3. Pachamama Coffee Cooperative. Retrieved from: https://www.pacha.coop.
4. The PEI Certified Organic Producers Co-op (COPC). Retrieved from: http://organicpei.com.
5. Cooperativa Sin Fronteras. Retrieved from: http://www.cooperativasinfronteras.net.
6. Vojvodina organic cluster. Retrieved from: http://vok.org.rs/en/.
7. Organic Science Cluster II (2013-2018). Retrieved from: https://www.dal.ca/faculty/agriculture/oacc/en-home/organic-science-cluster/OSCII.html.
8. Myanmar organic cluster. Retrieved from: http://www.mfvp.org/.
9. Organics Cluster in Rhône-Alpes. Retrieved from: http://www.organics-cluster.com/.
10. Organic Products Cluster. Retrieved from: http://www.biocluster.gr.
11. Ukrainian Organic Cluster. Retrieved from: https://organiccluster.com.ua/ [In Ukrainian].

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ПРОРИВНІ ТЕХНОЛОГІЇ ЯК ОСНОВА ЕКОНОМІКИ ШЬОСТОГО ТЕХНОЛОГІЧНОГО УКЛАДУ

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DISRUPTIVE TECHNOLOGIES AS THE BASIS OF THE ECONOMY OF THE SIXTH TECHNOLOGICAL DEVELOPMENT

Анотація. Еволюція соціально-економічних систем має нелінійний характер, в ній містяться як періоди плавних змін, так і різких трансформаційних стрибків. Через десять років після початку економічної кризи 2007–2009 рр. темпи відновлення і американської та європейської економіки залишаються вкрай низькими. Однією з причин стагнуючого стану економік розвинених країн є структурний і технологічний

дисбаланс, на подолання якого ще будуть потрібні і значний час і суттєві фінансові ресурси. Саме тому на початку XXI століття актуальним є аналіз впливу проривних технологій на економіку як розвинених країн, так і країн, що розвиваються.
У статті досліджено роль «проривних технологій» у сучасному інноваційному розвитку. Визначено основні сфери і напрямки впровадження «проривних технологій», що забезпечує інтенсифікацію розвитку нової економіки, включаючи формування нових принципів і підходів до організації цифрового промислового виробництва.
Виділено основні проблеми що впливають на ефективне впровадження країнами світу «проривних технологій» і можуть призвести до втрати певних наукових галузей, а в перспективі — хронічного відставання у економічному розвитку.
У статті визначається, що на початку XXI століття ключовим фактором розвитку проривних технологій є обсяг фінансування фундаментальних і прикладних досліджень як державного, так і приватного сектору. Особливістю сучасного етапу розвитку науки є можливість швидкого розповсюдження та тиражування технологій загального користування, що створює певні переваги для країн, що розвиваються, але самі розвинені країни відчувають певний дефіцит епохальних наукових винаходів. Усе це разом спричиняє не тільки нерівномірність технічного прогресу, але й значне уповільнення темпів економічного розвитку в цілому. Проривні технології виправдовують їхню місію лише в тому випадку, якщо вони широко використовуються у промисловості та забезпечують масовий споживач доступ до технологічно нових продуктів. Структурні дисбаланси можна подолати на основі розробки нових технологічних платформ, належного використання ринкових інститутів для створення конкурентного середовища та створення системи державно-приватних ділових відносин, де стратегія управління виробничими структурами повинна належати державі.

Ключові слова: проривні технології, шостий технологічний уклад, нелінійний розвиток економіки, тенденції розвитку світової економіки, інновації

Abstract. The evolution of socio-economic systems is non-linear in nature; it contains both periods of smooth changes and abrupt transformational leaps. Ten years after the start of the economic crisis of 2007–2009. the pace of recovery and the American and European economies remain extremely low. One of the reasons for the stagnating state of the economies of developed countries is the structural and technological imbalance, which will still require considerable time and substantial financial resources. That is why at the beginning of the XXI century the analysis of the impact of breakthrough technologies on the economy of both developed and developing countries is topical.
The article investigates the role of «disruptive technologies» in modern innovative development. The basic spheres and directions of introduction of «disruptive technologies» are defined, which provides for the intensification of the development of the new economy, including the formation of new principles and approaches to the organization of digital industrial production.
The main problems that influence the countries' effective implementation of «disruptive technologies» were outlined. This could lead to the loss of certain scientific industries, and in the future — a chronic lag in economic development.

