

Legal nature and types of digital assets in the activities of technology-oriented startups

Professor Dr. habil. **Kateryna NEKIT**¹

Abstract

Digital assets play an increasingly important role in people's lives and are ever more often becoming the basis for launching business. The prospects that digital assets open for identifying new sources of profit are stimulating the intensive development of technology-oriented startups. However, despite the active spread of relations arising from digital assets, legal regulation in this area is only at the initial stage of development. The concept and legal nature of digital assets remain unclear at the legislative level in most countries of the world. In the legal doctrine, there are active discussions on the legal nature of digital assets, but it still has neither a clear definition of its essence nor a clear delineation of the objects covered by this concept. Such legal uncertainty makes it much more difficult to run a business based on the use of digital assets. Therefore, the aim of this study is, first, to define the concept and fields of emergence of technology-oriented startups and the types of digital assets used in their activities. Secondly, the article looks into the legal nature of digital assets and considers the possibility to recognize digital assets as a type of property. The recognition of digital assets as a special type of property allows applying to them provisions on the right to ownership, which guarantee the highest degree of protection and best ensure the interests of their owners.

Keywords: digital assets, virtual property, crypto-assets, technology-oriented startups, digital economy.

JEL Classification: K11, K15, K22, K24.

DOI: 10.24818/TBJ/2023/13/2.08

1. Introduction

Modern society is characterized by an extremely high level of information technology development and digitalization of all spheres of social life. The number of Internet users according to the United Nations increased from 25.8% in 2009 to 53.6% in 2019, thus it was found that 4.1 billion people in the world were connected to the Internet. Of course, the number of Internet users has grown rapidly during the COVID-19 pandemic: in 2020, the number of Internet users increased by almost 300 million to 4.8 billion, which was approximately 63% of the total world population². As of April 2022, there were more than five billion Internet users worldwide, which is 63.1% of the global population. Of this total, 4.7 billion or 59% of the world's

¹ Kateryna Nekt - University of Mannheim, Germany; National University "Odesa Law Academy", Ukraine, katerinanekit@gmail.com.

² Mind. (2020). *Кількість інтернет-користувачів у світі досягла 4,8 млрд.* [The number of Internet users in the world reached 4.8 billion.] [online] Available at: <https://mind.ua/news/20219912-kilkist-internet-koristuvachiv-u-sviti-dosyagla-48-mlrd> [Accessed 1 Feb. 2023].

population were social media users³. Social media use continues to grow too, with the global user total reaching 4.74 billion in October 2022. That's equal to 59.3% of all the people on Earth and indicates that more than 93% of Internet users now use social media every month. The amount of Internet users continues to increase at an annual rate of 3.5%, and current trends suggest that two-thirds of the world's population should be online by the end of 2023⁴.

As social life moves online, business also moves into the digital world. Statistics demonstrate the active presence of business online. As of 2022, approximately 71% of small businesses have websites. About 70% of SMEs are investing more in their digital presence, actively showing that the future of business is on the digital landscape⁵. Statistical data convincingly testify to the activation of e-commerce and the relentless development of the digital economy. In turn, the development of the digital economy is accompanied by changes in emphasis in the regulation of social relations and the generation of new categories that need to be defined and introduced into the legal field.

In particular, the concept of so-called digital assets has been increasingly discussed recently. Despite the active use of this term in daily life, it has neither a clear definition of its essence nor a clear delineation of the objects covered by this concept. Instead, the concept of digital assets is often used alongside other synonymous categories such as virtual assets, digital or virtual property, crypto-assets etc., and the number of entities embraced by this concept is constantly growing. Digital assets are increasingly being used in the field of small and medium-sized businesses for profit, but there are no clear legal structures for the proper regulation of relations arising from digital assets. This forces businesses to either constantly look for solutions that will allow the use of digital assets in the legal field, or to leave part of the processes related to digital assets in the so-called "gray" area. Such legal uncertainty creates difficulties for business both from the point of view of implementing relationships with clients, and from the point of view of taxation and legalization of business activities. A clear understanding of the essence of digital assets will also contribute to the development of investment strategies and the development of new business⁶. Therefore, in order to bring certainty to the daily activities of numerous small and medium-sized enterprises and startups, the category of digital assets needs legal analysis and interpretation, its correlation with generic concepts and the range of objects it covers should be clarified.

³ Statista. (2022). *Number of internet and social media users worldwide as of July 2022*. [online] Available at: <https://www.statista.com/statistics/617136/digital-population-worldwide/> [Accessed 1 Feb. 2023].

⁴ Datareportal. (2023). *Digital around the world*. [online] Available at: <https://datareportal.com/global-digital-overview> [Accessed 1 Feb. 2023].

⁵ Flynn J. (2022). *20 Incredible Online Business Statistics* [online] Available at: <https://www.zippia.com/advice/online-business-statistics/> [Accessed 1 Feb. 2023].

⁶ Today, it is no longer surprising that there are various maritime, air, space or land investments, the construction and launch of satellites, the construction of renewable power plants, the construction and operation of blood plasma fractionation and much more - see in Cristina Elena Popa Tache, *Editorial*, „International Investment Law Journal”, Volume 1, Issue 1, February 2021, p. 1.

2. Variety of digital assets

The term "digital assets" nowadays embraces a wide variety of digital objects. Appearing around the mid-1990s, this term originally referred to digital images, videos, audio, documents, and other objects in digital form. Later, with the appearance of Bitcoin and other cryptocurrencies and tokens, the concept of digital assets covered also crypto-assets. Today, the concept of "digital asset" can be used in relation to such a wide variety of objects as: email accounts (such as Gmail, Yahoo, Hotmail, etc.), social media accounts (Facebook, Twitter, Instagram, etc.), subscriptions (professional journals, legal forms), marketplace accounts (Amazon, Ebay etc.), mobile apps, photos, books, music, videos (including iTunes, Spotify, Netflix, YouTube etc.), file sharing and storage (such as Dropbox, Google Docs etc.), financial accounts, gaming accounts, online dating accounts, medical accounts, insurance accounts, blogs and websites, online accounts for utilities (such as cell phone accounts, gas and electric, alarm companies, etc.), information, files or programs, stored on a phone, tablet or computer, loyalty program benefits (such as credit card "cash back" programs, frequent flyer miles, etc.).⁷

In some sources, it is suggested to treat as digital assets three categories of so-called digital property: personal digital property, personal digital property with monetary value, digital business property. Whereas personal digital property is believed to cover: computing hardware (computers, external hard drives or flash drives, tablets, smartphones, digital music players, e-readers, digital cameras, and other digital devices), any information or data that is stored electronically, any online accounts (such as email accounts, social media accounts, shopping accounts, photo and video sharing accounts, video gaming accounts, online storage accounts, websites and blogs), domain names, intellectual property (including copyrighted materials, trademarks etc.). Personal digital property with monetary value in this approach may include: computing hardware of monetary value; websites or blogs that generate revenue; art, photos, music, eBooks, intellectual property, or other digital property that generates revenue; accounts that are used to manage money and may hold money or credits (such as PayPal, bank accounts, loyalty rewards programs, and other accounts with credit balances); domain names. Digital business property from such perspective may include: all kinds of digital property owned by a business organization, online accounts registered to the business, assets of an online store which belongs to some business, any client information, including customer history etc.⁸

Another approach to types of digital assets offers to distinguish: digital tokens (also referred to as cryptocurrencies), content digital assets like images, video, documents etc., data packages (big data collections), digital models (such as

⁷ Hannibal B.S. (2022). *What are "digital assets"?* [online] Available at: <https://www.nolo.com/legal-encyclopedia/what-are-digital-assets.html> [Accessed 1 Feb. 2023].

⁸ Everplans. (2023). *A helpful overview of all your digital property and digital assets.* [online] Available at: <https://www.everplans.com/articles/a-helpful-overview-of-all-your-digital-property-and-digital-assets> [Accessed 1 Feb. 2023].

virtual reality or internet of things data collections), digital commodities (storage capacity), domain names and network infrastructure assets such as IP addresses, user accounts (social media account, email account etc.)⁹.

