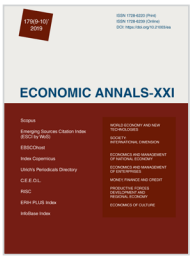

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Disruptive digital technologies as a means for destroying the foundations of oligarchomics: world experience and challenges for Ukraine

Abstract. The purpose of the article is to analyze the world experience of using disruptive technologies in the digital economy of the leading countries and to consider risks and perspectives resulting from the use of such innovations in Ukraine at the modern stage, including the peculiarities of digitalization of the country's economy. The theoretical and methodological basis of the investigation comprises the methods of deduction and induction, theoretical generalization, abstract-logical method and the method of financial and economic analysis. The results of the research are in the statement that the digital economy of the 21st century has a powerful potential thanks to which companies and even separate countries have leading positions in the world by the key directions in socio-economical development including disruptive technologies which radically change the situation in the world market and determine the direction of further development of economic relations. It is pointed out that among such innovations the most famous is the Internet of Things, Blockchain technologies, artificial intelligence, quantum calculations, digital twins, etc. By many indicators and ratings covering the implementation of the so-called «breakdown» technologies with regard to the digitalization of economy, Ukraine is significantly behind the leading countries. Despite declarations and ambitious statements at the government level, the Blockchain technology is perhaps the only successful example of the use of disruptive technologies in our country for over the last 5 years. The possibility, the pace and risks of introducing disruptive technologies within the Ukrainian economy, which can be transformed into a conceptual initiative and a mechanism for destroying the foundations of oligarchomics, remain debatable and highly relevant.

Keywords: Digital Economy; Digitalization; Disruptive Technologies; Innovations; Internet of Things; Blockchain; Artificial Intelligence; Quantum Calculations
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Підривні цифрові технології як засіб руйнування засад олігархономіки: світовий досвід і виклики для України

Анотація. Метою статті є аналіз міжнародного досвіду застосування «підривних» технологій у цифровій економіці провідних світових країн, а також розгляд ризиків й перспектив у результаті застосування цих інновацій в Україні на сучасному етапі, враховуючи особливості цифровізації економіки в

країні. Теоретико-методологічною основою дослідження є методи дедукції та індукції, теоретичного узагальнення, абстрактно-логічний метод і метод фінансово-економічного аналізу. Результати дослідження полягають у твердженні, що цифрова економіка у XXI столітті володіє потужним потенціалом, завдяки якому компанії та навіть окремі країни займають лідируючі позиції у світі за ключовими напрямами соціально-економічного розвитку, у тому числі завдяки «підривним» технологіям, які радикально змінюють ситуацію на ринку та визначають напрямок подальшого розвитку економічних відносин. Зазначено, що з-поміж таких інновацій найбільш відомими є «Інтернет речей», блокчейн-технології, штучний інтелект, квантові обчислення, цифрові двійники та ін. По багатьом показникам і рейтингам відносно впровадження «підривних» технологій та цифровізації економіки Україна суттєво відстає від країн-лідерів. Незважаючи на амбітні заява на рівні влади, за останні 5 років чи не єдиним успішним прикладом застосування підривних інновацій у нашій країні є блокчейн-технологія.
Дискусійним і дуже актуальним залишається питання можливості, темпів і ризиків впровадження «підривних» технологій у межах цифровізації української економіки, для якої використання останніх може перетворитися на концептуальну ініціативу й механізм руйнування засад олігархономіки за умови відповідних змін у законодавстві.
Ключові слова: цифрова економіка; діджиталізація; «підривні» технології та інновації; «Інтернет речей»; блокчейн; штучний інтелект; квантові обчислення; олігархономіка.

