

Blockchain as a new stage in the development of the digital economy of Uzbekistan

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Abstract

This article attempts to consider the features of the digital economy development. At the present stage, the research aims to ensure effective solutions to these problems, further development of science in our country, and obtain deep knowledge and skills of students on applying digital economy technologies, platforms, and business models in Uzbekistan. This paper highlighted the importance of perfect organization of operations for the implementation of the digital economy in Uzbekistan and the development and creation of major financial projects at the national level, and the use of blockchain technology in national networks, economics in the development and creation of major financial projects at the state level. Degree. The final aim is to analyze blockchain as a new stage in developing the digital economy in Uzbekistan.

1 Introduction

The relevance of the research is that today, in Uzbekistan's conditions, the study of laws, trends, and opportunities for the development of the digital economy, particularly the degree of penetration of modern information technologies in various sectors of the economy, becomes particularly relevant. The prosperity and prospects of Uzbekistan and the success of large-scale reforms carried out in our country depend directly on the introduction of innovations into the national economy. Therefore, the improvement of the digital economy and scientific research of its social, economic, political and legal foundations play an essential role. The issue of developing the digital sector of the national economy in Uzbekistan is being raised to the state level, and large-scale measures are being implemented in this direction. Electronic document management systems are being introduced, electronic payments are being developed, and the legal framework created in electronic commerce is being improved. Simultaneously, the digital economy, which operates on information technology platforms, is rapidly developing. This requires the need to create new models of such platforms. There no single information platform integrated with state databases to ensure transparency of the public procurement process; enterprises, state-owned enterprises, and organizations are today at the centre of the implementation of blockchain technology saving. Implementation of blockchain technology in all sectors of the national economy increases the effectiveness of the feasibility, justification of analysis and evaluation

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and the profitability of all financial investment projects, their cost and other signs of abuse

The purpose of the article is to study blockchain as a new stage in the development of the digital economy of Uzbekistan.

2 Materials and Methods

The research materials are the works of modern domestic and foreign scientists dedicated to studying blockchain technology in business and technical and statistical reporting materials of Uzbekistan. Research methods: economic-statistical, analytical methods, methods of comparative analysis.

3 Results

The development of the digitalization of the economy of Uzbekistan is closely related to the leading indicators. (Table 1) (Abdurashidov, 2019)

Table 1

Key indicators of the economy of Uzbekistan 2018-2020

Indicator	Value	Period
GDP volume	57.92 USD billion	2019
Annual GDP growth rate	5.6 %	2019
GDP per capita	2.459 USD	2019
The inflation rate for the year	14.4 %	2020
Interest rate	15 %	2020
Unemployment rate	6.9 %	2018
Wages	1.822 UZS thousand / month 177.094 USD/ month	2018
Trade balance	-4.292 USD million -4.292 billion. USD	2019
Current balance	-2.769 USD million -2.769 billion USD	2019

Thus, high-tech industries, such as software development, research and development, as well as all knowledge-intensive industries that form the basis of a new technological structure of the regional economy, measured as the drivers of the growth of the economy of Uzbekistan, which determine its sectoral structure (Abdurashidov, 2019). If we consider the economy as a high-rise tower consisting of such floors as the agricultural, industrial precapitalist, industrial capitalist and service economy floor, the digital economy is a superstructure in it.

The digital economy of Uzbekistan in comparative indexes over the past few years presented in figure 1.

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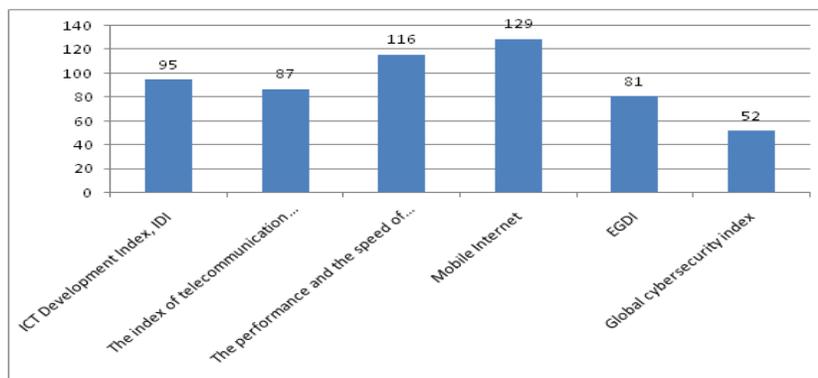


