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Implementation of Digital Transformations in the Economy of the Republic of Kazakhstan

The introduction of technologies of digitalization of the economy, allowing the state, business and society to interact effectively, is becoming an increasingly large-scale and dynamic process. The purpose of the study is to analyze the current state of implementation of digital transformation in the economy of the Republic of Kazakhstan. During the years of independence, we have managed to become one of the 50 most competitive countries in the world. Digitalization is necessary to improve the competitiveness of enterprises and the country as a whole, as well as to improve the quality of life of the population. The digitalization program is a great journey, not a project with some ending, it will live for many years and constantly improve. At present, global economic growth will depend on the quality of market institutions, productivity and capital growth through continued investment and the use of intellectual capacity, combined with modern information and digital technologies, and healthy and growing competition. The results of the study – analyzed the totality of all factors affecting the development of the digital economy, identified the main trends and shows the current state of the digital economy of the Republic of Kazakhstan. To promote the growth of the digital economy, measures of economic policy should be aimed at encouraging investment in productive capital and the stimulation of innovation through increased support of research and development, the introduction of tax incentives and subsidies, increasing productivity growth by improving the quality of education. The research methodology is focused on the use of a complex research method, methods of statistical, comparative, logical-structural and factor analysis are also used. Now there is a task to enter the number 30, which requires new innovative development and accelerated technological renewal from Kazakhstan. Scientific results will contribute to the development of the digital economy, focused on improving efficiency and competitiveness. This will improve the business and innovation climate in the Republic of Kazakhstan.

Key words: digitalization, digital ecosystem, digital technologies, digital literacy, e-government.

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Реализация цифровых преобразований в экономике республики казахстан

Внедрение технологий цифровизации экономики, позволяющих государству, бизнесу и обществу эффективно взаимодействовать, становится все более масштабным и динамичным процессом. Цель исследования – анализ современного состояния реализации цифровых преобразования в экономике Республики Казахстан. За годы независимости нам удалось войти в число 50 конкурентоспособных стран мира. Цифровизация необ-

ходима для повышения конкурентоспособности предприятий и страны в целом, а также улучшения качества жизни населения. Программа цифровизации – это большое путешествие, а не проект с каким-то окончанием, она будет жить много лет и постоянно улучшаться. В настоящее время глобальный экономический рост будет зависеть от качества рыночных институтов, роста производительности труда и капитала за счет непрерывных инвестиций и использования интеллектуального потенциала в сочетании с современными информационно-цифровыми технологиями, а также от здоровой нарастающей конкурентной борьбы. Результаты исследования – проанализирована совокупность всех факторов, влияющих на развитие цифровой экономики, выявлены основные тенденции развития и показано современное состояние цифровой экономики Республики Казахстан. Для того чтобы повысить рост цифровой экономики, меры экономической политики должны быть направлены на поощрение инвестиций в продуктивный капитал и стимулирование инноваций за счет увеличения поддержки исследований и разработок, внедрения налоговых стимулов и субсидий, повышение роста производительности путем улучшения качества образования. Методология исследования ориентирована на применение комплексного метода исследования, также использованы методы статистического, сравнительного, логико-структурного и факторного анализа. Сейчас стоит задача по вхождению в число 30, которая требует от Казахстана нового инновационного развития и ускоренного технологического обновления. Научные результаты будут способствовать развитию цифровой экономики, ориентированы на повышение эффективности и конкурентоспособности. Это приведёт к улучшению предпринимательского и инновационного климата в Республике Казахстан.

Ключевые слова: цифровизация, цифровая экосистема, цифровые технологии, цифровая грамотность, электронное правительство.

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Қазақстан Республикасының экономикасында цифрлық өзгерістерді іске асыру

