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The main lines of the State programme «Digital Kazakhstan» implementation

The general trend of digital technologies development is disclosed. Their specification as one of the ways of national economy diversification, its reorientation from raw material industries to industrial-service model is given. It is proven that given program will allow to develop and approve new tools directed to modernization and digitalization of our enterprises with export orientation, as well as improving the quality of life of the population and economic competitiveness of Kazakhstan by means of progressive development of digital ecosystem. It is noted that program is directed to development of following areas: digital Silk way, creative society, digital transformations in the branches of economy, proactive state. It is emphasised that infrastructure, sufficient for a good start is created in Kazakhstan: basic level of digitalization is present in all branches of economy, the majority of the population has access to the Internet, electronic government is created and successfully functions. Innovative technologies and intelligent systems are considered, which will be introduced to key economic branches with the aid of digitalization of the branches of economy in order to ensure productivity growth and increase in the competitiveness on international level; as well as creation of innovative ecosystem, increase in the amount of technological start-up projects initiated in Kazakhstan and their capitalization. Feasibility of creation of Astana Hub international IT start-ups technology park, development of the Law «On venture financing» is justified; transition to digital state; creation of the centre of competence to digital industry; realization of projects to partial computer-aided manufacturing by introducing and modernization of the sensor system that will allow to increase significantly in productivity. It is concluded that program «Digital Kazakhstan» implies realization of the complex of interconnected measures for achievement of the key purpose - creation of innovative economy, entry into developed countries and transformation of the society and production, in order not to be left behind of modern technological world; integration of information systems of State authorities. The key to preservation of our economy competitiveness is development of digital component by joint efforts of the state and business.

Keywords: digitalization, digital technologies, digital infrastructure, digital Silk way, proactive state, innovative ecosystem, start-ups, digital state, digitalization of Kazakhstan enterprises, digital economy.

Currently, digitalization is a global trend, which is followed by all parties aimed to development of competitive economy and improving the quality of life of the population.

The need to develop the state program «Digital Kazakhstan» was identified by the Head of state in the Address «the Third modernization of Kazakhstan: global competitiveness»

In the development of the state program «Digital Kazakhstan» was taken into account global challenges and possibilities that brings the digital era for the economy of Kazakhstan, which were identified as two areas: building long-term innovation development for sustainability of the digitization process and ensuring a pragmatic start of the program consisting of specific projects in the real sector.

The program «Digital Kazakhstan» was adopted, prepared with the participation of experts from national companies, state corporations, international consultants.

In the next Address Of the head of state to the people of Kazakhstan «New opportunities for development in the conditions of the fourth industrial revolution» it was noted that in 2018 it is necessary to begin the development of the third five-year plan of industrialization, «digital era»

For Figure 1 the state program «Digital Kazakhstan» is presented. The need to develop the state program «Digital Kazakhstan» was identified by the Head of state in the Address «the Third modernization of Kazakhstan: global competitiveness».

Given program will allow to develop and approve new tools directed to modernization and digitalization of our enterprises with export orientation.

The government as starting manoeuvre chose accelerated digitalization of 9 key economic branches, among which there is power sector and raw materials, agriculture, industry, logistics and the sector of information technologies.