Fig. 1 Uzbekistan's digital economy in comparative indexes

Thus, according to the ICT development index (ICT Development Index, IDI), Uzbekistan in 2017 ranked 95th (index – 4.9) among 176 countries (for comparison: Belarus-32nd (7.55), Russia-45th (7.07), Kazakhstan – 52nd (6.79). In the first place considered Iceland (8.98), second by South Korea (8.85) (Kutbitdinov, 2019)

According to the telecommunications infrastructure Index, Uzbekistan was ahead of only Turkmenistan and Tajikistan among the CIS countries and is almost 2 times behind Russia, Belarus and Kazakhstan with an index of 0.3307, while South Korea showed the best indicators – 0.8496. In terms of Internet speed (data from the Speed test Global Index website for September 2019), Uzbekistan ranked 116th in the ranking of 176 countries in terms of broadband (landline) and 129th in terms of mobile Internet, behind Tajikistan (111th and 135th places), Kyrgyzstan (83rd and 101st), Kazakhstan (68th and 97th), Belarus (51st and 121st) and Russia (46th and 93rd). Singapore took first place in this indicator for landline Internet and mobile – by South Korea. Simultaneously, if in this rating, the speed of broadband Internet in Singapore indicated as 196.88 Mbit/s, in Uzbekistan – 19.91 Mbit/s, on mobile in South Korea – 95.11 Mbit/s, in Uzbekistan – 10.79 Mbit/s, that was 10 times slower than the leaders of the rating (Niyazmatov, 2019).

According to the E-Government Development Index (EGDI), which was one of the indicators in the UN E-government 2018 study, Uzbekistan ranked 81st in the ranking, ahead of Kyrgyzstan (91st), Tajikistan (131st) and Turkmenistan (147th), and behind Kazakhstan (39th), Belarus (38th) and Russia (32nd). (Savina,2018)

According to the international telecommunication Union's Global cybersecurity index, Uzbekistan ranked 52nd out of 175 countries in 2018, behind Kazakhstan (40th) and Russia (26th) and ahead of Belarus (69th) Tajikistan (107th), Kyrgyzstan (111th), and Turkmenistan (143rd). At the same time, it should be noted that as recently as 2017, Uzbekistan ranked 93rd in the ranking for this index.

In Uzbekistan, the digitalization of economic processes could be stimulated by the following actions:

- To act as an organizer of common technological platforms that unite various organizations, or as a regulator that prescribes requirements for the use of specific technological solutions, since, without synchronization of the implementation of

standard technological solutions in entire segments of the economy, their wide distribution is impossible;

- Constantly improve the existing regulatory framework governing the development of the digital economy, and do this in a dialogue mode and taking into account the opinions of users, developers and service providers, who in practice will face new types of objects and subjects of information legal relations that require legal registration;
- become a participant in the overall process of digitalization of relations, including developing the "E-government" system and the list of services provided in electronic format;
- Encourage and reassure the introduction of information systems and electronic services in organizations and introduce tax incentives for the development of digital technologies, as well as cross-border online trade;
- Train the necessary number of IT specialists and programmers, as well as qualified users who are able to use constantly updated digital technologies;
- Ensure security against cyber threats, as well as the confidence of all entities involved in the digital economy in one way or another that the data they collect, store and use is protected from possible criminal actions;
- Expand international cooperation and create attractive conditions for the influx and introduction of advanced information technologies in all areas of economic activity (Mogayar, 2016).

In recent years, the Republic of Uzbekistan had made significant progress in the introduction and use of information technologies in public administration and various sectors of the economy, including:

- Provision of public services in electronic form and through the extensive infrastructure of public service centres;
- Formation of a system of interdepartmental electronic interaction;
- Creation of basic state information systems and resources;
- Regulation of relations in the field of personal data;
- Widespread use of electronic means of payment;
- Use of information technologies in the real sector of the economy;
- Start of implementation of the "Smart city" and "Safe city" projects (Drescher, 2017).