Мемлекетке, бизнеске және қоғамға тиімді өзара іс-қимыл жасауға мүмкіндік беретін экономиканы цифрландыру технологияларын енгізу неғұрлым ауқымды және серпінді процеске айналуға. Зерттеудің мақсаты-Қазақстан Республикасының экономикасында сандық қайта құруды жүзеге асырудың қазіргі жай-күйін талдау. Тәуелсіздік жылдары біз әлемнің бәсекеге қабілетті 50 елінің қатарына кіре алдық. Цифрландыру кәсіпорындар мен жалпы елдің бәсекеге қабілеттілігін арттыру, сондай-ақ халықтың өмір сүру сапасын жақсарту үшін қажет. Цифрландыру бағдарламасы-бұл қандай да бір аяқталуы бар жоба емес, үлкен саяхат, ол көп жылдар бойы өмір сүреді және үнемі жақсарыды. Қазіргі уақытта жаһандық экономикалық өсу нарықтық институттардың сапасына, үздіксіз инвестициялар есебінен еңбек өнімділігі мен капиталдың өсуіне және қазіргі заманғы ақпараттық-цифрлық технологиялармен үйлесімде зияткерлік әлеуетті пайдалануға, сондай-ақ салауатты өсіп келе жатқан бәсекелестік күреске байланысты болады. Зерттеу нәтижелері-цифрлық экономиканың дамуына әсер ететін барлық факторлардың жиынтығы талданды, дамудың негізгі үрдістері анықталды және Қазақстан Республикасының цифрлық экономикасының қазіргі жай-күйі көрсетілді. Сандық экономиканың өсуін арттыру үшін экономикалық саясат шаралары зерттеулер мен әзірлемелерді қолдауды арттыру, салықтық ынталандыру мен субсидияларды енгізу, білім беру сапасын жақсарту жолымен өнімділікті арттыру есебінен өнімді капиталға инвестицияларды ынталандыруға және инновацияларды ынталандыруға бағытталуы тиіс. Зерттеу әдіснамасы зерттеудің кешенді әдісін қолдануға бағытталған, сонымен қатар статистикалық, салыстырмалы, логикалық-құрылымдық және факторлық талдау әдістері қолданылды. Қазір Қазақстаннан жаңа инновациялық даму мен жедел технологиялық жаңартуды талап ететін 30-ға кіру міндеті тұр. Ғылыми нәтижелер сандық экономиканың дамуына ықпал ететін, тиімділік пен бәсекеге қабілеттілікті арттыруға бағдарланатын болады. Бұл Қазақстан Республикасындағы кәсіпкерлік және инновациялық ахуалды жақсартуға әкеледі.

Түйінді сөздер: цифрландыру, сандық экожүйе, сандық технологиялар, Сандық сауаттылық, электрондық үкімет.

Introduction.

Digital technologies play an increasingly important role in the development of the economies of the modern world. Today, more than 40% of the world's population has access to the Internet, and seven out of 10 households have a mobile phone. Digital technologies have given a number of advantages. This is the simplification of public and business access to public services, accelerating the exchange of information, the emergence of new business opportunities, the creation of new digital products and others.

Currently, the attention of the Government of the Republic of Kazakhstan and society to digitalization as a global trend, including the expectations of the socio-economic effect of their implementation, are significant. And this level, first of all, is set by the scale and specifics adopted by the President of Kazakhstan N. Ah. Nazarbayev Plan of the nation "100 concrete steps."

In particular, one of the "100 steps" is the creation of the state Corporation "Government for citizens" – a single provider of public services on the model of Canada Service in Canada and Centrelink in Australia.

As part of the current reforms, Kazakhstan is focused on countries that have achieved significant success in creating a digital state. As you know, it is Austria, USA, Denmark, Australia, Canada, Singapore. According to the level of digitalization of the economy in 2016, Kazakhstan took the 50th place in the ranking of 85 countries and was in the group with the emerging digital economy.

In the message of the President of the Republic of Kazakhstan to the people of Kazakhstan "the Third modernization of Kazakhstan: global competitiveness" dated January 31, 2017, it is noted that it is necessary to develop in the country such promising industries as 3D printing, online trading, mobile banking, digital services, including health and education, and others. These industries have already changed the structure of the economy of developed countries and gave a new quality to traditional industries.

In this regard, the Head of state set the task of developing new industries that are created with the use of digital technologies. To be in the trend of modern technologies, the Head of state adopted the state program "Digital Kazakhstan" in a timely manner. Its main goal was to improve the quality of life of the population through the progressive development of the digital ecosystem and the competitiveness of the economy of Kazakhstan. In the "Digital Kazakhstan" we expect the progressive

development of a digital ecosystem for sustained economic growth (Dnisev F. M, 2015).