Common for these approaches is that digital assets are understood as a wide range of digital objects (that is, a set of symbols, data that exist in electronic form) that have personal or material value. Some experts suggest distinguishing digital assets with sentimental value on this basis. As an example of such can be mentioned digital photos, private videos, emails, personal blogs (which do not bring revenue), which might be very precious to the one who creates them, but in the majority of cases are of little use or monetary value to anyone else. Another group of digital assets in such approach are assets which have practical value, such as ebooks, a digital collection of purchased knitting patterns or licensed Photoshop software. The last type of digital assets within this approach are digital assets with monetary value. As an obvious example here is mentioned cryptocurrency, online gaming credits, digital gift cards, loyalty points and outstanding balances in Paypal accounts. Significant monetary value can also have domain names, social media accounts and blogs which have a significant number of followers, digital artwork and so on.¹⁰

Obviously, from the mentioned variety of digital assets, only those that have real or potential material value and are capable of generating profit will be of interest to businesses. However, not everything is so clear-cut here. For example, even those assets that are qualified as having personal or sentimental value can play an important role in running a business. In particular, emails that contain information about negotiations or customer lists should obviously be qualified as important business assets. But in general, it would be advisable to distinguish the concept of digital assets in a broad and narrow sense. Thus, digital assets in a broad sense would include various digital objects that have personal, practical or material value, while the concept of digital assets in a narrow sense should refer only to those assets that have real or potential material value. For business startups, the concept of digital assets will be even narrower and will refer only to those digital assets that can be used in business activities for the purpose of making a profit. A separate category within digital assets should be crypto-assets, which will be discussed further.

3. The concept, types and fields of emergence of technology-oriented startups

Speaking about digital assets in the activities of tech-startups, it is appropriate to also dwell on the definition of the concept of technology-oriented startups and the types of digital assets that can be the base of their activities.

According to one of the most known definitions of startups, the latter is understood as a company, partnership or temporary organization designed to search

⁹ DAM News. (2023). *Types of Digital Asset*. [online] Available at: <https://digitalassetmanagementnews.org/features/defining-digital-assets/> [Accessed 1 Feb. 2023].

¹⁰ Roche Legal. (2023). *How Valuable Are Your Digital Assets?* [online] Available at: <https://www.rochelegal.co.uk/news/how-valuable-are-your-digital-assets/> [Accessed 1 Feb. 2023].

for a repeatable and scalable business model¹¹. Early-stage startups are the most vulnerable small businesses. They have a higher risk potential, but also a chance to succeed in business with their new ideas, products and services. According to the classical approach, three stages of the life cycle of startup companies are distinguished. At the initial stage (seed stage), the company has only an idea for a product or service and needs funds to complete its idea. In the growth stage, the enterprise has a working prototype, receives a certain profit and is very attractive for venture capital. Businesses in the expansion stage need financing to cover marketing costs for further expansion, but they already have an established way of working¹². A small number of these companies are technologically oriented with a strong commitment to creating new technological solutions, methods or ways¹³. According to statistics, of the 213 million SMEs that existed in 2020, 1.35 million (that is, less than 1%) were technology-oriented startups. Nevertheless, due to their innovative potential and propensity for rapid growth, they are attracting considerable attention as an essential element of the digital economy. They differ from traditional SMEs and require clear policy and programmatic support from the government and the wider startup ecosystem¹⁴.

A technology-oriented startup may be defined as an entrepreneurial venture that delivers new, innovative, and scalable technology-based products and services to the market¹⁵. Technology-oriented startups are a new segment of companies that appeared in the era of intensive development of information and communication technologies. These startups are an important driver of innovation and therefore have high potential for the digital economy. A common feature of technology-oriented startups at an early stage is their focus on the technical and scientific component. These companies create new forms, methods and channels of knowledge transfer. Their development and integration into traditional economic systems will become increasingly important in the future¹⁶.

¹¹ Spender J.C., Corvello V., Grimaldi M., Rippa P. (2017). *Startups and open innovations: A review of literature*. "European Journal of Innovation Management", 20(1), pp. 4-30.

¹² Jáki E, Molnár E.M. (2017). *Model of the state and EU involvement in the venture capital market*. "Proceedings 31st European conference on modelling and simulation ECMS 2017". ECMS-European Council for Modelling and Simulation, Nottingham, pp. 120-126.

¹³ Halmosi P. (2019). *A technológiaorientált start-up cégek lehetőségei és korlátai az ipar 4.0 korszakában-kérdőíves felmérés alapján*. [The possibilities and limits of technology-oriented startups under industry 4.0—a survey-based study]. "Vezetéstudomány-Budapest Management Review", 50(9), pp. 40-48.

¹⁴ Hampel-Milagrosa A., Vandenberg P. (2021). *Five Ways Tech Startups Are Different from Other Small and Medium-Sized Enterprises*. [online] Available at: <https://blogs.adb.org/blog/five-ways-tech-startups-are-different-from-other-small-and-medium-sized-enterprises> [Accessed 1 Feb. 2023].

¹⁵ Vandenberg P., Hampel-Milagrosa A., Helble M. (2020). *Financing of tech startups in selected Asian countries*. "ADB Working Paper Series", 1115. [online] Available at: <https://www.econstor.eu/bitstream/10419/238472/1/adbi-wp1115.pdf> [Accessed 1 Feb. 2023].

¹⁶ See Onețiu, D. D. (2020). *The Impact of Social Media Adoption by Companies. Digital Transformation*. „Studia Universitatis Vasile Goldiș Arad, Seria Științe Economice”, 30(2), 83, 84, available at <https://publicatii.uvvg.ro/index.php/studiaeconomia/article/view/648>; Alina Mihaela Dima, *Resilience and Economic Intelligence through Digitalization and Big Data Analytics*, „Amfiteatru Economic” Volume: 23, No. Special 15/2021, p. 896, DOI: 10.24818/EA/2021/S15/896.

The main competitive advantage of technology-oriented startups is their innovative potential, thanks to which they can develop and bring new products to the market. The reason why young technology companies play a key role in technological change, is the so-called phenomenon of creative destruction, which is described as the dismantling of old practices to make room for innovation. Searching for their "niche" next to leading companies on the market forces startups to actively search for new innovative ways to solve issues, which will subsequently lead to the spread of new technologies¹⁷.

Among technology-oriented startups, two groups of startups are distinguished – high-tech and tech-enabled startups. High-tech startups are extremely risky applications of technology in an emerging industry, and typically require a research and development phase, several rounds of prototyping, and then slow adoption in an uncertain market. The following features of high-tech startups are named: a long time to "enter the market"; the need for innovative patents; the need for academic research; returning huge profits to investors if they find an outlet to the mainstream market; high risk of never finding a commercial use for their technology. Tech-enabled startups use existing technologies to improve the efficiency of a product already in use on the market. Tech-enabled startups typically have the following characteristics: mostly use off-the-shelf and open-source software; have a market entry time of less than 1 year; use technologies to increase margins in the existing market; get the first income faster; are at high risk of being eclipsed by larger competitors if they cannot grow fast enough¹⁸.

Most tech startups are digital. They are focused on internet and platform technologies and have spawned a number of new sectors – fintech, e-commerce, agri-tech, green technology and others¹⁹. Recently, the COVID-19 pandemic has given a big boost to medical technology (telemedicine, wellness), edutech (online learning), and solutions that support business communications (telemeeting and conferencing).²⁰

¹⁷ Jáki E., Halmosi P. (2019). *Technology-oriented startups in the intersection of Industry 4.0, venture capital financing and business scaling – Empirical examples from the Automotive Industry*. In: Bem A., Daszynska-Zygadlo K., Hajdíkóvá T., Jáki, E. Ryszawska, B. (eds) "Sustainable Finance in the Green Economy". Springer Proceedings in Business and Economics. Springer, Cham. [online] Available at: https://doi.org/10.1007/978-3-030-81663-6_4

¹⁸ Hughes K. *High tech vs. tech-enabled Startups*. [online] Available at: <https://www.karllhughes.com/posts/high-tech-enabled> [Accessed 1 Feb. 2023].

¹⁹ Through this partnership, the European Union will pave the way for a new stage of technology, science and engineering, and the decarbonisation of the world economy is the greatest opportunity for global innovation. This partnership will lay the groundwork for a set of policies that will play a transformative role for Europe and all of humanity, a world open to change and transformation, a world in which digitalization and green energy will be key elements in reconfiguring the environment, health, society and humanity in general - see in Lidia-Lenuta Bălan and Lavinia Monica Dan, *Public-Private Partnership Essential Tool for Green Deal*, „Perspectives of Law and Public Administration”, Volume 11, Issue 2, June 2022, p. 346.

²⁰ Hampel-Milagrosa A., Vandenberg P. (2021). *Five Ways Tech Startups Are Different from Other Small and Medium-Sized Enterprises*. [online] Available at: <https://blogs.adb.org/blog/five-ways-tech-startups-are-different-from-other-small-and-medium-sized-enterprises> [Accessed 1 Feb. 2023].

