

## SHIFTED CHALLENGES IN TERMS OF DIGITAL ECONOMY

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**Introduction:** We live in the world where, in one 's hand, the pace of the new technologies development is accelerating, but in the other 's hand, the social-economic inequality is increasing not only between developed and developing countries, but also within the country's society. In frame of numerous uncertainties effectively overcoming of the economic policy problems needs coordination of government, science and business activities.

The situation is complicated by 2008's global financial - economic crisis, and also, by Covid-19 pandemic crises, resulting the world economy under particular stress and recession. People had hoped that the Fourth Industrial Revolution and the digital economy would be an effective response to the "sick" economic growth of developed countries, especially in term of social distancing. Industrial Revolution 4.0 and the digital economy create a particularly complex socio-economic configuration. Assessment Industry 4.0's outcomes are a very important when the global socio-economic situation is such a stressful one.

**Actuality of the research problem:** what must take into account economic policy makers in process of formation and development economic strategies to be able to overcome the challenges of the digital revolution and benefit from its progressive results? And what are the dangers of technological development, considering of which in the economic policy will be possible to mitigate the negative effects of industry 4.0? To answer these questions, we **aimed** to conduct a bibliographic study based on the modern advanced scientific researches and to systematize the expectations and challenges of the development of the digital economy by using induction and deduction methods. The results of the study will help us to foresee the generalized future concept of economic policy. During the research, we selected the latest and highest-ranked scientific papers, the induction method succeeded in identification of research results, and finally, we made

systematization of the results selected studies by using method of grouping.

During the research process, we have studied the works of Kovacs (2018), Nguyen et al. (2019), Bossler and Holt (2012), Remeikienes, Gasparyniene and Schneider (2018), Ukolov et al. (2018), Baur, Hong and Lee (2017) and others, where are presented different subjective assessments about digital economy, its' interdependence to the economic development, theoretical economic model, productivity, shadow economy, various institutional mechanisms and etc. (Gvelesiani, 2018; 2019<sup>1</sup>. Gogorishvili, 2018<sup>2</sup>.)

**Main part:** The digital economy is a high-tech part of the economy that is in line with the ongoing changes in the production process. It uses virtual space capabilities such as the Internet, computers, information, information technologies, and artificial intelligence.

Digitization is a method that connects the virtual sector of the economy with the real sector. A digital platform includes digital resources, which suggests services and content information. It provides a value-creating relationship between the entrepreneur and the customer. Digital platforms are the highest peak of digital infrastructure. These include the Internet, data centers, smart phones and tablets. Easy-to-access digital infrastructure is vital for new digital risky ventures.

Digital technology is the representation of information in bits. It reduces the cost of storing, computing and transmitting

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<sup>1</sup> Gvelesiani R. Role of Assessment in Decision Making and Empirical Examination of Their Results, volume 18, № 2, 2018, Las Vegas, Nevada, p41-44, [www.iabe.org](http://www.iabe.org). Gvelesiani, R. The problem of making optimal decisions on the implementation of economic policy objectives, The 2nd International Conference on business, Management and Economics, ISBN:978-609-8239-66-9, The Acavent, Vienna School of International Studies, Vienna, Austria, 21-23 June 2019, <https://www.icbmeconf.org/june-2019-vienna/>.

<sup>2</sup> Gogorishvili I. (2018). Small and Medium Enterprise Perspective in the Development of Digital Economy, E-Book of Abstract, Fifth Business Systems Laboratory International Symposium, Cocreating Responsible Futures in the Digital Age: Exploring new paths towards economic, social and environmental Sustainability, University "Federico II" of Naples, January 22-24.255-257. ISBN 9788890824265. <http://bslab-symposium.net/Napoli-2018/BOA-BSLAB-Symposium-2018.pdf>.

information. Accordingly, the research papers about digital economy studies the influence of digital technology capacity on economic activity.

Oliver Kovacs<sup>3</sup> (2018) in his work with the industry "The dark corners of the industry 4.0 – Grounding economic governance 2.0." analyzed the Fourth Industrial Revolution, which shifts society to the more difficult economy. The author concentrates on the complexity of interacting with Industry 4.0 and the digital development process, which can lead to uncertain results and calls on the government to make structural changes. In addition, the author suggests the basic principles of the new economic governance in the process of the contemporary industrial revolution and the emergence of the digital economy development by contribution of a sustainable development.

