Contemporary Readings in Law and Social Justice
ISSN: 1948-9137, e-ISSN: 2162-2752
Vol 16 (1), 2024
pp. 1036 - 1051

International and National Legal Regulation in the Sphere of Digital Rights, Assets and Ecosystems

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Abstract: One of the most important goals of sustainable civilization development is to create a digital environment that is safe, accessible and fosters the development of each individual within the digital community while respecting the rights and freedoms of individuals. Digital transformation enables individuals to become interoperable entities in the international legal space.

In the review of legal norms in the field of digital rights, assets, and ecosystems, the analysis revealed the problems in their legal regulation both at the national and international levels.

The study clarified the definitions of digital assets and digital platforms in the context of civil legal relations. A classification of digital objects has been developed, and various types of smart contracts used at the international level have been systematized. As a practical example, an overview of the proprietary project "EMY: System for Managing Socio-Economic Processes, Including Property and Non-Property Rights" was presented. This project illustrates how theoretical developments and classifications can be applied to optimize the management of socio-economic processes, regarding property and non-property rights.

Keywords: digital, data, token, digital assets, digital data, ecosystems, EMY code, EMY token, metaverse.

Received: 13 March 2024 **Revised:** 19 May 2024 **Accepted:** 16 June 2024

1. Introduction

We are all now connected by the Internet, like neurons in a giant brain. Stephen Hawking [1]

Technological progress has provided the global community with new opportunities for interaction and strengthening trust in institutional structures, information storage, and transaction execution in the social and economic sectors. With the implementation of new technologies, such as artificial intelligence, the Internet of Things, cloud computing, immersive technologies, data analytics, and mobile applications, digital transformation of the world's financial architecture has become possible. New technologies are altering traditional interactions within the global community, encompassing political, economic, social, technological, legislative, ethical, moral, and environmental aspects. Virtual reality is actively utilized, providing unrestricted access to information. It enables work, communication, knowledge acquisition, business endeavors, creativity, and much more in an online mode. Virtual reality technologies give rise to a metaverse — an immersive, decentralized three-dimensional space.

The rapid advancement of technology sharply raises the issue of further development and enhancement of established legal regulations — digital identity, property and non-property rights — while new forms of currency and assets emerge. A new subject of legal relations emerges: digital social and economic systems utilizing neural networks and artificial intelligence (AI). Smart cities represent a vivid example of a new reality, wherein without applying fundamental principles of sustainable development goals (SDGs) and ESG criteria, we risk subjecting ourselves to totalitarian control by the owners of these systems. The new realities necessitate the development of law to adapt to contemporary challenges and ensure justice and safety in society, including issues related to digital identity verification within such systems.

Digital assets are offering new opportunities to raise funds, replacing traditional financing instruments. These opportunities arise through the issuance of digital tokens, such as Initial Coin Offerings (ICO) or Security Token Offerings (STO). In such projects, decentralized networks and blockchain technologies are actively utilized. The blockchain technology enables the creation of a unified digital registry that consolidates data from all registries. Users have equal opportunities to own, participate, and grow without interference from others. Each block is encrypted, time-stamped, and cannot be changed, making it secure. The network regularly updates the registry across all nodes where it exists, ensuring that all copies remain identical. The unified digital registry will eliminate the need for intermediaries to conduct transactions or sign legal agreements. The ability to create a global value chain for goods, from their production inception to delivery, authenticity verification, quality assurance, and even the automation of legal regulation control, has become feasible. Blockchain is “a technology of utmost honesty” in the transmission of information[2]. It will be important for society to control the accuracy and reliability of information in the online environment and protect the right of everyone to access the Internet. Digital assets are becoming more widely used, and the traditional sector of the economy should not underestimate the importance of these innovations.

The digital transformation of the international financial architecture will enable the creation of an efficient infrastructure that ensures compliance with personal property and non-property rights, as well as access to justice for all. By establishing an efficient and society-accountable system of regulating relationships in both online and offline environments. In the modern world, there is a trend of diminishing interest among individuals in offline spaces due to the impact of quarantine measures implemented in response to the spread of new viruses, such as COVID-19. This contributes to the reorientation of individual development towards virtual reality, reflecting changes in the ways people interact with the environment. In the physical world, war is often associated with resource acquisition, whereas in the digital realm, conflict manifests in the struggle for information and popularity. Digitization has led to a shift in human mentality and eased access to information, presenting new challenges for science. It is crucial to formulate precise questions and explore novel approaches within existing paradigms, thereby contributing to scientific advancement through humanity’s unique capabilities. In the study of new phenomena, one can break free from the conventional reliance on aggregate data statistics and segmentation into groups. This opens the opportunity to focus on individual needs and unique human capabilities. This opens new opportunities for individual and societal development amidst global changes and challenges. At the same time, it should be noted that the accuracy of data is not always equivalent to the accuracy of identity, especially when it comes to data related to "digital identity as credentials". There is a need to limit anonymity on the Internet, as the security of sensitive information online directly depends on user authentication and identity verification.