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Подрывные цифровые технологии как инструмент разрушения основ олигархономики: мировой опыт и вызовы для Украины

Аннотация. Целью статьи является анализ международного опыта применения «подрывных» технологий в цифровой экономике ведущих стран, а также рассмотрение рисков и перспектив в результате применения этих инноваций в Украине на современном этапе с учетом особенностей цифровизации экономики в стране. Теоретико-методологической основой исследования являются методы дедукции и индукции, теоретического обобщения, абстрактно-логический метод и метод финансово-экономического анализа. Результаты исследования заключаются в утверждении, что цифровая экономика в XXI веке обладает мощным потенциалом, благодаря которому компании и даже отдельные страны занимают лидирующие позиции в мире по ключевым направлениям социально-экономического развития, в том числе благодаря «подрывным» технологиям, которые радикально меняют ситуацию на рынке и определяют направление дальнейшего развития экономических отношений. Отмечено, что среди таких инноваций наиболее известны «Интернет вещей», блокчейн-технологии, искусственный интеллект, квантовые вычисления, цифровые двойники и др. По многим показателям и рейтингам относительно внедрения «подрывных» технологий, как, собственно, и по цифровизации экономики, Украина существенно отстает от стран-лидеров. Несмотря на амбициозные заявления на уровне власти, за последние 5 лет едва ли не единственным успешным примером применения «подрывных» инноваций в нашей стране является блокчейн-технология.
Дискуссионным и очень актуальным остается вопрос о возможности и темпах внедрения«подрывных» технологий, а также связанных с этим рисков в рамках цифровизации украинской экономики, для которой использование таких технологий может стать концептуальной инициативой и механизмом разрушения основ олигархономики при соответствующих изменениях в законодательстве.
Ключевые слова: цифровая экономика; диджитадизация; «подрывные» технологии и инновации; «Интернет вещей»; блокчейн; искусственный интеллект; квантовые вычисления.

1. Introduction

The modern stage of the evolution of mankind is characterized by a transition to mature and competitive national economies, which in the 21st century acquires a qualitatively new outline, being determined by the processes of digitization and digital transformation. Today, digital technologies dominate almost in all spheres of life transforming into a productive force of socio-economic development. A new type of information and telecommunications technologies, the impact of which is now absolute, is at the heart of the digitization of the economy, which, in its turn, is the most important precondition for inclusive sustainable economic development of any country in the new millennium. According to modern researchers, a digital economy is a form of economic activity that emerges from billions of examples of networking of people, businesses, devices, data, and processes where hyperlinking, i.e. the interconnection of people, organizations, and machines, plays a key role in their development due to the Internet, mobile technologies and the Internet of Things (Deloitte, n. d.).

Today, a digital economy has a great potential due to which companies and even countries maintain leading positions in the world by the key directions in socio-economical development. According to K. Schwab, one of the developers of the fourth industrial revolution and the head of the World economical forum, it is about leadership which acquires a more global form of competitiveness in terms of efficiency, productivity and innovation, as well as in terms of ensuring high standards of living, including the use of fundamentally new digital forms of communication between people, the use of opportunities to meet the individual needs of people with artificial intelligence (Schwab, 2016).

New technologies and digital platforms give a possibility for companies and people to reduce transactional costs interaction on a larger scale, to establish closer contact with government agencies and businesses. In general, digitalization means a new stage of development in making goods so as the production is carries out on the basis of using modern information and communication technologies, which is why the digital economy operates effectively in markets with a large number of participants and a high level of penetration of services related to these technologies.

Problems and challenges which appear today become the subject of discussion and understanding in the circle of specialists who, among the considerable list, focus on the study of the analysis of digital economy and the challenges of modernizing industrial policy, which was developed in particular by the development of mobile business. In this case, the important thing is the question of the processes of economy digitalization in the context of integrative entities and specifics of a number of its disruptive technologies, better known as disruptive innovations. The term «disruptive technologies» was suggested by M. Clayton C. Christensen in his article «Disruptive Technologies: Catching the Wave» (1995) which he wrote together with Joseph Bower. The article tells us about management of the leader stuff, which decides on the financing and procurement of companies. In his more famous work «The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail» (1997) (Christensen, 2015) the author describes this term more basically and investigates the industry of drives and excavation equipment. Interestingly, in his work «The Innovator's Solution» Michael E. Raynor changed the tem «disruptive technology» into «disruptive innovation» given that these technologies are inherently disruptive or preserve their purpose.

For the authors of the article, it is very important to consider the demonstrating examples of the use of disruptive technologies on a global scale and outline possible risks and prospects of using such innovations in Ukraine at the present stage, as well as to understand to what extent it is possible in practical terms given the economic situation in the country.