The paper presents Industry 4.0 and the realistic picture of the digital economy with its bright and dark sides. The author believes that without this type of analysis, we will have simply confusing perceptions of the modern economy, because uncertainty is constantly increasing. Accordingly, it is important for government interventions to promote industry 4.0 and the digital economy and reduce the losses resulting from their development.

The study contains 4 "dark" aspects of industry 4.0 and digitization. These include security uncertainties that are not only related to cyber security (data protection, system hacking, cyber resilience, cyber terrorism, credit and debit card fraud, etc.), but also increase the risks of the innovative eco system.

The author discusses 4 "dark" sides of industry 4.0 and digitization:

1. The impact of automation on employment that increases the rate of release of people employed by computerization (Kovacs 2018, 141). This means acceleration of young people and widespread slowdown low-qualified older employment. With the loss of jobs, the insolvency of the population will increase significantly, leading to the bankruptcy of individuals;

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<sup>3</sup> Kovacs O. The dark corners of industry 4.0 - Grounding economic governance 2.0. *Technology in Society*. 55 (2018). pp.140–145.

2. The second negative result is the impact of computerization on people's mental condition. Digitization and automation can harm people's mental and physical health. Information and communication technologies, makes it possible to work in 24 hours, so executives will have the expectation that they will be able to be very fast action 's. This will break the work-life / leisure time balance and increase stress.

3. Significant problems arise with respect to statistics of information technology. The risks and uncertainties in this area will be related to the following situation: on the one hand, Information and Communication Technologies (ICTs) penetrate everywhere and everything, leading to the need to revise the statistical methodology. Productivity statistics will increase, that is, from digital fixed assets to digital services (data processing, computing, and network design, and so on). The second aspect of this issue which is linked to this problem is Big Data - based analyses, which will accelerate our scientific perception of the world through numbers. New forecasting approaches will be strengthened. However, the changes in the financial market will be more explained by psychology than by macroeconomic principles. This will, of course, be a big challenge for large databases, because it cannot reflect the innumerable, difficult to measure aspects.

4. Problems will result in negligent neglect of contextual links. The first set of unintended consequences arises from a backward interaction between developed and developing countries. In particular, low-wage competitiveness will be replaced by low-tech competitiveness, which will deepen inequality and make the economy less inclusive. The second problem arises, when the scientific community "will start skating" in a different time horizon of financial markets and industrial policy, because the financial sector will be focused on short-term investments, while the industrial sector - the long-term. That is why for sustainability industry 4.0 is important establishing a culture of long-term lending. The third of them arises in terms of neglecting 'mutual play' between the flexibility of the labor market and industrial policy. It is important to make

the labor market more flexible to reduce the side effects. This means that innovative companies will be able to hire and fire more easily, requiring less regulation of the labor market. This will complicate the development and implementation of appropriate welfare policies.

Thus, in the author's view, the success of Industry 4.0 and the results of the digital economy depend not only on the technical flexibility of the transformation but also on social acceptance. He suggests recommendations for Economic Governance 2.0, which should contribute to the sustainable development of industry 4.0 and the digital economy. He also sees the need of developing a new economic thinking, which means combining economics with a complex approach to science to get a real picture of the phenomenon (industry 4.0) and the policies that support structural change.

With rising of the digital economy and increasing of the electronic activities, unhealthy financial benefits from digital businesses have increased. However, as noted above, due to the imperfection of the statistical methodology, a significant portion of the economic operations in digital business are unrecorded. Consequently, one of the major challenges of the digital economy is the strengthening of the digital shadow economy.

There is a lack of scientific research about the digital shadow economy. However, interesting insights into the interpretation of the digital shadow economy have been offered by researchers of the University of Michola Romer (Lithuania) R. Remeikiene, L. Gaspareniene and F.G Schneider<sup>4</sup>. According to the authors, the study was aimed at introducing the definition of digital shadow economy, based on its characteristics. Accordingly, the study deals with illegal digital activity, which covers the criminal and economic aspects of the digital economy. Also, the study deals with

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<sup>4</sup> Remeikiene R., Gaspareniene L., Schneider F.G. The Definition of Digital Shadow Economy. (2018). Technological and Economic Development of the Economy. Volume 24 (2). pp. 696-717.