Currently, the digitized economy and data privacy contribute to negative financialization and lobbying of interests by a select group of individuals who own and utilize digital data. The information community promotes the inviolability of personal information and trade secrets. At the same time, innovative technologies that can solve global problems of the world community remain without application. The principle of openness and accessibility of information will allow achieving digital equality and redefining the global financial architecture.

The main goal of this research is to analyze legal norms and concepts in the sphere of production and circulation of digital assets, including ecosystems, encompassing digital law in both subjective and objective understanding. To identify the key characteristics and trends in the development of modern digital

ecosystems from the perspective of legal regulation of digital data, digital information, and digital assets.

2. Materials and methods

The materials consist of published information about to the circulation of various types of digital assets. The data characterizing various segments of the turnover of digital objects are contained in informational, statistical, reference, and analytical materials. The materials consist of legal case precedents. Other materials from international organizations were also utilized. The research was based on general scientific and specialized research methods. The dialectical-materialist method predetermined the conduct of the research on the legal regulation of digital objects. The systematic approach facilitated the examination of the major challenges related to understanding the nature and position of digital rights and entities within the legal framework. The methods of analysis and synthesis have provided the opportunity to substantiate the author's position with respect to finding directions and methods for resolving existing contradictions in the field of legal regulation of digital data and assets. The comparative legal approach was used to make a comparison of legal regulations governing digital asset circulation in Kazakh and foreign legislation.

3. The results

With the development of technologies such as blockchain, big data analysis, robotics automation, artificial intelligence, and the Internet of Things (IoT), which blur the lines between the physical and digital worlds, it has become crucial to develop legislation to protect the legal regulation of relations to achieve sustainable social development.

According to A. Vasiliev and others, one can note the formation of a special branch of legislation and scientific direction - digital law (Internet law). It should be understood in two meanings. In an objective sense, digital law is a set of legal norms aimed at resolving systemic problems of Internet law. In a subjective sense, digital law represents the legal possibility of using information and other benefits using the Internet space. [3]

In an objective sense, digital law refers to the rules governing relations related to the use of digital technologies such as artificial intelligence, distributed ledger systems, and other end-to-end digital technologies. In this context, digital law is understood as a collection of regulatory provisions that govern the actions of individuals and organizations in the sphere of information systems and networks. [4]

In a subjective sense, digital rights are contractual and other rights, the content and terms of which are determined by the rules of the information system. Digital law pertains to the ability of subjects of law to seek, utilize, store, and share information in digital form. This may include the rights of national and international actors to access digital services, as well as ensuring the protection of their online data, etc. [5]

The confirmation of the hypothesis regarding subjectivity as the primary issue of digital law (or the scientific convention regarding such a hypothesis) would imply the existence of a common doctrinal principle that should be considered in various forms of legislative and judicial activities in cases where the formal-legal method cannot be applied due to objective circumstances. [6]

The terms "digital" and "data" are closely interconnected, especially in the context of digital transformation. "Digital" pertains to the use of digital technologies to modify business models and create new forms of business processes and user experiences. "Data," on the other hand, serves as a key asset and accelerator of digital transformation, providing information and insights that enable organizations to make informed and timely decisions. In today's digitalized business landscape, data acts as the backbone for developing novel digital products and services, streamlining processes, and generating value for customers and enterprises.

"Put the observer in a room and show images of a virtual product and physical product side-by-side," suggests Prof. Michael Greaves of Florida Institute of Technology. Five years ago, it was easy for anyone to tell the difference between a photo of a physical product and an image of its virtual counterpart. "Today, almost nobody can spot the difference," explains the doctor who coined the term "digital twin".[7] A "digital twin" is a virtual copy of a real-world object or process that uses large amounts of data (Big Data) to

optimize operations and business processes.

The digitalization of the economy also raises the issue of revising traditional views on the system of objects of law and determining the place in this system of such objects as digital objects, digital rights. Incorporating digital rights and other legal categories of intangible property (tokens, cryptocurrency, etc.) into legislation actualizes private law regulation of relationships in the field of using big data in civil circulation, concluding and executing smart contracts, digitizing government procurement, blockchain technology usage, digital toolkit in antitrust legal regulation, and new forms of manifestation of intellectual property objects in the digital environment.

At the international level, the UN initiative to accelerate progress towards the Sustainable Development Goals (SDGs) calls for an inclusive digital transformation. Digital Public Infrastructure (DPI) project has gained importance after being endorsed by the G20 during the New Delhi Summit.[8] Discussion of DPI includes issues of online identity interoperability between countries with differences in national legislations regarding the management of personal information on a global scale.