The implementation of the state program "Digital Kazakhstan" will be carried out in four key areas. The creation of the "Digital silk road" implies the development of a reliable, accessible, high-speed and secure digital infrastructure. The formation of a "Creative society" will give impetus to the development of competencies and skills for the digital economy, will work to improve the digital literacy of the population and prepare industry ICT specialists. Digital transformation in the sectors of the economy will ensure the widespread introduction of digital technologies to improve the competitiveness of various sectors of the economy. The formation of a "Proactive digital government" guarantees the possibility of improving the system of e-and mobile government, as well as the optimization of the provision of public services (Dobrynin A.P, 2016).

The first priority is the accelerated technological modernization of the economy, which in turn requires the cultivation of a new industry with the use of digital technologies. There is also an urgent need to develop in the country such promising industries as 3D printing, online trading, mobile banking, digital services, including health and education, and others. These industries have already changed the structure of the economies of developed countries and gave a new quality to traditional industries. In addition, our legislation should be adapted to the new realities. It is also important to ensure the development of communications and universal access to fiber-optic infrastructure.

A significant advantage will be the development of financial technologies based on the activities of the Astana International financial center. Global studies confirm the correctness of our country's initiative. According to Gartner, a consulting company specializing in information technology markets, the world is actively entering the era of digital globalization (Gartner, 2016). In January 2018, the company's report revealed that global spending on information technology (IT) in 2017 increased by 3.8% and exceeded \$3.5 trillion (Gartner, 2016).

Materials and methods. The research methodology is focused on the use of a complex research method, methods of statistical, comparative, logical-structural and factor analysis are also used. In the international information space, there are three approaches to the definition of "digital economy":

- 1) digital economy as an organization of doing business on the Internet;
- 2) digital economy as a system of relations based on the use of digital technologies;

3) digital economy as an organization of specific production (L. I. Malyavkina, 2016-10).

In addition, there are 2 approaches to the concept of "digital economy". The first approach – the classical, digital economy-is an economy based on digital technologies and at the same time it is more correct to single out only the area of electronic goods and services (Haltiwanger J, 2000). According to the classical approach, the digital economy should be understood as an economy that is based on digital technologies and characterizes the sphere of electronic goods and services. Classic examples-telemedicine, distance learning, sale of media content. The second approach is advanced: "digital economy" is the production of goods using digital technologies (Knickrehm M., Berthon B, Daugherty P. 2016).

Literature review. Currently, the term "digital economy" is used all over the world. This topic has been the subject of numerous discussions in public authorities, the media and society as a whole. The date of appearance of the term "digital economy" is considered to be 1994. In this period came the famous book by the canadian economist and business consultant don Tapscott called "Digital Economy" (Dobrynin, A. P., Black, K. Y., Kapanowski V. P., Inaagaw S., 2016).

Interest in the digital economy is due to the fact that research by scientists and international organizations, in particular the world development Report 2016: digital dividends of the world Bank, shows that the use of digital technologies for the sale of goods and services, the provision of public services, education of citizens will allow the whole society to receive the so-called "digital dividends", which means both the growth of national welfare, material profits and transparency of public administration.

Tapscott argues that the essence of the digital economy is "not only in networking technologies, but in the interaction of people through networking technologies", which "combine intelligence, knowledge and creativity to make a breakthrough in the creation of social capital" (Tapscott d, 2018-230 p). However, the author does not define the digital economy directly and applies the concept of "the age of network intelligence" and focuses on the fact that the digital economy explains the relationship between the new economy, new types of business and new technologies and how one component leads to the emergence of another.

L. Lean writes that the digital economy is the convergence of computer and communication technologies on the Internet and the emerging flow

of information and technologies that stimulate the development of e-Commerce and large-scale changes in the organizational structure (Lane N, 2009-317). The author focuses on e-Commerce and the impact of the digital economy on issues such as privacy, innovation, standards and the digital divide.

L. Margherio does not give a clear definition of the digital economy, but considers four factors of the digital economy: the growth of the Internet, e-Commerce between enterprises, digital delivery of goods and services, retail sale of physical goods (Margherio, 2018). The author for the first time clearly identified the components of the digital economy. The focus is on the components of the digital economy rather than the concept itself.

King lamb argues that the digital economy includes goods or services, the development, production, sale or provision of which is critically dependent on digital technology (Kling R, Lamb R, 2015-324 p).