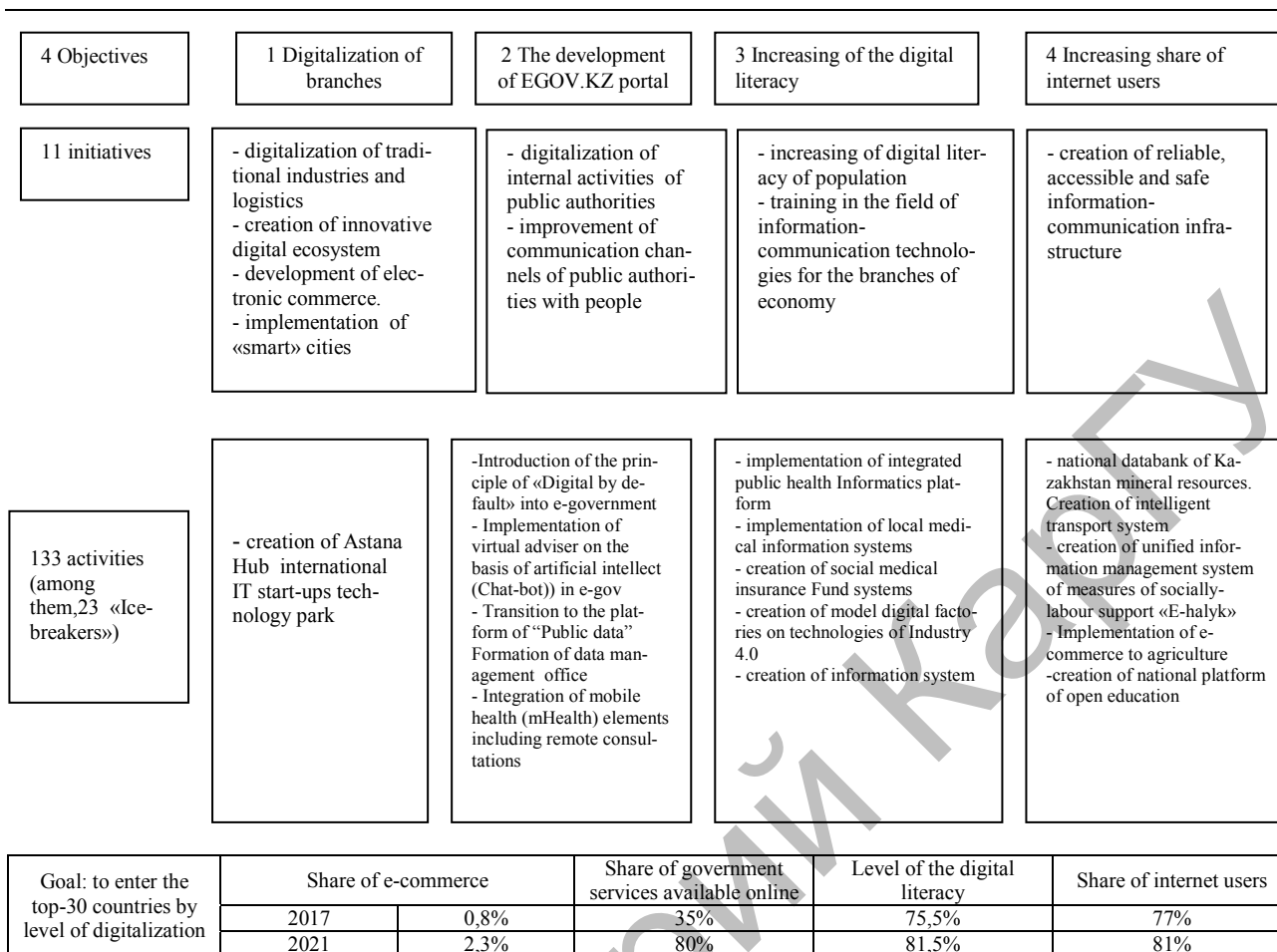


Figure 1. State program «Digital Kazakhstan»

It follows that two tasks are solved:

- an additional impetus is provided for the technological modernization of the country's flagship industries and conditions are formed for large-scale productivity growth;
- the role of information and communication services in the world market is being strengthened and support is being provided for domestic production and export of information services to improve the competitiveness of the information industry and modernize the economy of our country.

Strengthening of information-communication services role on world market and giving support of domestic productions and export of information services for increase in information industry competitiveness and modernization of our country economy.

It should be noted that attention of the state to development of digital technologies, is considered as one of the ways of national economic diversification, its reorientation from raw material industries to industrial-service model.

The purpose of state program «Digital Kazakhstan» is improving the quality of life of the population and Kazakhstan economy competitiveness by means of progressive digital ecosystem development.

In this approach Kazakhstan is not alone, building of national innovative economy based on technological progress of key economic branches – it's the way of numerous world leaders.

The main goals of the Programme should be:

- growth of digital economy considerably outpacing economical growth as a whole;
- Kazakhstan will take the 30th place in international ranking of digital competitiveness by 2050.