The objective challenges in defining sovereign digital space compel states to resort to the application of national legal mechanisms beyond their borders. The International Monetary Fund (IMF) highlights the importance of interoperability for digital assets in its Digital Asset Platform (DAP) model, which includes four layers: platform, asset, service, and access.[9] The ASAP (access, service, asset, platform) model is based on the experience of the IT industry and central bank experiments, incorporating elements such as platform (e.g., blockchain), asset (CBDC, bond, etc.), service (credit protocol and others), and access (interfaces for interacting with the platform). Interoperability plays a key role in integrating digital assets into financial systems, allowing them to function freely across different platforms. The ASAP model considers standardizing interoperability at the level of assets and services to be the most promising approach, facilitating more effective interaction within the ecosystem of digital assets.

In order to provide users of the digital space with proper protection in new conditions, the EU is developing a legal framework, creating infrastructure to regulate the circulation and use of new technologies and digital objects. The Luxembourg Convention on Privacy in Information Technology and Communications of 1981 (Convention 108)[10] prescribes rules for the protection of personal data in information and communication technologies. The European Union's Directive on E-commerce (2000/31/EC) [11] establishes the rights and obligations in this area of the economy. The 2020 Strategy "Shaping Europe's Digital Future"[12] identifies three development areas: technologies for people, a competitive digital economy, and an open, democratic, and sustainable society.

In 2021, the "Digital Europe"[13] program was approved. The policy regarding the use of digital technologies in the EU is entrusted to the European Digital Innovation Hubs (EDIH), which are formed by several InvestEU organizations with the European Enterprise Network (EEN) (European Commission, 2021 [128]).[14]

The European Parliament adopted the Artificial Intelligence Act (also known as the AI Act or AI Regulation) on March 13, 2024. It sets out harmonized rules on the use of AI and introduces a cross-sectoral approach to regulating the use of AI systems in the EU. The law's provisions are intended to regulate the activities of artificial intelligence system operators in order to decrease the risks associated with their operation. Lists of prohibited practices in emotion detection systems, biometric categorization, manipulation of image, sound, or video surveillance are introduced.[15]

The activities of major digital platforms and digital markets are regulated by the Data Governance Act[16], which came into force in June 2022, the Digital Services Act[17], and the Digital Markets Act[18], both of which came into force in November 2022.

The Declaration on Digital Rights and Principles was adopted in the EU on December 15, 2022 (2023/C 23/01)[19]. Its purpose is to ensure universal human values in a transformed digital environment. The main rights and principles of digital transformation include data protection and equal treatment, technological and network neutrality, and inclusiveness.

On April 20, 2023, the General Regulation on Supervision and Consumer Protection in Relation to Cryptocurrencies (Markets in Crypto Assets, MiCA)[20] was adopted.

The objective of MiCA is to ensure financial stability, protect investors, promote market fairness and integrity, as well as address existing gaps in traditional EU financial legislation. The regulation establishes strict rules for crypto asset issuers, including "stablecoins," as well as for trading platforms and wallets where crypto assets are stored.

The main provisions of the MiCA regulation include investor and consumer protection, requirements for stablecoin issuers to maintain reserves in low-risk instruments, and the establishment of liability, particularly for custodians of funds. The Regulation promotes innovation and investor protection but faces the challenge of balanced regulation given the dynamic growth of digital asset markets.

The European Digital Identity Wallet (EUDI) is an initiative of the European Union to securely share identity data, enabling convenient access to digital services. The trials launched on April 1, 2023, supported by €46 million from the European Commission, are aimed at real-life testing in various fields. All EU citizens will have the opportunity to use the EUDI wallet to access online services securely with full protection of personal data. The new legislation links digital wallets with national digital identities, seen as a major step towards the EU's 2030 goals. Future enhancements promise to facilitate access to public services and online transactions in Europe.[21]

The legal regulation of digital assets in the United States is based on classifying digital data as a commodity and is substantiated by the transfer of the physical medium on which this data is recorded. Wyoming's legislation recognizes three categories of digital assets: "digital consumer asset", "virtual currencies", and "digital securities". Each of these categories has a distinct legal nature: digital consumer assets are regarded as intangible property, virtual currencies as money, and digital securities as securities.

The law also establishes the jurisdiction of various regulators in the US concerning different types of digital assets. Regulation of relations involving "crypto goods" and crypto exchanges has been delegated to the Commodity Futures Trading Commission. The Department of the Treasury handles the regulation of "cryptocurrencies," while the SEC (Securities and Exchange Commission) regulates the trading of "crypto-securities" and their registration. This example demonstrates how the legal regulation of digital assets is gradually evolving and becoming a distinct area of legal thought. The history of legal institutionalization of digital assets in the USA has been shaped by the enforcement practices of executive authorities (mainly the SEC) and court decisions regarding companies conducting ICOs. Trends that initially found reflection in state laws are now beginning to shape enforcement practices at the federal level.

