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THE GROWTH OF CHINA'S INTERNET TECHNOLOGIES AND DIGITAL ECONOMY

The article presents an analysis China's digital economy's development and the latest achievements of China in this area. The digital economy already covers 30.6% of China's GDP. Without a doubt, the digital economy has become China's busiest area of economic development in recent years. In 2017, it was first mentioned in a government report. They began to consider it as a new force that accelerated the growth and development of China's economic life. The very first results of the development of China's digital economy have shown the whole world the enormous potential and attractiveness of the irregular growth of science and technology.

The digital economy is the modern development path of the global economy. It can not only increase economic productivity in undeveloped regions, but also, more importantly, give the people of these regions the most diverse opportunities for positive change. With digital communications, people from even the most remote areas can enjoy the same high-quality content as residents of large cities. The population of the undeveloped regions will be able to obtain the necessary information in the field of education, medicine, trade operations, etc., with a minimum cost, sell their agricultural products at higher prices. The digital economy provides opportunities to help the poorest. This is what inspires people in developing countries.

Key words: mobile payments, cloud computing, network security, e-commerce.

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Қытайдың ғаламтор технологиялары мен сандық экономикасының дамуы

Мақалада Қытайдың сандық экономикасының дамуына талдау және Қытайдың осы саладағы соңғы жетістіктері қарастырылған. Сандық экономика қазірдің өзінде Қытай ЖІӨ-нің 30,6%-ын қамтиды. Сандық экономика Қытайдың соңғы жылдардағы экономикалық дамудың ең белсенді саласына айналғаны сөзсіз. 2017 жылы бұл туралы алғаш рет үкіметтің есебінде айтылды. Олар оны Қытайдың экономикалық өмірінің өсуі мен дамуын жеделдететін жаңа күш деп санай бастады. Қытайдың сандық экономикасының алғашқы нәтижелері бүкіл әлемге ғылым мен техниканың жедел және қарқынды өсуінің зор әлеуеті мен тартымдылығын көрсетті.

Сандық экономика – әлемдік экономиканың заманауи даму жолы. Бұл дамымаған аймақтардағы экономикалық өнімділікті арттырып қана қоймай, сонымен қатар, ең бастысы, осы аймақтардың адамдарына оң өзгеріске алуан түрлі мүмкіндіктер береді. Сандық байланыстың көмегімен, ең шалғай аудандардағы адамдар да үлкен қалалардың тұрғындарымен бірдей сапалы ақпаратқа қол жеткізе алады. Дамыған аймақтардың халқы білім, медицина, сауда операциялары және т.б. салалардағы қажетті ақпаратты минималды шығындармен ала алады, ауылшаруашылық өнімдерін жоғары бағамен сату мүмкіншілігі пайда болады. Сандық экономика кедейлерге көмектесуге мүмкіндік береді. Бұл дамушы елдердегі адамдарды шабыттандырады.

Түйін сөздер: мобильді төлемдер, бұлтты есептеу, желінің қауіпсіздігі, электрондық коммерция.

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Развитие интернет-технологии и цифровой экономики Китая

В статье проводится анализ развития цифровой экономики Китая и рассматриваются последние достижения Китая в данной области. Цифровой экономикой уже сейчас охвачено 30,6% ВВП Китая. Несомненно, цифровая экономика стала самой оживленной областью

экономического развития Китая за последние годы. В 2017 г. о ней впервые упомянули в отчете о работе правительства. Ее стали считать новой силой, ускорившей рост и развитие экономической жизни Китая. Уже самые первые результаты развития цифровой экономики Китая показали всему миру громадный потенциал и привлекательность скачкообразного роста науки и техники.

Цифровая экономика – это современный путь развития мировой экономики. Это может не только повысить экономическую производительность в неразвитых регионах, но и, что более важно, дать людям этих регионов самые разнообразные возможности для позитивных перемен. Благодаря цифровой связи люди даже из самых отдаленных районов могут наслаждаться тем же высококачественным продуктом, что и жители крупных городов. Население неразвитых регионов сможет с минимальными затратами получать необходимую информацию в области образования, медицины, торговых операций и т.д., продавать свою сельскохозяйственную продукцию по более высоким ценам. Цифровая экономика предоставляет возможности помочь самым бедным. Это то, что вдохновляет людей развивающихся стран.

Ключевые слова: мобильные платежи, облачные вычисления, сетевая безопасность, электронная коммерция.

Introduction

The digital economy already covers 30,6% of China's GDP. Due to it, the country managed to create 2,8 million new jobs and ensure annual employment growth of 21%. Without a doubt, the digital economy has become China's busiest area of economic development in recent years (Bilateral trade flows by ICT goods categories, annual, 2000-2015). In 2017, it was first mentioned in a government report. They began to consider it as a new force that accelerated the growth and development of China's economic life.

The very first results of the digital economy in China have shown the whole world the enormous potential and attractiveness of the irregular growth of science and technology. In just a few years, mobile payments have been incredibly popular in China. They crossed the era of bank cards, the formation of which took hundred years. In the cities of the first and second lines, payment terminals (information management system at the point of sale) are no longer required, and for the vast majority of daily transactions, your mobile phone is enough.

The digital economy is the modern development path of the global economy. It can not only increase economic productivity in undeveloped regions, but also, more importantly, give the people of these regions the most diverse opportunities for positive change. With digital communications, people from even the most remote areas can enjoy the same high-quality content as residents of large cities. The population of the undeveloped regions will be able to obtain the necessary information in the field of education, medicine, trade operations, etc., with a minimum cost, sell their agricultural products at higher prices. The digital economy provides opportunities to help the poorest. This is what inspires people in developing countries.

