

Volume 6, Issue 1, 2020

ISSN 2522-1043

Central Asian Journal of
Social Sciences
and **Humanities**



Al-Farabi Kazakh National University

Central Asian Journal of Social Sciences and Humanities is a peer-reviewed academic journal covering all branches of social and humanitarian areas: historical; philological; philosophical, social, psychological, educational and legal sciences.

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Proprietor of the Edition: Al-Farabi Kazakh National University

Editor-in-chief: K.I. Baizakova

Certificate № 15155-Ж Registered on March 12th, 2015 in the Ministry of Cultural and Information of the Republic of Kazakhstan.



Computer page makeup and cover designer: A. Kaliyeva

IB №13566

Signed to publishing 15.04.2020. Format 60x84 1/8. Offset paper. Digital printing. Volume printer's sheet. Edition: 300. Order No3475. Publishing house «Kazakh Universiteti»

www.read.kz Telephone: +7 (727) 3773330, fax: +7 (727) 3773344

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KazNU, 71 Al-Farabi, 050040, Almaty

Printed in the printing office of the Publishing house «Kazakh Universiteti».

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PROSPECTS FOR THE DEVELOPMENT OF THE DIGITAL ECONOMY IN KAZAKHSTAN

Annotation. In modern Kazakhstan, the role of advanced technologies and innovations in economic development is growing. The latest technologies allow increasing the efficiency of production and business processes. Traditional approaches and methods of work are changing as the latest technologies penetrate into new industries and spheres of human activity. In this regard, the purpose of this article is to consider the impact of digitalization on the development of the economy and determine the main directions of development of the digital economy. At the same time, modern methods of scientific knowledge, such as analysis and synthesis, are used; induction, abstraction. The article considers the growth of GDP in the conditions of digitalization, the volume of venture financing of digital projects in Kazakhstan in comparison with other countries, the economic and social advantages of digitalization of the economy, including the impact of the digital economy on the labor market. Assistance in attracting direct private investment through crowdfunding platforms is proposed as a tool for developing the digital economy. Positive effects of the digital economy are revealed. The main directions of development of the digital economy are outlined: competent it regulation, developed infrastructure, national centers of competence and digital platforms. Segments of the digital economy are highlighted: the first is software products where added value is created. The second is the level of competence where research and development takes place. This is where platforms are created that are used to create products. And the third segment includes infrastructure, qualified personnel, and the regulatory environment, which is devoted to the question of how to describe new entities that are emerging in this economy, and how to configure relationships between participants.

Key words: digital economy, cyber stability, cybersecurity, competent it regulation, developed infrastructure, digital platforms.

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Қазақстандағы цифрлық экономиканың даму болашағы

Аңдатпа. Қазіргі Қазақстан жағдайында экономиканы дамытудағы озық технологиялар мен инновациялардың рөлі өсіп келеді. Жаңа технологиялар өндірістік және бизнес-үдерістердің тиімділігін арттыруға мүмкіндік береді. Жұмыстың дәстүрлі тәсілдері мен әдістері жаңа технологиялардың адам өмірінің барлық жаңа салалары мен салаларына енуіне қарай өзгереді. Осыған байланысты осы баптың мақсаты – цифрландырудың экономиканың дамуына әсерін қарастыру және сандық экономиканы дамытудың негізгі бағыттарын айқындау. Сонымен қатар талдау, синтез сияқты ғылыми танымның заманауи әдістері қолданылды: индукция, абстракция. Мақалада цифрландыру жағдайындағы ЖІӨ өсімі, басқа елдермен салыстырғанда Қазақстанның цифрлық жобаларын венчурлік қаржыландыру көлемі, экономиканы цифрландырудың экономикалық және әлеуметтік артықшылықтары, оның ішінде цифрлық экономиканың еңбек нарығына әсері қарастырылған. Цифрлық экономиканы дамыту құралы ретінде краудфандингтік платформалар арқылы тікелей жеке инвестициялауды тартуға жәрдемдесу ұсынылды. Сандық экономиканың оң әсері анықталды. Цифрлық экономиканы дамытудың негізгі бағыттары белгіленді: сауатты ат-реттеу, дамыған инфрақұрылым, ұлттық құзыреттілік орталықтары және сандық платформалар. Цифрлық экономиканың сегменттері бөлінген: біріншісі – қосылған құн жасалатын бағдарламалық өнімдер. Екіншісі – зерттеулер мен әзірлемелер жүргізілетін құзыреттілік деңгейі. Мұнда өнімдер пайда болатын платформалар құрылады. Үшінші сегмент, осы экономикада туындайтын жаңа мәндерді қалай сипаттауға, қатысушылар арасындағы өзара қарым-қатынастарды конфигурациялау мәселесіне арналған инфрақұрылымды, білікті кадрларды және реттеуші ортаны қамтиды.