T. Messenbourg points out that the concept of "digital economy" consists of three components: e-business infrastructure, e-business, e-Commerce (Mesenbourg L., 2001). The author focused on how to measure the phenomenon of e-business and e-Commerce.

Results and Discussion. The digital economy entails the emergence of new forms of cooperation that promote the inclusion of organizations in the world economy, intensify competition in the market, promote innovation and increase capital productivity, including by reducing barriers to mutual trade.

The growth of global it costs in 2017 was observed in all directions, but the largest increase was registered by experts in the category of corporate SOFTWARE, where costs increased by 8.9%, reaching \$355 billion (table 1).

Another notable segment was the devices where progress was recorded for the first time in the last two years. In 2017, for the purchase of computers, smartphones and other devices spent \$667 billion, which is 5.7% more compared to 2016. As it was put to Gartner, the impact of the new iPhone 8 and the iphones on the global it market last year was minimal. Traditionally, the most extensive it category in terms of costs were communication services, which in 2017 accounted for about \$1.39 trillion. The second most important direction was it services (\$933 billion) and the most modest expenses were registered in the segment of equipment for data centers (\$178 billion).

Table 1 – The largest segments of the it market

	2017 Spending	2017 Growth (%)	2018 Spending	2018 Growth (%)	2019 Spending	2019 Growth (%)
Data Center Syster	178	4,4	179	0,6	179	-0,2
Enterprise Software	355	8,9	389	9,5	421	8,4
Devices	667	5,7	704	5,6	710	0,9
IT Services	933	4,3	985	5,5	1,030	4,6
Communications Services	1,393	1,3	1,427	2,4	1,443	1,1
Oveall IT	3,527	3,8	3,683	4,5	3,784	2,7

In General, information technology is changing the economy of doing business across national borders. In particular, they reduce the costs of international transactions and transactions. In addition, they help to create entire markets and user communities on a global scale, which guarantees the business a huge base of potential customers and effective ways to access them.

In most countries, regardless of the model of innovative development, the state is mainly the initiator and catalyst of innovation. Kazakhstan is no exception to this trend, however, for development in the right direction, it is always desirable to analyze the current state of the ICT sector and identify problems that adversely affect its development.

In particular, Kazakhstan in the world Bank's Doing Business ranking in 2020 should be in the list of the first 35 countries. The index of «e-government» (according to the UN methodology) in 2020 should be among the first 25 countries. Availability of information and communication infrastructure in the households of the Republic of Kazakhstan should reach 100%, and the number of Internet users in 2020 – 75% (Nottebohm, 2018).

As you know, this programme is conducted in two stages – 2013-2017, and from 2018 to 2020. As part of the first stage, the government of the Republic of Kazakhstan approved the action Plan for the implementation of the state program “Information Kazakhstan – 2020” for 2013-2017. As a result of the implementation of the program for 2013-2015, Kazakhstan in the ranking of Doing Business of the world Bank in 2017 was in the list of the first 38 countries (2013 – 50 place, 2014 – 53 place, 2015 – 41 place). The index of “e-government” (according to the UN methodology) in 2017 allowed to enter the number of the first 30 countries (2012 – 38th place, 2014

– 28th place). The proportion of households with access to the Internet, fixed telephone and mobile phones has increased. The volume of Kazakhstan's blogosphere has increased, as well as the share of health organizations connected to the unified health network – from 25% in 2014 to 91.5% in 2015.

At present, digitalization is a strategic development priority in many countries. According to the forecasts of the world's leading experts, by 2020 a quarter of the world economy will be digital, and the introduction of technologies of digitalization of the economy, allowing the state, business and society to interact effectively, is becoming an increasingly large-scale and dynamic process. More than 15 countries implement national digitalization programs: Denmark, Norway, great Britain, Canada, Germany, Saudi Arabia, India, Russia, China, South Korea, Malaysia, Singapore, Australia, New Zealand and Kazakhstan (Nazarbaev N).

Kazakhstan in the evolution of digital development, Kazakhstan does not start from scratch, in the 90s started the state program on forced industrial and innovative development, initiated the program of international education “Bolashak”, in 2005 began the formation of e-government. Also, a number of elements of the innovation ecosystem have been created in Kazakhstan, a special economic zone PIT “Alatau”, “Nazarbayev University” is functioning, Astana Hub international Technopark is launched.