The digital economy was the result of the deep entry of mobile Internet, cloud computing, big data and other new generation technologies at each level of society. Now it is one of the main engines of growth in the global economic system. According to the China's State Internet Information Office over the past two years, it has been developing rapidly in China because of the "Internet+" program. It led to the integration of digital technology and the traditional economic system. Surveys conducted by Tencent Research Institute showed that the total growth of China's digital economy in 2016 amounted to about 62%, or 22,77 trillion yuan, and this is a welcome light during the painful period of transformation and modernization of the country.

Justification of the choice of article and goal and objectives

A report published in 2017 work of the government spoke about the in-depth development of the "Internet+" program and for the first time clearly defined the requirements for the rapid growth of the digital economy. From the Internet to "Internet+" and beyond – their development is inextricably linked with each other and keeps up to date. Thus, the Internet represents new technologies and advanced productive forces. "Internet+" focuses on communication, which leads to the activation of all industries, the growth of their innovative potential. And in turn, the digital economy reflects the results and effectiveness of the strategy of "connecting everything with everything". That is "Internet+", and the digital economy is its result. Traditional industry integrates with the Internet sphere through the concept of "Internet+", the boundaries between them are erased, which leads to rapid development. On the one hand, smoothing the process of transformation of economic forces contributes to structural transformations on the demand side. On

the other hand, it will help to realize our strategic goal: to become a strong country with a developed network structure.

The digital economy is a new form of economic and social development. It replaced the industrial economy, which replaced agricultural. People increasingly understand the realities of a new type of economy. The digital economy has been given many definitions, but the most representative of them can be considered the one that was given at the G20 summit in 2016 in Hangzhou in the document "G20 Digital Economy Development and Cooperation Initiative". It says that the digital economy is tactics of conducting the national economy, where digitized knowledge and information are the key production factors, modern information networks are the storage medium, and information with communication technologies (ICT) are the driving force behind productivity and optimizing the structure of the economy.

Material and research methods

In the study, we used mainly local materials of Chinese experts and economists. In order to achieve purpose of research, we used the methods of comparative analysis in the process of implementing of our work. In this study also were used scientific methods and techniques: scientific abstraction, grouping, qualitative expert estimates, quantitative assessment, comparative analysis and synthesis. In addition, was used the method of observation in the usingof printed media materials, articles in websites and social networks.

Main part

The quick growth of mobile Internet and the Internet itself made it possible to create a "connection of everything with everything" - "a person to a person", "a person to a thing", a "thing to a thing", which led to an explosive increase in data volumes. Worldwide tempo rates double every two years in accordance with Moore's law. Enormous amounts of data, their processing and application gave rise to such a concept as Big Data. Their importance is growing every day, and soon they will become the main asset and resource of enterprises: the competitive advantage will be on the side of the one who owns them. The same can be said of the state. The US government believes that big data is the "new oil of the future", the "currency" of the digital economy, and yet another major resource of the state, in addition to the rights to air, sea and land space.

China late embarked on the development of the digital economy and lagged behind the developed countries of America and Europe for a long time. According to China Info 100 (the Chinese research platform for informatization), in 1996 China's digital economy amounted to $ 4,3 billion, and this is only 1/63 of the volume in the United States, 1/23 in Japan, 1/6 – in the UK. And only at the beginning of the XXI century, especially over the past ten years, the growth of the digital economy in China accelerated sharply (Rastyannikova E.V. 2016: 63).

According to a report by Tencent Research Institute in 2016, "Internet+ Digital Economy in China – 2017", the total digital economy of China amounted to about 22,77 trillion yuan (or $390 million in terms of money). This is the second largest digital economy in the world, China goes the second after the USA. China has become a leader in terms of shipments of computers, mobile phones, number of Internet users, volumes of online retail trade and the development of mobile Internet. The USA and China have created the top ten largest Internet companies in the world.

The digital economy not only actively stimulates its own growth, but also helps optimally allocate resources in traditional industry. It corrects the structure of production, transforms and modernizes them. On April 19, 2016, Chairman Xi Jinping in a working conversation on network security and informatization emphasized that it is necessary to deeply integrate the Internet into real sectors of the economy, use data exchange to enhance the movement of technological, financial, human and material flows, and optimize resource allocation.

Manufacturing is the core of the national economy, the main battlefield in the framework of the «Internet+» program and the development of the digital economy. Information technologies of a new generation are integrating faster and deeper with traditional production, leading to its digitalization.

China has made great strides in the transformation and development of production. The level of application of digital, network and intelligent technologies has grown. The integration between the digital economy and traditional production on demand creates new management models in the integration of networks and production, large-scale custom production, remote intelligent services, etc. The Chinese company Weichai Power has created a worldwide platform for joint research and development of engines, on which development fell by a third – from 24 months to just 18. By switching to custom-made production, in 2016, the Hongling Group managed to double its revenue from sales of custom-made products and profit compared to the previous year. Sany Heavy Industry Co., Ltd,

through its intelligent service platform, provides monitoring, operation and maintenance services to over 200,000 pieces of equipment worldwide. This has increased its profit over the past three years by more than $2 billion. The Chinese company Casi Cloud through its platform serves more than 440,000 registered corporate users, providing them with services and industrial software solutions. In 2016, the total volume of operations on the platform reached $19,3 billion (Melyantsev V.A. 2016: 71).

Under the conditions of "three simultaneous periods" economic growth is affected by the problems of the total number of changes and structure, the last one being most noticeable.

The stimulation of structural transformations on the supply side is a serious innovation that creates a new model that stimulates economic development. The use of the advantages of the Internet, the development of the digital economy, the stimulation of the balance of supply and demand, the unification of the main innovative factors, as well as the optimal distribution of resources will help to solve the deep problems that are holding back development.