Key words: disruptive technologies, sixth technological way, nonlinear development of economy, tendencies of development of the world economy, innovations

JEL codes: F12, F 43, K 25.

Raising of the problem. Long-term trends in technological development, especially the development of breakthrough technologies and innovations that change the face of markets, industries and the economy as a whole are relevant today. This fact explains, on the one hand, the rapid growth in the world since the 1990s of

interest in foresight research methods, as well as the increase in the number of support programs for breakthrough directions in various most developed and fast growing economies of the world . Indicative in this regard are such events as Industry 4.0 in Germany, activities in the field of advanced production technologies and brain research in the USA, Made in China 2025, initiatives by SiP and ImPACT in Japan, Russian Rosnano. National technology initiative, alternative energy support activities in the USA, EU, China (including as a new source of growth in industry and technology). In the world, therefore, interest in accelerating and qualitatively changing the nature and dynamics of development is actualized.

Analyses of publications. The scientific analysis of the creation, dissemination and implementation of disruptive technologies and the development of the economy of the sixth development have been studied in works by D. Andrussen, N. Bonis, S. M. Klimov, R. Coase, B. Lev, B. B. Leontiev, LI Lukicheva, BZ Miller, IV Pronina, T. Stewart, R. Thyssen and others. The problems of increasing the international competitiveness of the world market of knowledge were considered in the works of E. Broking, L.G. Glushko, V.Yu. Zubko, R. Kaplan, AN Kozireva, D. Norton, A. Pulik, M. Meloin, L.V. Postanagov, K. Sweeby, K. Taylor, L. Edwinson and others. However, many scientific issues remain unresolved regarding the identification of the main elements of the new level of the development of the disruptive technologies and their implementation on the productivity of the international economy is still not solved.

The aim of the article. The goal of the article is to analyze the development of disruptive technologies and their role in the formation of the economy of the sixth technological development.

Methodology. The methodological basis of the article is the methods and forms of scientific knowledge adopted in domestic science, such as system approaches, comparative and synthesis methods, methods of abstract logical evaluation, methods of detailing, groupings and generalizations, experts evaluations.

Raising of the problems that were not solved before. In the modern conditions global economy has experienced rapid transformational development from a knowledge economy, through an innovative, to the economy of creativity. At the same time, if such terms as the knowledge economy, innovation, information and intellectual economy are often used as synonyms, the concept of a creative economy is filled with new content and acquires a number of qualitatively new signs and properties. At the same time, it can be argued that the creative economy does not deny the previous forms of development, but rather uses them as the basis of its further transformation. That's why nowadays it is very important to analyze the development of the disruptive technolohies.

Presenting main materials. The world economy, starting in 2008, is experiencing another cyclical crisis associated with the change of long waves of economic development of Kondratieff and the main technological platform based on semiconductor microelectronics. An analysis of the past 50 years of the situation shows that the current economic crisis has not yet been overcome precisely because of its systemic nature, when not only the financial system but also the entire structure of the global economy needs fundamental technological changes. According to Robert Solow, the Nobel Prize winner in economics, more than 3/4 of the growth rates of the modern economy are derived from technical progress. Indeed, thanks to

the scientific and technological revolution that gave rise to epochal innovations in the 20th century, unprecedented growth rates of the world economy have been achieved [1, p. 11–16]

The post-war years (1948–1973) were called the «golden age» in economic literature, when the global average annual growth rate of GDP was 4.9 %. However, the global economic crisis of the 1970s. became the first call about the need to understand the then existing energy policy. The sharp rise in oil prices led to a significant economic downturn, which was overcome by many countries only through structural measures, when individual energy-intensive sectors of the economy were closed and new, less energy-intensive ones were created. The example of Japan is very interesting here. The energy crisis of 1973 was extremely painful for its economy, primarily because its manufacturing industry had the highest energy intensity among industrialized countries. The government of the country in the shortest time has developed a plan to eliminate excess capacity in the manufacturing industry. Such scraping, for example, included open-hearth production and production of electric steel in ingots (16 %, or 2.3 million tons), aluminum production (24 %, or 390 thousand tons), production of nitrogen fertilizers (30 % or 2.5 million tons) and a number of others, and to implement this plan, a special fund was established with a guaranteed limit of 100 billion yen.