Despite some differences in basic initiatives and approaches, the EAEU countries are actually at the starting position and understand the practical feasibility of synchronizing digital processes. The eau has the capacity, resources and competencies to compete with other States and integration associations for its place in the digital world. Digitalization is significantly ahead of the existing system of

production requirements for the composition of professions engaged in the labor market.

According to preliminary estimates, the direct effect of the digitalization of the economy of Kazakhstan by 2025 will create an added value of 1.7 – 2.2 trillion. Tg, thus providing a return on investment of 4.8-6.4 times by 2025 to the total investment, taking into account private investment. The most significant effects in terms of GDP will fall on 12 key projects:

- creation of an international Technopark of it startups (Astana Hub);
- introduction Of industry 4.0 technologies, including implementation of “Intellectual field” projects, creation of model factories;
- implementation of “Paper Free” principle»;
- creation of an intelligent transport system;
- development of e-Commerce;
- creation of a digital platform for SMEs (single window);
- development of an information system for labeling goods to reduce shadow turnover;
- implementation of a set of measures for the development of non-cash payments;
- development of open platforms (Open API), Big Data and artificial intelligence;
- development of telecommunications infrastructure, including broadband Internet access;
- improvement of customs and tax administration and transition to electronic Declaration;
- implementation of Smart City components.

In addition to achieving economic benefits and increasing competitiveness, digitalization will have a positive impact on social spheres. The impact of the qualitative development of education, health and investment environment will be visible in the long term and will reduce the socio-economic gap with developed countries. Undoubtedly, “Digital Kazakhstan”, as the Head of state noted, is a very important program for the country. The success of its implementation depends primarily on the degree of involvement in the processes of digitalization and government agencies, and the market, and the population. Through the systematic development of the ICT sector, creating a favorable environment for attracting digital innovation technologies, providing support measures for talented young people, we will achieve the results outlined in the state program.

Certain areas of digitalization that require special attention from the authorized bodies and enterprises:

- it is important to build cooperation between the state and private enterprises and organizations. Creation of conditions for wide introduction of digital technologies in business.

In addition, the training of highly qualified personnel is important.

- it is very important to improve people’s skills. The principle of education for life becomes a need, a norm.

The financial sector, as the most sensitive to advanced technologies, is already making extensive use of digital solutions. He must continue to be at the forefront of this process. The international financial center “Astana” faces the task of promoting new financial technologies and instruments. The legislation should encourage entrepreneurial initiative, stimulate research and the introduction of new technologies. It is necessary to look at digitalization from the standpoint of pragmatism, to create startups, to achieve a jump in profits.

Building a national innovation economy based on the technological progress of basic industries is the path of a number of world leaders. Basic digital literacy of the population of Kazakhstan today is 77%. The task of 80% digitalization of public services by 2021 set in the program “Digital Kazakhstan” will serve as an impulse for the entire domestic IT sector. These decisions will concern Urbantech’s e-government and cybersecurity. One of the priorities of the program is the widespread introduction of digital service in all spheres of society. A striking example of such work is Singapore, where digital services for every citizen are fully integrated through the “smart home”, “smart city”, “smart country”.

Boston Consulting Group is a strategic partner of Kazakhstan in the implementation of the digitization program. Kazakhstan is entering a new era – digital. The growth of the Internet economy in developing countries is 15-25% per year, which can not be shown by any other sector of the economy. 90% of all global data was created in just the last two years. And 99% of the world’s data is already digitized. 35 billion devices around the world generate and share data every day. This is five times more than the world’s population and is only one percent of the devices that can be connected. However, the reverse side of the process is the fight against cybercrime. Last year, governments and corporations spent nearly half a trillion dollars fighting cyberattacks.

In recent years, we have witnessed the introduction of many technological innovations. They’re in all industries. More surprisingly, a lot of innovation is yet to come, we are just at the beginning. In our opinion, the timely introduction of technologies will increase productivity in various industries and give them a “second life”, create jobs. Electronic Commerce is gaining momentum

and erasing the borders of States. All this leads to economic growth. Countries where digital technologies are better developed are getting richer. Digital technologies are becoming a new "oil". And we see that many States are joining this race and putting it on the agenda. Now Kazakhstan is on the 50th place in the world for digital development. Over the past 5-6 years, the position has not changed much, but we are confident that in the next decade Kazakhstan will be able to enter the top 30.

