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ESSENCE AND ANALYSIS OF THE BENEFITS OF DIGITAL ASSETS

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Abstract. *Financial systems around the world have been changing rapidly in recent years. The development of the digital economy in general and digital technologies in particular has led to the emergence of a new concept – "digital asset" – and the gradual introduction of related processes. The use of the concept of a digital asset in the modern sense is primarily caused by the emergence of blockchain technology. Based on the relevance of this area, the authors of this article set a goal - to make an attempt to study in detail and reveal the essence and formulate the most complete definition of the concept of digital assets, compare their advantages and disadvantages, and identify the pace of their further development. At the same time, in the process of analysis, the authors proceed from the context of the interpretation of digital assets as a specific type of economic assets, which also have technological and legal features. The article examines the essence of digital assets and digital technologies, their relationship and interaction, and analyzes the main advantages and risks associated with the introduction of digital assets into circulation. The authors discuss the potential of digital assets and technologies for innovation and transformation, and highlight the risks and challenges associated with their adoption and use.*

Keywords: *digital assets, digital technologies, blockchain, digital currency, token, distributed ledger.*

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СУЩНОСТЬ И АНАЛИЗ ПРЕИМУЩЕСТВ ЦИФРОВЫХ АКТИВОВ

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Аннотация. *За последние годы финансовые системы во всем мире стремительно меняются. Развитие цифровой экономики в целом и цифровых технологий в частности обусловили появление нового понятия – «цифровой актив» – и поэтапное внедрение связанных с ним процессов. Использование понятия цифрового актива в современном понимании в первую очередь вызвано появлением технологии блокчейн. Исходя из актуальности данного направления, авторами данной статьи поставлена цель – сделать попытку подробного изучения и раскрытия сущности и формулирования наиболее полного определения понятия цифровых активов, сравнить их преимущества и недостатки, выявить темпы их дальнейшего направления развития. При этом, в процессе анализа авторы исходят из контекста трактовки цифровых активов как специфического вида экономических активов, обладающих также технологическими и юридическими особенностями. В статье исследуется сущность цифровых активов и цифровых технологий, их взаимосвязь и взаимодействие, анализируются основные преимущества и риски, связанные с введением*

цифровых активов в оборот. Авторы обсуждают потенциал цифровых активов и технологий для инноваций и трансформации, а также выделяют риски и проблемы, связанные с их внедрением и использованием.

***Ключевые слова**: цифровые активы, цифровые технологии, блокчейн, цифровая валюта, токен, распределенный реестр.*

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RAQAMLI AKTIVLARNING MOHIYATI VA AFZALLIKLARI TAHLILI

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***Annotatsiya**. So‘nggi yillarda butun dunyo bo‘ylab moliyaviy tizimlar tez o‘zgarib bormoqda. Umuman raqamli iqtisodiyotning va xususan raqamli texnologiyalarning rivojlanishi yangi konsepsiya – "raqamli aktiv" ning paydo bo‘lishiga va tegishli jarayonlarning bosqichma – bosqich joriy yetilishiga olib keldi. Zamonaviy ma’noda raqamli aktiv konsepsiyasidan foydalanish birinchi navbatda blockchain texnologiyasining paydo bo‘lishi bilan bog‘liq. Ushbu sohaning dolzarbligidan kelib chiqib, ushbu maqola mualliflari o‘z oldilariga maqsad qo‘ydilar – batafsil o‘rganish va mohiyatini ochib berish va raqamli aktivlar tushunchasining yeng to‘liq ta’rifini shakllantirish, ularning afzalliklari va kamchiliklarini taqqoslash va ularning keyingi rivojlanish sur’atlarini aniqlash. Shu bilan birga, tahlil jarayonida mualliflar raqamli aktivlarni texnologik va huquqiy xususiyatlarga ega bo‘lgan iqtisodiy aktivlarning o‘ziga xos turi sifatida talqin qilish kontekstidan kelib chiqadilar. Maqolada raqamli aktivlar va raqamli texnologiyalarning mohiyati, ularning o‘zaro bog‘liqligi va o‘zaro ta’siri ko‘rib chiqiladi, raqamli aktivlarni muomalaga kiritish bilan bog‘liq asosiy afzalliklar va xatarlar tahlil qilinadi. Mualliflar innovatsiyalar va transformatsiyalar uchun raqamli aktivlar va texnologiyalarning imkoniyatlarini muhokama qiladilar va ularni amalga oshirish va ulardan foydalanish bilan bog‘liq xavf va muammolarni ta’kidlaydilar.*