2. Brief Literature Review

Valuable from the standpoint of science are the studies of the problems of the digital economy and its development carried by scientists and inventors such as W. Isaacson, S. Brand, J. Wales, E. Williams, S. Huntington, B. Gates, B. Elbrecht, D. Engelbart, M. Clayton, C. Christensen, J. Licklider, John von Neumann, E. Peters, K. Schwab and others. When considering the problem of disruptive technologies in the context of the digital economy internationally and nationally, it is important to pay attention to the latest research on the Internet of Things, Blockchain, digital doubles, quantum computing, etc., as well as the prospects and challenges of these technologies within the digitalization of the Ukrainian economy at the present stage. Also, it is necessary to pay attention to works that are directly devoted to the problems of disruptive technologies: J. Manyika, S. Lund, J. Bughin, J. Woetzel, K. Stamenov and D. Dhingra; A. Utesheva, J. R. Simpson and D. Cecez-Kecmanovic, J. Bughin, E. Hazan, E. Labaye, J. Manyika, P. Dahlström and Ramaswamy; I. Aisenberg et al. (International Finance Corporation, 2018); E. Pouliquen, H. Kaleem and S. Schlorke; L. Haase, F. Gertsen, S. Johansen and C. Rosenstand et al.

3. Purpose

The purpose of the article is to analyze the world experience in using disruptive technologies in the digital economy of leading countries, as well as to consider the risks and prospects of using such innovations in Ukraine at the present stage, based on the potential of digitalization in the fight against oligarchomics as a dominant type of economic relations in Ukraine.

4. Results

The market is functioning and evolving through a combination of supportive and disruptive technologies, where the latter create a new market for an innovative product and determine the direction of further development. Then, they come with supportive technologies, the task of which is

to improve the product and thus improve the newly created platform. The complex application of these two types of technology determines the cycles of industry development. For example, if we imagine technological development spiraling, then it will turn out that disruptive innovations during the development of a new market provide a gap with the existing sites and the transition to a new round and, while supporting, stimulate the inside spiral coil, refining existing products and technologies.

Despite their interaction, it is important to clearly differentiate these innovations by a range of criteria (Table 1).

Considering the superstition of disruptive technologies, which is to create a new market that is free of competition and characterized by a high rate of profit, it is important to pay attention, firstly, to the geography of the headquarters of digital multinational enterprises with a market capitalization of more than USD 1 billion, which actively use disruptive innovations (North America - USD 2.8 trillion, Asia - USD 670 billion, Europe - USD 161 billion, Africa and Latin America - USD 61 billion) (Van Alstyne, 2016) and, secondly, world rankings for digitization and sustainable development, where countries with high levels of competitiveness and attraction of disruptive technologies should be singled out, compared to the situation in Ukraine.

Among top-leaders of the global ratings of competitiveness and sustainability (2017-2018), taking into account environmental, social, and effective leadership indicators, we can distinguish 10 leading countries (Table 2).

For example, in 2017-2018, Ukraine took 81st, 60th and 58th place in the ratings from Table 1, respectively.

Table 1:
Supportive and disruptive technologies: criteria of differentiation

	Supportive	Disruptive
Task	Redistribution of profits within the existing market	Creating and conquering new markets, attracting new consumers
Direction	Improvement of existing products	Creating new qualitatively products
The implementer	A company with a history and its own customer base	The company is a newcomer to the market or a market leader who strives to maintain its position and realize growth prospects
Market	Promotion to the upper segments of the existing market	Targeting fundamentally new markets or lower segments of an existing market
Price	More expensive	Cheaper
Quality of product	Improving product quality	Low quality of the original product, offset by the low cost, alternatives and ease of use
Target audience	Former consumers defining the requirements for the advanced product	New customers who were not satisfied with the existing products
Technical level	Improvement and complexity of the product by adding new features and qualities	Simple and convenient product, based on lies a new and sophisticated technology
Impact on the innovation process	Movement up the spiral of technological development	The transition to a qualitatively new round of development spiral

Source: Kepp (2018)

Table 2:
Leading countries of the world in competitiveness and sustainability (2017-2018)