One of the obvious modern digital tools that can be used by tech startups in a variety of areas is blockchain technology. The fields of operation of technology-oriented startups that use blockchain platforms are very diverse: banking, stock trading and hedge funds, crowdfunding, crypto exchange, self-executing will system with a blockchain which automatically distribute assets of an inheritance trust to beneficiaries, accounting (help auditors to accurately vet digital assets), loans and credit, insurance, charity, logistics, car leasing and sales (to more reliably track car histories for users looking to buy a used car), ride-hailing (Uber, Drife), public transportation, air travel (for example, Singapore Airlines' Kris+ lifestyle app has a digital wallet built on a blockchain that securely turns miles into cryptocurrency that can be used with merchant partners), construction and building, agriculture etc. Huge potential for technology-oriented startups lies on intersection of blockchain and Internet of things (IoT), in particular, industrial IoT²¹. For example, recently companies Helium and NetObjex have launched blockchain-based networks for IoT devices in internet infrastructure and smart city transportation, respectively²².

Another great area to use blockchain and digital assets for startups is real estate and moreover – virtual real estate. Thus, on the metaverse gaming platform Decentraland, record sums were paid for a piece of digital real estate: the Metaverse Group bought 116 land parcels for 2.4 million USD worth of cryptocurrency in November 2020 while someone paid 450,000 USD to be musician Snoop Dogg's neighbor on The Sandbox metaverse. Other perspective areas for startups using blockchain, in particular for social entrepreneurs, are energy management, waste management, healthcare, smart-government and voting systems. Retail and e-commerce are some more huge areas for new technology-oriented businesses to grow. Some totally new subdivision here would be e-commerce in metaverse. Thus, startup Walmart plans to launch its own cryptocurrency and NFTs, setting up shops in virtual lands. Basically, launching of new businesses based on using of blockchain technologies are possible almost in all areas of our life: education, entertainment, sport, art, advertising, human resources, forecasting and even cannabis industry (to create a blockchain-tracked supply chain)²³.

Statistical analysis of the fields of emergence of technology-oriented startups reveals intensification of the development of startups in the spheres of data analytics and artificial intelligence, time management, social platforms, as well as financial transfers and cryptocurrency²⁴. Downward trends are seen in mobile games,

²¹ Nekit K., Kolodin D., Fedorov V. (2020). *Personal data protection and liability for damage in the field of the Internet of Things*. "Juridical Tribune - Tribuna Juridica", 10(1), pp. 80-93; Boyes H., Hallaq D., Cunningham J., Watson N. (2018). *The industrial internet of things (IIoT): An analysis framework*. "Computers in Industry", 101, pp.1-12.

²² CBInsights. (2022). *Banking is only the beginning: 65 big industries blockchain could transform*. [online] Available at: <https://www.cbinsights.com/research/industries-disrupted-blockchain/> [Accessed 1 Feb. 2023].

²³ Idem.

²⁴ See for examples Christiani, T. A., Sundari, E. & Supriyanto, V. H. (2023). *Regulamento da Tecnologia Financeira da Indonésia Sob a Perspectiva da Proteção Legal*. „Lex Humana” (ISSN 2175-0947), 15(2), 391, 392. Available at <https://seer.ucp.br/seer/index.php/LexHumana/article/view/2509>.

social media, SEO and marketing services, online news and blogs, legal and professional services²⁵.

The variety of digital assets and areas of their use, the number of users who own digital assets and their potential property of use for the purpose of obtaining a fairly high profit, have created another, completely new field of business - digital asset management.

Digital asset management (DAM) is a way of handling different types of digital assets, from images, video and documents to stocks and digital currency. DAM allows tracking, storing and managing digital assets as well as simplifies investments in digital assets and helps businesses to optimize their communication and information strategies. In 2021, global digital asset management market was valued at USD 3.68 billion, and according to prognoses it may reach a market value of USD 9.32 billion by 2028. As digital asset management covers also cybersecurity, the number of startups actively engaged in securing of digital assets is growing as well²⁶.

Despite the fact that the field of digital asset management is relatively new, it is rapidly gaining popularity²⁷. The spread of relations regarding the management of digital assets has given impetus to the development of legal regulation in this area. In particular, the American investment market already has a regulatory framework for managing digital assets. The latter for regulatory purposes are divided in the most general form into "securities" (then the provisions of the Securities Act apply to them) and "commodities" (which are subject to the Commodity Exchange Act). In addition, digital asset operated in the United States must comply with the Investment Company Act of 1940, which regulates pooled investment vehicles that invest in securities and the Investment Advisers Act of 1940, which governs investment advisers to such funds. Therefore, American companies created for the purpose of managing digital assets must meet certain requirements established by the mentioned acts. Specifically, if a manager of a cryptocurrency fund or other digital asset fund provides advice on digital assets that qualify as "securities," it must register as an investment adviser with the U.S. Securities and Exchange Commission, unless such person or entity qualifies for exclusion from the definition or exemption from registration requirements²⁸.

General approaches to the legal regulation of relations in the field of digital asset management are also defined at the level of the recently developed Draft

²⁵ Savin I., Chukavina K., Pushkarev A. (2022). *Topic-based classification and identification of global trends for startup companies*. "Small Business Economics". [online] Available at: <https://doi.org/10.1007/s11187-022-00609-6> [Accessed 1 Feb. 2023].

²⁶ ScyQuest. (2022). *Digital Asset Management market to generate revenue of \$9.32 billion by 2028*. [online] Available at: <https://www.globenewswire.com/en/news-release/2022/09/08/2512745/0/en/Digital-Asset-Management-Market-to-Generate-Revenue-of-9-32-Billion-By-2028-Cybersecurity-Startups-in-Digital-Asset-management-Can-t-Keep-Calm-from-Raising-Funds.html> [Accessed 1 Feb. 2023].

²⁷ Costa Assis, C. (2023), *O Paradoxo Da Esfera Pública Digital*, in „Cadernos de Direito Actual”, (21), pp. 125. Available at <https://www.cadernosdedereitoactual.es/ojs/index.php/cadernos/article/view/906> (Accedido: 19 junio 2023).

²⁸ Rowland G. S., Kiviat T.I. (2021). *Cryptocurrency and other digital asset funds for U.S. investors*. [online] Available at: <https://ssrn.com/abstract=3813376> [Accessed 1 Feb. 2023].

UNIDROIT Principles on digital assets and private law (2022). The specified document contains the requirements and legal consequences of custody established for digital assets. The principles provide for the possibility of states adopting regulatory acts aimed at protecting clients in such relationships. An example of such regulatory measures can be the requirement for companies created for the purpose of managing digital assets to have a certain authorized capital. Another example is the requirement for specific disclosure of the relevant risks in the agreement or a requirement that providers of this type of account must be regulated entities conforming to standards²⁹.

Therefore, when creating startups in the field of digital asset management, it is worth being aware of and taking into account all existing regulatory norms in this field.

As it becomes obvious from the spheres of emergence of technology-oriented startups, the activities of most of them are related to the use of digital assets. Nowadays, digital assets are believed to be the future of capital markets, which make them highly attractive for startups as it's a new direction of business development, able to bring essential profit. In Germany, several startups (Finexity, Exporo) were launched to focus on creating digital assets based on real estate. Later on, not only real estate, but also oldtimers, art, and other real assets were digitized with help of blockchain technology. The approach, offered by the companies, is based on creating investable shares, which allow to invest even small amount of money in real estate or other valuable assets. Hence, digital assets (in this case under digital assets are meant digitized real assets) are making new investment categories possible and accessible even to retail investors. Digital assets enable focused, inflation-resistant, investments in individual real assets. It is believed that in the nearest future this use of digital assets will be applied to industrial goods, making them accessible to investors³⁰.

As noted above, the category "digital assets" applies to an extremely wide range of digital objects. It should be noted that sometimes the concept of "digital assets" is used when it comes to the so-called "digitized assets". Both types of assets can be used in the activities of technology-oriented startups, but it is necessary to understand their fundamental difference. The difference between digital and digitized assets is that digital assets exist in digital form and in a virtual environment, while digitized assets are physical assets the data about which exists in the form of electronic records such. Considerable attention to the distinction between digital and digitized assets was paid in a white paper from the American Bar Association, which summarized the existing regulations that govern digital assets in the United States. In this paper, digital assets are defined as an electronic record to which a person has

²⁹ UNIDROIT. (2023). *Draft UNIDROIT Principles on digital assets and private law*. [online] Available at: <https://www.unidroit.org/wp-content/uploads/2023/01/Draft-Principles-and-Commentary-Public-Consultation.pdf> [Accessed 1 Feb. 2023].