Market participants in the USA must consider whether a digital asset is deemed an investment contract and, consequently, whether it is considered a security. Thus, issuers and other marketing participants engaged in offering, selling, reselling, or distributing any digital asset must analyze the relevant transactions to determine whether they fall under the purview of federal securities laws.

Federal securities laws require that all offers and sales of securities, including digital assets associated with them, be either registered under their provisions or exempt from registration. Registration provisions require individuals to disclose certain information to investors, which must be complete and not misleading. Among the information that needs to be disclosed is information about significant managerial efforts that affect the success of the enterprise. In the absence of such information, there may be an information asymmetry between management and investors, which can be addressed through mandatory disclosure of information, one of the primary objectives of federal securities laws.

The concept of Russia's digital territory is enshrined in Federal Law "On the Activity of Foreign Entities in the Information and Telecommunication Network 'Internet' on the Territory of the Russian Federation" dated July 1, 2021, No. 236-FL.[23] It introduces criteria for determining when the activities of an entity, the owner of an information resource, are considered to be conducted on the territory of the Russian Federation and subject to Russian law. An information resource is a website, a separate page of a website, an information system and a computer program, including a mobile application. According to the law, the

recognition of the activities of a foreign entity as being conducted on the digital territory of the Russian Federation requires the establishment of two criteria: quantitative and functional. The quantitative criteria – more than five hundred thousand users located on the territory of Russia within a day. Functional criteria is meeting one of conditions: the presence of information on the resource in the official language of the Russian Federation, the official languages of the republics within the Russian Federation, or other languages of the peoples of the Russian Federation.

The legal regulation of digital objects is determined by their nature and functionality. In the work of L.Yu. Vasilevskaya, it is noted that tokens in civil circulation serve several roles: they can act as a digital unit of value, a digital equivalent of non-documentary securities, or a digital equivalent of other objects of civil rights. This classification corresponds to payment tokens, utility tokens, and asset tokens, respectively.[24]

One type of digital asset is an "account." It is not clearly defined in Russian legislation but may be considered as a database or a record on a social network server, as well as an account created by a user in an electronic system. From the perspective of legal application, an account can be considered as intellectual property, an information platform, or a means of communication, as well as a tradable asset. Legal regulation of accounts encompasses various aspects related to their creation, use, and circulation, including potential licensing agreements and the commercial value of the account.[25]

In Russian law, the protection of privacy rights in property relations includes the protection of personal intangible goods. Data of digital form and commercial value, such as an image, a person's name, and information about a person's private life are considered intangible goods. The Civil Code of the Russian Federation does not contain explicit provisions, but points to the non-transferability and inalienability of these intangible goods. Data use contracts are usually mixed and include the data controller and the person who contributed to its acquisition or production. Thus, the subject of personal data cannot automatically be recognized as the person who has the data, as it reflects the social reality of the subject.

In the Russian Federation, the legal regulation of digital financial assets (DFA), tokens, and accounts on platforms associated with them is based on the Federal Law of 31.07.2020 No. 259-FL "On Digital Financial Assets, Digital Currency, and Amendments to Certain Legislative Acts of the Russian Federation."[26] This law establishes rules for the issuance and circulation of DFAs in information systems and regulates the activities of information system operators and DFA exchange operators.

The Central Bank of Russia approves the rules of information systems, interaction with operators of these systems, production and circulation of DFA.[27] Regulation includes licensing of legal entities operating the information systems of DFA exchange. The amount of share capital, seniority and qualifications of management, information systems rules, internal control and risk management organization, and operational reliability are set for licenses.

The infrastructure of information systems may include classical processes from clearing to rights accounting, as well as blockchain-based fixation of ownership rights and automation of trading scenarios. The information system operator performs verification of issuers in accordance with Article 115 of Federal Law No. 259-FL dated 31.07.2020 "On Digital Financial Assets, Digital Currency and Amendments to Certain Legislative Acts of the Russian Federation"[26] and identification of investors.

The investor himself buys or sells the CFA via his personal account, and the smart contract automatically executes it according to the conditions of circulation of a particular CFA. The transfer of the asset is recorded in the form of a blockchain entry. Mass investors can participate in public asset issues. The issuer may authorize the splitting of CFAs when issuing them. This allows investors with any capital to enter the asset and participate in changes in its value. It also makes it easier to create a diversified portfolio. Digital rights are a type of property rights recognized in court. The main advantage of DFAs over cryptocurrencies is the legally regulated relationship between issuers and investors. The use of smart contracts reduces the number of intermediaries, greatly simplifies the issuance and circulation of assets, which ultimately leads to significant time and money savings for all market participants.[28]

Article 8 of the Federal Law dated 31.07.2020 N 259-FL[26] regulates the specifics of transactions with

utilitarian digital rights and digital financial assets through investment platforms and exchange operators. Its application contributes to the security and transparency of such transactions, promotes the spread and development of digital assets, which, in turn, ensures the legal protection of market participants.