No.	Ranking of the Global Competitiveness (2017-2018)	IMD Ranking of the Global Digital Competitiveness 2018	Global Sustainability Index 2019
1	Switzerland	USA	Sweden
2	USA	Singapore	Finland
3	Singapore	Sweden	Iceland
4	Netherlands	Denmark	Denmark
5	German	Switzerland	Norway
6	Hong Kong	Norway	Switzerland
7	Sweden	Finland	Estonia
8	United Kingdom	Canada	Luxembourg
9	Japan	Netherlands	Latvia
10	Finland	United Kingdom	Croatia

Source: Compiled by the authors based on data from:
The Global Competitiveness Report 2017-2018:
http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf
The 2018 IMD World Digital Competitiveness Ranking Top 15:
https://www.imd.org/globalassets/wcc/docs/release-2018/digital_top-15-2018.pdf
Global Sustainability Index 2019:
http://solability.com/download/global-sustainable-competitiveness-index-2019

Programs and strategies for the development and promotion of digital technologies and/or digitization of national economies and industries are now being developed and implemented in the countries all around the world, as well as at the interstate level. According to the official data from the European Commission as of March 2017, there are more than 30 national and regional digitization projects in the EU member states alone. The following initiatives and programs are the examples at the national level: Austria - Industrie 4.0 Oesterreich, Belgium - Made different - Factories of the future, Czech Republic - Průmysl 4.0, Geman - Industrie 4.0, Denmark - Manufacturing Academy of Denmark (MADE), Spain - Industria Conectada 4.0, France - Alliance pour l'Industrie du Futur / Nouvelle France Industrielle; Hungary - IPAR4.0 National Technology Initiative, Italy - Industria 4.0 i Fabbrica Intelligente, Luxembourg - Digital For Industry Luxembourg; Netherlands - Smart Industry, Slovakia - Smart Industry, Portugal - Indústria 4.0; Sweden - Smart Industry (see, for example, European Commission, 2017).

With regard to the disruptive innovations that have been the driving force of the digital economy in the 21st century, it is important to mention the Internet of Things, Blockchain technologies, artificial intelligence, quantum computing, digital twin and more.

According to a report by the World Bank of the Internet of Things (P. Lal Das et al., 2017), governments and companies around the world are actively using Internet connectivity to address global development issues, as well as environmental, urban transport, including road safety, and energy conservation. In addition to the pole-mounted sensors, GPS-based devices that track real-time traffic and smart meters that control energy consumption, the Internet of Things is a whole new step in the industry of leading nations, as artificial intelligence, wireless connectivity and cheap sensors are combined with data analytics to transform production, energy and transportation. The Internet of Things helps optimize workflows, track and analyze the equipment status, deliver predictive maintenance, interpret large volumes of data and make real-time decisions (Desjardins, 2018). The most well-known example of this technology is the traffic and highway management in Dubai, where in 2014 the relevant department launched 29 initiatives in the field of smart transport (smart bus stops, intelligent parking system, etc.) (Nedap, 2019).

The use of as a kind of distributed ledger technology is actively influencing the transformation of the industry, changing the configuration of financial processes and the emergence of new markets. Along with other distributed registry technologies, Blockchain can reduce costs in the global value creation process. This was understood by the Dubai government, when it recently announced a course on developing a comprehensive Blockchain strategy for public administration, and when Estonia embarked on a large-scale project on data integrity and information security. In 2016, the Estonian eHealth Fund launched a blockchain technology project aimed at creating an additional level of safety and integrity for patient records (Einaste, 2018).

Another sphere where blockchain is actively used is land registers. Only in the last few years have pilot projects been implemented in Dubai (ERES/ConsenSys), Georgia (Bitfury), Ghana (BenBen) and Sweden (Chromaway). In general, when it comes to the government and business, this kind of disruptive technology is a real challenge to traditional approaches, since it does not require assistance from the central authority in matters of identity, certification, land rights, keeping medical records, voting, etc. (Blockchain in Development, 2017). Nevertheless, if we want a Blockchain solution to work effectively, then without the help of regulators and policymakers, there is no need to manage the security of private Blockchain solutions. In addition, sufficient capacity needs to be created to understand the benefits and disadvantages of Blockchain, manage storage, and resolve ownership and legal recognition of Blockchain transactions.