All this made it possible to make important changes in the sectoral structure of production and provide a transition to a new growth model with an emphasis on the development of high-tech industries and the so-called system industries — trading information systems, hotels information systems, control equipment systems for the metro, etc. All this together allowed the Japanese economy to become in the early 1980s. the world's largest manufacturer of electronic components and individual semiconductors, when, taking into account the release of these products at foreign branches of Japanese firms, its share in world production was 60-70 %. However, the change of technological platforms for the leading economies of the world has not yet meant a steady trend of industrial development. On the contrary, according to studies for these economies (USA, Japan, Italy, France) there was a characteristic downward trend: the share of industry in GDP has been declining for almost 40 years.

At the same time, the economy of a country like Korea moved in a different direction: the share of the manufacturing industry in GDP grew steadily and by 2010 reached almost 30 %. This incredible phenomenon largely explains the resilience of the Korean economy, in which industrial priorities and tools, properly defined by the state, played a key role in minimizing the effects of the 2007–2009 crisis. This is confirmed, in particular, by the increase in the share of computer, electronic and optical equipment in the manufacturing industry[2, p. 248]

In 2013, the MacKenzie Global Institute published a report on promising technologies that may be industrial in nature in 2025 («Breakthrough Technologies: Benefits That Will Change Life, Business, and the Global Economy»). This report identifies 12 of this kind of technology — mobile Internet, automation of intellectual work, cloud technologies, Internet services and products, advanced robotics, self-driving and semi-self-guided vehicles, new generation genomics, energy storage and storage, 3D printing, high-tech materials, new oil and gas exploration and production methods, renewable energy. According to their estimates, the industrial use of these

technologies will directly or indirectly affect almost all sectors of the economy with a turnover of about $ 123 trillion (for comparison: the volume of global GDP in 2015 amounted to $ 73.5 trillion).

At the moment, it is still difficult to determine which of these technologies will become truly breakthrough and basic for the next 30–40 years, due to the uneven economic development of different countries of the world. Probably, it should be expected that in countries with a high per capita level of GDP, technologies related to the maintenance of human health and life will receive rapid development. These countries should include the United States and France, whose costs for health care are 16 and 11.2 % of GDP, respectively. More than 10 % of GDP is also spent by Germany, Switzerland, Austria, Canada, Belgium. Probably, it is not by chance that in these countries the share of pharmaceuticals and biotechnologies in the manufacturing industry is growing rapidly. Although Denmark is not among the countries with the highest share of expenditures in GDP for health care, it is one of the world leaders in insulin production, providing almost 40 % of its world production [3, p. 30–33]

Renewable energy technologies will occupy an important place in China, where the problem of air pollution is very acute. Probably, each country itself will determine which technologies to develop, primarily based on factors such as the availability of scientific resources, the availability of qualified personnel and materials, defense or other interests. However, the list of countries that can master new breakthrough technologies on an industrial scale is limited — these are countries where R & D expenditures make up at least 2-3 % of GDP. Unfortunately, today there is a significant gap in the area of R & D financing between Ukraine and those countries that are already on the verge of mastering new basic technologies. This also applies to budget and corporate financing, to fundamental and applied research. Against the background of the last 10 years, in essence, not scientific, but administrative reform of domestic science, a clear lack of funding may result in the loss of certain scientific fields, and in the long run a chronic lag in the development of breakthrough technologies.

According to experts, the industrial use of these technologies will directly or indirectly affect almost all sectors of the economy with a turnover of about $ 123 trillion (for comparison: the volume of global GDP in 2015 amounted to $ 73.5 trillion). It is still difficult to determine exactly which of these technologies will become truly breakthrough and basic for the next 30–40 years, due to the uneven development of different countries.

In 2014, a joint report by the University of Oxford and Deloitte was published regarding employment prospects in the UK in the context of widespread use of new technologies. According to this report, since 2013, 65 % of librarians and 50 % of personal assistants and secretaries have lost their jobs in London, and over the next 10–20 years it is expected that a third of all those employed in the economy (10.8 million people) will be forced to give up their jobs a new generation of machines. The report rightly notes that many clearly underestimate the profound social consequences of the new generation of intelligent robots or complex computer systems [4, p. 54–59]

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rapid development. These countries should include the United States and France, whose costs for health care are 16 and 11.2 % of GDP, respectively. More than 10 % of GDP is also spent by Germany, Switzerland, Austria, Canada, Belgium. Probably, it is not by chance that in these countries the share of pharmaceuticals and biotechnologies in the manufacturing industry is growing rapidly. Although Denmark is not among the countries with the highest share of expenditures in GDP for health care, it is one of the world leaders in insulin production, providing almost 40 % of its world production.

