
The Impact of the Novel Coronavirus Outbreak on the Development of Digital Economy in Commodity Countries

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1 Introduction

The coronavirus pandemic, which has already affected more than 200 countries, had far-reaching consequences for the global economy: the closure of small enterprises, the transfer of employees to their home office, and the closure of schools and universities. The outbreak has led many companies to pay more attention to the provision of online services. Companies that provide online business management tools are currently benefiting the most, indicating that crises of this kind are opening up opportunities for online businesses. This is due to the fact that enterprises, faced with a crisis, seek to reduce their costs, seek to efficiently distribute their resources, and look for any possible sources of income in order to compensate for losses. Current economic conditions require the digitization of industries and the digitization of everyday life.

The continuous spread of digital technology over a long period determines the paths of economic and social development that constantly lead to fundamental changes in people's lives. The formation and development of the digital economy is one of the key priorities of economic leaders and countries, including the United States, Britain, Germany, Japan, etc. This has allowed such countries to quickly switch to the digital format of doing business in the face of the current crisis. Nevertheless, countries with economies in transition, where innovation processes and the development of the digital economy are still in their infancy, have set a serious challenge for government policy and pointed out the need to support programs for the widespread adoption of digital technologies.

After the crisis, commodity countries are waiting for another economy if they can create the conditions for digital transformation and industry 4.0, but such crises are usually longer and more difficult, since it takes time to find new solutions.

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Unfortunately, at one time, countries with a developing innovative system did not pay special attention to the development of digital technologies, which led to a collapse during the coronavirus pandemic. Although digital economy is currently growing in developing countries, Kazakhstan and most of other post-soviet countries lag 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 investments. The introduction of innovative digital technologies has a positive impact on the labor market. In addition, digital technologies contribute to the social and financial involvement of the population and increase the accessibility, quality, and convenience of receiving services in such important areas as medicine, education, municipal and public services, and culture. The use of digital technology can increase the availability and efficiency of public services, and helps improve the business and investment climate. The following should be singled out as the main directions of the development of the digital economy: competent IT regulation, developed infrastructure, national centers of competence, and digital platforms.

2 Literature Review

Digitalization provides fundamental transformations in all spheres of human life and activity. Technology is becoming not only the engine for the development of new industries but also gaining important social roles, making a significant contribution to solving social problems, such as aging populations, social stratification, environmental problems, and climate change (Acemoglu and Robinson 2013). With the help of advanced science and technology, a “smart” society arises, based on new values of orientation to human needs, flexibility, creativity. Under the influence of digitalization, the labor market, healthcare, education, and spatial development are cardinally changing.

The introduction of new technologies and radical changes in the life sciences (bioinformatics, genomics, cell technology, synthetic biology) make it possible to modernize and personalize modern medicine by constantly monitoring the health status of each person, increasing the speed of medical care, and selecting individual therapy options, all this makes it possible to treat previously non-incurable (incurable) diseases. The development of bioinformatics allows the analysis of new DNA, RNA, or protein sequences only through *in silico* methods, which significantly reduces the time and material costs of conducting experiments. Bionics (biomimetics) is being developed rapidly, studying the possibilities of applying the principles of organization and functioning of living matter in the creation of technical systems and devices (Robosapiens 2017), for example, exoskeletons—mobile, wearable, robotic, electrified, or mechanized structures designed to complement the user’s physical abilities (Bender 2019). Neurotechnologies not only help to create systems similar to the human brain in algorithms but also to study the mechanisms of behavior and the potential for brain development. In the future, this will contribute to the development of a person’s cognitive abilities, increase his working capacity,

and overcome the negative consequences of stressful situations (Tremblay et al. 2017).

Digitalization is causing technological complication and the disappearance of a number of traditional professions due to the automation of the corresponding labor operations and at the same time the emergence of new professions and the growing demand for non-algorithmic work and creativity, the so-called human in man (Beil et al. 2005). A significant part of labor relations and entire segments of employment is moving into the virtual environment, the flexibility of forms of which is significantly increased (the share of nonstandard, partial and unstable, one-time employment, etc.).