Gasparėnienė L., Remeikienė R., Ginevičius R. & Schieg M. (2018) Adoption of a mimic model for digital shadow economy estimation. [Technological and Economic Development of the Economy](#). 24 / 4. pp.1453-

1465 / Last Seen 11 September, 2019 /.

illegal digital activity, which covers the criminal and economic aspects of the digital economy. The shadow digital economy considers the production of digital services and the online sale of goods, that are carried out directly in the digital space and, for the sake of illicit interests and for the purpose of material gain, do not envisage legal norms and regulations. The research method is based on scientific literature analysis and expert evaluation.

However, the lack of official statistics made it difficult to elaborate on the definition of the digital shadow economy. Focusing on cybercrime and cyber piracy does not explain the nature of the shadow digital economy, so it is necessary to improve the methodology of evaluating the shadow economy based on its features and channels.

According to Bossler and Holt<sup>5</sup> (2012), the main part of the shadow economy is generated in the digital space. Therefore, without a clear definition of the shadow digital economy, it is impossible to properly analyze the issue and develop policies. He even found the bottom on a stage is considered to be profit-oriented Internet-based activities of unregistered and illegal revenues, which are generated from online trade and services (Zorz, 2015)<sup>6</sup>.

It is noteworthy that the term digital shadow economy also refers to activities carried out by consumers, buyers, related to electronic piracy, copyright infringement and electronic fraud, thus depriving the producer of revenue and cash flow.

In response to the information needs of digital enterprises, it is important to set up real databases to enable data collection and analysis as digital information becomes a key factor in the manufacturing process (Ukolov et al. 2018)<sup>7</sup>.

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<sup>5</sup> Bossler A. M, Holt T. J (2012). Patrol officers' perceived role in cybercrime responding, *Policing an International Journal of Police Strategies & Management*: 35 (1): 165–181. <https://doi.org/10.1108/13639511211215504> / Last Seen 20 May, 2019 /.

<sup>6</sup> Zorz M. ( 2015). Global black markets and the underground economy [online], [cited 12 October 2015]. Featured News. Available from Internet: <http://www.net-security.org/article.php?id=2288> / Last viewed May 20, 2019 /.

<sup>7</sup> Ukolov V.F., Afanasyev V.Y., Vorontsov V.B., Baikova O. V., Bolshakova O. I. (2018). Digitalization of Economics and New Risks in the Leading Industries of FEC. *Helix Vol.8*. E-ISS N: 2319-5592; P-ISSN: pp. 2277-3495.

By digitizing it is possible to create a virtual clone of the object and produce a complete copy of it. The digitization process focuses on the technological features and optimal model of all phases of the manufacturing process.

Such capabilities significantly increase the effectiveness of technology installations, protect their security and monitor.

The study by Ukolov et al (2018)<sup>8</sup> is aimed at exploring the need to accelerate digitization in order to enhance the competitiveness of corporations in global energy markets. Digitization of the Russian economy, like many countries, is at the stage of data accumulation and free access, which increases the opportunities for development of the digital e-industry.

**The research hypothesis of this scientific article can be used to explore opportunities for digitization in other sectors of the industry and to formulate strategic approaches to practical economic policy.**

In recent years, there has been a growing interest in digital platforms, especially for companies that have achieved business success in a short time based on the digital platform. They include Alibaba, Amazon, Facebook, Google, etc. Many of the oldest companies have begun investing heavily in adapting to these platforms, including mechanical engineering, oil production, heavy machine installations, and so on. Manufacturers who make significant gains through platformization.

Researching problems of digital economy has attracted a significant attention number of researchers to the issue of digital money as it brings to the fore a whole new reality of financial and economic relations at both - national and global levels. Digital money - as an important resource of the economy, accelerates turnover and commodity monetization in general, completely reproducing the process, reducing labor costs and creating new opportunities for economic entities.