***Kalit so‘zlar**: raqamli aktivlar, raqamli texnologiyalar, blokcheyn, raqamli valyuta, token, taqsimlangan reestr.*

Introduction

Financial systems around the world have changed rapidly in recent years. The development of the digital economy in general, and of digital technologies in particular, has led to the emergence of a new concept - "digital asset" - and the gradual introduction of related processes. The use of the concept of digital asset in the modern sense is primarily caused by the advent of blockchain technology. You can see at least a few new forms of money, such as cryptocurrencies, digital currencies of central banks, NFT, and others. At the same time, taking into account the restructuring of global economic relations, experts of central banks of different countries have already mentioned several times in recent years that digital currency in this context may become at least as relevant, and perhaps even more relevant than before. For some, the interest in cryptocurrency is an attempt to earn, for some digital assets is an attempt to somehow protect themselves from inflation and some new risks, and for some it is basically a strategic rate, if you look at technology, for example, which is the basis of cryptocurrencies, and in principle the application of blockchain technology. Based on the relevance of this direction, we felt it necessary to first set the goal - to make an attempt to study and reveal the essence and formulate the most complete definition of the concept of Central Asia, to

compare their advantages and disadvantages, Identify the pace of their further development. At the same time, the analysis should be based on the context of the treatment of digital assets as a specific type of economic assets, which also have technological and legal features. In this article, we have attempted to understand the nature of digital assets and digital technologies by exploring their main aspects, types, characteristics and relationships. We analyze the role of digital assets and digital technologies in the modern economy and discuss the challenges and opportunities associated with their use.

Methodology

The study used general scientific methods of cognition, including methods of climbing from abstract to specific, analysis and synthesis, historical and logical, as well as methods of systemic and complex approaches, structural, factor, functional and comparative analysis.

Literature review

Digital technology is a key component of the modern digital economy. The rapid development of digital technology has consequently led to the emergence of new forms of assets and innovative technological solutions, in particular digital assets. Digital assets, such as cryptocurrencies and tokens, are digital forms of storage and transfer of value, while digital technologies provide the infrastructure and tools to handle these assets.

In simple terms, digital technologies include everything related to electronic computing and data conversion: gadgets, electronic devices, technologies, programs. Compared to analogue technologies, digital technologies are better suited for storing and transmitting large amounts of data and provide high speed calculations. In this case, information is transmitted as accurately as possible, without distortion [7]. According to the educational website, the concept of digital technologies refers to digital devices, systems and resources that help create, store and manage data. An important aspect of digital technology is information technology (IT), which refers to the use of computers to process data and information [6].

Another definition is given in the large Russian encyclopedia. Digital technologies, for example, include technologies that allow the creation, storage, processing and dissemination of data electronically using a computer and computer networks (often via the Internet). They are subject to digital legal relationships [5]. In the article Loseva (2021) notes that digital technologies in a broad sense is an electronic information system, which is based on discrete (discontinuous) methods of coding and translation of data, allowing for a very short time to solve various problems. The operation of such a system requires the use of a computer and computer technology [4].

Some of the major digital technologies include blockchain, cryptography, distributed systems, artificial intelligence, big data (Big Data) and the Internet of Things (IoT). More generally, digital technologies include: artificial intelligence and machine learning; high-speed internet; IoT; integrated industrial networks; augmented reality and 3Dprinting; cyberphysical systems and neurotechnologies with fundamentally new mechanism of interaction of human and robotic devices; modern bioengineering technologies; distributed registry systems (blockchain); technologies for the collection and analytical processing of large (global) databases (Big Data); cloud computing services; "smart" robotic complexes and devices, and technologies for the development of social networks, sophisticated digital technology platforms (digital counterparts, decentralized registry, quantum computing); security and safety technologies on the Internet (Cybersecurity) [8].

In reviewing the existing work, we agree with the view of some experts in the field of digital technologies that, to date, the notion of "digital asset" does not have a single, comprehensive definition that fully defines the term, which significantly complicates the understanding of many processes related to the use of digital assets and often affects the distortion and misinterpretation of the information underlying the existence of digital assets.