For country digitalization four basic elements are necessary:

- digitalization of basic sectors of the economy;
- development of mobile state;
- formation of creative society;
- construction of new infrastructure, needed for digital transformation of country.

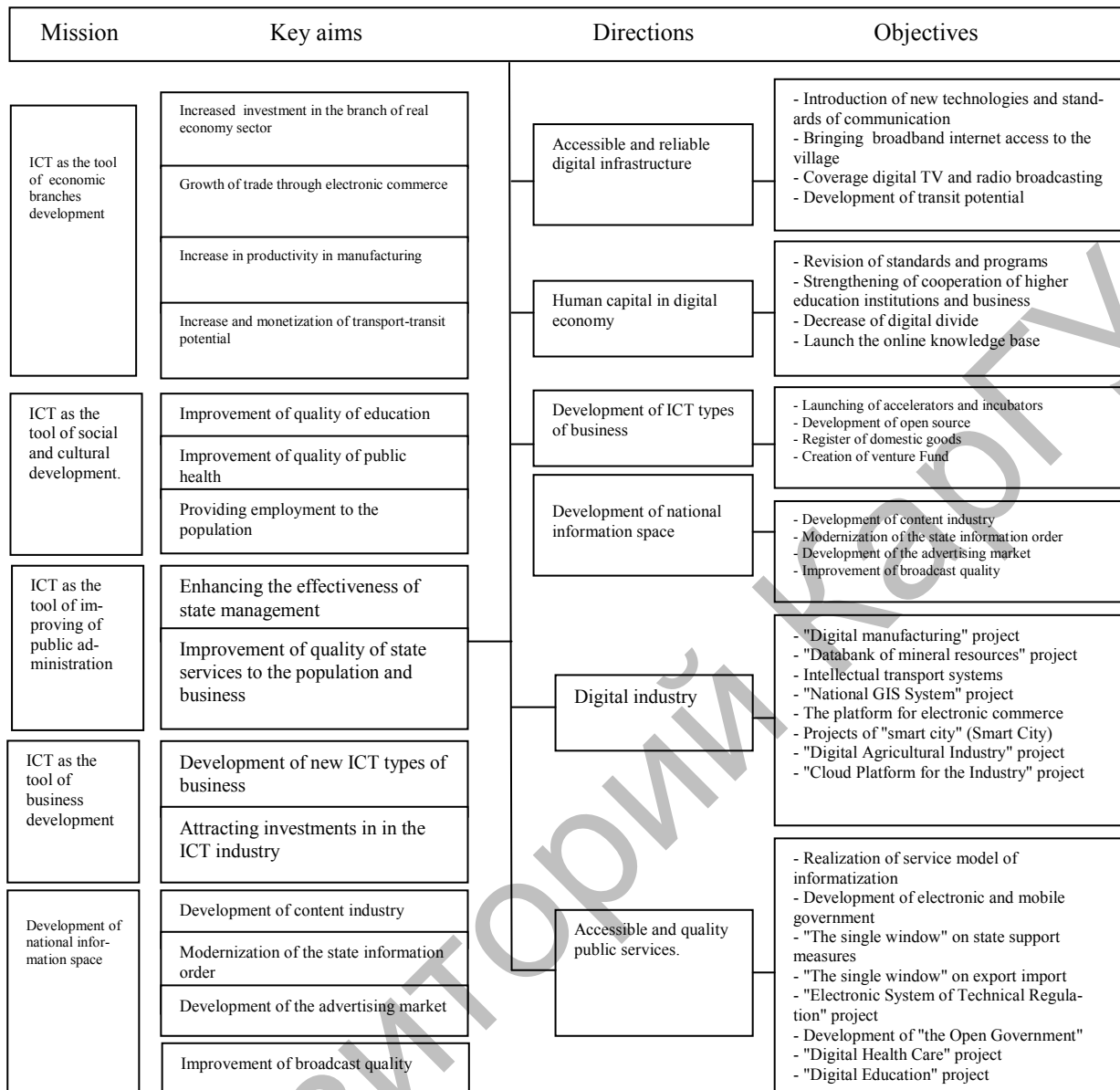


Figure 2. Depicts the mission of State program «Digital Kazakhstan»

The program is aimed at the development of the following spheres:

1. Digital Silk way is creation of hi-tech digital infrastructure by carrying out in rural settlements of broadband Internet access; improvement of broadcast and radio network, development of telecommunication hub; ensuring information security.

