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Legal models of digital objects in the EU: Experience and prospects for adaptation to Ukrainian legislation

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■ **Abstract.** The relevance of this study stems from Ukraine's ongoing integration into the European Union's legal framework and the growing need for legal regulation of digital objects, such as digital assets, artificial intelligence, and virtual assets. The study aimed to explore the legal regulation of digital objects within the EU and assess the prospects for its implementation in Ukraine. To achieve this objective, an analysis was conducted of the *acquis communautaire*, national legislation of EU member states, and key provisions of Ukrainian legislation in the specified field. The study identified the primary approaches to the legal regulation of digital objects in the EU and distinguished four main types of digital objects requiring different legal regimes. It was established that objects capable of existing in both digital and analogue forms may be subject to traditional legal regulation, taking into account the specificities of their digital use. A separate category comprises exclusively digital objects, which necessitates the development of specialised legal frameworks. Furthermore, the absence of a specific approach to regulating digital objects within the national legislation of EU member states was noted. It was also observed that the development of Ukraine's national legislation aligns with European standards. Ukraine's national legislation on regulating digital objects is evolving per the provisions of the *acquis communautaire*, driven by the country's European aspirations and its commitment to aligning domestic legislation with that of the European Union. This development is taking place not only through the expansion of regulations addressing the specificities of digital object use but also through the adoption of specialised digital laws that provide overarching provisions for all digital objects. This approach is considered effective in formulating legal acts that comprehensively reflect the specific aspects of legal regulation concerning the creation and use of digital objects. The results of this study can be applied to the development of effective legal frameworks for regulating digital objects in Ukraine, ensuring alignment with both European and national standards

■ **Keywords:** artificial intelligence; database; information; copyright; virtual property; cryptocurrency; *acquis communautaire*

■ Introduction

In 2025, the legal regulation of digital objects is becoming increasingly crucial due to the country's active integration into the European Union's (EU) legal framework. The lack of a comprehensive legal framework for digital assets, artificial intelligence, virtual assets, and other digital entities creates legal uncertainty and obstructs the growth of the digital economy. However, the EU has already established intricate legal models that can serve as a reference for adapting Ukrainian legislation. At a regional level, harmonising the legal regulation of digital objects is vital for ensuring cross-border interaction, attracting investment, and adhering to international standards. Globally, the legal aspects of digital assets remain a

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dynamic area requiring a flexible approach due to rapid technological advancements. From a scholarly perspective, researching the EU's legal models for digital objects and their adaptation for Ukraine will contribute to developing effective legal regulatory mechanisms that meet both European and national needs.

Historically, the EU's primary focus has been economic, aiming to ensure the efficient and seamless operation of the common market. However, digital transformation necessitates a broader perspective. J.J. Stankovic *et al.* (2021) emphasised that a key priority in the 21st century is the development of digital infrastructure. This infrastructure should not only support efficient economic function but also facilitate new approaches to addressing societal challenges. A. Małkowska *et al.* (2021) highlighted the need for a comprehensive approach to digital development and the regulation of digital relationships. Two levels of regulation are identified: EU law, which establishes supranational conditions for the use of digital objects, and national law, which ensures the accessibility of such objects and defines domestic policies in areas such as digitalisation, education, and access to emerging technologies.

The digital space is a distinct phenomenon. M.A. Hisseine *et al.* (2024) pointed out that digital networks are often perceived as chaotic and unregulated. Furthermore, there is a limited understanding of them, often seen merely as communication platforms, while their uses are far more extensive. These uses include data management, data protection, the construction of digital object architectures, and their implementation across all aspects of life. In turn, R.B. Compete (2023) identifies the dynamic nature of the digital space as one of its key characteristics. Alongside the rapid emergence of new technologies, existing digital objects or their specific attributes undergo constant change. Consequently, continuous updates, for example, are an essential condition in relevant contracts.

The concept of digital objects is a distinct topic of academic discussion. U. Schwardmann (2020) noted that this concept has existed for over thirty years and is used to describe a group of objects whose creation and existence are linked to the development of emerging technologies. Early definitions of digital objects often framed them as entities existing due to their description through metadata, referenced by a persistent identifier. However, this approach is predominantly technical. B. Koles & P. Nagy (2020) offer an alternative definition, describing digital objects as entities that exist solely in digital format, lack physical attributes, and are accessible only through digital devices. This definition captures the technical essence of digital objects and is useful for addressing issues in legal regulation and application. It is also important to acknowledge the valid point made by P. Faulkner & J. Runde (2019) that the concept of digital objects is not limited to entities existing in virtual space. They can also be components of hybrid objects, which have a physical form but incorporate a digital element. Consequently, the key characteristic of digital objects is their intangible nature, with their existence in virtual space or as an intangible component of physical objects being considered a form of that existence.