When touching upon the topic of artificial intelligence (autonomous vehicles, robotics, virtual assistants and machine learning), it is important to note that it is increasingly being used to provide benefits in the areas of health, education, retail, public administration, electricity and manufacturing, and assists in the process of improving forecasting and search, optimization and automation of operations. According to Accenture estimates, the introduction of artificial intelligence can double the rate of economic growth by 2035 (Accenture, 2016), and this is well understood by the Chinese, investing in research and development in the field of artificial intelligence.

In the case of Finland, artificial intelligence is generally a source of national competitiveness. That is why the Finns have developed a full-fledged program to accelerate the introduction of artificial intelligence, which provides for the increasing competitiveness of business through the use of this disruptive technology, efficient use of data in all industries, ensuring rapid and easy implementation of artificial intelligence, the creation of centers of competence in artificial intelligence,

investment in education in this area, funding for research and innovation in artificial intelligence and the creation of research networks, the creation of new models of collaboration, and the maintenance of Finland in a leading position in the field of artificial intelligence.

Quantum computing, which refers to strategic yet complex disruptive technologies, is in great demand. It can be used to scan huge volumes of audio and video, find new ways of eliminating risks and improve financial models, and optimize route transportation and logistics processes. In general, quantum computing is able to transform the industry in terms of their impressive computing power, creating opportunities to develop new applications that use quantum effects (Accenture, 2017). One of the first companies to develop a commercially available quantum computer variant was Canadian firm D-Wave Systems, which includes PSP Investments, Goldman Sachs and Jeff Bezos. Large technology platforms such as Google, Microsoft and IBM are also active in this field.

With regard to digital doubles, more than 21 billion sensors and end devices are planned to be connected by 2020, which will be a complete digital representation of objects, processes or individuals that can be used to reconstruct, model and predict real human behaviour and reactions, as well as to test the operational quality of goods and services (Pettey, 2017). Such technologies are becoming increasingly high-quality digital representations of the real world, and therefore increase the speed of work, reduce time to market and production costs, and significantly increase the efficiency of supply and production processes. An increasing number of industries and businesses in countries with a high level of digital development and use are applying digital duplicates. For example, Siemens has integrated them into manufacturing processes, in particular for product modeling, manufacturing and maintenance processes, which has enabled virtual testing prior to production (Siemens, 2017). Or General Electric, which uses digital duplicates in production based on the Predix operating online platform. In Singapore, they went further and launched the Virtual Singapore program in 2014, for which USD 73 million has been allocated since the launch date - July 2018. It is used for virtual experiments, simulations, crowd scattering simulations in the event of an emergency evacuation, and for research and development, planning and decision making. The program is run jointly by the National Research Foundation, the Office of the Prime Minister and the Cadastral Office (National Research Foundation Singapore, 2018).

In Ukraine, the situation could be much better and more optimistic than it actually is, though the positive dynamics take place. At the beginning of 2018, the Concept of Development of the Digital Economy and Society of Ukraine for 2018-2020 was adopted, which proved to be a conceptualization at the state level of the previous achievements of the Ukrainian government together with Hi-Tech Office Ukraine and market experts. It is about the implementation of the forced scenario of digitalization of Ukraine, which envisages the development of digital infrastructure, digitization of the real sector, in particular, through the promotion of infrastructure «Industry 4.0», as well as the basic areas of life, the development of the smart factory, the creation of a digital workplace, development STEM education, introduction of the eHealth and e-security, smart city concepts, and digital literacy development (HITECH, 2016).

As of today, the EU economy sectors related to intellectual property make up about 42% of EU GDP, which is EUR 5.7 trillion a year, provide 38% of all jobs and 90% of the EU exports. By 2020, the figures are expected to increase to EUR 739 billion, representing 4% of the EU total GDP. According to the National Commission for the State Regulation of Communications and Informatization, the share of the information technology sector in the GDP of Ukraine in 2014 was 1.39%. Today, IT products account for more than 3% of the country's GDP.