³⁰ Sandner Ph. (2021). *Digital Assets: The Future of Capital Markets*. "Forbs". [online] Available at: <https://www.forbes.com/sites/philippsandner/2021/08/24/digital-assets-the-future-of-capital-markets/?sh=255bd04e6a57> [Accessed 1 Feb. 2023].

a right or interest. In essence, a digital asset is simply code, meaning that digital assets are different from physical assets because the digital asset itself does not exist in physical form. A digitized asset is an asset (which can be a security or a physical asset) whose ownership is represented in an electronic record³¹. An example of a digitized asset can be an electronic record of ownership of real estate stored on a distributed ledger. The ledger may contain an electronic record that covers all the rights associated with ownership, although the asset itself (real property) exists separately from the electronic record.

4. The concept and legal nature of digital assets in the activities of technology-oriented startups

Despite the increased use of digital assets in the activities of technology-oriented startups and not only, the concept of digital assets at the legislative level is not yet clearly defined in most countries. Such uncertainty can cause significant difficulties in using digital assets. The number and variety of digital assets require their systematization and clarification of their legal nature. The definition of the legal nature of digital assets can provide effective regulation of relations that arise regarding such assets.

As of the time of writing this article, along with the category "digital assets", some other concepts are used with regard to digital objects, in particular, virtual assets, virtual property, crypto-assets³². Some of the mentioned terms are sometimes used interchangeably and definitions may vary depending on the jurisdiction and perspective. However, such an approach cannot be evaluated positively, since terminological differences can play a significant role in the legal regulation of relations arising with regard to certain digital objects. As an example of such a careless use of terminology, which has led to misunderstandings in practice, can be mentioned the case with legal regulation of crypto-assets in Ukraine.

For quite some time, the Ukrainian legislator has been making attempts to introduce cryptocurrencies into the legal field in order to ensure their proper taxation. Attempts to implement cryptocurrencies into the legal field in Ukraine have been ongoing since 2017, when three bills aimed at defining and legalizing cryptocurrencies were proposed almost simultaneously. These were Drafts of the Law "On the circulation of cryptocurrencies in Ukraine" dated October 6, 2017, the Law "On stimulating the market of cryptocurrencies and their derivatives in Ukraine" dated October 10, 2017, the Law "On amendments to the Tax Code of Ukraine (regarding stimulation of the market of cryptocurrencies and their

³¹ American Bar Association. Derivatives and Futures Law Committee, Innovative Digital Products and Processes Subcommittee, Jurisdiction Working Group. (2020). *Digital and Digitized Assets. Federal and State Jurisdictional Issues*. [online] Available at: https://www.americanbar.org/content/dam/aba/administrative/business_law/buslaw/committees/CL620000pub/digital_assets.pdf [Accessed 1 Feb. 2023].

³² Schmidt A. (2021). *Virtual assets: compelling a new anti-money laundering and counter-terrorism financing regulatory model*. "International Journal of Law and Information Technology", 29(4), pp. 332-363.

derivatives in Ukraine)" dated October 30, 2017. The attempt to ensure proper taxation of transactions with cryptocurrencies was repeated in 2019 with the Draft Law "On Amendments to the Tax Code of Ukraine and some other laws of Ukraine on the taxation of transactions with crypto-assets" of November 15, 2019. In 2020, two more Drafts of the Laws appeared: "On virtual assets" dated June 11, 2020 and "On tokenized assets and crypto-assets" dated November 5, 2020³³.

The titles of the mentioned drafts make obvious terminological differences in the approaches to legal regulation of crypto-assets. In the first two drafts the term cryptocurrency was used, which was common for most of scientific and legislative approaches to regulation of relations regarding digital currency back then in 2017. Later on, when the difference in legal nature of cryptocurrencies and tokens was realized, a new term appeared in world practice to embrace both concepts – crypto-assets. Thus, Ukrainian legislator tried to follow this world tendency, using this new term in drafts of laws starting from 2019. However, in the absence of clear understanding of the legal nature of crypto-assets, other terms, such as tokenized and virtual assets were used in the same area.

Eventually, in 2022 the Law of Ukraine "On virtual assets" was adopted, where a virtual asset was defined as an intangible good that is an object of civil rights, has a value and is expressed by a set of data in electronic form. Such a broad definition and the term itself bring up for discussion on possibility to apply this law to other kinds of digital assets, such as virtual property in multiplayer online games etc. However, the analysis of the mentioned law makes it clear the intention of the legislator to focus on regulation of crypto-assets.

The given example demonstrates that terminological differences can have significant practical meaning, therefore, for the legal regulation of relations arising with regard to certain digital assets, it is important to use appropriate terminology that will reflect their peculiarities.

The concept of "virtual assets" is closely related to the activities of the Financial Action Task Force (FATF) and the field of combating money laundering and terrorist financing. It is quite likely that the legal acts of this regulatory body influenced the terminology used by the Ukrainian legislator. Thus, the first regulatory policies regarding cryptocurrencies appeared in the field of combating money laundering and terrorist financing and contained recommendations for regulating relations with regard to cryptocurrencies, which countries were supposed to follow in their national legislation. In particular, in 2012, the FATF Recommendations established the concept of virtual assets, which at the time of the latest updates in 2022 are defined as "digital representation of value that can be digitally traded, or transferred, and can be used for payment or investment purposes"

³⁴. Obviously, in order to provide the widest possible protection to prevent the use of

³³ Некіт К.Г. (2022). *Розвиток правового регулювання обігу віртуальних активів (криптовалют) в Україні*. "Часопис цивілістики", 44, с. 45-51 [Nekit K.G. (2022). *Development of legal regulation of circulation of virtual assets (cryptocurrency) in Ukraine*. "Journal of civil law", 44, pp. 45-51].

³⁴ FATF. (2012-2022). *International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation*. [online] Available at: www.fatf-gafi.org/recommendations.html [Accessed 2 Feb. 2023].

cryptocurrencies in the field of money laundering and terrorist financing, the FATF used such a broad definition, although the focus of the legal regulation was aimed specifically at crypto-assets. However, the Recommendations were developed in 2012, and the term crypto-assets started to be actively used much later, when the range of virtual assets began to grow steadily and at the same time the specific features of crypto-currencies and crypto-tokens that distinguish them from other types of virtual (digital) assets became obvious.

In general, two approaches to understanding the concept of digital assets can be distinguished. According to the first approach, the concept of digital assets should be limited to crypto-assets only. The second approach offers a non-exhaustive list of digital objects, including accounts, virtual elements in online games, domain names, etc.³⁵

In this context, the findings of the Law Reform Commission of New South Wales are of interest. With regard to the terminology used in their report "Access to digital records upon death or incapacity", they state the following. In order to reflect the terms of reference and ensure a broad discussion, the Commission used the common term "digital assets" in its Consultation paper to refer to anything that can be accessed and stored in digital form. However, they discovered that the term "digital assets" did not quite accurately reflect what they intended to discuss. Usually, the term "asset" is used in the sense of "property". However, the Commission intended to cover digital items in a broader sense, including items that the user has created or related to the user, but which the user does not necessarily own. Since the use of the wording "property" outside the standard legal meaning may lead to confusion, the Commission decided to use two different terms: "digital records" and "digital assets".

The concept of "digital records" is used by the Commission with regard to digital assets, as well as elements that are not strictly owned by the user, in particular: social media accounts; digital music and e-book collections; online shopping accounts such as Amazon and eBay; loyalty program benefits such as frequent flyer points; sports gambling accounts; online game accounts and avatars.

The term "digital assets" is used by the Commission only to refer to digital materials in which users have ownership rights or interests. "Digital assets" include, but are not limited to: cryptocurrencies such as Bitcoin; digital materials in which users have intellectual property rights, such as digital photographs, digital illustrations, or written works³⁶.

Both positive and negative aspects can be identified in this approach. It can be estimated positively the attempt to demarcate the categories of digital objects, traditionally covered by the concept of digital assets. There is also an intention to distinguish between the concepts of digital assets in a broad and narrow sense.

³⁵ Gurinovich A., Lapina M., Tolstopyatenko G., Patrikeev P. (2022). *About approaches to the definition of concept and problems of legal regulation of digital financial assets*. "Public Organization Review", 22, pp. 1005-1024. Doi.org/10.1007/s11115-021-00549-x

³⁶ New South Wales Law Reform Commission. (2019). *Report 147 «Access to digital records upon death or incapacity»* [online] Available at: <https://www.lawreform.justice.nsw.gov.au/Documents/Publications/Reports/Report%20147.pdf> [Accessed 2 Feb. 2023].