Түйін сөздер: сандық экономика, киберқауіпсіздік, сауатты ат-реттеу, дамыған инфрақұрылым, сандық платформалар.

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Перспективы развития цифровой экономики в казахстане

Аннотация. В условиях современного Казахстана растет роль передовых технологий и инноваций в развитии экономики. Новейшие технологии позволяют увеличивать эффективность производственных и бизнес-процессов. Традиционные подходы и методы работы меняются по мере проникновения новейших технологий во все новые отрасли и сферы жизнедеятельности человека. В связи с этим цель данной статьи – рассмотреть влияние цифровизации на развитие экономики и определить основные направления развития цифровой экономики. При этом использованы современные методы научного познания, такие как анализ, синтез; индукция, абстракция. В статье рассмотрены прирост ВВП в условиях цифровизации, объем венчурного финансирования цифровых проектов Казахстана в сравнении с другими странами, экономические и социальные преимущества цифровизации экономики, в т.ч. и влияние цифровой экономики на рынок труда. В качестве инструмента развития цифровой экономики предложено содействие привлечения прямого частного инвестирования через краудфандинговые платформы. Выявлены позитивные эффекты цифровой экономики. Обозначены основные направления развития цифровой экономики: грамотное ИТ-регулирование, развитая инфраструктура, национальные центры компетенции и цифровые платформы. Выделены сегменты цифровой экономики: первый – программные продукты, где создается добавленная стоимость. Второй – уровень компетенций, где происходят исследования и разработки. Здесь создаются платформы, на базе которых возникают продукты. И третий сегмент включает в себя инфраструктуру, квалифицированных кадров и регуляторную среду, посвященную вопросу, как описать новые сущности, возникающие в этой экономике, как конфигурировать взаимоотношения между участниками.

Ключевые слова: цифровая экономика, киберустойчивость, кибербезопасность, грамотное ИТ-регулирование, развитая инфраструктура, цифровые платформы.

Introduction. In the modern world of telecommunications and information technology in society become an integral part of every human being. The rapid development of computer technology and it gave rise to the formation of a society that seeks to improve and interact business, science and technology.

Production of electronics, development and sale of software and information systems, mass distribution of personal computers, as well as the development of economic relations in a competitive environment-all this served to form a new concept of modernity-the digital economy.

The digital economy is not a separate industry, in fact it is a way of life, a new basis for the development of the public administration system, the economy, business, the social sphere, and the entire society.

The concept of “digital economy” arose in the 90 – ies of the twentieth century. Its ideology was best described in 1995 by the American computer scientist Nicholas Negroponte (Megroponte N, 1995). – The formation of the digital economy is a matter of national security and independence, competition of domestic companies.

Global trends, such as the emergence of breakthrough technologies, digitalization and acceleration of the product life cycle, lead to

radical changes in most industries. Value chains are changing, profitability zones are shifting-and this radically changes the balance of forces in industries, significantly accelerating the introduction of new ideas and developments. The frequency of new opportunities and threats, as well as the speed of their penetration into markets, continues to increase. Every year new technologies get into our lives faster, and companies have less time to implement them (Ашинова М.К, 2018).

Today, the popularity of the digital economy as a fundamentally new model for the development of the economic system is increasing. With the increase in the world’s population and the consumption of various resources, the e-economy can affect every aspect of human life: health, industry, education, social policy, agriculture, and culture. Now it is possible to make an appointment with a doctor via the Internet, with the help of distance education, you can improve your knowledge without leaving home, make documents online and receive financial services.

In scientific sources, the interpretation of the term “digital economy” is diverse and varies. “The digital economy is a form of economic activity that is based on a global electronic environment with the predominance of knowledge and information as the

most important elements of the productive forces and the accelerated dynamics between supply and demand.

In General, the digital economy is a segment of economic relations mediated by technological advances, a global network, and information systems. But digitalization, like any process, is impossible without the use of such components as technologies and tools. They become intermediaries between the state and the people, banks and enterprises, reducing the chain of contractors and increasing the speed of decision-making.

A tool, in this case, refers to a tool used to influence, create, or transform an object (object), as well as to achieve specialized tasks. Digital economy tools such as the Internet of things, big data, artificial intelligence, machine learning, cyber-physical systems, monitoring systems, blockchain, neural networks, robotics, 3D modeling, virtual reality, cloud computing, and many others contribute to the digitalization and integration of all data flows to create an information society.

