to identify ways to create value, the means of overcoming obstacles in these processes. It provides an understanding of the potential for value creation and distribution, forms of value renewal, management, and value acquisition. According to the results of the seminar, the need to develop the digital economy in all countries of the world, the need to accelerate the transition to a digital economy.

In general, the digitization program ensures the transparency of public administration and is the digitization of the economy as a means of joint regulation of the digitization process. And here business plays a very important role, helping to determine the prospects of the digital economy, formulating action plans and evaluating how they are implemented.

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