In the Republic of Kazakhstan, self-employed individuals and legal entities may be issuers and operators of digital platforms for the exchange and storage of secured digital assets. A permit must be obtained from the Ministry of Digital Development, Innovation and Aerospace Industry of Kazakhstan[29] for the issuance and circulation of secured digital assets. Issuers of secured digital assets are included in the relevant state register and become subjects of financial monitoring in accordance with Kazakhstan's legislation on combating money laundering and terrorist financing.[30] State control over the activities of the subjects is carried out in accordance with the Entrepreneurial Code[31]. In Article 5 of the Law "On Digital Assets in the Republic of Kazakhstan" [32] defines the requirements for secured digital assets - to contain data on the person who issued it, to certify the right to tangible, intellectual services and assets, to have a decision on issuance, confirmation of property and (or) intellectual rights to the asset before its formation as a secured digital asset, a record in the blockchain network on the movement of the asset and (or) rights to the property.

Digital asset miners must obtain a license from the Ministry of Digital Development, Innovation and Aerospace Industry of Kazakhstan[33] to carry out their activities. Digital mining pools, which pool the capacity of digital mining equipment and distribute the resulting assets, must also be accredited.[34] Accredited digital asset exchange platforms licensed by the Astana International Financial Centre (AIFC) are required to sell at least 75% of the extracted assets through AIFC-licensed exchanges.[32]

Under the laws "On Digital Assets"[32] and "On Amendments to Other Legislative Acts Relating to Digital Assets and Informatization", the issuance and circulation of unsecured digital assets is prohibited in Kazakhstan. Unsecured digital assets may be issued and traded through the Astana International Financial Centre (AIFC). It is allowed to trade on a digital asset exchange - a digital platform that provides organizational and technical support for trading, issuance, circulation and storage of digital assets. To regulate the circulation of digital assets, the AIFC issued the AIFC Financial technology rules (fintech rules) AIFC rules NO. AFSA-F-PC-2019-0001)[35].

The financial regulator MFCA, when issuing a license, divides investors into three groups: retail, accredited and professional, which affects the ability to acquire certain financial assets. The Financial Services Regulatory Committee (Astana Financial Services Authority, AFSA) sets limits both on the number of clients and on the volume of transactions made by each type of client. There are also requirements for financial and IT audit, compliance systems and prevention of criminally derived money laundering (legalization) and terrorism financing.

A taxonomy is needed to better define the concept of a digital asset. Taxonomy facilitates information retrieval, analysis and exchange by structuring the objects under study into easy-to-understand hierarchical systems. It also facilitates the development of scientific disciplines by establishing clear principles of classification and nomenclature. Let us consider several approaches to the taxonomy of digital assets.

Under EU law, a crypto asset is a digital representation of value recorded in a cryptographically protected distributed ledger or similar technology.[36]

1 July 2023 US developed non-authoritative guidance by Stacey Ferris, CPA "Taxonomy for Classifying Digital Assets" to help accountants identify digital assets, manage general ledger accounts, establish internal controls and comply with expected regulatory changes regarding reconciliations and disclosures. The taxonomy was developed with input from the Government Blockchain Association, the CryptoCFO community, Peter Rehm, and AICPA technical reviewers.[37]

In the opinion of the US authors, CBDC taxonomies represent a type of digital asset, but their key difference is that they are issued and controlled by a state's central bank. In contrast to CBDC, other interoperable crypto assets and NFTs are issued by private developers or organizations and have varying degrees of

decentralization. This basic difference makes CBDC a unique digital asset in terms of regulation, accounting, and use in states' financial systems.

The Digital Asset Taxonomy System (DATS)[38] of the global investment consulting company Wilshire Advisors LLC (USA) is a method of classifying digital assets from industry to subsector based on their functionality or use case. All assets classified within this taxonomy include digital assets existing on public blockchain networks; private blockchain companies are not included in this taxonomy. Within the digital asset industry, the taxonomy comprises three sectors – digital currencies, computational platforms, and financial instruments. The digital currencies super sector consists of digital assets whose primary aim is to replicate the fundamental functions of money: store of value, medium of exchange, and unit of account. The computational platforms super sector consists of assets existing on networks that support smart contracts.

The Milken Institute in the United States classifies digital assets in their taxonomy[39], categorizing them as digital or virtual currencies, and then systematizing them into specific examples of digital assets. These digital assets vary based on characteristics, including convertibility, interchangeability, the underlying distributed ledger technology, legal payment status, and more. The schema is designed to easily identify a specific asset (such as Ether) and navigate upward to view its characteristics. Similarly, the descending approach allows readers to understand which characteristics correspond to specific assets.