More than 25.6 thousand km of fibre-optic communication lines had laid. More than 67 percent (22.5 million users) of the country's population had access to the global Internet information network (from now on – the Internet). In contrast, the number of mobile users of the third and fourth generations had exceeded more than 16 million subscribers.

In the Republic created several innovative elements of the digital ecosystem to increase the export of digital technologies, stimulate the development of business models related to digital technologies, increase investment in, set up, and operate the following centres.

Mirzo Ulugbek Innovation Center, a Technology Park of software products and information technologies, together with leading foreign partners, created the centre for the implementation of educational programs at Webster University (USA), Inha University (Korea)

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and Amity University (India) to train highly qualified specialists in the field of digital technologies (Katasonov, 2017).

Today, the Republic of Uzbekistan represented in many foreign and international indexes and studies that indirectly assess the country's readiness for digital transformation.

Thus, the results of the work done over the past years in the field of development and implementation of the e-government system had a positive impact on the positions of the Republic (Table 2)

Table 2

The analysis of the digital transformation of the Republic of Uzbekistan

Indicator	Rating
UN e-government development index 2020	81st place (0.6207 points) among 193 countries
E-participation index 2020	59th place (0.7584 points out of 1,000)
United Nations development programme (Human development index 2020)	105th place (0.710 points) among 198 countries
Information and communication technologies development index 2020	95th place among 176 countries
Telecommunications infrastructure development rating 2020	114th place among 193 countries

At the same time, South Korea and Denmark were the leaders in this rating with 1,000 points each; in the "Human development index of the United Nations Development Program 2020" -105 place (0.710 points) among 198 countries, rising by 2 positions compared to 2016 and entering the group of countries with a high human development index; in the "information and communication technology development Index 2017" (according to the International telecommunication Union) - 95th place among 176 countries; in the "telecommunications infrastructure development Rating 2020" -114th place among 193 countries (Drescher, 2018).

However, the measures taken in this direction are insufficient, as evidenced by the low indicators in some ratings and studies.

The main tasks for the development of the digital economy of Uzbekistan were:

- Implementation and development in the field of crypto assets turnover, including mining (activities for maintaining and creating new blocks with the ability to receive remuneration in the format of new units and Commission fees in various cryptocurrencies), smart contracts (an electronic contract, the execution of rights and obligations under which performed by accomplishment of digital transactions automatically), consulting, issuing, exchange and storage, distribution, management, crowdfunding (collective financing), as well as blockchain technologies for the diversification of various forms of investment and business activities;

- Training of qualified personnel in the development and use of blockchain technology, who had practical skills using modern ICTs;

- Comprehensive development of cooperation with international and foreign organizations in the field of crypto assets and blockchain technology, attracting highly qualified foreign specialists in the field of blockchain technology development for joint implementation of projects in the digital economy;

- Introduction of the procedure for licensing activities in the field of crypto assets from October 1, 2018, including the creation of crypto exchanges for trading crypto assets (Kurpayanidi, 2018).

Also, the above-mentioned decree of the NAPU under the President of the Republic of Uzbekistan instructed the Ministry for the development of information technologies and communications to develop and implement a program for the development of blockchain technology, which provided the possibility of implementing crypto assets on local and international crypto exchanges and the introduction of blockchain technology from January 1, 2021 (Kozak, 2017).

As the analysis showed, several countries reacted positively to the introduction, and to maintain the blockchain system, so-called miners are required. Miners checked new blocks, connected them in a chain (chains) and created whole mining farms for this purpose. As a result, the blockchain system rewarded the miner with cryptocurrency. In other words, this process called mining or cryptocurrency mining. Today, the most popular cryptocurrency in the world is bitcoin. Figure 3 showed the profitability of mining one bitcoin by country (in US dollars) (Fig. 3) (Niyazmatov, 2019).