The legal issues surrounding digital objects are largely related to their usage. The list of usage types is not exhaustive, allowing for various classification approaches. For example, A.S. Kenfield *et al.* (2022) identified the following (in order of increasing impact on the object): accessing the object; downloading the object for personal use; changing the format of the digital object; modifying the object's functionality without altering its content; providing access to the object; changing the object's content; creating a new digital object based on the existing one. Therefore, the types and conditions of digital object usage require careful legal regulation.

L. Manera's (2022) research demonstrated that the extent of such regulation is significantly linked to the digital object's origin, which may either exist natively in digital format or result from the digitisation of a physical object. In the latter case, digitisation becomes a form of physical object usage. K. De Smedt *et al.* (2020) point out that digital objects differ based on their functional purpose, even though their characteristics as intangible objects may be similar. Specifically, concerning objects like data, their potential use across various sectors (business, scientific research, etc.) is highlighted. This multifunctionality transcends disciplinary boundaries and demands specialised processing tools. However, I. Michurin (2022) pointed out that this does not remove digital objects from the scope of traditional approaches used to regulate relationships concerning intangible objects. Nevertheless, this does not exclude the need to explore new regulatory approaches. The EU has adopted a series of acts regulating digital relationships between 2022 and 2024, but they have not yet been sufficiently studied in academic literature.

This research aimed to examine the legal regulation of digital objects in the EU and the prospects for its implementation in Ukraine. The research objectives included a systematic analysis of the *acquis communautaire*, national legislation of EU member states, and key provisions of Ukrainian legislation in this field.

■ Materials and Methods

The first stage of this research involved analysing the EU's supranational digital legislation. In determining the acts that most comprehensively reflect the regulation of specific digital objects (copyrighted works, databases, digital assets, and artificial intelligence), a dataset on EU legislation for the digital world,

compiled by Bruegel experts (Marcus *et al.*, 2024), was used. The analysis was based on the provisions of the following acts: Directive of the European Parliament and of the Council No. 2019/790[1], Directive No. 96/9/EC[2], Regulations of the European Parliament and of the Council No. 2022/868[3], No. 2023/2854[4], No. 2022/858[5], No. 2023/1114[6], No. 2024/1689[7]. The second phase of the research focused on examining the approaches to the legal regulation of digital objects in the legislation of two specific EU member states: France and Denmark. The provisions concerning the legal regulation of digital objects were examined in the Intellectual Property Code[8], Law of France No. 2016-1321[9], Law of France No. 2024-449[10], Proclamation of the Copyright Act[11], Federal Data Protection Act[12], and the Act on Copyright and Related Rights[13]. The third phase of the research involved an overview of Ukraine's national legislation concerning digital objects. The analysis covered the provisions of the Laws of Ukraine No. 1629-IV[14], No. 2811-IX[15], No. 2074-IX[16], No. 3321-IX[17] and No. 3320-IX[18], as well as Order of the Cabinet of Ministers of Ukraine No. 1556-p[19]. Particular attention was paid to the issue of the conformity of Ukraine's national legislation, which regulates digital objects, with the EU's *acquis communautaire*.

Results

One of the fundamental documents shaping the development of the digital society within the European Community is the Digital Europe Programme. This programme encompasses initiatives aimed at enhancing citizens' digital literacy, encouraging businesses to adopt digital technologies more broadly, and digitising the public sector. The overarching goal of the programme is the comprehensive digital transformation of European society (European Commission, 2019). Furthermore, the creation of a modern, secure European digital space aligned with the demands of the new digital era has been identified as a priority by the European Commission (EU4Digital, 2025). This approach aims to elevate the conditions for the functioning of the European space to a new level. The development of EU digital legislation is primarily linked to the operation of the common market. However, given the contemporary condi-