Each country has its own unique path. And focuses on one of the technologies that change our lives. For example, Germany is developing the industrial Internet of things, the US – artificial intelligence, Sweden – blockchain, China – 3D printing, and Saudi Arabia-big data. Kazakhstan is one of the 15 countries in the world, which launches a comprehensive program that includes all four components of success – the digital transformation of traditional sectors of the economy, the development of human capital, the digitalization of public services and the development of digital infrastructure.

But there are four reasons for failure in this area. This includes limited private sector participation, focusing primarily on the ICT sector, focusing only on quick results and "today's" technologies.

A technological breakthrough needs to be organized quickly to enter the number 30 in 10 years, not 25. It's time to start this transformation. Countries need to develop capabilities related to strategic foresight, citing the example of Singapore. Kazakhstan has the right approach to digitalization as a strategy for economic development and improving the lives of the population. Two factors are important here-the creation of infrastructure that connects all state agencies with each other, and a single platform for providing services to the population.

In the digital economy, there is incredible innovation and development of human capital, the search for ways to improve the quality and productivity, the transition from simple digital technology to complex innovations based on combinations of artificial intelligence technologies, industrial Internet (big data Analytics – Big Data), robotics and process automation (from design, production modeling to registration of the purchase of goods and the moment of delivery to the consumer in the fields of production, catering, retail, Finance, education, health, etc.).

The main driving force of innovation in the new era of information technology is the digitalization of the economy, people, business based on artificial intelligence, 3D printers, additive technologies and

the Internet of things. And this, above all, new ways of communication with customers and achieving their maximum satisfaction with the digital enterprise, automation of production processes using the Internet of things (computer network of physical objects, which is equipped with built-in technologies for interaction with each other and with the external environment; the addition of intellectual and communication functions in production, household and other devices), which communicate with each other and make certain decisions without direct human intervention.

Today, you can use the huge resources of the Internet for free (download various software, applications, books, information materials, video files, photos, music, games, etc.), the services of Google and Facebook are actually free for consumers (the revenue they receive thanks to online advertising, not from people using their services), which falls out of the GDP calculation. The services to be provided on call Uber drivers and the delivery of housing to rent Airbnb partially accounted for in GDP, purchases of goods and banking services via the Internet reduces the GDP growth because it reduces investment in the banking and retail buildings. Thus, it can be concluded that the GDP deflator overestimates structural shifts in the digital economy and understates the growth of real GDP volume. Thus, the volume of digital capital in the global economy is increasing due to the excess of the level of return on capital over the overall level of global economic growth due to cost savings through labor, fuel, raw materials and materials (Stefanova N.A., Sedova A.P., 2017)/

Traditional business models and established values in the financial sector are changing under the influence of innovative application of innovative IT and financial products and financial and technological start – UPS. The development of cloud technologies, high – speed Internet, user data analysis system, artificial intelligence, digital virtual assistants and voice identification, the formation of fundamentally new tools and methods to attract funding for innovative projects outside the geographical and territorial boundaries is another important factor in entering the digital economy.

Big data technologies and the use of neural learning networks in the practice of risk identification significantly accelerate and increase the reliability of risk assessment in lending to retail borrowers and small companies (no need to open an account and visit the Bank's office), remote identification of individuals will significantly devalue the cost of maintaining a branch network of banks.

Today, the e-Commerce market, the activity of using Bank cards and electronic payments is growing, households and companies mainly make online payment transactions through Internet banking, using a card, messenger and payment application, almost all financial transactions are carried out virtually, bypassing cash transactions, money exists in the form of electronic numbers in computers, which can significantly reduce the costs of States, including printing cash and supporting their circulation.

The use of online services, cloud digital technologies, the Internet of things, artificial intelligence and big data, the introduction of innovative products based on nano-, bio-information and cognitive Sciences and technologies provide new opportunities for the growth of innovative activity and fundamentally change the business model and the nature of the economic functioning of the global economy.

Already today, around the world, robots have successfully replaced workers in production and management processes, most of the services and customer service systems are automated (ATMs and terminals for payment of various services, food sales, Parking, online booking services and registration of hotels and air tickets, self-service ticket offices, etc.). At the same time, the economic activity of the population and the number of working hours are growing: such platforms as YouDo.com, Freelancer.com, Thumbtack.com, Uber, Airbnb, website Care.com, TaskRabbit (search for helpers in everyday Affairs-cleaning, delivery, minor repairs, child care, elderly, home, etc.) provide an opportunity for additional income for students, pensioners, women on maternity leave and others.