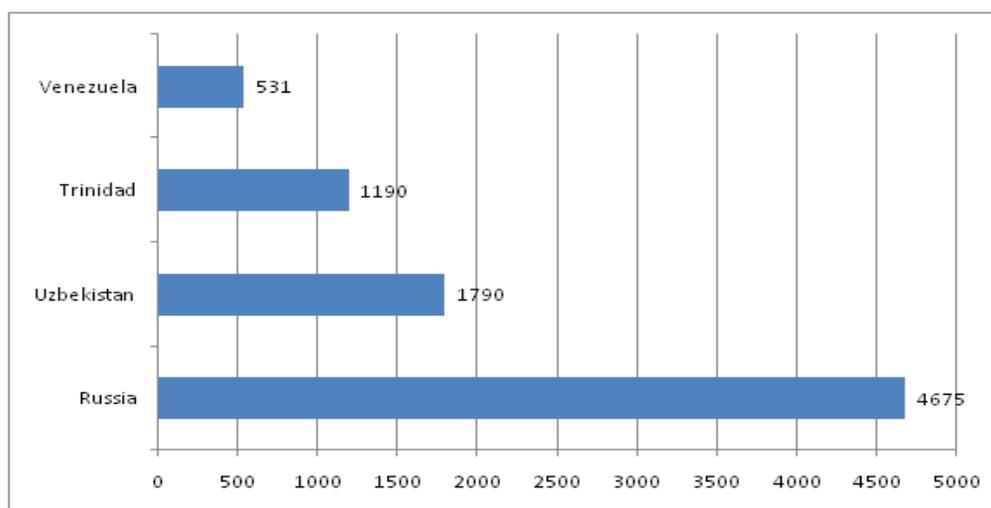


Fig. 3. Profitability of mining one bitcoin by country (in US dollars)

Thus, at the present stage, much attention in Uzbekistan paid to the use of blockchain in digitalization to improve the activities of public authorities. Digital economy development was directly related to the level of development of information and communication technologies (ICT), which used to evaluate the following indicators: the digital economy share of GDP; the size of investment in the ICT industry; the Internet speed, the degree of coverage of the territory

of the country and accessibility for public use; the development of electronic commerce; provision of organizations with specialists in the field of ICT. We can safely say that blockchain is a new stage in developing the digital economy of Uzbekistan. (Niyazmatov, 2019)

4 Discussion

A critical factor in the success of digitalization processes in Uzbekistan and the development of digital infrastructure was the availability of a sufficient number of highly qualified personnel and a flexible training system with specific competencies for developing and implementing digital technologies.

Digitalization in a significant way changes the labour market. Along with the spread of information technology in all areas of life, digital skills were becoming critical requirements for employers. This would lead to a large-scale transformation of requirements for specialists since many processes that were not affected by previous stages of digital technology implementation could be automated.

Even now, the development of technologies, the digital transformation of the state and business, and the growth of competition for jobs lead employees to change their professional sphere several times throughout their lives, acquiring new competencies and skills. To remain in demand in the labour market, a person must acquire new knowledge faster than previously.

A concept of a profession transformed since the set of competencies that an employee who had received training in a particular profession or speciality should have ceased to be fixed and changes with the development of new technologies and their application in various industries (Niyazmatov, 2019).

It is necessary to review approaches to training and transformation of educational models. The key challenges facing education today include creating educational content that meets the requirements of a dynamically changing labour market and human needs and reducing costs through the use of technology. The most urgent tasks facing the education system were continuous or lifelong learning, distance learning, mentoring, mixed learning (learning using all possible communication channels), project-oriented learning, "self-learning" organizations, and others.

It should be noted that the state was not currently the only provider of digital skills training. Employers and companies at both the national and regional levels played a role in developing digital skills and are equally interested in radically changing the current education and professional development situation.

An important aspect of the development of digital skills of the population was to reduce the "digital divide" in regional, age and gender terms. In this regard, the state needed to introduce methods for evaluating digital competencies among different segments of the population and identify sectors where digital skills could be more actively promoted to ensure equal access to digital dividends among the population (Abdurashidov, 2019).

New technologies, data and analytics, artificial intelligence, and the introduction of foresight technology would provide the state apparatus with significant opportunities to achieve better results in the development of public policies, interaction with the public, and the ability to perform powers more effectively and efficiently. Support and interaction between the state and

the private sector would reduce transaction costs for entrepreneurs and increase the transparency of decisions made by state bodies and organizations (Kurpayanidi, 2018).

International experience showed that digital technologies mainly developed by the scientific community and the private sector. In this regard, the state needed to create a favourable environment for them, stimulating innovative projects and IT companies in various ways.

By supporting the innovation ecosystem, the state should remain an innovator in this area, that was, provide access to modern methods of education, introduce new regulatory standards for innovative services, assist in the formation and development of new markets, and mitigate the negative consequences of the technological process (Tapscott, 2017).