Firstly, the Internet increases the possibilities for an effective offer. This is a main direction of structural transformations. Xi Jinping proposed five main objectives: the elimination of excess production capacity and an oversupply of market supply, the reduction of excess debt burden, cost reduction and breakdown of bottlenecks. They reduce inefficient supply in the low price segment and at the same time increase effective supply in the middle and upper segment. Deep integration between the Internet, production, logistics, agriculture and other traditional industries promotes innovations in the organization of production, business models, supply chain management, etc., increases the efficiency of management and organization of production, leads to the modernization of traditional industries. At the same time, new technologies, products, methods and management models based on the Internet are rapidly developing. The Internet, as the foundation of mass entrepreneurship and mass innovation, unleashes the unlimited creativity of people (Clark Duncan 2017: 42).

Secondly, the Internet increases overall demand. This is an integral and important part of the structural transformations on the supply side. In China, the level of average income and consumption has grown, and custom-made production is increasingly able to meet the needs of customers. The Internet is increasing market sales, allowing you to promote long-tail products in a variety of areas. Users can receive better products, better service. This improves management methods, the quality of user perception of goods and services, creates new methods of consumption and creates effective consumer demand. At the same time, the "Internet+" and "Made in China 2025" programs facilitate investment in the construction of a new generation of information infrastructure, accelerate the implementation of large projects under the "Internet+" program: intellectual production, development of intellectual products, etc.

Thirdly, the Internet facilitates the transition from a low-level balance between supply and demand to a high-level one. The main task of structural transformations is to improve the quality of supply, its ability to better satisfy ever-growing demand. The demand structure is shifting from goods necessary for survival to goods of a higher segment. The release and development of social production capacities stimulates the adjustment of the structure, enhances the adaptation of the supply structure to changes in demand, and increases the overall factor productivity.

The digital economy forces people to use their mental abilities, increases self-awareness, stimulates a sharp jump in production capacities, leads to a shift in the structure of production and an increase in employment. A report by the Tencent "Internet+" Research Institute of the Digital Economy in China in 2017 it is said that in 2016, the Digital Economy created 2.8 million jobs in China. This is 21% of the total number of new jobs this year. An EU paper "i2010 - The European Information Society for Development and Employment" of 2005 expresses the hope that ICTs will become a powerful engine for economic and employment growth. The White Paper on Informatization and Telecommunications, released in Japan in 2015, says that if enterprises can take full advantage of smartphones, cloud computing, and other ICTs, they can create more than 200,000 official jobs (Ivanova S.V. 2018: 101).

In a report of the government at the All-China People's Congress and the People's Political Consultative Council of China in 2017, Premier Li Keqiang said: In the era of the Internet, faster and cheaper information networks are necessary to develop each sector of the economy. This year, speeds are increased and costs fell down, during the year the fees for long-distance mobile communications and roaming were completely canceled, the cost of Internet access via dedicated networks for small and medium-sized businesses was significantly reduced, and international telephone tariffs were reduced as well.

Due to their higher speed and bandwidth compared to 4G, 5G networks are able to fit the needs

of users – they support virtual reality technologies, ultra-high-definition video, etc. And besides, they are more reliable, they have lower time delays, and they are better suited for industry applications such as automatic piloting, smart manufacturing, etc., provide connectivity and interaction between multiple devices.

China began to develop mobile communications later than other countries, but is now included in the group of world leaders in developing 5G standards. At the beginning of 2016, 5G technical tests were launched; at the end of 2016, Huawei's Polar Code solution for encoding networks was included in international 5G standards. In 2020, China set a goal to launch 5G in commercial operation (Tsvetkova N.N. 2018: 90).

In China, there are also more and more pilot projects on the distribution of communication services, the development of broadband networks in rural and remote areas. Thus, the government has set the goal by 2020 to cover networks of over 90% of poor villages. Increasing speed, reducing costs, helping people in need with the help of networks and other measures will reduce the digital divide between the village and the city, will fully develop the Internet and increase rural incomes, and help rural residents overcome poverty.

In recent years, China has been rapidly building railways. The length of railways is constantly growing, reaching 124,000 km at the end of 2016. Of these, more than 22,000 km are high-speed roads, and this is more than 60% of all railways around the world. Railway infrastructure is gradually shifting to digital technology (Tsvetkova N.N. 2018b: 95). By the end of 2015, more than 600 large, medium and small computers, about 100,000 microcomputers were working on the railways, a railway communication network was created covering the head office of the Chinese Railway, Railway Administration (CR) and main sections.

The railway communication network consists of two main components – the transport network and the data transmission network.

A transport network in China consists of three networks: a backbone layer, a convergence layer, and an access layer. The first is equipped with transmission equipment using synchronous digital hierarchy (SDH) technology and high density wavelength division multiplexing (DWDM) technology. It provides communication between the parent company of CR and the railway departments and within the latter, as well as a bypass protection channel for the network, which includes all the railway management tools. The network at the convergence level is responsible for transmitting signals that come from control channels on the hauls along the railway tracks to the nodes of the control stations and the backbone network. It also provides bypass protection channels for a network of related offices. The network is equipped with SDH and DWDM equipment, which transmits signals between all controlled stations and from stations – to control room and control stations. The access level network uses MSTP technology, which provides access to and transmission of information from railway stations and railway lines. As nodes of the access level network, nodes at stations and stages are used.

The data network is a dedicated broadband network based on IP technology. It covers all railway stations and designed specifically for the railway system. With the help of MPLS VPN technology, data from information systems of dispatch control DMIS (traffic control information system), TMIS (transport management information system), ticket system, etc. are transmitted through it. Transmission network integrated in the railway structure Data works separately, independent IP-based network. It is intended for the DMIS system, the railway management information system (TMIS), ticket and other systems. The bandwidth of this network is relatively small – mainly 2 Mbit / s or n connections of 2 Mbit/s. A separate network is created for each service (Lu Hui 2019: 68).

In addition, a number of applied information systems have been developed in China: a dispatch control system for trains, an information management system for rail transport, a system for selling tickets, reservations, etc.