Thus, the traditional production plants, hydrocarbon energy and financial systems are being replaced by the systems of virtual interactive relationships between the consumer and the Bank, mobile software applications for managing production and management processes, online settlement and retail accounts, savings, pensions and investments, new innovative technologies for the use of new and renewable energy sources.

The development and application of artificial intelligence technologies contributes to the automation of production and management processes. Mobile applications, cloud services of machine intelligence, engaged in the analysis of large data sets are able to automatically identify objects, images, speech, human faces, recognize voice commands, translate from one language to another directly during the conversation, build patterns of

data behavior and reproduce the principles of data thinking, justifying answers to questions and giving tips for formulating new and most importantly constantly improve yourself, learn, expand your competencies and automatically adapt to work with new data and tasks, not blindly follow the clear instructions of the programmer (Nottebohn O, 2018).

To date, the share of renewable energy in Germany's electricity consumption is 32.5%, Austria receives 75% of energy from renewable sources, Denmark already receives 42% of energy consumption from wind turbines, Norway produces almost all electricity at its hydroelectric power plants. The US and EU have set a goal to achieve by 2020 an increase in the share of alternative energy to 25%, 40% by 2040.

Today, developed countries have already made fundamental decisions to stimulate the development of the electric vehicle market and increase investment in environmentally friendly transport infrastructure while the key task is to establish the production of cheap new lithium-ion batteries and the development of a network of electric filling stations. In particular it should be noted that the development of the world market of electric vehicles is constrained by low gasoline prices and the lack of large-scale investment of automakers. Although the prerequisites for a transition to electric cars exist mainly in developed countries, automakers have already begun to mass produce environmentally friendly electric cars, developing models on hydrogen fuel. For example, Norway, the leader in the share of electric vehicles, provided with cheap electricity generated by hydroelectric power plants, can actually switch to electric transport. Norway, the world leader in the share of electric vehicles in sales, announced a plan to ban the sale of cars without an electric motor from 2025, and Germany – from 2030.

According to the "Kazakhstan Association of companies" for 2016, 2,560 companies operating in the field of information technology are registered in the country. These companies perform different types of activities, and of these 770 companies engaged in software development (Digital dividends, 2016). Among these companies there are IT companies that provide a high share of local content (up to 100%) in their IT projects. World experience shows that the creation of conditions for the development of IT companies and the formation of a full cycle support for startups are provided by technoparks.

Today, information and telecommunication infrastructure is becoming an essential element of economic development. Without modern accessible telecommunications infrastructure, it is impossible

to consolidate Kazakhstan in the global economic and information space. ICT accessibility is the Foundation for building a digital economy. The main component of the developed ICT infrastructure is broadband Internet access.

One of the indicators characterizing the level of development of countries in this area is the index of development of information and communication

technologies (ICT Development Index-IDI). IDI is a combined indicator of the world's achievements in terms of information and communication technologies (ICT). Development index IDI is a composite index that combines 11 indicators into one benchmark measure. This index allows to estimate the rate and level of ICT development of countries for a certain period of time.

Table 2. World ID ranking by country

Country	Place in the ranking as of 2016	IDI index in 2016	Place in the ranking as of 2017	IDI in 2017
Belarus	31	7,26	32	7,55
Russian Federation	43	6,95	45	7,07
Kazakhstan	52	5,57	52	6,79
Armenia	71	5,60	75	5,76
Kyrgyzstan	113	3,99	109	4,37
Note-according to the literature 15				

In 2017, the leader in the region was Belarus, which occupies 32 place in the global ranking. The Russian Federation, Kazakhstan and Armenia occupy the corresponding positions – 45, 52, 75. The IDI for these countries is in the range of 7,07 – 5,76 units. Compared with 2016, the company observed deterioration in Belarus, Russia, Armenia. Kazakhstan remained in the same position. But Kyrgyzstan has improved its position in comparison with 2016. The reasons for the decline in the world ranking in 2017 were the fact that the international telecommunication Union does not take into account the geographical features of the countries, population density and the nature of its distribution, while these factors significantly complicate the development of ICT in Belarus, Russia and Armenia. Summary table 3 shows the total population, the number of Internet users, and the growth rate of Internet users by five countries (Stefanova N.A., 2017)

In General, information technology is changing the economy of doing business across national borders. Digital technologies offer a number of advantages:

- simplification of public and business access to public services,
- accelerating the exchange of information, the emergence of new business opportunities,
- creation of new digital products and others.