Author Kud A.A. describes the triune nature of virtual assets: technological, economic-legal, informational, and applied.[40] According to the author, this classification helps to determine prospective tools for accounting for property and rights. The informational essence of a tokenized asset is determined by the informational component contained within its underlying asset. If the underlying asset of a tokenized asset originated from an informational resource associated with that asset, then the tokenized asset becomes a subcategory known as a digital asset of a decentralized information platform. The informational resource of a digital asset is formed by the owner of the underlying asset and confirms its quality as an object of intellectual property. The productivity of the informational resource of a digital asset, like that of the underlying asset for the digital asset and its derivative, depends on the set of rights and obligations belonging to the owner of the digital asset.

Depending on the approaches used to define digital assets in different countries, different types of relationships arising from entities are regulated. Common to all these objects is the digital form and the possibility of carrying out transactions for the purpose of making profit by individuals and legal entities. Classification of the above terms, i.e. correlation of them with one of the existing types of tokens, is of practical importance. Namely, the attribution of this or that asset in different states to a certain type of digital asset will give us an idea of its economic purposes, which in turn predetermines the legal nature and legal regulation of the turnover of this token. Thus, depending on the type and kind of digital asset, the state and international bodies responsible for the legal regulation of these objects are determined. This classification is necessary because the applicability of certain laws in most countries depends on the classification of a token as a utility token, payment token or asset token.

4. Discussions of the results

Analyzing the state and regularities of legal regulation of public relations regarding creation and use of information systems with the use of digital assets, helps to conclude that it is necessary to further develop and improve legislation in this area. It is important to consider the growth of the digital economy and the expansion of the use of digital assets, which requires an appropriate legal framework to ensure the rights and interests of all participants in the process. It is recommended to pay special attention to the definition of the legal status of digital assets, mechanisms for the protection of property rights, as well as the establishment of effective liability measures for violations in this area. It is also important to harmonize national legislation with international standards and practices to ensure compatibility and competitiveness of national digital solutions in the global market.

The study defines digital asset as an element of information systems and describes its features. A digital asset is an asset that exists only in digital form and is subject to a right of use or a separate authorization

for use. Digital data that does not have these characteristics is not considered an asset. Digital data can be part of a digital asset. An asset becomes an asset when it conveys a potential benefit, property interest and profit to its owner or confers a right of possession over a certain value. It is the rights attached to the data that determine whether it becomes an asset. They include, but are not limited to, cryptocurrencies, digital data and others that can be an object of purchase, sale, exchange, i.e. be negotiable. Digital assets can be defined as objects of legal relations represented as digital records that certify certain rights and value. They change the way business is conducted and values are exchanged, providing transparency, security and convenience of interaction with assets.

A digital platform is a software-based online infrastructure that facilitates interactions and transactions, carrying out transactions between users. Such platforms can act as data aggregators, helping users navigate through vast amounts of information, akin to what search engines do; A digital platform acts as a kind of "intermediary" to facilitate transactions between users, such as digital marketplaces; or as collaborative tools to support the development of new content, as in the case of online communities. Digital platforms can also combine several of these functions.

These analyses indicated the need to develop more relevant techniques for identifying digital assets that provide a more objective representation of these assets for users. It is important to create a universal methodology that can report both current and future digital assets correctly. Additionally, more detailed classification of digital assets is required to improve the accuracy of the reporting information provided to users. This article proposes criteria for identifying digital assets, which will correctly determine their type and, accordingly, determine the order of accounting of assets and the content of disclosure of information about them to users.

Digital rights objects should be classified according to the following criteria, including:

Types	Criteria
Functionality or use-case option	Digital currencies
	Computing platforms
	Financial instruments
Structure	Centralised (controlled by a central authority)
	Decentralised (no central control)
Scope of application	Financial (cryptocurrencies, stablecoins)
	Non-financial (smart contracts, digital identities)
Technology	Blockchain-based (assets based on blockchain technology)
	Non-blockchain-based (assets not reliant on blockchain technology)
Role	Tools of exchange (used as a medium of exchange)
	Accumulation funds (used to preserve value)
	Agreement tools (used to enter into smart contracts)
Divisibility	Divisibility (cryptocurrencies such as Bitcoin and Ethereum are highly divisible because they can be divided into smaller units (e.g., satoshi or wei).
	Indivisibility (such as unique identifiers (NFTs) or shares in an integral asset, can be indivisible)
Interoperability	Interoperable (functioning freely on different platforms)
	Non-interoperable (operating on one platform)

Table 1. Classification of digital assets.

In the digital asset field, practices are actively using contracts such as smart contracts, which are blockchain-based contracts. They contain terms and conditions in digital form in the form of self-executing code, which automates the contracting process and ensures control over the execution of the contract.