Literature review. Consider the fundamental tools of digitalization:

1. Big data.

The term “big data” appeared in 2008 while big data existed earlier. But, with the increase in the global flow of information, it became necessary to designate such a huge array of data. Today, in the world, the concept of big data means an object for analysis, or more precisely, large volumes of heterogeneous and fast-moving digital information that can not be studied by traditional methods. In the Russian-speaking community, in addition to the above, big data is also understood as technologies for processing this data, as well as tools and methods for their further use in solving specific goals and tasks. At the same time, data sources are Internet sites (from social networks, blogs and mass media to ordinary sites), archival documentation (for example, in the public sector), sensor readings, PC reports, and others. In the future, the volume of the global big data market will grow according to the forecast of the Wikibon Agency.

Big data technologies help specialists notice certain and unexpected patterns that are inaccessible to humans. An example of the application of this technology is the experience of the world-famous electric car manufacturer Tesla, where Analytics is used to collect information from the consumer. A large amount of information is created by the car itself, and processing this information helps employees identify patterns of driving behavior, driver behavior, and other data.

In 2015, Beeline launched a project that assesses the creditworthiness of subscribers. About 20 banks were interested in the experiment. Now banks can purchase information about the points assigned by the operator for payment for cellular communication, the services provided by the mobile operator and geolocation data. Banks, in turn, can assess the solvency of potential customers.

2. Internet of things.

Back in 1926, Nikola Tesla predicted the possibility of creating a “big brain” by means of radio, when all things without exception will become inseparable, and the devices that made it possible to do this will be so simple that a person can easily carry them in his pocket. In 2008-2009, the number of devices connected to the world wide web exceeded the number of people using the Internet. Thus, the concept of the Internet of things emerged.

The Internet of things refers to a network consisting of physical objects (things) that can communicate with each other or with the external environment without human involvement. What is important here is the autonomy of devices that can transmit data independently (АШИМОВА М.К., 2015).

The ideology of the Internet of things is aimed at increasing the productivity of the economy by automating processes in diverse areas of activity and eliminating human participation from them. According to Huawei’s forecast, the Internet of things in 55% of cases will be focused on business, development and improvement of smart cities and production, the remaining 45% – on human needs-household appliances, driverless cars, medical devices. The Internet of things technology has significant advantages over other technologies: it is widespread in the consumer market, in the sphere of production and Commerce. Also, there is a ready-made infrastructure for the spread of the Internet of things, and the introduction of various sensors and sensors in the future will be inexpensive.

It is planned that in the future, the components of the Internet of things will be able to perform the function of participants in Commerce, where they will coexist and communicate with each other, transmitting information to each other about the world around them.

For example, a smart thermoregulation mechanism will send power consumption data to the smart grid. As soon as a certain amount of electricity is used, the other mechanism will pay for this energy, based on the bill specified to it.

In Copenhagen, the government plans to reduce carbon dioxide emissions to zero by 2025. To do this, install street lights based on the concept of the

Internet of things. They change the brightness of the lighting, focusing on external conditions. Installed sensors detect the presence of pedestrians and cars, air clogging, climate.

3. Blockchain.

Initially, the blockchain technology was first used in 2009. It served as the basis for secure anonymous transactions with cryptocurrency. Cryptocurrency can be described as a virtual, electronic coin, which is encrypted information that can not be copied. Blockchain is used in almost any cryptocurrency and guarantees its operation. More than hundreds of cryptocurrencies have already been created and this number continues to grow. But the possibility of using blockchain technology is not limited to cryptocurrencies.

Blockchain is a tool for storing information or a digital inventory of transactions, transfers, agreements, and contracts. Any data that needs to be documented and verified. You can store all sorts of information in this database, from your medical history to your Bank account status or the history of important contracts (Гао М, 2017).

A significant difference between the blockchain and its indisputable advantage is that all participants in the chain have separate access to it, without a hierarchical distribution of powers, which eliminates the possibility of data falsification, without the knowledge of other participants in the system. This registry can store a regularly updated list of entries in chronological order. Such lists with information are called blocks.

At the same time, the blocks are interconnected with each other and all information is subject to irreversible encryption. This explains the negligible possibility of a hacker attack.

The main functions of the blockchain include: its transparency – all actions are recorded, security – every step is subject to cryptography, and efficiency – fast and easy data exchange. Any personal data is classified. Only information about a particular operation is available to system participants.

When the technology becomes commonplace, the participation of banks, notaries, and government agencies will not be necessary. The blockchain will be able to perform the necessary roles: fixing agreements, verifying identity, and confirming transactions.