Nowadays almost all major transport highways have been laid in China as a part of the five horizontal and five vertical road transport development program. The road network is constantly growing. By the end of 2015, the total length of existing roads in the country reached 4,57 million km, of which 120,000 km are high-speed routes. All of them are covered by a fiber-optic network, of which 19,000 km are in the fiber-optic backbone network, which covers 28 provinces (autonomous regions, cities of direct subordination).

Although for a long time road construction in China showed high rates, they were restrained by a number of problems, in particular, the lack of a single investment and a single construction subject at an early stage, the incompatibility of technical standards, etc. The lack of a common approach to the integrated construction of communication resources was a constraining factor and transmission, for

network structure and equipment configuration, for protective measures for all network roads. Scattered fiber optic transport resources did not suit for the requirements in creating a network.

In December 2011, the Ministry of Transport developed and published the General Program for Connecting High-Speed Roads for the Information and Communication System, which detailed the technical solution and project standards. At the beginning of 2013 at the All-China Workshop on transport issues, the ministry pointed out the need for further development of an information and communication system for high-speed roads. Its main task is the construction of a communication network that would cover the entire road network in the country. In other words, it was significant to create a high-speed digital fiber-optic network with a large bandwidth throughout the country. Which should lead to the informatization of transport, increase the level of management and public services, the possibility of emergency response and the state's preparedness even in case of war.

During the construction years, by September 30, 2014, the connection of the transport equipment system to the fiber optic network at 259 stations of the trunk line was completely completed, and control tests were carried out. The system was launched on five ring roads (Central China, southeast, northwest, central western region, southwest) and the northeast line. It covered the provinces of Liaoning, Jilin, Heilongjiang, Hebei, Shandong, Anwei and Jiangsu, the cities of Beijing, Tianjin, Shanghai, Zhejiang, Fujian, Jiangxi, Hunan, Hubei, Henan, Shanxi, 28 autonomous regions and cities of direct subordination: Ningxia, Gansu, Qinghai, Shaanxi, Sichuan, Chongqing, Yunnan, Guizhou, Guane, Guangdong. In these regions, the system is already linked into a single network. A combination of fiber optic transport network and technology is used for transmission. Synchronous digital hierarchy created five ring networks and one linear chain, the total length of the lines is 19,000 km.

While planning the 13th five-year plan, China set a number of tasks: to use the resources of the state electronic government network, public networks, dedicated networks and other networks as efficiently as possible, create a unified information and communication backbone network for transport in all provinces, and connect it to the national transmission network for high-speed roads; to increase the stability and reliability of this network, to continue research and the creation of efficient market mechanisms for the operation and maintenance of the network; implement the "Broadband China strategy". The priority tasks included assistance to telecommunication enterprises in creating a broadband network for high-speed roads, covering bus stations and other transport terminals with broadband networks with the ability for the user to choose an operator; simultaneously with other countries, the creation of a marine satellite communication system, the strengthening of control over international resources, the formation of an integrated ground-air basic information and communication network for a transport system spanning the entire globe; the use of high resolution telemetry satellites. Digitalization of more than 3,000 km of the Qinghai-Tibetan and Sichuan-Tibetan routes, the collection of basic data for disaster tracking, management, repair and maintenance, has begun (Woetzel J. 2017: 72).

Innovations in the digital economy inevitably lead to difficulties in applying the traditional legal system and regulatory methods. Therefore, on the one hand, it is necessary to constantly refine the legislative system of China, for example, to introduce laws such as digital rights property, intellectual property rights, digital taxation and other laws to provide the necessary institutional guarantees for the development of the digital economy. On the other hand, the necessary space should be left for digital economic innovation – one cannot strangle them with overly strict supervision. At the same time, to strengthen exchange and cooperation with international organizations and foreign governments, we must use the G20, APEC, BRICS, SCO platforms. This will assist in the development of international trade, investment and judicial rules that promote the healthy development of a transnational digital economy.

In the 2017 Digital Evolution Index ranking, China ranks 36th place, as shown above. However in China's Global Internet Development Index has been given a second place in the world, after the USA. Which of these indices is truer reflection of the situation:

In 2018, sensational news on the economy press appeared that in the development of the digital economy, China is second place in the world. Indeed, according to the Development Report Ternet in China 2017, presented at the fourth World Conference on the Internet, held in December 2017 in China the city of Wuzheng, in 2016 the volume of Chinese digital economy reached 22,58 trillion yuan (about 3,4 trillion dollars), which amounted to 30,3% of the country's GDP and brought China to this second indicator place in the world after the USA [1]. In 2017, the digital economy in China

accounted for 32,9% of GDP (27,2 trillion yuan, or $ 3,9 trillion) (Belova L.G. 2018: 28).

What is this data based on? First of all, here is taken broad definition of economics (as in UNCTAD), taken into account all six groups of indicators used in the report on global internet development.

How was the internet used in China? The number of Internet users in China is growing rapidly. In 2016, there were more than 710 million Internet users. In 2017 China had about 750 million, in June 2018 - 802 million users, in December 2018 - 829 million Internet users, 817 million of them used mobile devices. Finally, in June 2019 they got 854 million users. This is so much more than anything the population of the countries in the European Union and the USA. The scale effect is colossal. In 2018, 98,3% of Internet users in China were reaching internet, including mobile devices. The same person can use different devices at different times. For three years the number of Internet users in China has increased by 20%.

E-commerce has been greatly developed in China. In 2016, 448 million people bought e-commerce products in China; June 2018 – 569 million (71% of users). In June 2019, this kind of trade had 639 million people using it (74% of all Internet Users) which means every second one in China. In two years, the number of customers in electronic commerce increased by more than 1/4, within 3 years – by 40% (La Comarre H. 2016: 55).