Other advantages of the digital economy development in the world Bank in its review of 2016 “Digital dividends” include: growth of labor productivity; increase of competitiveness of companies; reduction of production costs; creation of new jobs; overcoming poverty and social inequality (Digital dividends, 2016).

In the future, the level of digitalization will be the main determining factor in the effective development of the company and its competitive advantage in the world market. Leading players in the global market are intensely introducing digital tools in all sectors of the economy.

In these circumstances, in our opinion, we should pay special attention to the further improvement of the quality of economic institutions and, above all, online education and distance learning, retraining of employees and training of qualified engineering and technical specialists capable of developing new ideas and technologies, adequately assess and professionally implement large-scale and long-term technological projects. More efficient allocation of enterprise resources and increased business spending on R & d, human resource development as intellectual property, software and management skills are key factors (Rouse M, 2018).

Conclusion

Thus, in the digital economy there is a decrease in the role of capital in the economy and an increase in the role of knowledge as a factor of production. Digital technologies and robotics allow to realize this or that function, traditionally realized by the person, human mental and physical work in this area becomes unnecessary. Thanks to the use of scientific and technical achievements in the field of genetics and biotechnology in the practical activities of people and their synergy with the use of innovative digital technologies, intelligent robots are gradually taking over not only almost all kinds of physical labor, but also intellectual human activity.

Today, artificial neural networks mimic the model of the neurons of the human brain. Deep Mind Google is developing an artificial hippocampus-part of the brain system responsible for the formation of emotions and memory consolidation. Soon, machine super-intelligence and other machine learning algorithms will acquire a mobile communication format, will become smarter than a person in real time, which are able to better process a huge amount of data, recognizing images by neural networks, in the long term, significantly change the technological picture of the world.

Most of these technological breakthroughs have occurred and are taking place in developed countries, primarily in the United States, where a global center

for innovative entrepreneurship, human and digital capital has been formed, employing over 50% of the world's most highly cited scientists.

The share of grants for R & d focused on the formation of fixed capital of American companies is high. The creation of innovative products and services, technology upgrades and modernization of industries in the United States is also driven by competitive environment. At the same time, the most profitable U.S. companies no longer belong to the traditional industrial manufacturers, they belong to the innovative technology IT-companies and sectors that own intellectual property and make research and development, brands, software, and algorithms (in pharmaceuticals, media, Finance, information technology, business services).

The global digital system of financial regulation becomes a centralized-hierarchical structure (Bank for international settlements, European Central Bank) based on linear, functional, regional and project structures, and moves to unified system of information disclosure, security, clearing and settlement for all OTC financial transactions quantitative restrictions (currency zones, for example, Euro, agreed parameters of monetary interest and fiscal policy, inflation ceilings, public debt limits, capital adequacy requirements), limitation of Bank leverage and derivatives markets and structured financial products).

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Contents

Law

Brauweiler, Hans-Christian, Mukhtarova Karlygash, Yerimpasheva Aida,
Development of the service economy in Kazakhstan.....

Petr Hajek, Tovma N.A, Akimbaeva K.T. Kупenova J.K.
Implementation of digital transformations in the economy of the Republic of Kazakhstan.....

Celetti David, Myrzakhmetova A.M.
Analysis of transport industry of Kazakhstan in modern conditions.....

Sayakbayeva A.A., Ashimbaev T.A., Akylbekova N.I., Sayakbayev T.D.
Innovative processes in financial markets and their development trends.....

Elmesov R.E., Bekmuratkyzy S.
Agriculture of Kazakhstan: state and capacity in the international market.....

Lailieva E.D., Aitzhanova D.A., Sh.R.
Abzhalelova Drivers of the growth of the Kazakhstan's economy under conditions of industrial revolution.....

Rajasehara Mouli Potluri, Dabylyayeva N.Y., Kerimbekova.U.A., Medukhanova L.A.
Problems and prospects of improving the quality of life in Kazakhstan and world experience.....