2. Creative society – development of the human capital through increase in digital literacy of population, upgrading the qualifications of specialists in the field of information and communication technologies, development of creative thinking.

3. Digital transformations in branches of the economy – development of the digital industry through introduction of digital technologies in the sphere of agricultural industry, the industry; improvements of accounting systems of mining branch; automation of transport and logistics system of the country; development of electronic trading; improvement of health care; development of information and communication branch of the country; realization of technologies for smart cities creation.

Proactive state is formation of digital government through further development of electronic and mobile government; increase in public services provided in an electronic form; formation of open government and open parliament.

Its realization will allow to improve the quality of life of the population due to digital technologies using and will create conditions for transition of economy of Kazakhstan to essentially new trajectory of development. And for this purpose there are all makings.

The infrastructure sufficient for a good start is created in Kazakhstan. The basic level of digitalization is present at all branches of economy, more than 70 % of the population have Internet access. Electronic government is created and successfully functions.

It will allow to achieve strategically important indicator, to create not less than a third of an yearly economic growth due to sectors of digital economy.

Due to joint efforts of the state and business Kazakhstan should build the digital sector as the new branch of economy penetrating all life of the country in 10 years.

One more important point is qualified personnel. In this direction a great deal of work is being carried out, first of all with educational institutions. Kazakhstan students show good results at the international Olympic Games and competitions. Nowadays, bright prospects to apply knowledge in the homeland for our talented youth are offered.

It is necessary to consider such factor as a business environment. The large and medium-sized Kazakhstan enterprises along with the multinational companies intend to introduce digitalization elements in different industries.

This program contains 5 directions.

The first is a digitalization of branches of economy. It means that innovative technologies and intellectual systems will be introduced in key branches of economy that will give impetus to their development by providing a productivity growth and increase in competitiveness at the international level. As a result growth of domestic export on foreign markets both in raw material industries, and in agro-industrial complex will be provided, that in turn will lead to growth of capitalization of the largest production companies.

The fourth industrial revolution is connected with mass introduction on production of such technologies as Internet of things (the various digital devices connected to Network), artificial intelligence, robotization. All this will lead to productivity growth by branches on average for 50 % by 2022.

To date, a number of Kazakhstan enterprises successfully introduces elements of the Industry 4.0, it means that management comes to recognize the need of investment in innovations. In a short time of implementation of pilot projects in an oil and uranium fields essential (up to 10 %) optimization of costs of the electric power, chemical reagents, transportation costs is demonstrated. Such enterprises as ERG, Kazzink LLP, JSC NAC Kazatomprom, JSC KEGOC, Astana REC, Kazakhmys corporation are ready to continue this work.

And finally, the fifth direction of the program – creation of an innovative ecosystem: increase in the number of technological start-up projects initiated in Kazakhstan and their capitalization. The innovative ecosystem will be created on the basis of existing technology parks, venture funds, research institutions and higher education institutions, as well as on the basis of currently being set up Astana Hub technology park. This environment will provide conditions for bringing new ideas, technologies, digital decisions and also active involvement of talented Kazakhstan citizens who are engaged in IT projects abroad.

It is full support of implementation of courageous projects of people with ideas – technological businessmen. Most of the world IT industry giants existing today – Apple, Google, Facebook – aspiring entrepreneurs in the past, who with the help of created innovative ecosystem conditions, could construct huge multinational corporations. Now we have great opportunities to contributing significantly to social and economic development of the country, as well as to providing additional opportunities to citizens to realize themselves.

First of all the program includes creation of Astana Hub international IT start-ups technology park. Within the framework of the project initiated by the Head of state conditions for attracting technological businessmen and experts from around the world will be created, thus, we will have the critical mass of world-class IT professionals.

Residents of Astana Hub will take advantages IFCA (International Financial Center Astana) regarding the special labor and visa regimes, the principles of English law and the International Court of IFCA.