The main types of smart contracts include:

№	Smart contract type	Description
1	A contract whose object is a token	Used to purchase rights in investment funds using a token.
2	A contract whose subject matter is an investment	Intended for online investing.
3	Contracts whose subject matter is the control of transportation execution and pricing of goods	Utilized for monitoring transportation execution via any mode of transport and pricing of goods in real-time online mode.
4	Contracts (NFTs) whose subject matter is the control of transportation execution and pricing of goods using tokens.	Similar to the previous type, but utilize tokens (NFTs) for monitoring transportation execution and pricing of goods in real-time online mode.

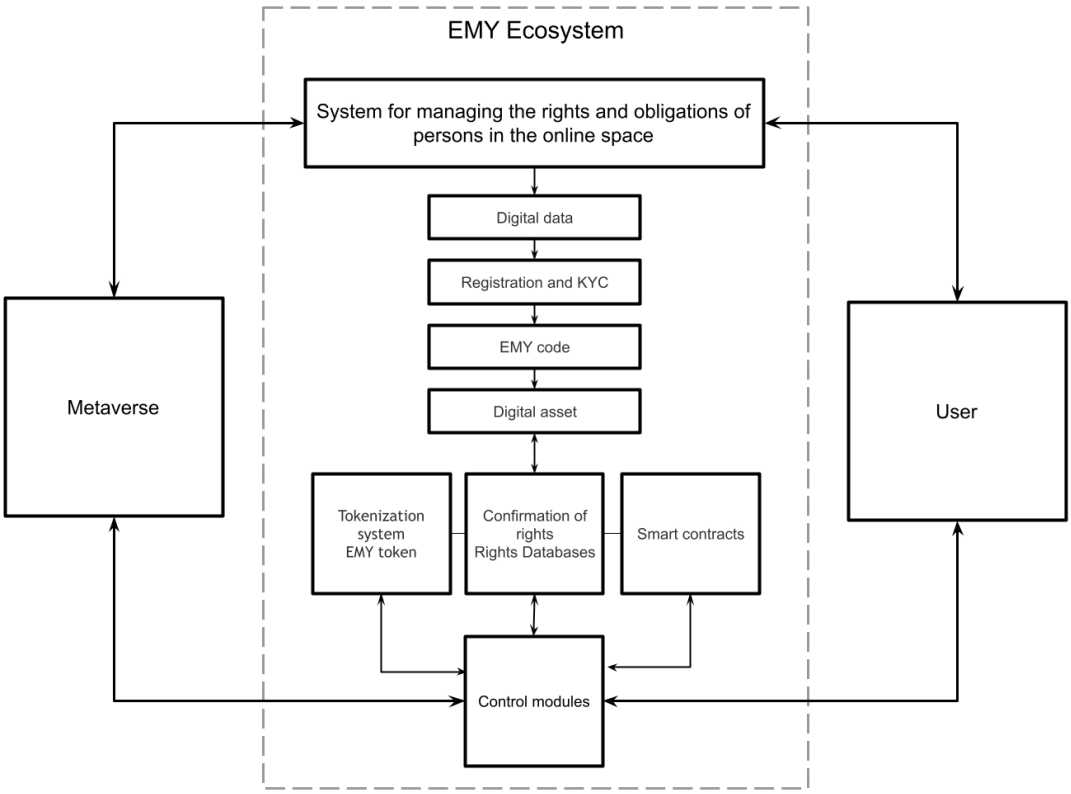
Table 2. Types of smart contracts.

The traditional concept of ownership cannot be applied to digital assets. While this is possible, there are good reasons to avoid "extending" the concept. It would be better to start from the premise of exclusive control over information in a digital registry and develop appropriate actions and remedies, rather than working along the lines of physical possession.

In order to implement the exclusive control over the information in the digital registry, the author of the article received the copyright certificate for the invention "System of management of socio-economic processes, including property and non-property rights EMY", issued by the Republican State Enterprise "National Institute of Intellectual Property" of the Ministry of Justice of the Republic of Kazakhstan dated 27 March 2024 №43998.

Within the EMY ecosystem, everyone should have the right to profit from their data and to protect their rights over their own digital objects. This can be achieved by building an ecosystem based on the values of the UN Sustainable Development Goals (SDGs) and ESGs (environmental, social and governance criteria used to assess companies' commitment to sustainable operations), where the interests of the individual are respected without discrimination.

To solve this problem, the author of the article proposes the EMY (Ecosystem Metaverse Yakamoz) ecosystem, with the assignment of a unique EMY CODE and the issuance of EMY digital assets. The EMY ecosystem is a platform designed to register objects in a digital environment. Once a digital object is linked to a specific entity, the data becomes an asset, enabling effective management of rights and obligations. Transparency and availability of data ensures the purity of information. Decentralised environments allow for different perspectives. The author proposes to use the unique EMY CODE to register objects in the digital environment through the EMY ecosystem, which is a private centralised system for registering a person's rights. The system provides the ability to validate data in centralised public and other private systems. This allows to efficiently address the registration of person data to transform it into information and then into EMY token digital assets.