[1] Directive of the European Union and of the Council No. 2019/790 "On Copyright and Related Rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC". (2019, April). Retrieved from https://eur-lex.europa.eu/eli/dir/2019/790/oj/eng.
[2] Directive of the European Union and of the Council No. 96/9/EC "On the Legal Protection of Databases". (1996, March). Retrieved from https://eur-lex.europa.eu/eli/dir/1996/9/oj/eng.
[3] Regulation of the European Union and of the Council No. 2022/868 "On European Data Governance and amending Regulation (EU) 2018/1724 (Data Governance Act)". (2022, May). Retrieved from https://eur-lex.europa.eu/eli/reg/2022/868/oj/eng.
[4] Regulation of the European Union and of the Council No. 2023/2854 "On Harmonised Rules on Fair Access to and Use of Data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act)". (2023, December). Retrieved from https://eur-lex.europa.eu/eli/reg/2023/2854/oj/eng.
[5] Regulation of the European Union and of the Council No. 2022/858 "On a Pilot Regime for Market Infrastructures based on Distributed Ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU". (2022, May). Retrieved from https://eur-lex.europa.eu/eli/reg/2022/858/oj/eng.
[6] Regulation of the European Union and of the Council No. 2023/1114 "On Markets in Crypto-Assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937". (2023, May). Retrieved from https://eur-lex.europa.eu/eli/reg/2023/1114/oj/eng.
[7] Regulation of the European Union and of the Council No. 2024/1689 "Laying Down Harmonised Rules on Artificial Intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)". (2024, June). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1689.
[8] Intellectual Property Code. (1995, July). Retrieved from https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006069414/.
[9] Law of France No. 2016-1321 "On Digital Republic". (2016, October). Retrieved from https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000033202841.
[10] Law of France No. 2024-449 "On Securing and Regulating the Digital Space". (2024, May). Retrieved from https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000049563368.
[11] Proclamation of the Copyright Act. (2014, October). Retrieved from https://www.retsinformation.dk/eli/lta/2014/1144.
[12] Federal Data Protection Act of the Federal Republic of Germany. (2021, June). Retrieved from https://www.gesetze-im-internet.de/englisch_bdsg/index.html.
[13] Act on Copyright and Related Rights of the Federal Republic of Germany. (1965, September). Retrieved from https://www.gesetze-im-internet.de/englisch_urhg/englisch_urhg.html.
[14] Law of Ukraine No. 1629-IV "On the National Programme of Adaptation of Ukrainian Legislation to the Legislation of the European Union". (2004, March). Retrieved from https://zakon.rada.gov.ua/laws/show/en/1629-15#Text.
[15] Law of Ukraine No. 2811-IX "On Copyright and Related Rights". (2022, December). Retrieved from https://zakon.rada.gov.ua/laws/show/2811-20#n855.
[16] Law of Ukraine No. 2074-IX "On Virtual Assets". (2022, February). Retrieved from https://zakon.rada.gov.ua/laws/show/2074-20#Text.
[17] Law of Ukraine No. 3321-IX "On Digital Content and Digital Services". (2023, August). Retrieved from https://zakon.rada.gov.ua/laws/show/3321-20#Text.
[18] Law of Ukraine No. 3320-IX "On Amendments to the Civil Code of Ukraine to Expand the Range of Objects of Civil Rights". (2023, August). Retrieved from https://zakon.rada.gov.ua/laws/show/3320-20#Text.
[19] Order of the Cabinet of Ministers of Ukraine No. 1556-p "On Approval of the Concept of Artificial Intelligence Development in Ukraine". (2020, December). Retrieved from https://zakon.rada.gov.ua/laws/show/1556-2020-%D1%80#Text.

tions of this market, it covers a wide range of issues, which can be broadly categorised into three groups: the regulation of government actions at the supranational level, the operational conditions for businesses in the digital environment, and the empowerment of consumers and the development of their competence in consuming digital goods and services. This approach is clearly evident in the adopted Digital Single Market for Europe (European Council, 2020). The strategy aims to create conditions for the development of the EU's internal market in line with the demands of the new digital era and to advance the EU's single digital market through the corresponding development of the EU economy as a whole, various industries, and society. In terms of defining and governing the use of digital objects, key areas include the development of the data economy, the regulation of artificial intelligence, and new approaches to copyright in the digital environment.

One of the most recent classifications of EU digital legislation (from the Bruegel platform database, which provides users with summarised data on EU legislative regulation regarding digitalisation) includes twelve areas that are, in one way or another, covered by digital laws as of late 2024 (Marcus *et al.*, 2024). These areas encompass:

- regulation related to technological development and innovation;
- digital aspects of industrial policy;
- the application of digitalisation in the field of communications;
- ensuring data security and information privacy;
- protection of intellectual property rights;
- regulation in the field of cybersecurity;
- the use of digital technologies in law enforcement;
- digital technologies in the field of security;
- digital commerce and consumer protection;
- the use of digital technologies in competition;
- digitalisation of the media and the financial sector.

However, all of these acts are more of a corrective nature, aimed at refining the regulation of certain aspects of community law's operation concerning digitalisation and the development of emerging technologies. Concerning the objects themselves, they mostly remain traditional and are only subject to some adjustments due to their use in the digital space (Marcus *et al.*, 2024). One of the first categories of objects where questions arose about their existence and use in the virtual space were copyright and related rights objects. This is due to the lack of independent material form in the majority of them (including literary and musical works, phonograms, videograms, audiovisual works, computer programs, etc.), and their physical existence is linked to carriers (physical or digital). Overall, as of June 2024, EU digital regulation covered objects such as databases, industrial designs, trade secrets, patents, and copyright and related rights objects. The corresponding directives are aimed at harmonising the legislation of EU member states and addressing issues arising from new methods of creating, distributing, and using intellectual property objects (Marcus *et al.*, 2024).