According to the "Statista" organization, in 2018 the total number of people around the world buying consumer goods in e-commerce, amounted to 2,8 billion people, it is 37% of the world population. In china to June 2018, 569 million people used e-commerce, 68% of Internet users, almost half the population, which is much higher than the world average. Nearly 1/4 of global customers trade between companies and individuals is Chinese. This is higher than their share in the global population.

The Chinese are buying various services online. So in 2016, 150 million Chinese ordered online take-out food, and the number such customers are growing rapidly. In June 2018, already 364 million (45% of users) ordered take-out food online, in June 2019. 421 million people used the delivery of prepared food, every third Chinese; and over 3 years, the number of people ordering food online has grown in 2,8 times. Chinese students studying outside of China had a survey. According to the survey, the delivered food was cheap, while they bring it very quickly, hot, and the company does not take money from clients if the order was delivered too long. This service is primarily used by working people and students. Older people prefer to cook themselves. One of the largest shipping companies ready meals EleMe is part of a group of companies led by "Alibaba". There are other food delivery companies, such as "Meituan".

In 2016, 264 million chinese booked online tickets for flights, trains and hotel rooms, in June 2018, 393 million (49%) used online travel booking services – transport tickets and hotel rooms, for two years the number increased by 50%.

159 million Chinese used taxi services in 2016 online, in 2018 – 346 million (43%). In almost two years, the number users of taxi services online increased 2,2 times. Already in 2016, 122 million Chinese used online car services sharing and car rental. In 2018, only rental services 245 million Chinese have used online bicycles (31% of users) (Annunziata M. 2016: 73). In 2019, 40% of Internet users use used DiDi taxi reservation service (joint ownership Alibaba and Tencent), which competed with Hello TransTech, which is supported by Alibaba Group.

Finally in China, the electric online payments were getting more attention. In 2016, 455 million Chinese carried out online, in 2018 – 569 million (71% of Internet users), the number during 2 years increased by 25%. In June 2019, 639 million – every second Chinese man used online payments (74% of all internet users). Within 3 years, the number of Chinese using electronic payments increased by 40%.

10 million Chinese people purchased financial products in 2016 by Internet, in 2018 - 169 million (21% of users) (an increase for 17 times). 417 million (52% of users) in 2018 used Internet banking services.

The Internet in China like in other parts of the world is also used for entertainments. In 2016, there were 391 million inter no-users who played online computer games. In 2018, 486 million Chinese people played online games, and again it is 60% of the total number of Internet users. The number of gamers who play in online games over 2 years increased by 24%. This is bigger than global average, the percentage of people playing online games can be explained by the young population of China compared to the population of North America, Europe, where the proportion of young ages is still higher than in mentioned countries. In China, India – a huge number of so-called "digital-aborigine people' they are under 25 years old.

More than 308 million people in China in 2016 read literature online, in 2018 – 406 million (51% of users). Over 2 years, this number has increased by 31%.

514 million Chinese people watched videos online in 2016. In June of 2018, 609 million (76,0% of users) watched movies online, the number increased by 18%. In 2019, more than 759 million (88,1%) users watched movies online (2018 had in total 92% of internet users around the world, who watched movies online, thus we can see the number of Chinese people getting close to be global).

The most recent data on the Internet's development in China are given in the 44th report of the Internet Information Center, which was published in September 2019. According to it, in June 2019, 854 million people in China were able to access the Internet, 847 million of them used mobile Internet (Zhan Dongyang 2018: 65). 630 million (74%) of them lived in cities and 225 million of them lived (26%) in countryside. As of June 2018, the number of rural network users in China accounted for 211 million, 26,3% of the total the number of network users, which was 2,04 million more than at the end 2017 year.

The digital economy is changing the way people live their lives. Also we can take to pieces what intests people in the Internet, 14,5% of the time is taken by exchanging short messages, 13,4% - to watch movies, 11,5% - to watch short videos, 10,7% - to listen to music, 9% - for reading, 8,8% - for online audio services, 4,5% - for Social networks.

If internet users in most countries use mostly messengers, social networks of American companies such as Facebook, Chinese users prefer their own instant messengers – WeChat (Tencent companies) and QQ (Baidu companies). The Chinese instant messenger WeChat (incoming Tencent group) there once were 0,94 billion users per month.

Alitalk, Momo, YY Live messengers work primarily with young audience. Alibaba, Tencent, NetEase invested in the creation of instant messengers for enterprises. Messengers are closely related to e-commerce and electronic payments. Considering this WeChat (Tencent company) proposed one fascinating initiative for Chinese New Year (Spring Festival) the Chinese usually give red and white envelopes with money to their families. WeChat has included a red newsletter app envelopes for Chinese New Year, now it can be done with using an electronic payment system.

For three years, in 2016-2019, the number of electronic users trade and electronic payments in China, which was high already in 2016, increased by 1,4 times, for example the number of users ordering take-out foods through online applications – 3 times. Here we try to understand its popularity.

In developed countries, there are many hypermarkets (commercial and entertainment centers), people are used to spending time there on weekends, combining purchases with a visit to the cinema, restaurants. This tradition is also accepted in Kazakhstan. In China, large hypermarkets have a much smaller role in retail than in developed countries.

Duncan Clark, author of a book about Alibaba and its creation, the body of Jack Ma (Ma Yun) "The House that Jack Built" explains key reasons for the popularity of e-commerce in China. One of these reasons is associated with high prices for land leading to high real estate prices, high rent, including for commercial establishments. "Marketing, customer service, human resources, logistics in China's traditional retailers have attracted much less investment than in Western countries. Therefore the Chinese retail market is highly fragmented and inefficient. In the United States, three biggest food stores make 37% of sales. In China, three biggest food stores are doing only 7% of sales (Rastyannikova E.V. 2016: 31). The largest department store in the United States presents 44% of total segment sales. And in China it is only 6%.