It is easy to see that world leaders are TNCs of three states — the USA, Japan and Germany, and the branches of the greatest application of their funds are such areas as pharmaceuticals and biology, technological equipment, automobile production and IT technologies, they account for more than 60 % of all expenses. American companies view the production of semiconductors, photovoltaic cells, energy storage of the new generation and pharmaceuticals as strategically important. It should be noted that private companies in the USA provide about 2/3 of R & D funding, and for Japan this figure is even higher — almost 3/4. A significant part of the funds goes to support universities that have become part of the national systems. World practice shows that the role of the private sector and universities is extremely important for the development of science and technology, and later for the industrial development of new products, but for this it is necessary to find economic levers of support and properly set national priorities.

Conclusion. The introduction of new technologies will lead to the creation of a new economy, including the formation of new principles and approaches for organizing digital industrial production («smart» factories in accordance with the concept of Industry 4.0). In particular, it will be possible to create a new «interface» economy based on the use of additive technologies on an industrial scale when a decentralized system of industrial production is unprecedented. And if this happens, the whole economic system will change, and with it the social structure of society. However, this seems a distant prospect. A more important task in the near future (10–15 years) is to learn to foresee and manage possible structural changes (which is more a function of the state than the private sector) in order to minimize the inevitable losses in the future

Literature

1. Ильяшенко С.Н. Интеллектуальный капитал и корпоративная культура в инновационном обществе: аспекты на уровне региона / С.Н. Ильяшенко, Ю.С. Шипулина // Украина и ее регионы на пути к инновационному обществу : монография : [в 4 т.] Т. 1. / [А.И. Амоша, И.П. Булеев, В.И. Дубницкий и др.] ; под. общ. ред. В.И. Дубницкого и И.П. Булеева ; НАН Украины. Ин-т экономики промышленности ; Донецкий экономико-гуманитарный институт ; Академия экономических наук Украины. — Донецк : ЮгоВосток, 2016. — С. 11–16.

2. Халлиган Б. Маркетинг в Интернете: как привлечь клиентов с помощью Google, социальных сетей и блогов / Б. Халлиган, Дж. Шах; пер. с англ. Н. Коневская. — М. : Диалектика, 2015. — С. 21–26.

3. Ансофф И. Стратегическое управление / И. Ансофф; под ред. Л.И. Евенко ; пер. с англ. — М. : Экономика, 2016. — С. 30-33.

4. Ильяшенко С.Н. Применение методов и инструментов маркетинга в управлении знаниями / С.Н. Ильяшенко // Маркетинг и менеджмент инноваций. — 2014. — № 2. — С. 54–59.

References

1. Iliashenko, S.N., & Shipulina, Yu.S. (2016). The intellectual capital and corporate culture in innovative society: aspects at the level of the region. Ukraine and its regions on a way to innovative society. V.I. Dubnitskii, I.P. Buleev (Ed.); NAN Ukraine. In-t ekonomiki promyshlennosti; Donetskii ekonomikohumanitarnyi institut; Akademiia ekonomicheskikh nauk Ukrainy. (Vols. 1-4; Vol. 1). Donetsk: YuhoVostok [in Ukrainien]

2. Halligan, B., & Shah, Dh. (2015). Inbound Marketing: Get Found Using Google, Social Media, and Blogs. (N. Konevskaia, Trans). Moscow: Dialektika. [in Russian].

3. Ansoff, I. (2016). Strategic management. L.I. Evenko (Ed.). Moscow: Ekonomika. [in Russian].

4. Iliashenko, S.N. (2014). Primenenie metodov i instrumentov marketinha v upravlenii znaniiami [Application of methods and instruments of marketing in management of knowledge]. Marketinh i menedzhment innovatsii — Marketing and Management of Innovations, 2, 7–9 [in Russian].

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ВИЗНАЧЕННЯ СТАРТАПІВ ЯК РІЗНОВИДУ ПІДПРИЄМНИЦТВА В УКРАЇНІ

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