Digitalization requires the formation of new competencies in the labor market, which entails the restructuring of the entire education system. Transnational forms of education are developing (cross-border education), and a highly competitive environment is being formed in the rapidly growing global educational market, where both traditional (USA, UK) and new providers of educational services from East and Southeast Asia, Eastern Europe, and the Middle East coexist. The number of students entering universities in another country after graduation is growing by 10% per year and by 2020 will reach 8 million. Many countries, including Russia, have already adopted and are implementing education export support programs. In the near future, the labor market will experience an increasing influence of the exit of young workers, representatives of Generation Z, using digital technologies almost from birth (digital natives) and having unlimited access to information and developed digital competencies. Their share by 2025 will reach 25% of the total global employment (BCG 2017). The key motivating factor for them is the possibility of personal development (including those not related to work), and not just career growth and the level of remuneration, as in previous generations.

Accordingly, companies will have to change the tactics of hiring and retaining personnel, taking into account the values of the new generation (Shiu and Lam 2008).

Online technologies and the forms of education based on them are increasingly becoming part of the educational process at universities. The development of mass online education, the emergence of high-quality mass opens online courses (MOOCs), the abundance of information in open sources lead to the loss of a monopoly on knowledge transfer by universities. At the same time, open-access training courses of leading world universities have a significant impact on educational technologies (Myovella et al. 2019). The audience of such courses can reach millions of people, and training can be done in a user-friendly schedule and anywhere in the world. However, the digitalization of education also introduces a number of difficulties, requiring the solution of the issues of adapting the educational system to the digital environment, working out the ethical aspects of the use of digital technologies in the long term (Njoh 2017). The transition to personalized learning makes it necessary to implement a system of adaptive education and assessment that allows you to take into account the needs, level, and interests of the student. The teacher becomes more of a mentor and navigator in the educational process and not a “reproducer” of information.

The rapidly growing volume of data significantly exceeds the ability of a person to assimilate it, which determines the demand for artificial intelligence technology and electronic assistants. An increase in the speed of information exchange and its application requires an increase in the information literacy of the population, which raises the issue of digital inequality and the risks of a “digital split” on the agenda (Pradhan et al. 2014). At the same time, the reduction in the cost of technology leads to the emergence of intelligent devices that ensure active social inclusion of people with disabilities, single elderly people, etc., and the use of technology in public places allows solving social problems through cooperation. At the same time, the “smarter” access devices become, the higher the owner’s vulnerability level. The spread of the Internet of things will make a person virtually transparent to any interested parties and structures, which, in turn, creates a demand for the development of information security technologies and cybercrime technologies.

3 Methodology

In this study, a comparative analysis of the institutional changes which should be implemented by countries of such as Kazakhstan in the face of the coronavirus outbreak in order to prevent its spread was carried out. The reason behind choosing the aforementioned countries was the fact that the economies of these nations are highly dependent on energy sales.

4 Findings

Oil is the most important export item both in the world as a whole and in Kazakhstan, where it accounts for more than 80% of all commodity exports of Kazakhstan. Thus, if Kazakhstan continues to specialize in the extraction of oil and other natural resources, it is unlikely to achieve a significant increase in the average per capita income in the medium term. In addition, it is unclear how long Kazakhstan’s existing reserves of natural resources will last. According to available estimates, existing oil fields in Kazakhstan will be sufficient for oil production at the current rate for 20 years. This is relatively short term: Kazakhstan’s reserves, for example, are believed to last for more than 60 years, Saudi Arabia for more than 70 years, and the United Arab Emirates for more than 90 years.

The concentration of commodity-dependent economies in the oil industry determines their high dependence on the situation in the world oil market. It means that a significant part of the state budget revenues of these states is generated through the sale of raw materials on foreign markets and, accordingly, any decrease in oil prices leads to a decrease not only in exports and government revenues, but also contributes to a slowdown in economic growth. This demonstrates that the fall in oil prices in the face of coronavirus outbreak once again emphasizes the need to shift away from the raw material orientation and the need to diversify the economy,

including the development of the digital economy and the development of alternative forms of conducting business.