With the growth of companies they will need support for expansion, so-called scaling up of business that means accessible financing. However, when it comes to start-ups, we speak about a specific high risk type of financing – venture. The international experience shows that only about 10-20 % of start-ups become successful.

On this basis development of the Law «About Venture Financing» which will allow to apply the best world practices in Kazakhstan is provided. Within the framework of Astana Hub work with representatives

of Kazakhstan business for the purpose of cultural development of investment in startups will be carried out. Many progressive businessmen already consider this direction.

New, but very perspective direction – corporate innovations will develop. This is interaction of large business with representatives of SMB which are start-ups at the initial stage of development. Corporations in their activity need a large amount of various type of service and goods which can be provided by start-ups. «Digital Kazakhstan» will create conditions for mutually beneficial cooperation of aspiring entrepreneurs innovators with the existing corporations.

As we can see programme «Digital Kazakhstan» assumes realization of complex of interconnected measures for key ambitious goal achievement – creation of innovative economy, entry into 30 developed countries by 2050 and transformation of society and production in a way that not to be left behind the modern technological world. Achievement of this goal demands consolidation and mobilization of all society, a breakthrough within a short timeframe. There is no time for doubts, forward to the digital world of future!

Let's give examples and ways of realization of accepted directions of «Digital Kazakhstan» program.

The domestic IT companies and research institutions will be involved in realization of the first direction. This measure will be considered an excellent opportunity for Kazakhstan developers to find practical application for the technologies. «Ust-Kamenogorsk Titanium Magnesium Plant» which introduces developments of KBTU programmers and KazNRTU after K. Satpayev can set excellent example of such cooperation. The East Kazakhstan state technical university opened department at the Kazzink enterprises: learning the theory at the university, students master their knowledge in production activities. And on the basis of KazNRTU – the center of competence – will train teachers of higher education institutions, representatives of industrial enterprises and students to plan and realize projects of Industry 4.0.

The second direction is transition to the digital state. It is quite simple to describe this process: it is necessary to reduce the number of workflow and to deliver services to the people and business at the earliest time possible. It will be reached by integration of public authorities information systems.

First, about 20 million references will be cancelled, secondly, public authorities will switch to electronic workflow (exchange of references and information), thirdly, access to personal information to the third parties with permission of citizens – customers will be provided.

So far, only a quarter of public services is provided in electronic format. In accordance with principle of «paper free» (completely paperless processes) 80 % of public services will be rendered only in electronic form. Such documents as address reference, the certificate of criminal record, the real estate and about 30 more types of references will disappear. These data will be transferred in a digital form between the systems of public authorities and also in special protected mode are available to banks of the second level, municipal services and other institutions.

Based on the research of «Boston Consulting Group» company, reflected in the article «Kazakhstan on the Way to Digital Economy» on the level of digitalization of economy Kazakhstan holds the 50th place of rating from 85 states and is in group with a nascent digital economy. The digital divide between the states leaders and the countries lagging furthest behind increases from year to year. A key to maintaining competitiveness of our economy is development of a digital component by through joint efforts of the state and business [3].

Until 2019 proactive services (which does not demand visiting) will be introduced, each of which includes up to 5 services. Now community service centres provide to 40 million references in a year. It is very simple to count budgetary savings due to process of digitalization that represents approximately 33,5 billion tenges.

Significant improvement will be reached with respect to automation of internal processes of public authorities, for example, strategic and budget planning, management of land and mineral resources or import and export operations.

One of key questions is effective use of transit capacity of our country. Introduction of such systems as a single window of export-import transactions and the intellectual transport system, is directed to minimization of a human factor, acceleration and ensuring transparency of all processes.

The third, one of strategically important directions – realization of digital Silk way. There are two important initiatives – expansion of communication networks covering and strengthening of cyber security.

The first measure covers questions of development of broadband access to global networks infrastructure and the secure transmission.

It is planned to construct fibre-optic connection lines in more than 1 200 rural settlements according to the scheme of state private partnership. Thus more than 2,1 million people will have technical capability of

connection to the high-speed Internet. In all regional centers there will be mobile infrastructure of new generation (networks 4G, and 5G in the future).