However, the very approach to classification does not seem to be entirely successful, because cryptocurrencies and other crypto-assets are fundamentally different from objects of intellectual property law, which makes it impossible to combine them within the framework of one subcategory.

Specifics of the legal nature of crypto-assets clearly indicates the need to separate them into a sub-category of digital assets. Many experts note the need to distinguish between the concepts of cryptocurrencies (crypto-assets) and digital assets, given their fundamental differences³⁷. The understanding of crypto-assets as a specific type of digital assets can also be traced in the regulatory documents on digital assets.

In recently published report of the Financial Stability Board “Assessment of Risks to Financial Stability from Crypto-assets” (2022), digital asset is defined as a “digital instrument that is issued or represented through the use of distributed ledger or similar technology”. The report underlines difference between digital and real currency, mentioning that digital assets do not include digital representations of fiat currencies. The concept of crypto-assets is defined separately in the report. Crypto-assets are defined as “type of private sector digital asset that depends primarily on cryptography and distributed ledger or similar technology”³⁸. Thus, the report talks about the need to distinguish crypto-assets as a specific category of digital assets with their unique features, in particular, crypto-assets have cryptographic protection. A similar definition of crypto-assets was mentioned in the previous report of the Financial Stability Board “Crypto-asset markets: Potential channels for future financial stability implications” (2018), where crypto-assets were defined as “type of private asset that depends primarily on cryptography and distributed ledger or similar technology as part of their perceived or inherent value”³⁹. However, at that time the report did not contain a definition of the concept of a digital asset. From this approach, the intention to understand the category of digital assets as a broader concept that includes crypto-assets can be traced.

As of the beginning of 2023, the main regulatory act in the field of crypto-assets at the EU level is “Markets in Crypto-Assets” (MiCA). This act is intended to provide unified approaches to the regulation of activities in the field of crypto-assets for all European countries, as well as to regulate crypto-active services and crypto-assets that are no longer subject to European regulation⁴⁰. It should contribute to the

³⁷ Buntinx J. (2017). *Digital assets vs cryptocurrencies*. “The Merkle” [online] Available at: <https://themerke.com> [Accessed 2 Feb. 2023]; Walker M. (2017). *The new uniform digital assets law: estate planning and administration in the information age*. “Real Property, Trust and Estate Law Journal”, 52(1), pp. 52-78.

³⁸ Financial Stability Board. (2022). *Assessment of risks to financial stability from crypto-assets*. [online] Available at: <https://www.fsb.org/wp-content/uploads/P160222.pdf> [Accessed 2 Feb. 2023].

³⁹ Financial Stability Board. (2018). *Crypto-asset markets: Potential channels for future financial stability implications*. [online] Available at: <https://www.fsb.org/wp-content/uploads/P101018.pdf> [Accessed 2 Feb. 2023].

⁴⁰ Grieser S.G., Zlatanov I. *Newest developments on the crypto-assets regulation*. “ReedSmith”. [online] Available at: <https://www.reed-smith.com/en/perspectives/2021/03/newest-developments-on-the-crypto-assets-regulation> [Accessed 2 Feb. 2023].

creation of a level playing field for providers of crypto-active services, relieve them of the need to adapt their activities to the different requirements of the laws of different countries, and also create transparent conditions and legal certainty for investors. In MiCa, crypto-asset is defined as “a digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology”. Distributed ledger technology or 'DLT' means “a type of technology that supports the distributed recording of encrypted data”⁴¹. Thus, a distinctive feature of crypto-assets as a type of digital asset is cryptographic protection due to the existence within the framework of a distributed ledger of technologies. Therefore, crypto-assets could be defined as a subset of digital assets that use cryptography to protect digital data and distributed ledger technology to record transactions.

As for the concept of "digital assets" itself, one of the first regulatory acts that offered a definition of this concept was the Law on Fiduciary Access to Digital Assets and Digital Accounts adopted in 2014 in the state of Delaware (U.S.). This act defined digital assets as “data, text, emails, documents, audio, video, images, sounds, social media content, social networking content, codes, health care records, health insurance records, computer source codes, computer programs, software, software licenses, databases, or the like, including the usernames and passwords, created, generated, sent, communicated, shared, received, or stored by electronic means on a digital device”⁴². In fact, this definition is limited to listing objects that exist in digital form (but not exclusively), most of which are also objects of intellectual property rights. It seems that the given definition embraces concept of digital assets in a broad sense. At the same time, it is important to keep in mind the correlation between the property and intellectual property rights to the mentioned digital objects. This issue will be discussed later.

In 2015, a similar act (the Revised Uniform Fiduciary Access to Digital Assets Act) was enacted in most US states. The law defined a digital asset as an electronic record in which an individual has a right or interest.⁴³ Thus, in this act the concept of digital asset is defined quite broadly and can include both simple digital files and crypto-assets or other types of virtual property.

European institute of law in its published in 2022 report “ELI Principles on the Use of Digital Assets as Security” also defines digital assets quite broadly. According to its findings, “digital asset means any record or representation of value that fulfils the following criteria: (i) it is exclusively stored, displayed and

⁴¹ European Commission. (2020). *Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets and amending Directive (EU) 2019/1937*. [online] Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:f69f89bb-fe54-11ea-b44f-01aa75ed71a1.0001.02/DOC_1&format=PDF [Accessed 2 Feb. 2023].

⁴² Delaware House Bill 345. (2013-2014). *An Act to Amend Title 12 of the Delaware Code Relating to Fiduciary Access to Digital Assets and Digital Accounts*. [online] Available at: <https://legiscan.com/DE/text/HB345/id/1023563> [Accessed 2 Feb. 2023].

⁴³ Uniform Law Commission. (2015). *Revised Uniform Fiduciary Access to Digital Assets Act* [online] Available at: <https://my.uniformlaws.org/viewdocument/final-act-no-comments-33?CommunityKey=f7237fc4-74c2-4728-81c6-b39a91ecdf22&tab=librarydocuments>. [Accessed 2 Feb. 2023].

administered electronically, on or through a virtual platform or database, including where it is a record or representation of a real-world, tradeable asset, and whether or not the digital asset itself is held directly or through an account with an intermediary; (ii) it is capable of being subject to a right of control, enjoyment or use, regardless of whether such rights are legally characterised as being of a proprietary, obligational or other nature; and (iii) it is capable of being transferred from one party to another, including by way of voluntary disposition”⁴⁴. It is mentioned in the Principles, that the proposed definition of digital assets covers all kinds of objects, covered by the defined features, irrelevantly whether the use cryptography or no. Under such approach digital assets cover a wide variety of assets, such as crypto-currencies, stable coins, social media profiles and online gaming accounts.

In 2022, also the UK Law Commission published a consultation paper on digital assets. The paper doesn't provide the definition of digital assets, but instead offers to consider digital assets as a “third category of personal property” (neither “things in possession”, which cover objects capable of possession, e.g. tangible, moveable and visible things, nor “things in action”, which is any personal property that can only be claimed or enforced through legal action or proceedings, e.g. debts, rights to etc.). The paper also defines criteria, which allow to treat an object as a digital asset. Thus, according to the UK Law Commission findings, to fall within the third category of personal property an object must: 1) be composed of data represented in an electronic medium, including in the form of computer code, electronic, digital or analogue signals; 2) exist independently of persons and of the legal system; 3) be rivalrous.⁴⁵ To outline objects which fall under mentioned criteria the UK Law Commission uses also another term – data objects, explaining their approach by recognizing the fact that terms “digital” or “electronic” are more often used with regard to digital assets in a broad sense⁴⁶. Such an approach confirms our previous notice about the necessity to distinguish digital assets in a broad and narrow sense.

The UK Law Commission underlines, that they use the term digital assets as a broad, umbrella term. They also admit the necessity to distinguish different types or sub-categories of digital assets, which have differences in the ways they exist can be transferred or used. Among sub-categories of digital assets, the Commission names: digital files and digital records, domain names, email accounts and in-game digital assets, various types of carbon emissions scheme and crypto-tokens⁴⁷.

The authors of the UK Law Commission Consultation paper enter into a polemic with the drafters of the UNIDROIT Principles on digital assets and private law, drawing attention to the fact that the latter use the terms “digital” and

⁴⁴ European Law Institute. (2022). *ELI Principles on the Use of Digital Assets as Security: report of the European Law Institute*. [online] Available at: https://www.europeanlawinstitute.eu/fileadmin/user_upload/p_eli/Publications/ELI_Principles_on_the_Use_of_Digital_Assets_as_Security.pdf [Accessed 2 Feb. 2023].