Today, the world is on the verge of new global changes. The innovations that came into our lives with the advent of the Fourth Industrial Revolution (Industry 4.0)—the wider use of information and telecommunication technologies, the use of the Internet by about 60% of the world population (this figure increased against the backdrop of the COVID-19 coronavirus pandemic), robotics and artificial intelligence technologies, the Internet of Things (IoT—Internet of Things), big data (Big Data) and digitalization resulting from all of the above open up new opportunities for us. These opportunities are now revealing themselves more than ever.

In connection with the infection of the coronavirus that began in China earlier this year and the declaration of the virus (COVID-19) as a pandemic by the World Health Organization on March 11, millions of people in homes and offices began to use digital platforms more actively. The coronavirus pandemic that has swept the whole world resembles the phenomenon of the Black Swan (the term used by the American economist and writer Nassim Talebi in his book *Black Swan Under the Sign of Unpredictability*—meaning a global phenomenon that is difficult to predict and has significant influence). This time, the emergence of a new type of coronavirus epidemic caused the debate in the world on digitalization of the economy and various fields of activity and accelerated the transition to the digital economy.

Coronavirus gives impetus to the use of new generation technologies, bringing digital technology to the fore.

At the moment, the Black Swan phenomenon, in addition to opening the door to changes in the economy at the global level, can also change our behavior—to change both people and organizations. Against the backdrop of the pandemic, the heads of government refuse international tête-à-tête meetings, preferring conferences in Skype, Zoom, and other similar programs to them; business, education, and other various fields are moving to the online platform. As a result of working at remote workstations and video conferences, the wider use of connection services, and the work of millions of people outside the office from home, costs are significantly reduced. Experts believe that in the fight against a pandemic, fast delivery without people and contact fully demonstrates its advantages. Service robots, self-service stores without sellers, etc.—form a new direction and help reduce the risk of infection. The spread of infection in the world isolated many cities in America, Europe, and Asia and seriously affected the development of digital technologies in the economy. Fearing a virus infection, people and companies now prefer offline trading to its online counterpart, which increases the share of e-commerce.

The current situation leads to a great demand for online applications, digital technologies, and this, in turn, makes it necessary to exist and build a sustainable infrastructure in the countries of the world. So, thanks to the transfer of millions of people to their home working hours, the demand for connection services is growing rapidly, the volume of content transmitted over the Internet is increasing, which makes the development of infrastructure necessary.

Currently, authorized bodies, private companies, and scientists are trying to find new ways to combat the virus. In China, police using drones monitored people who

did not wear masks in areas at risk of infection, and Internet giants (Google, Facebook, Amazon, etc.) launched a campaign to combat false information related to the virus. The Canadian company “BlueDot” collects information from around the world about cases of new infections and, using artificial intelligence, is trying to predict the presence of infections in new territories in China and other countries of the world. The American start-up “AIME” (Artificial Intelligence in Medical Epidemiology—Medical Epidemiological Artificial Intelligence) has been using the capabilities of artificial intelligence since 2015 to analyze epidemics and predict them.

China’s real-time fight against coronavirus has shown the world the power of modern technology and superApps (special mobile applications that combine several services). At the end of December 2019, cases of infection that erupted in China began to decrease by February due to the mobilization of the country and the use of all possible means to combat the virus. The use of artificial intelligence applications from large Chinese companies such as Baidu, Alibaba, Alipay, and others has led to significant effects. More than 50% of the requests received in the medical system were transferred to the online format, as carriers of the virus could transmit it during a visit to the doctor. For this, a connection to a high-speed 5G network was created and the widespread use of a telemedicine system began. At the same time, medical applications were provided for use, providing patients with communication with doctors, pharmacies, as well as applications that provide useful tips on combating the virus. What is happening demonstrates that mitigation of the damage caused by epidemics is made possible thanks to information technology, including, thanks to the Internet—digitalization has changed the approach of mankind to the diagnosis and monitoring of many diseases.

For spatial processes of development of digital economy are of great importance among economic institutions. When these institutions work well, firms and people are encouraged to innovate as a source of revenue from their activities. Good institutions also attract investment from foreign firms with new technological competencies that are not necessarily related to the existing production structure in the country or region. New digital technologies involve costs, but firms are encouraged to bear these costs because they can expect to make a profit in the case of success.