One of the main tasks of the blockchain is to reduce the load on staff engaged in monotonous work, which makes it possible to optimize the workforce. Banks have already announced their intention to create a blockchain-based document management platform and remotely resolve most customer issues.

4. Intelligent information technologies.

Intelligent information technologies are technologies that can process various data using artificial intelligence algorithms. With the help of IIT, it became possible to formulate and regulate situations that were usually considered subject only to human intelligence. These situations could not be considered as a formal system or calculus and subjected to automation.

It is generally believed that IIT originated from the joint application of decision support systems and artificial intelligence in practice. Their combination contributed to an increase in the effectiveness of decision-making. Now each case could be described and modeled.

The distinctive features of IIT include the ability to self-study and development, and the availability of a database with some examples of solved problems. They are also able to identify solutions based on incomplete data. And explain the mechanism for making this decision.

Intelligent information technology can be described as a process with a clear schedule of actions and operations performed on data. At the same time, the main task of the IIT is to obtain important information for the user, using the achievements of scientists and mankind in any applied field. In addition, IIT not only preserves the knowledge and experience of various specialists, but also generates the missing ones. Such technologies help to accelerate the analysis of various problems: from technical, economic to social or personal, and can serve as a universal technical tool. In the foreseeable future, the competitive advantage will belong to companies with a high level of digitalization (Малявкина Л.И, 2016).

Already, the world's leading players are vigorously introducing digital tools in various sectors of the economy, financing the construction of data centers and the introduction of storage systems for business operations and customers. Digital tools will allow you to combine industrial production with individuality, reduce the period from the development of an idea to the sale of finished products, and provide an opportunity to achieve effective customization to meet the requirements of the consumer. The customer will be able to influence the desired characteristics of products or services.

Material and Methods. In this connection, it is safe to say that the fourth industrial revolution is getting closer.

Today, digital technologies have improved cost-effectiveness, changed the operating model of companies, and identified new opportunities in

the market. Even in the most traditional industries, methods for analyzing large amounts of data are increasingly used to acquire new knowledge and make effective management decisions. The main reason for the slow growth of domestic innovative companies is the lack of investment. At the same time, the volume of state funding for research and development in Kazakhstan corresponds to the level of developed countries, amounting to 0.4 % of GDP.

In order to change the situation, it is important to create the basic infrastructure of the digital economy, including secure communication lines and data centers, with the participation of the state and private business, as well as to increase the output of specialists in the field of the digital economy and achieve universal digital literacy.

An important tool for the development of the digital economy is the promotion of attracting direct private investment through crowdfunding platforms, in particular, the creation of a regulatory framework for the operation of such platforms (Добрынин А.П., 2016).

In addition to positive effects, unfortunately, the digital economy entails negative consequences and risks. For example, the expansion of the range and individualization of digital services leads to a decrease in control in the field of digital services, and the opportunities for fraud increase. The risks of information leakage increase significantly, which requires increasing the level of protection and allocating additional investments in information security.

Many experts fear that the digital economy could lead to mass unemployment. Of course, there is a certain risk: automation leads to the release of labor resources, reducing the number of jobs that require average qualifications, and increasing the difference in pay levels. As a result, digital technologies can increase the gap in socio-economic inequality, thereby increasing competition for jobs, which can later lead to stagnation of wages. However, the introduction of innovative digital technologies has a positive impact on the labor market, as digital platforms create new jobs. In addition, they help to develop additional skills and improve skills, especially for people who previously did not have such opportunities due to social or geographical restrictions. New specialties and professions are emerging.

Results and Discussion. First, digital technologies contribute to social and financial inclusion of the population and increase the availability, quality and convenience of services in such important areas as medicine, education, municipal and public services, and culture.

Second, digital technologies make it possible to create comfortable and safe cities. In the context of digitalization, centralized systems for monitoring the state of urban infrastructure are emerging. Innovative digital technologies allow us to identify links where new infrastructure is needed and how to maintain it more cheaply and efficiently. The result is that with the same budget, the city authorities can provide citizens with more comfortable living conditions.

In addition, the use of digital technologies makes it possible to increase the availability and efficiency of public services (registration of legal entities, certification and accreditation, obtaining permits, declaring and paying taxes, customs support), thereby helping to improve the business and investment climate.

Digitalization contributes to the development of an entire ecosystem of business services (logistics services, mobile banking), increasing the transparency of business conditions (electronic platforms for tenders and purchases, feedback portals).

The main directions of development of the digital economy are the following: competent regulation, developed infrastructure, national centers of competence and digital platforms.