⁴⁵ UK Law Commission. (2022). *Digital assets: consultation paper*. [online] Available at: <https://www.lawcom.gov.uk/project/digital-assets/>. [Accessed 2 Feb. 2023].

⁴⁶ Ibid.

⁴⁷ Ibid.

"electronic" synonymously when talking about digital assets. Thus, in the UNIDROIT Principles, a digital asset is defined as "an electronic record capable of being subject to control". An electronic record means «information stored in an electronic or digital medium, which is capable of being retrieved». The category of control in the Principles is defined as the exclusive capabilities of a person 1) to prevent others from obtaining substantially all of the benefit from the digital asset; 2) to obtain substantially all the benefit from the digital asset; 3) to transfer all the abilities regarding the object to another person (a 'change of control')⁴⁸.

Under such an approach, there are some categories of digital assets that cannot be subject to control in the sense proposed by the Principles. In particular, objects of intellectual property rights, such as data sets, drawings, texts, which cannot be subject to control by themselves, are demarcated in this way, as they are characterized by the property of copying and existence in an unlimited number of copies. Thus, an object of intellectual property itself that is not embodied in a digital form and not individualized in such a way does not qualify as a digital asset within the meaning proposed by the Principles. Accordingly, the specified objects remain objects of intellectual property rights and do not become objects of property rights.

An analysis of the approaches of the UK Law Commission and UNIDROIT to the definition of the concept of digital assets leads to the conclusion that they intend to outline the range of digital objects that can be considered digital assets and fall under the legal regulation proposed by the above-mentioned acts, as they have certain defined characteristics. Thus, digital assets within the meaning of the said acts must, in particular, be rivalrous and controlled by one entity in a specific period of time, which brings them closer in their characteristics to tangible things and, accordingly, makes it possible to apply the provisions on the right of ownership to them.

From the above approaches, it becomes obvious the desire of the regulatory authorities to equate digital assets with a type of property and to apply property rights provisions to them. The UK Law commission, emphasizing the importance of digital assets, notes the need to consider digital assets as objects of property rights, since property rights are recognized against the whole world, whereas personal rights are recognized only against someone who has assumed a relevant legal duty. That is, in the opinion of the Commission, the application of the property rights provisions to the legal regulation of relations regarding digital assets will ensure their more reliable protection. As noted earlier, the Commission believes that digital assets cannot be properly assigned to any of the traditionally recognized categories of things in possession or things in action (in the narrow sense). They are neither tangible things in the ordinary sense (although they have a widespread tangible existence), nor can they be claimed or enforced only by legal action or proceeding. Instead, they function more as objects in their own right. Therefore, the Commission proposes to use the term "digital objects" regarding such assets and mentions as the

⁴⁸ UNIDROIT. (2023). *Draft UNIDROIT Principles on digital assets and private law*. [online] Available at: <https://www.unidroit.org/wp-content/uploads/2023/01/Draft-Principles-and-Commentary-Public-Consultation.pdf> [Accessed 1 Feb. 2023].

main qualifying feature that they consist of data presented in an electronic medium, for example in the form of computer code, electronic, digital or analog signals. At the same time, the Commission emphasizes that when determining the characteristics of digital objects, they do not use the criterion of intangibility, since the networks or systems themselves have a tangible, albeit very distributed, existence. It is therefore important to emphasize that it is the unique instance of specific data in such systems that allows some digital assets to acquire characteristics or attributes that make them function much more as objects than pure information, simple records or data⁴⁹.

The tendency to treat digital assets as specific objects, which should be recognized as a type of property and, accordingly, objects of property rights (or its specific type - virtual property), has developed in scientific research for a long time. For the first time, the concept of virtual property appeared in the context of defining approaches to the legal regulation of relations related to the Massively Multiplayer Online Game, when it became obvious the value in the objects of virtual worlds and game accounts, since there was a high demand for them, which could be satisfied, however, only within the "gray" market⁵⁰.

The concept of virtual property was based on the assumption that, firstly, some objects in the virtual space are quite similar to objects in the physical world and, secondly, that virtual property is different from intellectual property, therefore it is necessary to prevent abuse by intellectual property rights holders who object to the emergence of virtual property rights by referring to the end user license agreement. At the same time, the general theory of property may well be applied to digital objects⁵¹.

Indeed, by their legal nature, digital assets are more similar to objects of property rights and are different from objects of intellectual property rights. We will dwell on the correlation between virtual and intellectual property here only briefly, since we have already conducted this analysis in previous studies⁵².

The specific characteristics of the objects of virtual property rights allow to distinguish them from the objects of intellectual property rights. Among such features, the scholars name rivalrousness (the property of an object, according to

⁴⁹ UK Law Commission. (2022). *Digital assets: consultation paper*. [online] Available at: <https://www.lawcom.gov.uk/project/digital-assets/>. [Accessed 2 Feb. 2023].

⁵⁰ Castronova E. (2001). *Virtual worlds: a first-hand account of market and society on the Cyberian Frontier*. "CESifo Working Paper Series", 618. [online] Available at: <https://ssrn.com/abstract=294828> [Accessed 2 Feb. 2023].; Nelson J.W. (2010). *The virtual property problem: what property rights in virtual resources might look like, how they might work, and why they are a bad idea*. "McGeorge Law Review", 41. [online] Available at: <https://ssrn.com/abstract=1805853> or <http://dx.doi.org/10.2139/ssrn.1805853>. [Accessed 2 Feb. 2023].

⁵¹ Fairfield J.A. (2005). *Virtual property*. "Boston University Law Review". 2005. Vol. 85. P.1047-1102. URL: <https://ssrn.com/abstract=807966> [Accessed 2 Feb. 2023]; Fairfield J.A. (2015). *Bitproperty*. "Southern California Law Review", 88(4), pp. 805-874.

⁵² Nekit K. (2020). *Social media account as an object of virtual property*. "Masaryk University Journal of Law and Technology", 14(2), pp. 201-226; Nekit K. (2020). *Legal aspects of the use of social media accounts: current state and perspectives*. "The Lawyer Quarterly", 10(3), pp. 305-323.

which it can be controlled by only one person at a specific time), stability or persistence (for example, an account exists constantly, even if it is used only a few minutes a week, while a melody exists only during the time it sounds), interconnectivity (for example, an URL has a value not only because its owner can control it, but also because other people can link to it and use it with the owner's consent)⁵³.

Among other features that allow digital files to be considered digital assets and, accordingly, objects of virtual property rights, is mentioned reusability. This property allows the digital object to be reused an unlimited number of times. That is, a digital asset is characterized by duration and non-consumability⁵⁴. Digital assets have long-term value and are reusable just like other types of assets. In addition, digital assets can be recognized and reused by others, not just the owner or creator of the digital asset.⁵⁵

Some scholars consider that digital assets have such features as uniqueness and authenticity, which are ensured by the circulation of a digital asset in a distributed ledger. The key property of a digital asset is the ability to circulate in the digital environment and not be copied during transfer from one electronic address (storage, wallet, cell) to another. That is, a digital asset must necessarily have not only its own environment for circulation, but also clearly defined rules and conditions of existence in such an environment. The given features allow the scholar to define a digital asset as a set of digital (binary) data that is autonomous, uniquely identifiable and has a certain value⁵⁶. Under this approach, all intellectual property rights that exist in digital form, such as photos, videos, audio, and other files that can be copied an indefinite number of times, are delineated from digital assets.

5. Conclusions

Digital assets open new areas for gaining profit, which stimulates the intensive development of technology-oriented startups. Among technology-oriented startups, two groups of startups are distinguished: high tech and tech-enabled startups. The activities of high-tech startups are related to the application of technology in the latest industries, while tech-enabled startups use existing technologies in their activities to improve the efficiency or productivity of a product that is already in use on the market. However, a common feature for both groups of startups is the development of new directions for obtaining profit through the use of digital assets and a significant role in the development of the digital economy

⁵³ Fairfield J.A. (2005). *Virtual property*. "Boston University Law Review", 85, pp. 1053-1054. [online] Available at: <https://ssrn.com/abstract=807966> [Accessed 2 Feb. 2023].

⁵⁴ Moon M. (2007). *Activity lifecycle of digital assets*. "Journal of Digital Asset Management", 3(3), pp. 112-115.

⁵⁵ Toygar A., Rohm C.E., Taipei Jr., Zhu J. (2013). *A New Asset Type: Digital Assets*. "Journal of International Technology and Information Management", 22(4). [online] Available at: <https://scholarworks.lib.csusb.edu/jitim/vol22/iss4/7> [Accessed 2 Feb. 2023]

⁵⁶ Kud A. (2019). *Substantiation of the term "digital asset": economic and legal aspects*. "International Journal of Education and Science", 2(1), pp. 41-52. Doi:10.26697/ijes.2019.1.06.

through innovative potential.