Therefore, it is very important to develop institutions for the development of the digital economy in commodity countries.

The first and most important is the availability and reliability of the telecommunications infrastructure. The availability of broadband Internet should become a state-guaranteed social minimum. All state institutions should be connected to it, and most houses in settlements should be able to connect. In addition, mobile Internet also becomes a necessary social minimum where it is impossible to connect broadband Internet. Now, for example, in Kazakhstan and in Russia, mobile operators for their towers receive land on a common basis or rent it from private owners. Therefore, communication coverage may not only develop but may even worsen due to the fact that the number of towers in a particular place has decreased. It is necessary to allocate a special category of land for them and in any

master plans, detailed planning plans to allocate land for them already, since they are very small.

The second should be a digital state. Right now, in Kazakhstan they give out material assistance through an application sent to the E-government platform, and immediately there were problems with access to the site, because, apparently, it was not designed for such a number of requests. Accordingly, the state should approach the filling of its sites and services with maximum responsibility. President Tokayev has already talked about introducing the institute of digital officers in state bodies, but in my opinion, there is still a need for constant checks on the occupancy and relevance of state websites. Everything that the state does, except classified information, should be available on the Internet.

Thirdly, trade should move to the Internet. Now in Kazakhstan, the share of online commerce is about 4%. This is very small. We must reach the level of 20–25%. Online trading will help to significantly reduce the volume of smuggling, counterfeiting and tax-free trading. At the same time, it is necessary to ensure free online trading throughout the territory of the Eurasian Economic Union without various restrictions, certificates, and so on.

For example, for example, we can buy goods in Russian stores, but on the contrary, it can sometimes be difficult due to restrictions of state bodies of other countries. It should be understood that it is impossible to limit duty-free trade with third countries. The threshold of 200 euros of duty-free purchases should remain on; otherwise, the Russian Internet giants will monopolize the entire market.

Fourthly, the work of mail and various delivery services is an extremely important factor. Payments are sent through the mail, pension and social payments are received through the mail, goods are ordered and received from the catalogs, well, in addition, there is still the opportunity to receive financial services. For the countryside, mail is an island of life. Therefore, by the way, the US Post constantly works at a loss to itself, but it ensures the coherence of the entire US economic space. Well, now, sitting in quarantine, we see that delivery is becoming a vital element of the urban economy. Without couriers, life would have become generally unbearable. And, perhaps, the courier will become one of the most important forms of employment for young people and, in general, for low-skilled labor. Therefore, it is very important that couriers have some kind of social guarantees, and delivery services have certain preferences for official vehicles, warehouses, and personnel.

The fifth important component of the digital economy is warehouses. The presence of large warehouses with automated loading and unloading systems is an essential element of urban security. Indeed, it is only thanks to them that the city can live in quarantine. Therefore, it is extremely harmful to think that warehouses with railway dead ends have no place inside the city. As you can see, under the conditions of quarantine, such warehouses are an ideal solution for the whole city—the goods are imported with minimal labor force participation, there is no need to organize a large flow of trucks from the region to the city.

The sixth part of the digital economy is a system of automated and remote work. Nowadays, employers are increasingly realistically evaluating both the amount of labor and the maintenance of offices. As we always remember, the human factor is

always the most vulnerable. Automated accounting systems, document management, order tracking, collaboration on documents, and so on—that is the future. And, of course, systems that allow you to work remotely from anywhere in the world. In general, there will be a big reevaluation of the role of staff and the office in the life of each company.

A seventh of the new digital economy is distance education. Now it is possible only as a second higher, but most likely, it will be necessary to make it possible and the first in certain specialties or subjects. Of course, this requires much more responsible students, but it is necessary to raise the level. In fact, the university should mainly provide and emphasize the practical work of students, as close as possible to the real requirements of employers. You need to invest not so much in buildings as in laboratories, libraries, and software.

In this study, an analysis of the institutional changes implemented by Kazakhstan in the face of the coronavirus outbreak in order to prevent its spread was carried out. The reason behind choosing the aforementioned countries was the fact that the economies of these nations are highly dependent on energy sales.

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