Thus, Kud (2019) in the process of analyzing modern scientific publications and research on the digital asset divides them into five groups, and concludes that to date there is no clear definition and understanding of this concept. According to the analysis, one group of scientists (Aryanova

(2018); Averyanov, Evtushenko and Kochetova (2016); Buntinx (2017); Fiduciary Access to Digital Assets and Digital Accounts Act, (2014); Gray (2016); Harbinja (2017); Kud & Pyko (2018); Osterary (2018); Walker Sap (2018), Walker and Okova (2018). "digital asset"; second group (EthereumNews, 2018; Tsegoev (2018); Zakharova (2018)) - the concept of "cryptocurrency"; third group (Great (2018) - the concept of token; fourth group (Main legal portal of Ukraine, 2018) - the concept of "virtual asset"; fifth group of scientists (Lenz, 2012; Owens, 2017; Wink, Concannon, Jennings, Kates, & Gabay, 2018) applies several concepts simultaneously as synonyms, that is, there is a close intertwining of concepts [2]. In the result of the study, the author clarifies his own concept of digital asset in the economic and legal aspect: digital asset - information resource derived from the right to value and traded in the distributed registry in the form of a unique identifier. At the same time, to clarify the concept of digital asset, certain essential and semantic features, presented by four components: economic, legal, information, value.

In simple terms, digital assets are forms of assets that exist and are transferred digitally. They may be forms of value, right or ownership. Examples of digital assets include cryptocurrencies such as Bitcoin, Ethereum, and Litecoin, as well as tokens used in blockchain platforms and innovative projects.

However, not every electronic information created, processed, stored and transmitted by a computer is a digital asset. According to Loseva (2021), an important feature of a digital asset is that it has a unique identifier that authenticates the asset and indicates its "name" and location in an information system, such as a distributed registry for digital financial assets, as well as restricting access to it by other users through cryptographic or other security mechanisms. This identification confirms the owner’s rights and prevents duplication and illegal copying of a digital asset. Therefore, a normal computer program by default does not generate digital assets in computer games, the Internet, virtual space, etc. because it does not provide them with the same mechanism of fixing and protecting creator/owner rights [4].

A key characteristic of digital assets is their decentralized nature and the use of cryptography to secure and control transactions. Digital assets are often based on blockchain technology, which allows network members to build trust and build consensus without the need for a centralized broker. Analyzing the above definitions, the author provides the following interpretation of the notion of digital assets, which in our view better reflects the essence of the concept.

"Digital assets are assets that are represented only digitally, reflecting unique digital value representations based on cryptography and blockchain technology. Digital assets have decentralization, integrity, transparency and security properties that can be transferred and used to represent and transfer value, participate in network protocols and perform smart contracts.

Analysis and results

Below is an analysis of the main properties and characteristics of digital technologies and digital assets, which allows a broader understanding of the main essence of these categories.

The main characteristics and aspects of digital technologies include:

Digital data processing: Digital technologies are based on digital data processing, storage and transmission. This means that information is presented and processed using bits and bytes, which allows more efficient and accurate storage and processing of information.

Computers and software: Digital technology includes the use of computers and software to perform various tasks. Computers provide computing power and data storage, and software provides tools and applications to work with data and perform various operations.

Network technologies: Digital technologies are often associated with the use of networks and communications to transmit information. The Internet and other networking technologies play a key role in connecting people, devices and systems in digital space.

Automation and artificial intelligence: Digital technologies also include the ability to automate tasks and use artificial intelligence to analyze data, make decisions, and perform complex tasks. Artificial intelligence enables computers to "learn" from data and experience, enabling them to perform tasks that previously required human intervention.

Multimedia and visualization: Digital technologies allow the creation, processing and reproduction of various forms of multimedia, including images, sound and video. They also provide visualization of data and information for better presentation and analysis. Examples of digital technologies include programming, databases, the Internet, social networking, cloud computing, machine learning, virtual and augmented reality, the Internet of things, blockchain, and more.

Digital technologies play a key role in various areas, including business, education, health, transport, entertainment and public administration. They provide new opportunities for efficiency, innovation and quality of life. Blockchain, as a key digital technology, provides secure and transparent recording of transactions, as well as support for digital asset matching and management mechanisms. Cryptography, in turn, ensures the security and confidentiality of data used in digital assets and transactions.

Consider the interaction of digital technology and digital assets.

Digital technology as the foundation of digital assets: Digital assets, such as cryptocurrencies, tokens, or digital certificates, are based on digital technology, particularly the blockchain. Blockchain is the foundation for creating and securing digital assets. Blockchain technology ensures reliable recording and transmission of information, ensuring data security, transparency and consistency. Thus, the development of digital technologies such as blockchain creates the conditions for the emergence and development of digital assets.