Legal regulation of technology-oriented startups activities is at the stage of initial development. The main difficulty that tech startups can face is the uncertainty of the legal nature of digital assets. The variety of digital assets used in tech startups requires their systematization and classification in order to determine legal provisions which should be applied to different digital objects.

Analysis of recent documents aimed at defining approaches to the legal regulation of digital assets reveals a common tendency to introduce new terminology in order to distinguish categories of digital objects within the framework of a more general concept of digital assets. Thus, the UK Law Commission offers to use the concept of “digital data” along with the term “digital assets”. The Law Commission of South Wales uses the term “digital records”, which, along with digital assets as such, include other types of digital objects. The need to understand digital assets in a broad sense and further possible classification is also discussed in UNIDROIT. This confirms the necessity to define the categories of digital objects that are covered by the concept of digital assets and have a specific legal nature.

The classification of digital assets can be carried out according to various criteria. Depending on the effect that digital assets have on their owners, it is appropriate to distinguish between digital assets in a broad and a narrow sense. Digital assets in the broad sense encompass a variety of digital objects that have personal (sentimental), practical or material value, while the concept of digital assets in the narrow sense should refer only to those assets that have actual or potential material value. A separate category of digital assets in the narrow sense can be considered business assets that can be used in business activities for the purpose of obtaining profit.

Depending on the connection with real-world objects, a distinction should be made between digital and digitized assets. The difference between digital and digitized assets is that digital assets exist in digital form and in a virtual environment, while digitized assets are physical assets the information about which, such as ownership rights, exists in the form of electronic records.

Currently, there are active discussions about the need for further categorization of digital assets, since they differ significantly in the ways of existence, use and transfer to other persons. In particular, the UK Law Commission is considering such sub-categories of digital assets as digital files and digital records, domain names, email accounts and in-game digital assets, various types of carbon emissions scheme and crypto-tokens. However, some issues regarding specific types of digital assets are still debatable. For example, accounts are qualified as digital assets by the UK Law Commission, while UNIDROIT considers it impossible to recognize accounts as digital assets, citing licensing arrangements. Therefore, for now, the attention of rulemakers is focused on defining the legal framework for digital assets as a whole, without focusing on the diversification of approaches to the legal regulation of individual groups. However, it is already obvious that within the framework of the general concept of digital assets, the subcategory of crypto-assets, which are characterized by cryptographic protection due to their existence within the

framework of a distributed ledger, should be allocated. Thus, crypto-assets could be defined as a subset of digital assets that use cryptography to protect digital data and distributed ledger technology to record transactions. Specific approaches to legal regulation are being developed with regard to crypto-assets.

It is also important to distinguish between digital assets and intellectual property objects, such as ordinary video, audio, text files, images, etc., which can be copied an indefinite number of times. It is necessary to distinguish the form and content of such objects. If an object of intellectual property is not embodied in a digital form and is not individualized in such a way, it does not qualify as a digital asset.

Digital assets cover digital objects that meet certain features, in particular: 1) consist of data presented on electronic media; 2) can be separated from a person and transferred to another; 3) can be controlled by a specific person in a certain period of time; 4) are rivalrous; 5) are reusable (durable, long-lasting, non-consumable). Provisions on the right of ownership (virtual property) can be applied to objects that meet the specified characteristics, which guarantee the highest degree of protection and best ensure the interests of their owners.

Acknowledgements

This work was supported by Volkswagen foundation.

Bibliography

1. American Bar Association, Derivatives and Futures Law Committee, Innovative Digital Products and Processes Subcommittee, Jurisdiction Working Group. (2020). *Digital and Digitized Assets. Federal and State Jurisdictional Issues*. [online] Available at: https://www.americanbar.org/content/dam/aba/administrative/business_law/buslaw/committees/CL620000pub/digital_assets.pdf [Accessed 1 Feb. 2023].
2. Bălan, Lidia-Lenuta and Dan, Lavinia Monica, *Public-Private Partnership Essential Tool for Green Deal*, „Perspectives of Law and Public Administration”, Volume 11, Issue 2, June 2022, p. 343-347.
3. Boyes H., Hallaq D., Cunningham J., Watson N. (2018). *The industrial internet of things (IIoT): An analysis framework*. “Computers in Industry”, 101, pp. 1-12.
4. Buntinx J. (2017). *Digital assets vs cryptocurrencies*. “The Merkle” [online] Available at: <https://themerke.com> [Accessed 2 Feb. 2023].
5. Castronova E. (2001). *Virtual worlds: a first-hand account of market and society on the Cyberian Frontier*. “CESifo Working Paper Series”, 618. [online] Available at: <https://ssrn.com/abstract=294828> [Accessed 2 Feb. 2023].
6. CBInsights. (2022). *Banking is only the beginning: 65 big industries blockchain could transform*. [online] Available at: <https://www.cbinsights.com/research/industries-disrupted-blockchain/> [Accessed 1 Feb. 2023].
7. Christiani, T. A., Sundari, E. & Supriyanto, V. H. (2023). *Regulamento da Tecnologia Financeira da Indonésia Sob a Perspectiva da Proteção Legal*, „Lex Humana” (ISSN 2175-0947), 15(2), p. 390-400.
8. Costa Assis, C. (2023), *O Paradoxo Da Esfera Pública Digital*, in „Cadernos de Direito Actual”, (21), pp. 101-129.

9. DAM News. (2023). *Types of Digital Asset*. [online] Available at: <https://digitalassetmanagementnews.org/features/defining-digital-assets/> [Accessed 1 Feb. 2023].
10. Datareportal. (2023). *Digital around the world*. [online] Available at: <https://datareportal.com/global-digital-overview> [Accessed 1 Feb. 2023].
11. Delaware House Bill 345. (2013-2014). *An Act to Amend Title 12 of the Delaware Code Relating to Fiduciary Access to Digital Assets and Digital Accounts*. [online] Available at: <https://legiscan.com/DE/text/HB345/id/1023563> [Accessed 2 Feb. 2023].
12. Dima, Alina Mihaela, *Resilience and Economic Intelligence through Digitalization and Big Data Analytics*, „Amfiteatru Economic”, Volume: 23, No. Special 15/2021, pp. 896-898, DOI: 10.24818/EA/2021/S15/896.
13. European Commission. (2020). *Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets and amending Directive (EU) 2019/1937*. [online] Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:f69f89bb-fe54-11ea-b44f-01aa75ed71a1.0001.02/DOC_1&format=PDF [Accessed 2 Feb. 2023].
14. European Law Institute. (2022). *ELI Principles on the Use of Digital Assets as Security: report of the European Law Institute*. [online] Available at: https://www.europeanlawinstitute.eu/fileadmin/user_upload/p_eli/Publications/ELI_Principles_on_the_Use_of_Digital_Assets_as_Security.pdf [Accessed 2 Feb. 2023].
15. Everplans. (2023). *A helpful overview of all your digital property and digital assets*. [online] Available at: <https://www.everplans.com/articles/a-helpful-overview-of-all-your-digital-property-and-digital-assets> [Accessed 1 Feb. 2023].
16. Fairfield J.A. (2005). *Virtual property*. “Boston University Law Review”. 2005. Vol. 85. P.1047-1102. URL: <https://ssrn.com/abstract=807966> [Accessed 2 Feb. 2023].
17. Fairfield J.A. (2015). *Bitproperty*. “Southern California Law Review”, 88(4), pp. 805-874.
18. FATF. (2012-2022). *International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation*. [online] Available at: www.fatf-gafi.org/recommendations.html [Accessed 2 Feb. 2023].
19. Financial Stability Board. (2018). *Crypto-asset markets: Potential channels for future financial stability implications*. [online] Available at: <https://www.fsb.org/wp-content/uploads/P101018.pdf> [Accessed 2 Feb. 2023].
20. Financial Stability Board. (2022). *Assessment of risks to financial stability from crypto-assets*. [online] Available at: <https://www.fsb.org/wp-content/uploads/P160222.pdf> [Accessed 2 Feb. 2023].
21. Flynn J. (2022). *20 Incredible Online Business Statistics* [online] Available at: <https://www.zippia.com/advice/online-business-statistics/> [Accessed 1 Feb. 2023].
22. Grieser S.G., Zlatanov I. (2021). *Newest developments on the crypto-assets regulation*. “ReedSmith”. [online] Available at: <https://www.reedsmith.com/en/perspectives/2021/03/newest-developments-on-the-crypto-assets-regulation> [Accessed 2 Feb. 2023].
23. Gurinovich A., Lapina M., Tolstopiatenko G., Patrikeev P. (2022). *About approaches to the definition of concept and problems of legal regulation of digital financial assets*. “Public Organization Review”, 22, pp. 1005-1024. Doi.org/10.1007/s11115-021-00549-x.
24. Halmosi P. (2019). *A technológiaorientált start-up cégek lehetőségei és korlátai az ipar 4.0 korszakában-kérdőíves felmérés alapján*. [The possibilities and limits of technology-oriented startups under industry 4.0—a survey-based study].