Specifically, Directive No. 2019/790[1] was adopted. The Directive establishes new conditions for the functioning of the single market, characterised by the emergence of new methods of creating, distributing, and using copyright and related rights objects, as well as the appearance of new business models and digital market participants. The Directive does not define new digital objects but addresses certain aspects of their classification based on the degree of access freedom. The role of online content access service providers is particularly emphasised. In this Directive, online content acts as a unifying concept for all types of digital objects in the field of copyright and related rights. An analysis of the Directive's text allows for the identification of digital objects with closed, limited, and open access, depending on the type of access; naturally digital and digitised objects, depending on their creation. The list of copyright and related rights objects themselves remains traditional: literary, musical, and artistic works, phonograms, audiovisual works, etc. Thus, the Directive focuses on new types of digital object usage but does not propose any new approaches to their understanding.

It is important to note that in the 21st century, the European Union has significantly intensified its efforts aimed at preserving the cultural heritage of its member states and creating a European cultural space. One of the key areas of this work has been the digitisation of cultural heritage objects (European Union, n.d.). In this context, digitisation is used both to ensure seamless and secure access to these objects and for their preservation and even restoration. From a broader, political perspective, the goal is to create a unified European data space in the field of cultural heritage. This also involves ensuring the secondary use of digitised cultural heritage objects for educational, cultural, and other purposes, as well as for the development of the tourism sector. The European digital cultural platform Europeana is intended to serve as a unifying space (European Union, 2021). Thus, in the field of intellectual property, digitisation does not lead to the emergence of new objects; rather, the expansion of legal regulation occurs through the extension of their usage methods.

[1] Directive of the European Parliament and of the Council No. 2019/790 "On Copyright and Related Rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC". (2019, April). Retrieved from https://eur-lex.europa.eu/eli/dir/2019/790/oj/eng.

As mentioned, one of the key areas of development for the EU's digital market is the so-called "data economy". An analysis of the development of the *acquis communautaire* in the digital sphere shows that databases are digital objects that receive particular attention in EU law. One of the first acts aimed at regulating related relationships was Directive (EU) 2019/790[1]. However, this does not preclude the application of the Directive's provisions to non-electronic databases, and they can also be components of hybrid objects. Attention is also drawn to the complex nature of protection when a database includes other copyright or related rights objects.

Data protection is a priority for the development of a sustainable digital market in the EU. A significant development both for EU digital technology legislation and the internal market was the adoption of two new laws aimed at fostering the digital economy – the Data Governance Act[2] and the Data Act[3]. Academic literature views this as laying the legal foundation for a fundamentally new direction in digital market development – the data economy (Groza & Acrila, 2024). Thus, data emerges as a distinct digital object, subject to requirements regarding accessibility, reliability, compatibility, reusability, and secure access. The Data Act delineates various types of data. The term "data" itself is understood as a compilation of facts, information, and details about actions, etc., in any form. Furthermore, metadata, personal data, and non-personal data are distinguished. Regarding the nature of data, it can be either independent information or information generated as a result of certain actions (mostly by the developer of the relevant product) and has a product-related character. In the latter case, databases should be considered not independent but ancillary digital objects. At the same time, the formation of data, as something that occurs using certain algorithms, can therefore happen using other intellectual property objects, making a digital database a complex digital object. Thus, digital objects can be divided into independent objects, which have value in themselves, and ancillary objects, which have value only in connection with a specific product or object. Databases, in this context, can belong to either the former or the latter, depending on the information they contain.

Digital assets can be identified as a separate category of digital objects. Over the past two years, the EU has made significant strides in regulating this area. For instance, while Regulation No. 2022/858[4] noted that the use of crypto-assets remains one of the least regulated and most problematic aspects of digital asset use, by 30 December 2024, the EU is characterised as the jurisdiction with the most comprehensive legal regulation of crypto-assets in the world (Hall, 2024). Crypto-assets are defined by EU law as digital representations of value or rights that have the potential to generate significant benefits for market participants and can also serve as a means of payment. Simultaneously, they also have a more "object-like" definition of a specific type of technology. A crucial aspect in characterising digital assets as digital objects is their operation based on blockchain technology. It should be noted that the essence of blockchain is described as a database (Remeur, 2023), which also allows it to be considered a separate digital object. Following the fundamental characteristics of this technology, namely immutability and decentralisation, digital assets inevitably acquire similar traits. These characteristics of digital assets allow for the expansion of the classification of digital object types, adding immutable and mutable objects, as well as centralised and decentralised objects.

The rapid increase in the use of artificial intelligence (AI) necessitates the creation of an effective legal framework for such use. Between 2018 and 2024, the global average annual revenue from AI usage increased from 10.1 billion USD to 94.41 billion USD, with a steady upward trend in this revenue (Table 1).