Let's highlight three segments of the digital economy. The first is software products where added value is created. The second is the level of competence where research and development takes place. This is where platforms are created that are used to create products. And the third segment includes infrastructure, qualified personnel, and the regulatory environment, which is devoted to the question of how to describe new entities that are emerging in this economy, and how to configure the relationships between participants. In the future, it is necessary to have a jurisdiction in a country that attracts investors from the point of view of technological innovations on the one hand, and protects the intellectual property, interests and rights of data owners on the other, and supports data turnover in the correct mode.

The regulatory environment in the context of digitalization should be ahead of the technical capabilities of economic participants in terms of innovation. In our opinion, it is necessary to provide for the mechanism of "sandboxes" in the legislation, or to introduce such rules in advance that allow you to immediately begin its implementation and engage in innovations at the moment when the technology appears. It should be noted that the current professions, taking into account the transformation of economic sectors in the conditions of digitalization,

require an additional set of competencies related to information technologies.

Within the framework of the “Digital economy of Kazakhstan” program, by 2024, the infrastructure sector in Kazakhstan provides for the elimination of digital inequality, and communication will appear in all hard-to-reach areas of the country. The situation with data centers will change significantly. Now the two largest Chinese data Centers surpass all the capacities of our Republic in terms of computing power. It is necessary to create a data Center development plan that is synchronized with the electrical infrastructure and the data link infrastructure. By 2024, the infrastructure should be a smart infrastructure. This is not just a set of individual elements, but a service platform that provides a set of digital semi-finished products on the basis of which you can create platforms. One of these services can be, for example, a service for electronic identification and authentication of individuals and legal entities.

Another component of the Foundation of the digital economy is cyber stability and cybersecurity. The number of threats and the complexity of the technologies used will increase every year, so it is advisable to implement solutions at the infrastructure level that protect the basic elements of this infrastructure from key threats.

At the middle level, we believe that one of the key tasks is to ensure closer interaction between research teams, large national companies, startups and financial institutions.

Conclusion. Thus, despite the fact that Kazakhstan is currently experiencing growth in the digital economy, Kazakhstan lags behind the leading countries. The main reason for the slow growth of domestic innovative companies is the lack of investment. Crowdfunding platforms can be singled out as an important tool for attracting investment. The introduction of innovative digital technologies has a positive impact on the labor market. In addition, digital technologies contribute to social and financial involvement of the population and increase the availability, quality and convenience of services in such important areas as medicine, education, municipal and public services, and culture. The use of digital technologies makes it possible to increase the availability and efficiency of public services, and helps to improve the business and investment climate. The main directions of development of the digital economy are the following: competent it regulation, developed infrastructure, national centers of competence and digital platforms.

The need to develop information and communication technologies, which are becoming a vital stimulus for the development of the world economy, is emphasized in the Charter of the global information society (adopted on Okinawa island on 22.07.2000), adopted by the United Kingdom, Germany, Italy, Canada, the United States, France, Japan, and Russia. According to the Charter, the development and sustainability of the global information society is based on the promotion of values such as democracy, freedom, and justice in people’s lives, which will be achieved by the freedom to exchange information network resources, encouraging scientific and cultural exchanges of knowledge, and increasing respect and tolerance for the civilizational characteristics of other peoples. Research on information and communication technologies in the context of human rights has led to the conclusion that a new fundamental human right – the right to access the Internet-will be recognized in the near future.

As the recommended principles and approaches identified in the Charter:

- ensuring fair competition in the markets of information technologies and telecommunications, considered as electronic products and services, which implies equality of rights and legitimate interests of users to access for inclusion in system telecommunications lines, based on non-discrimination and protectionism;

- protective measures of intellectual property protection for developed information technology processes, as well as promotion of various forms of e-Commerce and cross-border digital commodity exchange transactions, while expanding the principle of freedom and openness of trade networks, the principle of preserving global trade chains and their financing procedures under WTO law;

- stimulating taxation of international e-Commerce revenues based on the principles of proportionality of the tax burden, payment of taxes by the beneficiary, prevention of aggressive taxation, use of simplified tax systems, and other provisions of the OECD in the context of international tax policy for development;

- continue the practice of exempting electronic transfers from customs duties until it is reviewed again at the next WTO Ministerial conference;

- promotion of market standards, including, for example, technical interoperability standards;

- further development and effective functioning of electronic identification, electronic signature, cryptography and other means of ensuring security and reliability of transactions, etc.

When assessing the significance of the adopted Charter of the global information society, the literature notes that information and communication technologies include digital methods of data transformation,

modern means of communication and means of data transmission using global networks, primarily the Internet, the development of which forms a new habitat for humanity, defined as an information society.

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