The fourth – development of the human capital. For achievement of the best results Kazakhstan needs to create qualitative personnel potential. Therefore the program provides measures for increase in digital literacy on average, technical and professional, higher education. Step by step the subject «Programming Bases» beginning with the 2nd class will be introduced. And the program of high school will be complemented with such subjects as robotics, virtual reality, 3D-printing and others.

For development and support of talented youth on a regular basis hackathons, the Olympic Games and competitions are already held, various groups on robotics and programming everywhere open. The population, including jobless, will have access to on-site training for study demanded digital skills.

It should be noted that for increase in labor productivity, increase in production and decrease in below-cost of products of processing industry implementation of measures of stimulation of digital technologies use is necessary for the Republic of Kazakhstan.

For carrying out system and consecutive approach to elements of the fourth industry «the Industry 4.0» is required to analyse the level of technological development of Republic of Kazakhstan economy and to identify potential of economic branches to new challenges.

Also for digitalization of the industry in Kazakhstan Mekinsey E Co together with SEZ park of innovative technologies plans to create the center of competence on the digital industry on basis of MSC center of competence together with the technological multinational companies which purpose will be the implementation of pilot project in the mines on streamlining and automation of productions, implementation of projects on collecting and in-depth analysis of data.

First of all the ICT infrastructure will be created, namely events for connection of neurochannel Internet access and also the industrial Internet for implementation of projects on the digital industry at 10 large enterprises and 1 SEZ will be held.

Implementation of 10 projects on partial automation of production by introduction and modernization of system of sensors is intended in the future that will allow to increase labor productivity to 15-20 % by 2020 at these 10 enterprises and 1 SEZ [4].

In a follow-up President of Kazakhstan Nursultan Nazarbayev's Address to the Nation of Kazakhstan «New opportunities under the fourth industrial revolution» is noted: The Comprehensive program «Digital Kazakhstan» is adopted. It is necessary to realize the pilot project on digitization of several Kazakhstan industrial enterprises, and then widely extend this experience. Development of own ecosystem of digital and other innovative solutions developers becomes crucial issue.

In 2018 it is necessary to begin development of the third five-years period of the industrialization devoted to formation of «digital era» industry [5].

The government of Kazakhstan will continue to build institutes of long-term innovative development, creating favorable climate for self-realization of people and business in digital economy.

The countries making a right choice have an opportunity of new branches creation and ways of big objectives solution.

In view of the foregoing, conditions for cultural transformation of society, structural changes of economy, transition to the concept of proactive state and increase in digital competitiveness in the world will be created in Kazakhstan. As a result the labor productivity will increase, the volume of electronic trading and a share of electronic services will increase.

It should be noted that these measures would be implemented through development of the concept, and then – new State program of industrial innovative development, devoted to formation of industry «Digital era».

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«Цифрлы Қазақстан» мемлекеттік бағдарламасын жүзеге асырудың негізгі бағыттары