Despite the massive creation of shopping centers, supermarkets and shops within a walking distance, the level of retail business in China is still extremely low. For every person in the country there are only 6 square meters feet of retail space, which is 4 times less space than in the USA. That's why online shopping in China is more popular than in the West. As Jack Ma says: "in other countries e-commerce is the way to the store, but in China – it is a way of life". As an important period for the growth of e-commerce can also be considered 2003-2005 in China, at this time China had a "bird flu" epidemy, and consumers were afraid of infections, they began to buy more products online, thus it stimulated the growth of e-commerce.

Since 2009 Chinese e-commerce company Alibaba carries out its special initiative to increase sales. PRC State Council takes measures to stimulate developing e-commerce in the countryside. Chinese companies create serving e-commerce in rural areas, overcoming limitations, related to logistics and information flows.

Alibaba introduced an interesting initiative to development of Taobao villages. Villagers produce various goods to sell them through the Taobao website. Some villages specialize in furniture manufacturing; others specialize in the production of wooden toys, others grow flowers. And all this can be sold through the Alibaba company's Taobao website. In 2018 China had more than 3000 Taobao villages.

Villagers used to deal only with rural economy. Now many of them have got their own business (for example the production of paints, plywood, furniture transportation), their incomes grew. In China, more than 3,5 million small, mostly family, enterprises selling goods on the Taobao platform. Taobao movement contributed to the growth of rural incomes, employment opportunities for people who have previously migrated to cities, they return to their old villages. Village. Taobao model can become a good example for other countries" (Melyantsev V.A. 2016: 72).

In particular, the idea was proposed to develop African countries. Alibaba, or rather, its Ant Financial division operates in the field of electronic payments. Ant Financial Head Lucy Peng, he is one of founders of Alibaba, today is the head of this subsidiary Alipay research institute, in 2012 he talked about the launch of this service like that: "A simple model [deposit] provided in the early stages a reliable scheme for online shopping" Later, Alipay service was separated into a separate company, which was renamed as "Ant Financial". Alipay System was very convenient: buyers who were afraid to transfer money beforehand and stay without a purchase, transfer money to a depositor, sellers who were afraid not to get paid for the goods, they would send the goods after confirmation of receipt of money from a bailor. After getting their goods, sellers would get their money. This scheme has been and remains convenient for small producers and buyers purchasing retail goods on the Taobao electronic platform (Clark Duncan 2017: 60).

Over the past 10 years, China has become a leader in several areas of digital economies - particularly in electronic commerce and electronic payments. The development factors of the digital economy in China are not only positive зщштеы, but also disadvantages. Development electronic payments contribute to the fact that in China the number bank branches and ATMs are much smaller than in the same USA. Digital services fill existing gaps, deliveries of orders made online are cheaper, than shopping at supermarkets due to high rents. So we can come to conclusion that there should be fewer hypermarkets – more ecommerce, less ATMs – more electronic payments.

China estimates the share of the digital economy in various sectors of the national economy. Chinese explorer Zhang Dongyang published an article on the development of digital economy. ICT sector ("core" of digital economics, as defined by UNCTAD) accounted for 6,9% of GDP in China (5,2 trillion yuan), the remaining 23,4% is the "integration" part (Ivanova S.V. 2018: 109). The volume of the integration part of the CE in 2016 amounted to 17,4 trillion her, the average share of CE in the services sector reached 29,6%, in industrial 17%, in agriculture – 6,2%. In 2016, income from communication services amounted to 2,1 trillion yuan; revenue from Internet businesses equals to 1,3 trillion yuan; income from software sales and services reached 4,9 trillion yuan.

Of course, in terms of the intensity of digital transformation in China's industry and agriculture are inferior to such countries like Japan or South Korea, Singapore, Scandinavian countries. However, the colossal scale of the Chinese market is the growth of solvent demand of the population, and because of this reasons China's digital economy is also gaining ground.

China has developed the "core" of the digital economy: manufacturing ICT goods and ICT services.

Table 1 – Export of ICT goods from China by categories 2000-2015 years (billion dollars)

	2000	2005	2010	2011	2012	2013	2014	2015
ICT Products	44,1	234,1	459,5	508,0	554,3	605,8	607,6	607,6
Computer equipment	17,9	109,1	196,9	209,0	218,5	214,1	215,9	184,0
Telecommunication equipment	5,9	33,1	106,6	134,1	153,9	175,8	196,3	214,4
Consumer Electronics	11,3	46,8	64,7	66,0	69,3	70,0	71,1	74,1
Electronic components	6,6	25,5	74,1	82,2	96,1	130,4	107,3	119,8

China is a leading global exporter of ICT products as a whole and for each of the individual categories of goods indicated below. The export of ICT goods from China increased in 2000-2015

from 44 up to $608 billion, including computers – from 18 to 184 billion dollars, telecommunication equipment – from 6 to 214 billion dollars, consumer electronics – from 11 to 74 billion dollars, electronic components for ICT goods – from $ 7 to $ 120 billion (see table 1).

In 2015, China accounted for 31,2% of global exports of goods ICT, including 40,8% of exported equipment telecommunications, 38,7% – computer equipment, 37,2% – consumer electronics and 17,6% – electronic components for ICT goods.

Moreover, China is a manufacturer and exporter of digital devices, and today they also make components for the functioning of the Internet, which is helping to create the basis for the development of the digital economy in countries that themselves do not produce such technology, for example, in Africa.