- “Vezetéstudomány-Budapest Management Review”, 50(9), pp. 40-48.
25. Hampel-Milagrosa A., Vandenberg P. (2021). *Five Ways Tech Startups Are Different from Other Small and Medium-Sized Enterprises*. [online] Available at: <https://blogs.adb.org/blog/five-ways-tech-startups-are-different-from-other-small-and-medium-sized-enterprises> [Accessed 1 Feb. 2023].
 26. Hannibal B.S. (2022). *What are “digital assets”?* [online] Available at: <https://www.nolo.com/legal-encyclopedia/what-are-digital-assets.html> [Accessed 1 Feb. 2023].
 27. Hughes K. *High tech vs. tech-enabled Startups*. [online] Available at: <https://www.karllhughes.com/posts/high-tech-enabled> [Accessed 1 Feb. 2023].
 28. Jáki E, Molnár E.M. (2017). *Model of the state and EU involvement in the venture capital market*. “Proceedings 31st European conference on modelling and simulation ECMS 2017”. ECMS-European Council for Modelling and Simulation, Nottingham, pp 120–126.
 29. Jáki E., Halmosi P. (2019). *Technology-oriented startups in the intersection of Industry 4.0, venture capital financing and business scaling – Empirical examples from the Automotive Industry*. In: Bem A., Daszynska-Zygadlo K., Hajdíkóvá T., Jáki, E. Ryszawska, B. (eds) “Sustainable Finance in the Green Economy”. Springer Proceedings in Business and Economics. Springer, Cham. [online] Available at: https://doi.org/10.1007/978-3-030-81663-6_4
 30. Kud A. (2019). *Substantiation of the term “digital asset”: economic and legal aspects*. “International Journal of Education and Science”, 2(1), pp. 41-52.
 31. Mind. (2020). *Кількість інтернет-користувачів у світі досягла 4,8 млрд*. [The number of Internet users in the world reached 4.8 billion.] [online] Available at: <https://mind.ua/news/20219912-kilkist-internet-koristuvachiv-u-sviti-dosyagla-48-mlrd> [Accessed 1 Feb. 2023].
 32. Moon M. (2007). *Activity lifecycle of digital assets*. “Journal of Digital Asset Management”, 3(3), pp. 112-115.
 33. Nekit K. (2020). *Legal aspects of the use of social media accounts: current state and perspectives*. “The Lawyer Quarterly”, 10(3), pp. 305-323.
 34. Nekit K. (2020). *Social media account as an object of virtual property*. “Masaryk University Journal of Law and Technology”, 14(2), pp. 201-226
 35. Nekit K., Kolodin D., Fedorov V. (2020). *Personal data protection and liability for damage in the field of the Internet of Things*. “Juridical Tribune - Tribuna Juridica”, 10(1), pp. 80-93.
 36. Nelson J.W. (2010). *The virtual property problem: what property rights in virtual resources might look like, how they might work, and why they are a bad idea*. “McGeorge Law Review”, 41. [online] Available at: <https://ssrn.com/abstract=1805853> or <http://dx.doi.org/10.2139/ssrn.1805853>. [Accessed 2 Feb. 2023].
 37. New South Wales Law Reform Commission. (2019). *Report 147 «Access to digital records upon death or incapacity»* [online] Available at: <https://www.lawreform.justice.nsw.gov.au/Documents/Publications/Reports/Report%20147.pdf> [Accessed 2 Feb. 2023].
 38. Onețiu, D. D. (2020). *The Impact of Social Media Adoption by Companies*. „Digital Transformation. Studia Universitatis Vasile Goldiș Arad, Seria Științe Economice”, 30(2), pp. 83-96.
 39. Popa Tache, Cristina Elena, *Editorial*, „International Investment Law Journal”, Volume 1, Issue 1, February 2021, p. 1.
 40. Roche Legal. (2023). *How Valuable Are Your Digital Assets?* [online] Available at:

- <https://www.rochelegal.co.uk/news/how-valuable-are-your-digital-assets/> [Accessed 1 Feb. 2023].
41. Rowland G. S., Kiviat T.I. (2021). *Cryptocurrency and other digital asset funds for U.S. investors*. [online] Available at: <https://ssrn.com/abstract=3813376> [Accessed 1 Feb. 2023].
 42. Sandner Ph. (2021). *Digital Assets: The Future of Capital Markets*. "Forbs". [online] Available at: <https://www.forbes.com/sites/philippsandner/2021/08/24/digital-assets-the-future-of-capital-markets/?sh=255bd04e6a57> [Accessed 1 Feb. 2023].
 43. Savin I., Chukavina K., Pushkarev A. (2022). *Topic-based classification and identification of global trends for startup companies*. "Small Business Economics". [online] Available at: <https://doi.org/10.1007/s11187-022-00609-6> [Accessed 1 Feb. 2023].
 44. Schmidt A. (2021). *Virtual assets: compelling a new anti-money laundering and counter-terrorism financing regulatory model*. "International Journal of Law and Information Technology", 29(4,) pp. 332–363.
 45. ScyQuest. (2022). *Digital Asset Management market to generate revenue of \$9.32 billion by 2028*. [online] Available at: <https://www.globenewswire.com/en/news-release/2022/09/08/2512745/0/en/Digital-Asset-Management-Market-to-Generate-Revenue-of-9-32-Billion-By-2028-Cybersecurity-Startups-in-Digital-Asset-management-Can-t-Keep-Calm-from-Raising-Funds.html> [Accessed 1 Feb. 2023].
 46. Spender J.C., Corvello V., Grimaldi M., Rippa P. (2017). *Startups and open innovations: A review of literature*. "European Journal of Innovation Management", 20(1), pp. 4-30.
 47. Statista. (2022). *Number of internet and social media users worldwide as of July 2022*. [online] Available at: <https://www.statista.com/statistics/617136/digital-population-worldwide/> [Accessed 1 Feb. 2023].
 48. Toygar A., Rohm C.E., Taïpe Jr., Zhu J. (2013). *A New Asset Type: Digital Assets*. "Journal of International Technology and Information Management", 22(4). [online] Available at: <https://scholarworks.lib.csusb.edu/jitim/vol22/iss4/7> [Accessed 2 Feb. 2023].
 49. UK Law Commission. (2022). *Digital assets: consultation paper*. [online] Available at: <https://www.lawcom.gov.uk/project/digital-assets/>. [Accessed 2 Feb. 2023].
 50. UNIDROIT. (2023). *Draft UNIDROIT Principles on digital assets and private law*. [online] Available at: <https://www.unidroit.org/wp-content/uploads/2023/01/Draft-Principles-and-Commentary-Public-Consultation.pdf> [Accessed 1 Feb. 2023].
 51. Uniform Law Commission. (2015). *Revised Uniform Fiduciary Access to Digital Assets Act* [online] Available at: <https://my.uniformlaws.org/viewdocument/final-act-no-comments-33?CommunityKey=f7237fc4-74c2-4728-81c6-b39a91ecd22&tab=librarydocuments>. [Accessed 2 Feb. 2023].
 52. Vandenberg P., Hampel-Milagrosa A., Helble M. (2020). *Financing of tech startups in selected Asian countries*. "ADB Working Paper Series", 1115. [online] Available at: <https://www.econstor.eu/bitstream/10419/238472/1/adbi-wp1115.pdf> [Accessed 1 Feb. 2023].
 53. Walker M. (2017). *The new uniform digital assets law: estate planning and administration in the information age*. "Real Property, Trust and Estate Law Journal", 52(1), pp. 52-78.
 54. Некіт К.Г. (2022). *Розвиток правового регулювання обігу віртуальних активів (криптовалют) в Україні*. "Часопис цивілістики", 44, с. 45-51 [Nekit K.G. (2022). *Development of legal regulation of circulation of virtual assets (cryptocurrency) in Ukraine*. "Journal of civil law", 44, pp. 45-51].