EMY CODE is an interoperable code for registration of objects and entities in the digital environment. EMY CODE types - for natural person, legal entity, digital information, assets, intellectual property, etc.

The EMY ecosystem is aimed at resolving issues of registration of digital objects, property and non-property rights in the global environment.

Blockchain technology and smart contracts increase the transparency of transactions and build trust between market participants. The integration of analytical tools and personalized approaches allows for more effective interaction with users, tailoring offers to specific customer needs and preferences. The system helps manage the legal aspects of intellectual property trading, including licensing, dispute resolution and regulatory compliance.

Description of the EMY project work system

Integrated business process management system, copyrights, patents, trademarks using automated data integration, tokenization and automated contracts using blockchain.

The developed system is aimed at increasing the efficiency, functionality, security and reliability of storing information about ownership of assets. Key goals include optimizing property rights management and implementing innovative software and hardware solutions. In addition, the system strives to create a convenient way to redistribute, transfer, record and manage these rights.

In the first stage, the system identifies and digitalizes assets, including works of art, literary works, patents and trademarks, turning them into digital assets. This process involves creating unique digital identifiers for each asset, allowing clear tracking of ownership and use. Further, the automated sales data integration module provides the collection and analytical processing of transaction data, which is important for financial accounting and informed decision making. The inventory management module, using machine learning algorithms, allows you to optimize inventory levels and minimize associated costs.

A tokenization system converts intellectual property rights into digital tokens, opening up new investment opportunities and simplifying sales and licensing processes. Tokens can represent shares of ownership of

an asset or rights to receive income from its use.

Integration of automated contracts with blockchain ensures the fulfillment of contractual obligations, improving the reliability and transparency of transactions. Smart contracts automatically enforce the terms of agreements between parties, including revenue distribution and intellectual property rights management.

The rights confirmation mechanism ensures verification and management of intellectual property rights, tailored to the specifics of each asset. This includes registering rights, monitoring their use and protecting against misuse.

The right of the author of a work of art to receive part of the income from the subsequent resale of paintings, in accordance with the legislation of the Republic of Kazakhstan.

In addition to these components, the system includes a number of databases to manage information about customers, marketplaces, distributors and partners, suppliers, and regulations, allowing for comprehensive management of all aspects of intellectual property.

The finance and accounting modules automate financial accounting and warehouse management, the business process module optimizes internal operations, and the advertising and brand module supports marketing and advertising campaigns. The insurance system and payment systems module provide additional protection for investments and assets, and also simplify and automate financial transactions, including transactions using digital currencies.

The token and capital management module allows you to effectively account and manage digital tokens and financial resources, optimizing investment processes and increasing the transparency of financial flows. The investor and government database provides centralized management of information on external investors and interaction with regulatory authorities, ensuring that all activities comply with legal requirements and regulations.

The Emergency Management Module integrates tools to quickly respond to emergency situations and crisis events, ensuring business continuity and protecting data and assets in any environment.

This integrated system creates an ecosystem for managing intellectual property, where each element of the system is interconnected and complementary to each other, providing effective asset management, protecting property rights, streamlining business processes and enhancing opportunities for monetizing intellectual property.

5. Conclusion

Digital identity is an important digital asset, it represents a set of characteristics and attributes associated with a uniquely identifiable object and subject in the digital space. Digitalization has led to the application of digital technologies in all spheres of human, societal and governmental activities. It is used for various transactions, interactions, and representations on the Internet. Examples are the various information platforms of public and private ecosystems that contain data about citizens, digital assets, digital currencies, cryptocurrencies, and data about the subjects of crime. Digital identity, being an asset, requires responsible and secure use in modern world.

The traditional concept of ownership of digital data, information and assets is based on exclusive control in a digital registry, which implies appropriate legal remedies. The specifics of the rights and obligations of actors will differ depending on the details of the interactions in a particular case. The analysis has shown the need to develop more relevant methodologies for identifying digital assets that provide a more objective representation of these assets for users. It is important to create a detailed methodology that can correctly represent existing digital assets. The taxonomy should be revised on an ongoing basis, due to the development of new technologies.

The main goal of the world community is to eliminate poverty, at the same time increasing economic growth and solving social and environmental issues. Openness, transparency, and respect for human rights

play an important role in the sustainable development of the world. Digital transformation will help build a more equitable space where everyone is heard and can make decisions on issues important to society.

Blockchain technology makes it easier to identify unfair participants because transactions are publicly and permanently recorded. However, in the case of storing information in a decentralized database and processing it in different jurisdictions at the same time, a coordinated international legal regulation is required.

FINANCIAL SUPPORT: This study was financed/funded by the Committee for Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. BR21882302 "Kazakhstani society in the conditions of digital transformation: prospects and risks").

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