At the 20th Ukraine-EU Summit held on 9 July 2018, the participants welcomed in a joint statement regarding Ukraine's determined willingness to move towards the approximation of its legislation with the European Union in accordance with the EU-Ukraine Association Agreement, in particular in the digital market. On the eve of the summit, the Verkhovna Rada adopted a resolution calling on the European institutions to maximize the integration of Ukraine into the EU internal market in areas of common interest and covered by the above agreement. In particular, it was also necessary to form a common vision of Ukraine's integration paths to the EU Digital Single Market (Nochvay et al., 2018).

On 5 October 2017, the Declaration was approved at the 2nd Ministerial Meeting on Digital Economy of the Eastern Partnership Initiative in Tallinn, certifying the countries' intention to work in six priority areas: telecommunication services rules and infrastructure, trust and security in the digital economy, e-commerce (eCommerce, eCustoms and eLogistics), digital skills, ecosystems of technological innovation and startups, and e-health. It is important that these priorities should be operationalized by

Ukraine with specific measurable goals consistent with the European ones. Our country has already begun to move towards the digitization of important socio-economic spheres and the use of disruptive technologies. Yet, despite the first successful steps, there are all indications of weak progress towards the key achievements identified in the harmonization of digital markets and described in the «Eastern Partnership - 20 Deliverables for 2020: State of play in 2018» with a focus on key priorities and tangible results (European Comission, 2019). In this regard, Ukraine's main problem is the lack of a coherent strategic approach to policymaking towards digital market harmonization with the EU and the Eastern Partnership region, which would require the development of strategic documents, roadmaps and action plans for each of the above areas of harmonization of the digital market.

The analysis of the readiness to implement disruptive technologies within the digitalization of the Ukrainian economy reveals numerous gaps in this direction: the absence of a national roadmap for the creation of harmonized e-commerce systems between Ukraine and the EU; discourse on developing a national strategy for developing digital skills and creating a national coalition for digital skills and digital jobs has not started; Ukraine's unwillingness to implement digital platforms, which is recorded in the «The Accenture Digital Performance Index»; the slow Internet in Ukraine and limited access to broadband Internet; digital divide by region (city - village); the absence of alternative coordination solutions when using a particular platform and, consequently, no competition; a lack of coordination of the state, business and civil society in the matter of digitization of the economy; insufficient regulation of the activities of technology platform operators; ineffectiveness of financing the activities of national programs for informatization of society and opacity of information on the state of the implementation of measures known as the «Concept of the Development of the Digital Economy and Society of Ukraine for 2018-2020»; a lack of available statistical data and inaccurate operation in the development of informatization of the economy; the use of different methodologies for the collection and processing of statistical and administrative information, which makes it impossible to objectively analyze and benchmark; the conflict of standards of functioning of digital platforms and blocking of the introduction of the Blockchain technology; lagging of legislative support on the pace of development of digitalization of public administration, businesses, educational institutions and civil society; a lack of vision, state initiatives, programs and strategic documentation aimed at creating a comprehensive national digital literacy development system, etc.

According to a Microsoft study released at the «Manufacture talks. IoT & other technologies», 2% of equipment suppliers in Ukraine use the Internet of Things technologies. 47% do not anticipate the introduction of such technologies, and 51% are completely unaware of its capabilities for businesses. Although, as of 2019, almost 90% of manufacturers were trying to make the most of the cloud technology to optimize their supply processes, and by 2020 they plan to translate 40% of enterprise operations into an automated mode. Other technological trends include maximizing the use of cloud technology to optimize the delivery process, mandatory connection of machines to the Internet and building a digital duplicate of equipment or processes within 3-5 years. At present, all of these are plans, and the reality is this: according to the State Statistics Service of Ukraine, as of 2017, there are more than 837,000 wholesale and retail entities in Ukraine, of which only 4,135 companies used cloud computing services during the year, with 1,165 of them being commercial enterprises; 9,470 (2,672 commercial ones) used social media to promote themselves or advertise their goods and services in Ukraine. Consequently, the share of enterprises that use not only computer technologies in their business, but also disruptive technologies is extremely small in Ukraine - approximately 0.32%.