Digital assets as digital applications: Digital assets use digital technologies for their existence, transmission and management. Blockchain technology provides decentralized management and secure digital asset transfer, providing process reliability and automation. Other digital technologies, such as smart contracts or identity technologies, can be used to improve the functionality and use of digital assets. Thus, the development of digital assets requires the use and development of digital technologies.

Interaction and synergy: The development of digital technologies and digital assets are mutually supportive. The growth of digital technologies, such as artificial intelligence, the Internet of Things, or cloud computing, provides new opportunities for creating and managing digital assets. At the same time, the development of digital assets stimulates innovation in digital technology, such as blockchain or cryptography, to improve the security and efficiency of digital assets. This cooperation contributes to the overall development of the digital economy and technological progress.

Impact of regulation and regulatory frameworks: The development of digital assets also influences the regulatory and regulatory environment for digital technologies. With the advent of new types of digital assets and technologies, regulators and governments around the world are developing rules and laws to ensure safety, transparency and stability in the digital ecosystem. The regulation of digital assets has an impact on the development of digital technologies and, in turn, shapes the future dynamics of the digital asset market.

Thus, the development of digital technologies and digital assets is closely interlinked and ensures co-development and innovation in the digital economy. Interaction between them contributes to the evolution and creation of new digital opportunities and benefits for business, society and the state.

The features of digital assets include the following:

Digital in nature: Digital assets exist in electronic form, consisting of digital records or data. They have no physical manifestation and can be easily transferred or copied in a digital environment.

Ownership and transfer: Digital assets may be controlled by individuals or entities. Possession may be transferred by transferring relevant digital records or access keys.

Cryptographic security: Digital assets typically use cryptography to secure and protect against unauthorized access. Cryptographic methods may include encryption, electronic signatures and hash algorithms.

Programmability and "smart contracts": Some digital assets, especially those based on blockchain technology, can be programmed using "smart contracts". Smart contracts are computer programs that automate and perform the conditions and actions of interaction with digital assets.

Turning to the analysis of types of digital assets, some studies on the classification of this type of asset should be highlighted. For example, as shown in Fig. 1., in the work of Vlasov (2022), in the study of definitions of digital asset (CA), cryptoasset, digital currency, cryptocurrency, digital token, digital rights, digital financial asset (DFA), digital certificate, etc. the author presents various variants of them, and reflects their unified scheme of relationship as follows:

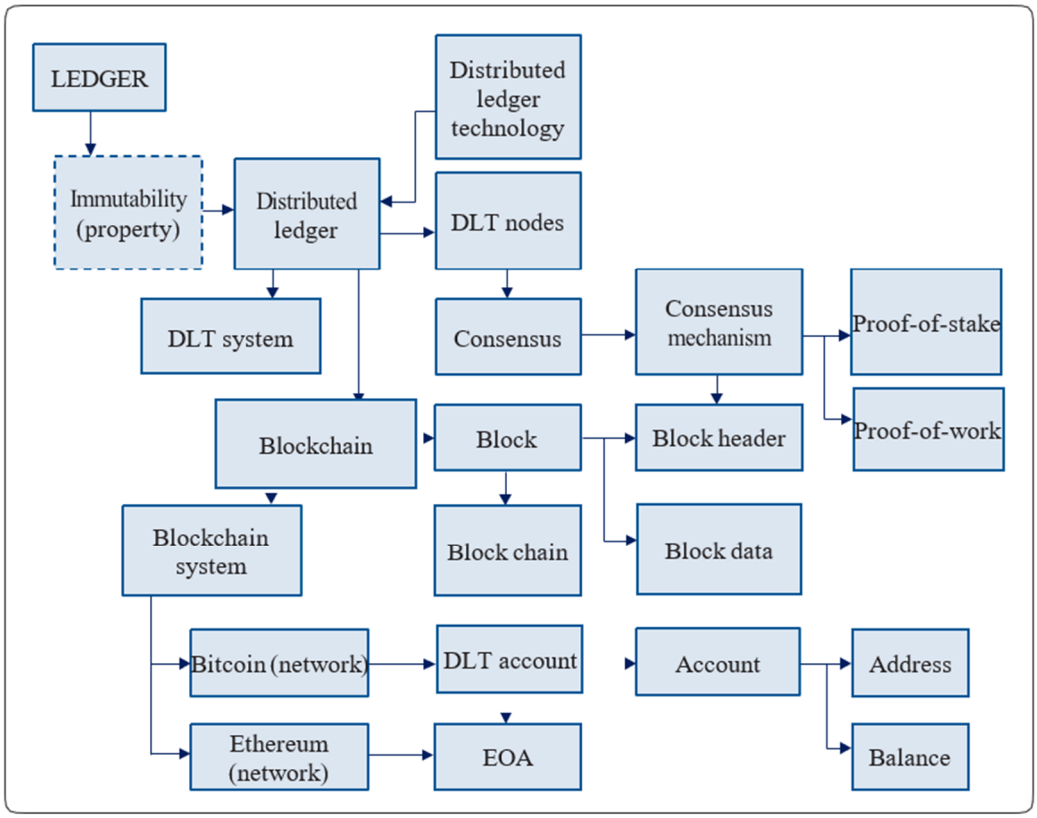

Fig. 2. Relationships of financial and economic terms [1]

From the scheme it can be concluded that the author refers to digital assets, digital currency, crypto-asset, digital token and DLT token.

In turn, N. P. Moradi Sani includes digital assets in the list of financial instruments, and proposes to highlight an additional classification feature of financial instruments - digital financial instruments.

According to Moradi Sani, the digital currencies of central banks should be distinguished into a separate category of digital financial instruments, i.e., they represent a digital form of money and perform 3 basic functions of money, while digital financial assets serve as a means of payment and investment. The division of digital assets into financial and non-financial assets is caused by the need to separate different kinds of tokens (tokens - securities, user tokens, tokens - assets). For example, tokens belonging to digital financial assets can be invested and financed like securities, but there are many tokens used to log into a user application or representing a right to digital work (unique tokens).

We offer our own version of the classification of digital assets, and we believe that this definition most fully includes all possible types of assets (Fig. 2). In our opinion, digital currencies of central banks should be separated into a separate category of digital financial instruments, since they represent a digital form of money and perform 3 main functions of money, while digital financial assets perform the function of a means of payment and are an object of investment. However, it should be especially noted that this classification cannot be complete from the point of view of the fact that the continuous and widespread development of technology can give rise to more and more new varieties of digital assets.

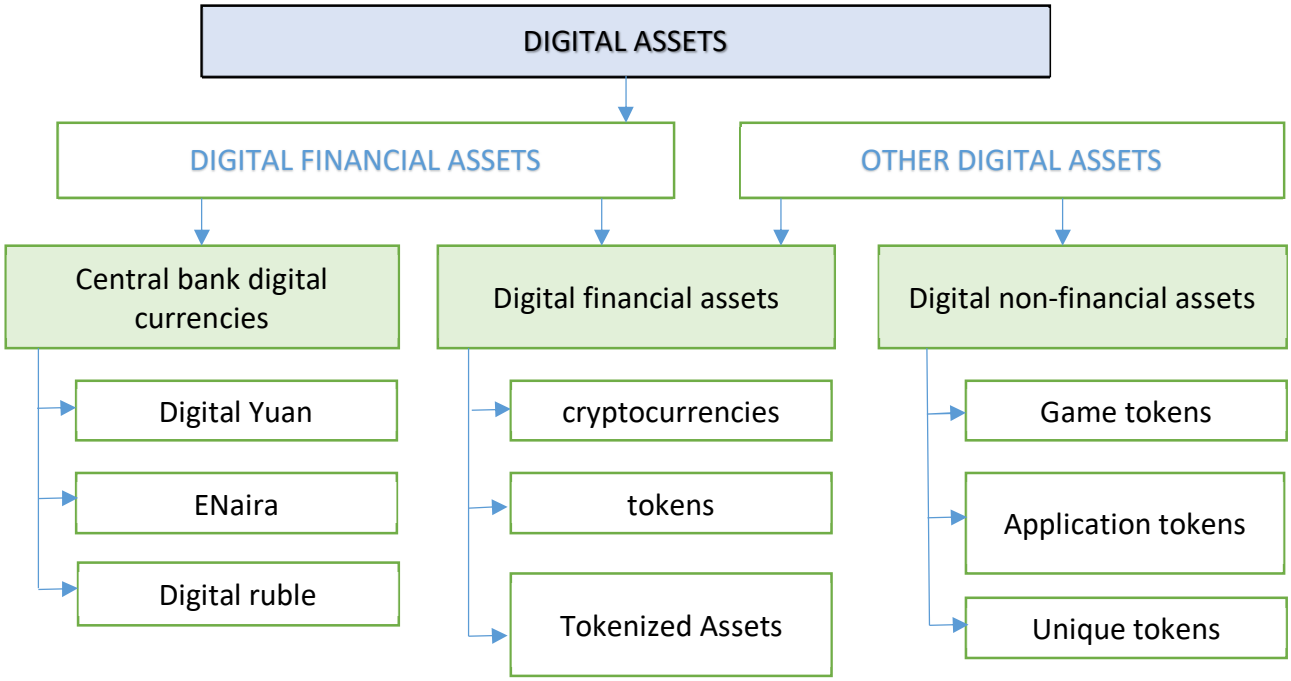

Fig. 3. Classification of digital financial instruments and digital assets[4]

The widespread use of digital assets such as cryptocurrencies, tokens, and other forms of digital value has its pros and cons. Consider them in more detail (Fig. 3.).