Even in Georgia, where there is a shortage of financial resources, issues of digital currency production, income generation and other related issues are drawing the attention of economists. The essence of digital currency and its characteristics are discussed in the

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<sup>8</sup> The same (5)

scientific papers of Prof. D. Sichinava<sup>9</sup> (2019), I. Gagnidze<sup>10</sup> (2019), I. Gogorishvili<sup>11</sup> (2019) et al. The studies mainly focus on digital currency trading and regulation, as Georgia ranks second in the world after China in terms of digital money production and trade. In addition, the Government of Georgia promotes the development of Bit coin platforms both in the private sector (production systems are located in free economic zones) and in the public sector, which in turn has given the public greater interest in digital currency generation<sup>12</sup>. "However, Georgia has the second largest Bit coin data center."<sup>13</sup> It is noteworthy that the providers involved in this business believe that, in contrast to the state-controlled, centralized, closed system of government and corporations and the secrecy of their management decisions, decentralized, open and transparent crypto systems work perfectly in the processes and challenges modern interconnected world.

Interesting research on digital money – Bit coin has been conducted by Baur, Hong, and Lee<sup>14</sup> (2017). They define Bit coin as digital money in a decentralized co-payments network. It is a hybrid

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<sup>9</sup> Sichinava, D. Cryptocurrency - A future medium of exchange (2019). Economics and Business, Vol.11 Issue 1 (19). Iv. Javakhishvili Tbilisi State University.

<sup>10</sup> Gagnidze, I. (2019) Future challenges and the problems of development of the Circular Economy Business models. Proceedings of the International Scientific and Practical Internet Conference "BUSINESS STRATEGY: FUTUROLOGICAL CHALLENGES". ISBN 978-966-926-310-0. KNEU, Kyiv, 20-22 November. pp.13-18.

<sup>11</sup> Gogorishvili, I., Gagnidze, I., Papachashvili, N.(2019) Innovative Approaches in Higher Education System, 6th Business Systems Laboratory International Symposium, BORDERS WITHOUT BORDERS: Systemic frameworks and their applications for sustainable well-being in the global era. *BOOK OF ABSTRACTS*. ISBN 9788890824272, Pavia, Italy, Ab.56 <http://bslab-symposium.net/Pavia-2019/BSLAB-%20Book%20of%20Abstract-Pavia-2019.pdf#page=214>

<sup>12</sup> <https://www.bm.ge/en/article/diplomebi-blokchein-platformaze-gantavsdeba/38452/> / Last viewed September 24, 2019 /

<sup>13</sup> <http://www.iset-pi.ge/index.php/en/iset-economist-blog/entry/2017-07-07-10-19-51> / Last viewed September 24, 2019 /

<sup>14</sup> Dirk G. Baur, Kihoon Hong, Adrian D. Lee. Bit coin: medium of exchange or speculative assets? (2017). Elsevier BV Journal of International Financial Markets, Institutions and Money. pp.177-190.



of commodity and paper currency that is independent of government and monetary rulers and has no substantive value.

The article analyzes the static properties of Bit coin and finds that it is not correlated with traditional assets such as stocks, bonds, etc. In both normal and financial volatility. The data analysis of Bit coin account transactions shows that it is mainly used as a speculative investment and not as an alternative currency or intermediary component of the exchange.

Bit coin is preferably considered an asset because it does not carry all the functions of the currency (the currency has the function of payment, value measurement and accumulation – author). It attracts potential users of virtual currencies with low transaction costs, proportionality, globality and government-free design. However, it may be possible to purchase illegal goods (drugs, weapons, etc.). It is regarded as a speculative tool. Demand for assets and prices can be much variable.

Thus, the success of Bit coin or similar alternative currencies or assets is related to the state of the currency and financial assets in question. Baur, Hong, & Lee's<sup>15</sup> (2017) study confirms that Bit coin is mainly used as a speculative investment due to its high volatility / volatility and high returns.