With regard to Blockchain, the situation is much better with the use of this technology in Ukraine, as evidenced by the creation of the non-profit organization Blockchain Association of Ukraine in 2018. In his report on the Networked Hotbeds of Blockchain, Don Tapscott, the founder of the Blockchain Research Institute, noted that Ukraine is among the 14 leading countries in the development and implementation of Blockchain technologies, being among countries such as the USA, Canada, Brazil, Australia, Israel, the UAE, Georgia, Estonia, the UK, France, Germany, Sweden and China (Marutyan, 2018). This is supported by several illustrative examples. For instance, the Land Registry of Ukraine and some other organizations have already switched to the Blockchain technology. The State Agency for Electronic Governance of Ukraine and the American company Bitfury Group, the world leader in Blockchain development, signed a memorandum of cooperation. In March 2016, the Memorandum on the Development and Implementation of a System of Decentralized Online Auctions in the Public Sector was signed in Kyiv. The Eauctoin 3.0 platform was created by IDF Reforms Lab, Distributed Lab, Savings Bank, Privatbank, Microsoft and Unitybars. In early July of that year, the first Blockchain auction took place, which allowed it to lease state property.

It is time to move from the approval of the Digital Agenda for Ukraine 2020 to its planned and comprehensive implementation. Firstly, by using information technologies to create an infrastructure based on the mobile Internet and as a tool for total distribution of fiber-optic communication in Ukraine. Secondly, by improving the regulatory framework, especially paying attention to the adoption of regulations on digital financial assets, agreements concluded in electronic and digital form, electronic guarantees and digital liens, e-books, electronic means of trust, decentralized registers of certificates of identity, etc. Thirdly, by creating digital platforms that support digitized data transactions, as well as a permanent electronic profile for citizens and the so-called «digital highway» that ensures the development and uniform movement of all the collected data for their use. This key envisages integration of information from 5,000 sites of various governmental institutions in order to create a single «state window» on a single portal and create a single geo-infrastructure for digital interaction within Ukraine, neighboring countries and the EU member states. The main purpose of such platforms is not so much in the digitization of existing processes, but in the introduction of fundamentally new tasks, the solution of which is impossible without the latest disruptive technologies. Fourthly, by training and retraining the relevant personnel to form basic skills and competencies that meet the needs of the digital economy. Fifthly, by providing information security that involves the creation of reliable and effective data protection systems, the formation of regulatory mechanisms and the definition of rules to access data, including personal data, as well as the regulatory requirements for machines, equipment and processes.

If oligarchomics is considered a parasite on the country's economic organism, then disruptive digital technologies can be considered to be ways and instruments to recover from it. The political regime that has been forming in Ukraine for almost 30 years, with conditions to maintain a kind of the so called «social contract» between the bureaucracy and businesses when the political and state elite is completely dependent on oligarchs at all levels, can and should be undermined by a digital breakthrough in the socio-economic sector. The state should create all necessary conditions for such a change and support digitalization of the financial and economic sectors, creating unviable conditions for oligarchomics by doing so. The Internet of Things, the Blockchain technology, artificial intelligence, quantum computing, digital twins and other disruptive digital technologies are a powerful and effective tool in the fight against oligarchomics, which can break the current system and bring Ukraine to the appropriate level of the country in terms of innovative and technological development and economic well-being of citizens in a fairly short time.

5. Conclusions

Today, for the progressive part of the world, there is no doubt about the importance and inevitability of the digital economy, as well as the need to introduce disruptive technologies. The question is not whether the digital economy will continue to grow, or whether it should be allowed to develop, or how it will do so. It is inevitable in the 21st century: the digital economy will grow - especially with regard to competition from firms and states. The disruptive technologies are the future and this is well understood by the world's leading countries. In Ukraine, which having a new government, is positioning herself as a young democracy that is actively struggling with its Soviet and post-Soviet oligarchic legacy, this is a good chance to make a technological breakthrough by undermining the foundations of oligarchy that have been in Ukraine for almost 30 years and to move from declarative statements concerning the prospects of digitization of the Ukrainian economy towards planned and systematic actions. To do this, we need to start planning and systematically using information technologies to create technological infrastructure, to continue to improve the regulatory framework, to create digital platforms, adjust the process of training and retraining of appropriate personnel in order to form the basic qualifications and specific competencies that meet the needs of the digital economy, as well as to provide information security, which involves the creation of reliable and effective data protection systems. The development of disruptive innovations can be a significant element of Ukraine's conceptual initiative, especially when it comes to social technologies.

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