Table 1. Average annual revenue worldwide from the use of artificial intelligence (2018-2024)

Year	Annual revenue from AI use (billion USD)
2018	10.1
2019	14.69
2020	22.59

[1] Directive of the European Union and of the Council No. 2019/790 "On Copyright and Related Rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC". (2019, April). Retrieved from https://eur-lex.europa.eu/eli/dir/2019/790/oj/eng.
[2] Regulation of the European Union and of the Council No. 2022/868 "On European Data Governance and amending Regulation (EU) 2018/1724 (Data Governance Act)". (2022, May). Retrieved from https://eur-lex.europa.eu/eli/reg/2022/868/oj/eng.
[3] Regulation of the European Union and of the Council No. 2023/2854 "On Harmonised Rules on Fair Access to and Use of Data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act)". (2023, December). Retrieved from https://eur-lex.europa.eu/eli/reg/2023/2854/oj/eng.
[4] Regulation of the European Union and of the Council No. 2022/858 "On a Pilot Regime for Market Infrastructures based on Distributed Ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU". (2022, May). Retrieved from https://eur-lex.europa.eu/eli/reg/2022/858/oj/eng.

Table 1. Continued

Year	Annual revenue from AI use (billion USD)
2021	34.87
2022	51.27
2023	70.94
2024	94.41

Source: compiled by the author based on J. Howarth (2025)

Artificial intelligence can be characterised not only as having a complex legal nature but also as possessing a certain perceived "subjectivity" due to its ability to influence humans. The adoption of Regulation (EU) 2024/1689[1] represents a further step towards improving the EU's single digital market. According to the provisions of the aforementioned Act, an "artificial intelligence system" can be identified as a digital object. It is defined as an automated system designed to operate with varying levels of autonomy is adaptive, capable of generating outputs (predictions, content, recommendations, decisions, etc.) based on the data it receives, and can influence its surrounding environment. The specificity of this object also lies in the fact that it is a separate digital object used to generate new digital objects. However, an analysis of the provisions of the EU Artificial Intelligence Act suggests that it is a digital object with a unique nature and, therefore, capable of impacting human life and well-being. Consequently, it is emphasised that AI systems deployed must be human-centric, uphold fundamental human rights, and reflect the values of modern democratic society. Thus, specific security and ethical requirements are imposed on artificial intelligence. Artificial intelligence can be considered from the perspective of its ability to create a risk of harm. This is perhaps its most significant distinction from other types of digital objects.

In connection with AI activity, some specific digital objects that are its products can be identified. For example, such an object is a "deepfake", – an AI product that maximally imitates real people or events and can be perceived as corresponding to reality. Due to the risks that artificial intelligence can pose, EU law contains a series of restrictions – prohibited AI practices. Various types of AI systems are also identified, including high-risk AI systems, which are subject to special usage conditions.

It should also be noted that issues related to artificial intelligence are a focus of attention for the Council of Europe, as a leading European institution in the field of human rights. The Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law[2] was adopted. The Convention draws attention to the risks posed by the use of artificial intelligence from the perspective of ensuring human rights. In particular, it mentions possible dangers such as the possibility of digital discrimination, and encroachment on human dignity and autonomy. The definition of artificial intelligence proposed by the Convention is similar to that contained in the EU Artificial Intelligence Act, and it also emphasises its ability to influence the analogue and virtual world. Thus, this once again underscores the specificity of artificial intelligence as a digital object of a special nature. Therefore, digital objects can be classified as in Table 2.

Table 2. Types of digital objects based on the specifics of their legal regulation

Types of objects	Objects that can exist in both analogue and digital forms	Traditional digital objects that can exist exclusively in digital form	New digital objects that can exist exclusively in digital form
Examples of objects	Intellectual property objects Databases	Digital assets Computer programs	Artificial intelligence
Specifics of legal regulation	Legal regulation is similar to analogue objects, taking into account the specifics of use in the digital environment	Require separate legal regulation, taking into account their exclusively digital nature	Requires separate, harmonised international legal regulation, considering their dual nature as a separate object and as a generator of new digital objects, as well as their ability to independently influence individuals and society

Source: compiled by the author

[1] Regulation of the European Parliament and of the Council No. 2024/1689 "Laying Down Harmonised Rules on Artificial Intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)". (2024, June). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1689.

[2] Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law. (2024, September). Retrieved from https://rm.coe.int/1680afae3c.

EU legislation, as supranational law, aims to harmonise legal regulation in the main areas of EU life while leaving EU member states some autonomy regarding national legal regulation of issues related to digital objects. National approaches, therefore, vary within the general limits set by the *acquis communautaire*. The European space, while unified, is not homogeneous. For example, the level of digitalisation varies across EU member states, from the highest levels in Scandinavian countries to the lowest in Eastern European countries (Stankovic *et al.*, 2021). Thus, approaches to the legal regulation of digital objects at the national and supranational levels will differ, although the *acquis communautaire* serves as the primary guideline for EU member states.