Besides, it was necessary to ensure the formation and maintenance of a stable demand for innovations to prevent the leakage of highly qualified personnel and transfer the activities of innovative companies to other countries.

Typical measures were forming modern research and production laboratories, providing state grants, and close interaction between the state and leading technology companies on innovative developments.

The priority tasks of creating an ecosystem of digital innovations in Uzbekistan were:

a) encourage innovative companies and start-up projects by creating venture funds, business incubators and digital factories, as well as launching technology competitions;

b) creating demand for innovative solutions by creating a portfolio of orders for innovative technological and digital solutions aimed at solving problems and topical issues in various sectors of the economy and social sphere;

c) creating "digital regulatory sandboxes" and intensifying cooperation between the public and private sectors, in order to provide opportunities for high-tech companies to experiment in a clearly defined space and time frame, without fear of violating current legislation, with guarantees to reduce the consequences of unsuccessful experiments and maintain the stability of technological systems;

d) stimulate demand for locally available solutions, as well as the digital transformation of traditional industries, by encouraging solid links between the traditional industrial sector and the developing digital sector through measures to engage the industrial sector with developing its companies in the country;

e) providing comprehensive support for the creation of new markets, most of which will be networked and focused on people as the end-user;

e) assist IT entrepreneurs in exporting products and services by reducing bureaucratic and other barriers, helping them find new markets and foreign partners, and promoting local products and services at various international events;

g) localization of foreign innovations on mutually beneficial terms, including the formation of joint competence centres, joint research, with access to new markets (Tapscott, 2017).

International best practices demonstrated the need to develop digital innovation in the economy by strengthening the innovation ecosystem, developed a balanced incentive and competition policy, provided funding and created new competencies in the digital world,

provided that national security, privacy and consumer protection adequately ensured, which would require the introduction of new technologies for protecting personal data and commercial information. In our opinion, the digital economy would ensure gross domestic product growth by at least 30 percent and dramatically reduce corruption.

This confirmed by analytical studies of reputable international organizations. The starting step in the formation, implementation and development of digitalization as a new innovative component of the economy was the adoption of the decree of the President of the Republic of Uzbekistan "On State program on the realization of Strategy of actions in five priority directions of development of the Republic of Uzbekistan in the years 2017-2021 the" primary focus of which is the formation of an innovative model of development of Uzbekistan's economy (Kutbitdinov, 2019)

Then the decree of the President of the Republic of Uzbekistan Sh. M. Mirziyoyev dated July 3, 2018, no. PP-3832 "On measures for the development of the digital economy in the Republic of Uzbekistan". This document was a comprehensive strategy for developing information technologies in the country for the next decade.

As a result of the implementation of the use of blockchain in the development of digitalization in Uzbekistan by 2030, it expected:

- high-quality, secure, low-cost and intelligent access to high-speed broadband Internet and mobile communications;
- stable and competitive communications and telecommunications market;
- efficient distribution and use of computing power depending on the needs of the state, business and the population;
- reducing digital inequality between cities and rural areas;
- availability of favourable and rapid access to education throughout the life of a citizen;
- availability of a reserve of professional personnel in the field of digital technologies;
- building trust in the state authorities, safe and easy interaction with the state;
- the primacy of an electronic record over a traditional paper or electronic document;
- improving the investment climate and minimizing the negative impact on innovation;
- strengthening the fight against corruption;
- availability of necessary guarantees for the development of the company;
- fast and easy public administration while adapting the state and society to changes.

5 Conclusion

In conclusion, it should be noted that, in general, the blockchain industry in Uzbekistan has grown from a small and bold concept to a multibillion-dollar market. For example, the capitalization of bitcoin today is \$69 billion. This technology is already changing the economic environment and approaches to managing companies in Uzbekistan. Moreover, shortly, it had every chance to penetrate the everyday life of each of us.

The introduction of blockchain in various spheres of life could produce an "economic revolution". One of the strengths of blockchain is decentralization. All participants are interested in the system's operation, and each computer is a guarantee of General security.

Blockchain should be considered a global registry, a book in which all existing information and changes recorded. All transactions from the first to the last recorded in a database (ledger) did not belong to anyone but evenly "distributed" among participants.

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