Мақалада цифрлық технологиялардың дамуының жалпы үрдісі ашылған. Ұлттық экономиканы әртарапандыру оның шикізаттық үлгісінен индустрия-сервистік түріне қайта бағдарлау жолдарының бірі ретіндегі сипаттамасы берілген. Аталған бағдарлама өнім экспортына бағдарлана отырып, кәсіпорындардың жанартылуына және цифрлануына бағытталған жаңа құралдарды жасап шығарып, алғашқы өндірістік байқаудан өткізуге, сондай-ақ цифрлық экожүйенің прогрессивті дамуы арқылы халықтың өмір сүру сапасын жақсартуға және Қазақстан экономикасының бәсеке қабілеттілігін арттыруға мүмкіндік беретіндігі дәлелденген. Бағдарлама Жібек жолы, креативті қоғам, экономика саласындағы цифрлық түрлендіру, белсенді мемлекет секілді салаларға бағытталғандығы айтылған. Қазақстанда жақсы бастау алуға жеткілікті инфрақұрылым жасалғандығы көрсетілген, цифрландыру деңгейі экономиканың барлық салаларында жеткілікті дәрежеде жоғары, интернет халықтың басым бөлігінде қолжетімді, электронды үкімет құрылып және ол сәтті қызмет атқарып жатқандығы көрсетілген. Өнімділіктің артуы және халықаралық деңгейде бәсекеқабілеттілігін қамтамасыз ету мақсатында экономика салаларын цифрландыру көмегімен экономиканың іргелі салаларын енгізлетін технологиялар және зияткерлік жүйелер, сондай-ақ Қазақстанда бастама көтерумен инновациялық жүйені құру, технологиялық стартап-жобалар санын арттыру қарастырылған. IT-стартап Astana Нив Халықаралық технопаркін құру қажеттілігі, «Венчурлік қаржыландыру туралы» Заң жобасын әзірлеу, цифрлы үкіметке көшу, цифрлық өнеркәсіп бойынша құзыреттілік орталығын ашу, еңбек өнімділігін едәуір арттыруға мүмкіндік беретін өлшеуіш құралдар жүйесін енгізу және жанарту жолымен ішінара автоматтандырылған жобаларды іске асыру негізделген. «Цифрлық Қазақстан» бағдарламасының өзекті мақсаты – дамыған елдер қатарына ену және заманауи технологиялық әлемнен қалып қоймау үшін қоғам мен өндірісті түрлендіру, мемлекеттік органдардың ақпараттық жүйесін интерациялауды білдіретіндігі туралы қорытынды жасалған. Отандық экономиканың бәсекеқабілеттілігін сақтап қалудың шарты – цифрлық құраушыны мемлекет пен бизнестің бірлесіп дамытуы болып табылғандығы дәлелденген.

Кілт сөздер: цифрландыру, цифрлық технологиялар, цифрлық инфрақұрылым, Жібек жолы, белсенді мемлекет, инновациялық экожүйе, бастамашылық, сандық мемлекет, қазақстандық кәсіпорындарды цифрландыру, сандық экономика.

Т.Б. Казбеков, Е.Б. Романько, А.О. Мусабекова, Т.А. Мукашев

Основные направления реализации Государственной программы «Цифровой Казахстан»

Раскрыта общая тенденция развития цифровых технологий. Дана их характеристика как один из путей диверсификации национальной экономики, ее переориентации с сырьевой на индустриально-сервисную модель. Данная программа позволит разработать и апробировать новые инструменты, направленные на модернизацию и цифровизацию наших предприятий с ориентацией на экспорт продукции, а также поможет обеспечить повышение качества жизни населения и конкурентоспособности экономики Казахстана посредством прогрессивного развития цифровой экосистемы. Отмечается, что программа направлена на развитие следующих сфер: цифровой Шелковый путь, креативное общество, цифровые преобразования в отраслях экономики, проактивное государство. В статье показано, что в Казахстане создана инфраструктура, достаточная для хорошего старта: базовый уровень цифровизации присутствует во всех отраслях экономики, большинство населения имеют доступ в Интернет, создано и успешно функционирует электронное правительство. Рассматриваются инновационные технологии и интеллектуальные системы, которые будут внедрены в базовые отрасли экономики с помощью цифровизации отраслей экономики с целью обеспечения роста производительности и повышения конкурентоспособности на международном уровне, а также создание инновационной экосистемы, увеличение количества технологических стартап-проектов, инициированных в Казахстане, и их капитализация. Обосновывается целесообразность создания международного технопарка IT-стартапов AstanaHub, необходимость разработки Закона «О венчурном финансировании», перехода на цифровое государство, создания центра компетенции по цифровой промышленности; реализации проектов по частичной автоматизации производства путем внедрения и модернизации

системы датчиков, что позволит существенно увеличить производительность труда. Авторами сделан вывод, что программа «Цифровой Казахстан» предполагает: реализацию комплекса взаимосвязанных мер для достижения ключевой цели — создания инновационной экономики, вхождения в число развитых стран и преобразования общества и производства, чтобы не остаться за бортом современного технологического мира; интеграцию информационных систем государственных органов. Ключом к сохранению конкурентоспособности нашей экономики является развитие цифровой составляющей совместными усилиями государства и бизнеса.

Ключевые слова: цифровизация, цифровые технологии, цифровая инфраструктура, цифровой Шелковый путь, проактивное государство, инновационная экосистема, стартапы, цифровое государство, оцифровка казахстанских предприятий, цифровая экономика.

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