Specifically, French legislation does not have a unified concept of digital objects. An analysis of the content of relevant legislative acts allows for the identification of several types of such objects. For example, Law of France No. 2016-1321 "On Digital Republic"[1] only mentions certain digital objects without providing their definitions (digital data, digital documents, software, works in electronic form, etc.). The law itself is not an act that regulates digital relations but merely introduces relevant amendments to a series of laws, adapting them to the conditions of the digital society. Law of France No. 2024-449[2], in addition to provisions directly related to the protection of citizens' rights in the digital space, contains Section IV on the development of the gaming economy with monetised digital objects. Although the content of the section primarily contains protective norms, its analysis adds another basis for the classification of digital objects, which can be divided into monetised and non-monetised. The Intellectual Property Code[3] also contains provisions only regarding the specifics of digital object usage, without categorising them separately. For example, it specifically regulates the publication of books in digital format, the digital exploitation of unavailable books, and online content sharing. In this context, the concept of online content is a unifying term for all copyright and related rights objects in a digital format. Similarly, Danish legislation only distinguishes the digital form of objects[4]. German legislation shows significant compliance with the *acquis communautaire*. In particular, issues related to digital data are regulated by the Federal Data Protection Act[5], following EU law standards. The Act on Copyright and Related Rights[6] identifies digital objects such as software products, databases, and other works in digital form. In general, the national legislation of EU member states regarding digital objects is developing in two main directions: amending existing legislation to bring its provisions into line with the functioning of the digital environment and developing new digital legislation. In the latter case, the new laws immediately comply with the *acquis communautaire*.

In the context of this study, the consideration of legal models of digital objects in Ukrainian legislation requires addressing two aspects: the adaptation of national legislation to EU legislation and the development of legal regulation of the digital space. The beginning of the adaptation process was the approval of Law of Ukraine No. 1629-IV[7], which provided for the gradual alignment of Ukrainian national legislation with the *acquis communautaire*. Specifically, aligning national legislation with the *acquis communautaire* was identified as a priority task of national foreign policy. The programme does not single out the digital sphere as a separate area of adaptation but provides for the alignment of national legislation with both primary and secondary EU acts, which include relevant digital acts. Moreover, among the areas of legislation that should become a priority for adaptation are those closely related to digitalisation and the use of digital objects. In particular, legislation in the field of intellectual property, technical regulations, banking legislation, and financial services. It is also important to note that the adaptation law provides not only for the alignment of existing legislation with the *acquis communautaire* but also for the mandatory verification of national draft laws for compliance with EU law. Thus, the provisions of digital acts adopted by the EU are taken into account in Ukrainian national legislation.

Ukrainian legislation is also aiming to develop legal regulation in the digital sphere. In 2022 and 2023, the legislative framework for regulating digital relations underwent significant changes aimed at

[1] Law of France No. 2016-1321 "On Digital Republic". (2016, October). Retrieved from https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000033202841.
[2] Law of France No. 2024-449 "On Securing and Regulating the Digital Space". (2024, May). Retrieved from https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000049563368.
[3] Intellectual Property Code. (1995, July). Retrieved from https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006069414/.
[4] Proclamation of the Copyright Act. (2014, October). Retrieved from https://www.retsinformation.dk/eli/lta/2014/1144.
[5] Federal Data Protection Act of the Federal Republic of Germany. (2021, June). Retrieved from https://www.gesetze-im-internet.de/englisch_bdsg/index.html.
[6] Act on Copyright and Related Rights of the Federal Republic of Germany. (1965, September). Retrieved from https://www.gesetze-im-internet.de/englisch_urhg/englisch_urhg.html.
[7] Law of Ukraine No. 1629-IV "On the National Programme of Adaptation of Ukrainian Legislation to the Legislation of the European Union". (2004, March). Retrieved from https://zakon.rada.gov.ua/laws/show/en/1629-15#Text.

aligning national legislation with the *acquis communautaire*. For example, Law of Ukraine No. 2811-IX[1] took maximum account of the new trends in EU law regarding digital objects. The law contains definitions of a range of objects that fall under the digital category – database, website, webpage, computer program, account – as well as a series of concepts that allow for the determination of the legal status of actions and entities using such objects – website or webpage owner, hyperlink, electronic (digital) information, rights management information, hosting service provider.

Two special laws were also adopted: Law of Ukraine No. 2074-IX[2]. Amendments were also made to the Civil Code, which was supplemented with a new object of civil rights – digital things. The following characteristics of a digital thing were defined: it is a certain good that has property value, and its existence is limited to the digital environment[3]. This concise approach, based on defining the main features of a digital thing, is considered quite successful from a law enforcement perspective.