Interesting research on crypto currencies as financial assets belongs to Corbet, Lucey, Urquhart, and Yarovaya <sup>16</sup>(2018). The study provides a systematic review of empirical literature related to the development of crypto currencies as a financial asset market since 2009. Using a systematic analysis approach, the researchers aimed to delve deeper into the field and identify unexplored “cracks”. Systematic analysis is a powerful tool for scientists, professionals, and policy makers in the field of knowledge, consent and uncertainty around the issue.

The authors conclude, that most of the studies address the questions of positivism, though philosophical, scientific paradigms

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<sup>15</sup> The same (12)

<sup>16</sup> Corbet S., Lucey B., Urquhart A., Yarovaya L. (2018). Crypto currencies as a financial asset: A systematic analysis. Elsevier BV International Review of Financial Analysis. pp.182-200.

are more important for practitioners and policy makers. The paper provides recommendations on which areas to diversify crypto currency research. Specifically, such issues include expanding the database of crypto currency studies; Research on the legal, economic and regulatory issues of crypto currencies; Issues of information asymmetry; Theoretical development; Alternative Potential Benefits of Block chain Consumption; Valuation of crypto currencies as an asset; the issue of environmental change with regard to crypto currencies, etc. However, the authors pay great attention to the triad of problems: disorientation of regulation, price spikes and cybercrime.

However, it is important to consider cyber risks - there is a threat from hackers. Terrorists and other criminals can easily use it. Because of this, the risk of banning it is high. In addition, the transaction is not insured - the currency cannot be returned after the executed transaction. While this currency is unofficial so far, there is a chance that you will be misled by any Bit coin exchange service. In the period of the financial crisis, crypto currencies in fact have been created for higher security than traditional money and assets, but as reality shows, bankruptcy and hacker attacks are still permissible here. In addition, victims of bankruptcy of crypto currency exchanges lose everything because of the lack of regulatory mechanisms.

Thus, crypto currencies are a high-risk investment, with high returns. Crypto currency market is controlled by no one, and it is only a mechanism to regulate the market, respectively, characterized by strong price volatility and create favorable conditions for speculative transactions. However, it should be noted, that without proper scientific theoretical elaboration of the crypto currency issue it is not possible to identify and retrieve regulation policy instruments<sup>17</sup>.

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<sup>17</sup> Lekashvili E., Mamaladze L. Crypto Currency - A New Challenge for the Georgian Economy. Copernican Journal of Finance and Accounting (2018, volume 7, issue 4). DOI: <http://dx.doi.org/10.12775/CJFA.2018.022> ISSN 2300-1240 (print); 2300-3065 the ISSN of the (an online) / Last Seen 24 September, 2019 /.

Researchers in digital economics theory (Rogers<sup>18</sup>, 2018) believe that models of limited resources and monopoly no longer fit into the digital age. This applies to both commercial entities and the state. Commercial Block chains will in future compete with state Block chains based on structural advantages. According to Rogers, "the effects of an open, public Block chain-based network are definitely greater than any private system".

With the advent of electronic money and increasing complexity, the relationship between financial centers and political power in society will change: finances will be based on security, and security will be based on finances. Accordingly, Block chain is only one component of the control of the extending techno-hybrid power in which humans are currently present.

The behavior of crypto currencies as an investment asset has attracted much attention from researchers and investors lately. The research (Nguyen et al.<sup>19</sup>, 2019) shows that the response of crypto currencies to macroeconomic policy has proved ineffective. The asymmetric effect of monetary policy on crypto currency yields under strict and soft monetary policy regimes has been investigated.

Interestingly, that the study showed the response of four major crypto currencies, including Bit coin to China's tight monetary policy, while US monetary policy did not have a significant impact on crypto currency revenues.

In addition to researching digital currencies, the interest of scientists in studying the economic nature of digital goods has attracted much attention. T. Rayna's<sup>20</sup> (2008) authored work investigates the economic nature and characteristics of digital goods. There are also two practical issues involved in identifying the issues

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<sup>18</sup> Rogers Z. Blockchain and the state: Vehicle or vice? *Australian Quarterly*, Vol. 89, No. 1 (JAN-MAR 2018), pp. 3-9, 44. Australian Institute of Policy and Science. <https://www.jstor.org/stable/26450190> ./ Last Seen 24 September, 2019. /

<sup>19</sup> Nguyen T.V., Nguyen B.T., Nguyen K.S., Pham H. Asymmetric monetary policy effects in crypto currency markets. *Elsevier BV Research in International Business and Finance* 48 (2019). pp. 335-339.