Table 2 – Leading exporters of ICT goods, 2019 (billion dollars), exports, imports, and export growth (2018-2019)

Countries	Export of ICT goods in 2019, billion dollars	Rates of growth 2018–2019,%	Import of ICT goods, 2019, billion dollars
China	620,3	10	329,8
The Republic of Korea	143	29	71,9
Taiwan	140	16	63,9
Singapore	119,5	8	91,4
Germany	72,7	15	102,5
The USA	68,6	0	351,7
Malaysia	67,1	16	
Mexico	66,0	9	63,5
Japan	56,3	9	87,4
Netherlands	55,6	10	64
all the countries	1632,2	4	

In 2017, 86% of global exports of ICT goods accounted for 10 countries. China was the first ($612 billion), its share reached 37,5%. Export from the following Republic of Korea was 142 billion dollars (9% of exports). World ICT Export and exports from China in 2013-2015 grew pretty slowly that was associated with rather sluggish demand, saturation of the market in some countries and the stagnation of already low incomes in others. However, in relation to 2017, they already spoke of a “boom” between national trades in digital equipment. In 2017, increased export of electronic components, which was associated with exponential growth in demand for various kinds of sensors, detectors and other digital devices for the Internet. In connection with the development of the Internet in 2017, the growth of exports of ICT goods took place at a faster pace than the entire world export. And the main exporters of electronic components for ICT are countries of East and Southeast Asia (Lu Hui 2019b: 68). In 2017 ICT goods exports reached $2,1 trillion, accounting for 13,4% of the total world export of goods. Export growth of electronic components for ICT goods – evidence of the digital transformation of the world massive economy, the rapid development of the Internet.

Table 3 – Country groups: export and import of ICT goods in 2018 (billion dollars)

Country Groups	Export	Import
The developed countries	443,6	950,6
Transition countries	3,0	29,2

Continuation of table 3

Developing countries	1185,6	1147,1
Asia	1115,5	1024,4
East Asia	894,1	771,4
Southeast Asia	216,3	172,6
West Asia	2,4	32,8
South Asia	2,6	47,4
Latin America and the Caribbean	67,5	105,1
Africa	2,7	17,7

Among regions from exporters of ICT goods are only developing countries in East and Southeast Asia. Especially significantly dependent on imports of ICT goods are the countries of South and West Asia, Africa, transition countries.

Was COVID-19 a big test for China's digital economy?

It was all three months of fighting the epidemic. China has made a tremendous leap into a digital future. During the epidemic, China's health authorities have put robots and drones at the forefront to control the spread of the virus and avoid new infections among humans. Autonomous robotic systems scan people for signs of infection, measure their temperature, deliver medicines and treat surfaces of devices with a disinfectant.

The epidemic in the Middle Kingdom has created a real boom in digital services. For the first time in history, 170 million Chinese schoolchildren and students are now studying online, and online tutoring services are generating millions of profits. Unsuccessful attempts to transfer education online have been made in China before, but it is known that there is nothing stronger than a human habit(Information center CNNIC., march 2020). And now: three months of the epidemic – and digitalization in China occurred at lightning speed.

At this very time, the Beijing municipal government announced a three-year plan to promote innovation and development of industries related to the Beidou navigation satellite system - during the crisis, it also received a brilliant run-in in reality.

The new satellite navigation system entered the launch phase on March 9, 2020. On March 3, the 54th satellite of China was deployed in geostationary orbit. Takeoff took place in the launch center of Xichang in southwest China. The system works thanks to blockchain and artificial intelligence, and cryptography processes the collected data. By May, the platform should enter the market. It will be useful for public safety, energy management, fishing, transport, smart cities and, of course, for the military. She is a growing competitor to GPS and GLONASS.

Users in China will receive information in a matter of seconds, as the positioning signal can be transmitted and processed within five seconds thanks to 2200 satellite stations in the country, explains CASC.

Digital yuan is China's officiall currency

People's Bank of China conducted the first stage of introducing the digital yuan in November 2019, choosing three regions for testing: Shenzhen, Hebei, Zhejiang. These three regions with a total population of 261,5 million people. Testing was successful. For Xi Jinping, the long-awaited launch of a digital coin is a strengthening of the yuan on a worldwide scale, says Takahide Kiuchi, an economist at the Nomura Institute (Japan's largest private consulting company).

"The People's Bank of China is delaying the launch of the digital yuan, scheduled for the first quarter of 2020," by Chinese media reporting. Others believe that the launch can go according to plan, because the Central Bank has everything it needs.

Former President of the People's Bank of China Lihui Li said that, on the contrary, coronavirus can accelerate the launch of the digital yuan.

One of the main routes of transmission of coronavirus is through the surfaces of objects. That is, through cash (the first cases in Wuhan were fish market traders who used cash).

The epidemic, which claimed so many lives, accustomed people to wear masks, latex gloves and go into self-isolation and digital reality, will allow China to make a quick transition from cash to digital money - just as it happened with education.

Offline payment can be carried out in the absence of an Internet connection through direct communication between two devices, for example, via NFC or

Bluetooth. Judging by the name and icon from the application, in the case of the digital renminbi, we can talk about NFC. In addition, the "digital currency exchange" (DC兑换) button is also of interest, which is very likely to mean transferring money from a regular bank account to a new digital yuan. This fact once again confirms that the digital yuan will technically differ from the usual currency, which can be accessed electronically through an online bank.

Recall that decentralized cryptocurrencies such as bitcoin, for the most part, they suffer from a low transaction confirmation rate. This is due to the need to confirm operations by many computers before writing to the blockchain, which leads to significant delays in transfers. In the case of the digital yuan, the blockchain will most likely be centralized, and the servers located in large banks will confirm transactions, which will avoid delays. Offline transfers are likely to be taken into account when both devices are online for the first time after transaction.

Results and discussion

China has become a leading manufacturer and exporter of ICT goods. Analysis of exports and imports of electronic components shows how China participates in global value chains, in the development of which an important role was played by foreign direct investitions and non-corporate organizations of international production.

In terms of the added value created in the production of ICT services, China ranked third in the world in 2015 after the United States and the European Union (all 28 countries combined).