Regarding the regulation of issues related to the use of artificial intelligence, the Order of the Cabinet of Ministers of Ukraine No. 1556-p[4] was approved. The concept defines activities related to the creation, implementation, and use of artificial intelligence as a separate area of activity in the field of information technology. However, the definition of artificial intelligence itself closely links the activity of artificial intelligence with human activity: "an organised set of information technologies with the application of which it is possible to perform complex tasks". This is a somewhat limited approach to the autonomy of artificial intelligence, as presented in the EU Artificial Intelligence Act, which discusses various levels of such autonomy, as well as the adaptability of artificial intelligence, which should be taken into account in the future when adopting a national law of Ukraine on artificial intelligence.

Discussion

The research has shown that, for the most part, digital objects are not considered by EU law as something fundamentally new. The only exception is perhaps artificial intelligence, which is the subject of close attention not so much because of its unique qualities as a digital object but because of its ability to have a significant impact on individuals and society, potentially making it dangerous. As S. Islam *et al.* (2022) point out, despite the active development of a legal framework for regulating digital objects, it should be concluded that regarding the objects themselves, there is hardly a need to look for new approaches. From the perspective of their understanding, particularly through the application of the abstraction mechanism, existing law enforcement experience is being used quite successfully. The analysis conducted in this study did not reveal any specific characteristics of digital objects other than their intangible nature. However, the digital space introduces new requirements for the use of objects placed within it. This conclusion is supported by other researchers. For example, R. Adams (2023), studying issues related to intellectual property protection in the digital age, points out that the main problems arise from the emergence of new types of object use, issues of access to them in digital networks, and the heightened challenge of protecting them from unauthorised use. Thus, the researcher reaffirms that the problem lies not with the digital objects themselves but with their usage. While this does not exclude difficulties in determining the legal nature of some digital objects.

Indeed, when considering the nature of Bitcoin, R. White *et al.* (2020) highlight the possibility of various approaches to its characterisation: as a unique form of currency, a technological product, and a type of technological enterprise. Other types of cryptocurrencies can be viewed from the same perspective, as Bitcoin, although the most widespread, is only one of many. However, even in the absence of a unified approach, the need to recognise digital assets and the necessity to regulate relations regarding these digital objects is not disputed. One can agree with V. Giang & V.T.M. Huong (2023) that, despite cautious attitudes towards this type of object, countries around the world should direct efforts towards regulating their legal status. This would not only ensure their use in investment and other economic activities but also provide a basis for preventing criminal activities involving their use. Moreover, digital transformation, including the implementation of digital assets, is an irreversible process, so the presence of appropriate legal regulation makes the national economy more attractive to investors. Regarding the development of digital legislation in general, the three main directions of its development demonstrated in the study are: similar to analogue objects; with adjustment of regulation given the digital nature of the object; and

[1] Law of Ukraine No. 2811-IX "On Copyright and Related Rights". (2022, December). Retrieved from https://zakon.rada.gov.ua/laws/show/2811-20#n855.
[2] Law of Ukraine No. 3321-IX "On Digital Content and Digital Services". (2023, August). Retrieved from https://zakon.rada.gov.ua/laws/show/3321-20#Text.
[3] Law of Ukraine No. 3320-IX "On Amendments to the Civil Code of Ukraine to Expand the Range of Objects of Civil Rights". (2023, August). Retrieved from https://zakon.rada.gov.ua/laws/show/3320-20#Text.
[4] Order of the Cabinet of Ministers of Ukraine No. 1556-p "On Approval of the Concept of Artificial Intelligence Development in Ukraine". (2020, December). Retrieved from https://zakon.rada.gov.ua/laws/show/1556-2020-%D1%80#Text.

the creation of new regulation for fundamentally new objects (an example of which is artificial intelligence). Such an approach is supported, for example, by T. Alsamara & F. Ghazi (2024). At the same time, the researchers rightly note that the specificity of digital law lies in its extension to all other sectors, as digitalisation has already encompassed all areas of life. In turn, X. Sun & Y. Xiao (2024) point out the need to consider issues related to the regulation of digital objects and the digital space at a higher level, particularly from the perspective of the rule of law and the supremacy of law. This approach is entirely valid, as the research has shown that the digital environment is an area of significant risks in terms of protecting confidentiality and data dissemination, and artificial intelligence can be used, among other things, as a means of influencing individuals.