<sup>20</sup> Rayna T. Understanding the Challenges of the Digital Economy: The Nature of Digital Goods, *Communication & Strategies*, no.71, 3<sup>rd</sup> quarter 2008. pp.13 - 33.

of massive consumer piracy and the value of digital goods. It deals with cases where users produce, distribute and change digital goods without having to spend money on them.

However, the author rejects the idea that traditional economics cannot work in the digital economy and that the "new economics" is needed. This result derives from the following fundamental economic features: digital goods are easily replaceable (it is possible to produce copies without loss of quality and information). Digital goods are public goods and durable goods. However, some digital goods are trial goods and will not be marketed.

Studies are also being conducted on the interrelationship of digital technologies and economic growth. The scholarly article by Qu, Simes, and O'Mahony<sup>21</sup> (2017) provides new empirical evidence that emphasizes the importance of digital technologies in promoting economic growth. It assesses the long-term economic impact of digital technologies based on indicators of mobile phone and internet use. The article presents the results of improving Australia's economy through the impact of digital technologies in 2004-2014.

Other studies (Golddfarb & Tucke<sup>22</sup>, 2019) provide insights into the impact of digital technology changes on economic activity. According to the authors, understanding the content of the effects of digital technologies does not require a new economic theory. It requires different accents. The question arises, what is the difference? What can be done easily when the information is in bits and not in atoms? Digital technology often means that spending can hinder economic activity. Consequently, the digital economy explains the changes in standard economic models, when specified costs fall substantially, or at least equal to zero. The authors classify these costs into five groups:

1. Lower search costs;
2. Lower cost of propagation;
3. Lower transportation costs;

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<sup>21</sup> Qu J., Simes R., O'Mahony J. How do Digital Technologies Dive into Economic Growth? *Economic Record*, vol.93.Issue, June, 2017. pp.57-69.

<sup>22</sup> Golddfarb A., Tucke C. Digital Economics. *Journal of Economic Literature* 2019, (57), pp.3-43. <https://doi.org/10.1257/jel.20171452> . / Last viewed September 24, 2019 /

4. Lower tracking costs;
5. Less verification / verification costs<sup>23</sup>.

Each spending change creates an improved economic model. However, digital economic literature is increasingly influenced by areas such as economic crime, public goods economics, organizational economics, finance, urban economics, labor economics, development economics, public finance and international economics. According to the author, the digital economy can be seen as a way of thinking that deals with many aspects of the economy. However, digitization has different consequences for countries, regions, firms and individuals. It affects productivity, trade, the economic role of cities, national and international outsourcing, and how people spend their leisure time.

An important issue in the modern stage of digital technology development is the control of commercial internet activities in the historical context of decentralization. Commercial interests competing with each other should also be taken into consideration. Consequently, the main problem of digital technologies is related to openness and control of information.

Information literacy among professional competencies is also important, which should be reflected in the content of educational programs at all levels of education.

Thus, the systematization of the results of the analyzed scientific literature shows the multiplicity of expected negative outcomes, whose existence and origin require more literary readiness from the modern citizen and government. The negative effects are linked to a number of uncertainties, the expected decline in the employment of under-aged people, the increase in stressful working conditions for managers, the unfair distribution of income, the growth of the digital shadow economy, cybercrime, the rise of ill-advised financial gain that will enhance financial Sector and increase the value of speculative assets. As a result, regulation will be complicated, prices will rise. The links between financial centers and political power will become even more important.

From an economic point of view, digitizing the economy may require huge additional costs, but ongoing operations reduce the

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<sup>23</sup> The Same (21)

costs of searching, multiplying, transporting, tracking and verifying information. However, the emergence of digital money accelerates turnover. It is cheaper, faster, and more global in content than traditional cash. In order to facilitate the formation of databases, it will be necessary to develop an information production accounting methodology. In order to find effective tools for managing these and other challenges, it is important to establish a new economic mindset on the basis of which a new economic model in the form of a digital economy should be explored.

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