China has formed its own TNCs for the production of ICT goods and ICT services, TNCs in the digital economy.

There are such digital companies as "Alibaba, Tencent, Baido", they are designated by the abbreviation BAT, and the largest manufacturer's digital equipment provide digital transformation of other countries.

Table 4 – TNCs of the digital economy among the largest 100 TNCs from developing and transition countries, 2019 (billion dollars)

A place in the general list	Company	Country	Assets, billion dollars		Turnover, billion dollars		Numbers of Employed	
			foreign	all	foreign	all	foreign	in total
3	Hon Hai	Taiwan	71	80	134	135	773	873
5	Samsung Electronics	Republic Korea	64	218	115	174	216	309
6	Broadcom	Singapore	48	50	13,0	13,2	15	16
24	Flex	Singapore	24,3	24,4	23,3	23,9	199	200
27	*Legend*	China	22	46	31	44	33	69
32	*Lenovo*	China	19	27	31	43	32	52
40	*Tencent*	China	16	57	1	23	11	39
46	Quanta	Taiwan	15	18	24	28	85	90
54	*Huawei*	China	13	64	43	78	36	180
66	*China Electronic Corporation*	China	10	37	8	30	39	145
79	United Microelectronics	Taiwan	8	12	3	6	8	20
88	Wistron	Taiwan	7	9	3	20	77	83
	LG	Republic Korea	6	34	35	63	37	74

By 2018, the number of Chinese TNCs in the ranking of 100 largest TNCs from developing and transition countries compared to 2012 increased condiderably. Among multinationals digital

economy in ranking (ranked by foreign assets) entered companies such as Legend (№27 on the list), Lenovo (№32), Tencent (№40), Huawei (№54), China Electronic Corporation (№66). In terms of turnover and even the largest of them are Legend and Lenovo (by the way, these are two related companies, the first is holding-company for the second) inferior to the South Korean giant Samsung Electronics (№5). And Xiaomi is not included in the rating, BBK, whose brands (Xiaomi, Oppo, Vivo) are in the top five leaders in the smartphone market, as well as ZTE, TCL and the little-known even the Chinese "Transsion".

To increase their competitiveness, Chinese companies actively involved in the development of automation and robotic technicians. Large investments are made by the state. By Chinese Institute of Electronics (CIE), the robot market in China in 2019 was estimated at 8,68 billion US dollars, which is 30% of the global market for robots, he grew in 2013-2018 for 20,9% per year.

Conclusion

According to a World Bank report, digital technology has spread rapidly. in most countries of the world. However, digital dividends are broader development benefits from using these technologies - they are late. The cumulative effect of using digital technology turned out to be weaker than expected and distributed unevenly. To maximize but to harness the potential of the digital revolution, countries need to engage in "analogue additions": to improve the legislation ensuring innovation and competition, bring the qualifications of workers in accordance with the requirements of the new economy, ensuring-institute accountability.

So, for China, it's important to find a middle ground between the regulatory system Internet, innovation in the economy and society and the implementation of global digital standardseconomics.

According to McKinsey's consulting company, China's expert report 2019 was one of the three world leaders in venture capital investments into key technologies of the fourth industrial revolution. Investments in the development of new financial technologies in 2018 amounted to $7,3 billion in China, and $ 5,5 billion in the United States dollars, in the UK - $2 billion, in Germany – 0,7 billion dollars, in Japan – 0,5 billion dollars. On investments in analysis The United States ($ 6,1 billion) was the leader in big data the second place was Great Britain ($ 1,7 billion); the third one – China (0,9 billion dollars), on the fourth – Singapore (0,7 billion dollars), in the fifth - Russia (0,5 billion dollars).

In terms of investment in 3D printing, the first place was occupied by the USA, the second place – China (230 million dollars. The rest three countries out of the five leaders: Germany, Japan and Russia invest shares amounted to 181-182 billion dollars each. For venture capital investments in artificial intelligence and machine learning led USA ($3,8 billion), the Great Britain ($1,2 billion) was second, but China ($0,9 billion) was the third; Japan was also among the top five (0,5 billion dollars) and Australia (0,3 billion dollars) (Woetzel J. 2018: 73).

Investing in the creation of virtual reality is a leader whether the United States (1,5 billion dollars), in second place was China (1,3 billion dollars), Japan's investments amounted to 0,2 billion dollars. United States took first place in unmanned vehicles ($582 million), China ($357 million) was in second place, then came Japan ($268 million), Australia ($264 million), Great Britain and France ($142 million each).

The United States was the first to invest in robotics and drones ($728 million), the second is China ($227 million), and the third one is Japan (129 million dollars), the fourth – Singapore (96 million dollars), the fifth is Canada ($59 million). This is a fragmentary data for one year, but they give an idea that the undisputed leader in venture capital investments were the United States, but China was second in investment of big data analytics, 3D printing, creating virtual reality, in unmanned vehicles, in robotics and drones. China was the third investing in artificial intelligence, and on investments in fintech – first. Generally China was inferior to the United States, but ahead of the West European countries and other developed countries.

Summarizing all the above, can China claim leadership in digital development of economics? Of course, they can claim second place. But the answer is ambiguous, almost like the answer to the question of China's place in the world economy. If we talk about the development of the digital economy in absolute numbers – it is colossal, just like the Chinese GDP in PPP and in exchange rates for the first, China overtook the United States, in the second is approaching them. However, if we talk about the coverage of the digital technology, of course, they is inferior to small and highly developed states – like the Scandinavian countries or Singapore. And at the same time there is a number of key points that play in favor of China. China does not take by its population – undoubtedly became the leading producer and the first world exporter of digital equipment, they are among the

leaders in the production of software products. China directs investments into the fourth industrial revolution. Amount figures for the use of digital advanced technologies are also growing rapidly.

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