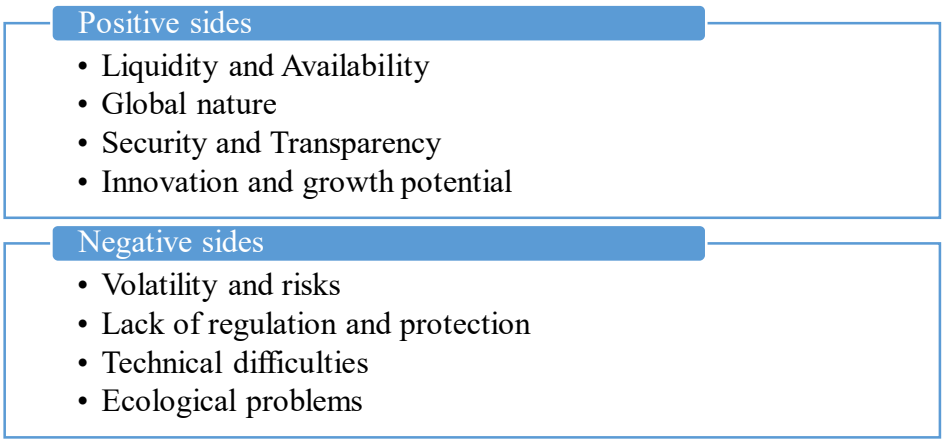

Fig. 4. Advantages and disadvantages of digital assets[5]

Digital assets offer a new form of liquidity and affordability. They allow for the rapid and efficient transfer of value and ownership without the need for intermediaries or traditional financial institutions. Digital assets have no territorial limits. They can be used and transmitted anywhere in the world without hindrance, thus facilitating international trade and financial transactions.

With the use of modern cryptographic technology and blockchain, digital assets provide a high level of security. Transactions with digital assets can be verified and protected from fraud, and data privacy can be maintained. Blockchain technology, used in many digital assets, ensures the transparency and integrity of transaction records. All transactions are publicly available and can be verified by network members, which promotes trust and reduces the potential for fraud.

[4] Compiled by author based on: Moradi Sani N. Digital financial instruments: the concept and types in the conditions of digital development, Belarusian State University of Economics, Minsk, Belarus, 2022

[5] Compiled by author.

Innovation and Growth Potential: Digital Assets is a new form of financial instruments that opens the way for innovation and new opportunities in various fields such as finance, investment, smart contracts and decentralized applications.

However, widespread use of digital assets also has its downsides:

Volatility and Risks: Digital assets, especially cryptocurrencies, are often characterized by high price volatility. Their value can vary significantly and is subject to market forces. This creates potential financial risks and uncertainty for investors and users.

Lack of regulation and protection: Digital assets are largely outside traditional financial systems and regulatory frameworks. This may lead to a lack of consumer protection, the potential for fraud and insufficient guarantee of return in case of problems.

Technical challenges: Digital assets require technical knowledge and specialized software or wallets. This can create difficulties and inconveniences for newcomers and less technically trained users.

Environmental issues: Some digital assets, especially those that use proof mechanisms (Proof-of-Work), consume large amounts of energy. This can have a negative impact on the environment and cause environmental problems.

In general, the widespread use of digital assets offers new opportunities, but also carries certain risks and necessitates the development of appropriate regulatory and regulatory mechanisms to ensure stability, security and the protection of stakeholders' interests.

Conclusion and suggestions

Digital assets and digital technologies play a significant role in the modern digital economy. Digital assets represent a new form of storage and transfer of value, and digital technologies provide the infrastructure and tools to deal with these assets. The interaction between digital assets and digital technologies creates new opportunities and challenges in the field of economics, finance and technology, requiring further research and development.

Overall, the widespread use of digital assets offers new opportunities, but also carries certain risks and necessitates the development of appropriate regulatory and regulatory mechanisms to ensure stability, security and stakeholder protection.

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