The adoption of the Artificial Intelligence Act[1] has been a significant contribution to EU legislation in the digital sphere. Based on its provisions, this study concluded that it is possible to consider it as a separate digital object. The approach to artificial intelligence as a new and complex digital object finds support in academic research. For example, A.P. Olimid *et al.* (2024) indicate that revealing the nature of artificial intelligence raises a range of issues of not only a legal but also an ethical, security, and psychological nature. The most critical issue in the discussion surrounding the nature of artificial intelligence is the question of its object or subject nature. In fact, questions regarding copyright on AI-generated works or liability in the event of errors in AI-controlled systems remain open. Z. Wen & D. Tong (2023) highlight the need to move away from legal anthropocentrism when considering the legal status of AI, similar to the theory of legal entities as derivative subjects. E.D. Putriyanti *et al.* (2023) also support the idea that the provisions used for legal entities could be applied to the status of artificial intelligence. However, while this approach is understandable from the perspective of granting AI certain rights, the issue of liability remains unresolved due to its virtual nature, as, unlike legal entities, it does not have a personified governing body or assets.

It is also important to support the position of M. Civit *et al.* (2022) regarding the need for further study of the legal nature of objects created using artificial intelligence, which can be considered a separate type of digital object created by the joint work of humans and machines. However, here, as in most cases involving digital objects, the question is not about the legal nature of the result, as it will fall under the classical concept of a work, but about the nature of the rights arising from its creation and their ownership. The conclusion regarding the need to treat artificial intelligence as a special digital object that can influence the environment and, therefore, requires special attention is also supported by another academic research. Indeed, A. Jayalath *et al.* (2023) highlight the need to balance the benefits provided by the use of artificial intelligence in various fields of activity with the risks associated with such use, primarily in the area of data protection and security. Expanding the approach to defining security problems related to the use of artificial intelligence, M. Eppler *et al.* (2023) point out that despite all the advantages, AI algorithms can contain errors or use unreliable information in their analysis. As a learning system, artificial intelligence can also generate content that reflects a biased position. Thus, this once again confirms the findings of the study that artificial intelligence is a special digital object, and its ability to autonomously require reflection in legal regulation.

Conclusions

The regulation of public relations regarding digital objects in EU member states occurs at both supranational and national levels. The *acquis communautaire* primarily regulates issues related to the development and functioning of the common digital market. This approach is logically sound, considering both the nature of the EU itself as an economic and political entity and the fact that the main specifics of digital objects lie in the peculiarities of their use. Given that a significant portion of the digital *acquis communautaire* was adopted only in the 2020s, regulation in the digital sphere in EU law is still in its formative stages. Four groups of digital objects can be identified: those that exist in both analogue and digital formats; those that exist exclusively in digital format but whose relations can be regulated similarly to physical objects; and those that exist exclusively in digital format and require separate legal regulation. Artificial intelligence is separately identified, as it exists both as an independent object and as a generator of other digital objects, with its main specificity being its ability to independently influence individuals and society. Due to these peculiarities, artificial intelligence requires harmonised legal regulation, specifically at the supranational level.

The reflection of digital objects in the national legislation of EU member states is also in its formative stage. The main legal technique for regulating

[1] Regulation of the European Parliament and of the Council No. 2024/16893 "Laying Down Harmonised Rules on Artificial Intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)". (2024, June). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1689.

public relations regarding such objects is through the introduction of relevant amendments to existing legislation. This approach is quite suitable for the majority of objects, especially those that can exist in digital and analogue formats, as such digital objects have no other specificity than their intangible form, which necessitates enhanced protection during use. The legislation of EU member states regarding digital objects largely fully complies with the *acquis communautaire* and does not propose radically new approaches to the regulation of digital objects.

Ukrainian national legislation on the regulation of digital objects is developing, taking into account the provisions of the *acquis communautaire* through Ukraine's European aspirations and the fulfilment of its commitments to align national legislation with EU legislation. Furthermore, the development of national legislation is occurring not only through the expansion of regulations concerning the specifics of digital object usage but also through the adoption of specialised digital laws that provide unifying provisions for all digital objects. This approach is considered successful in creating legal acts that reflect all the specific aspects of the legal regulation of relations arising from the creation and use of digital objects. The research was limited exclusively to existing legal acts and does not include an analysis of draft laws, so the conclusions and recommendations made in it are the result of an analysis of the current situation and do not contain forecasting.

The legislative regulation of relations concerning the creation and use of artificial intelligence as a special digital object remains an area of particular attention. The research results can be used in the teaching of legal disciplines, as well as a basis for further scientific research. A future direction of research could be the study of the specifics of artificial intelligence as a unique digital object.

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Conflict of Interest

None.

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Правові моделі цифрових об'єктів в ЄС: досвід і можливості адаптації до українського законодавства

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■ **Анотація.** Актуальність цього дослідження зумовлена поточною інтеграцією України до правової бази Європейського Союзу та потребою в правовому регулюванні цифрових об'єктів, таких як цифрові активи, штучний інтелект і віртуальні активи. Дослідження мало на меті розглянути правовк регулювання цифрових об'єктів в ЄС, щоб оцінити перспективи його впровадження в Україні. Для досягнення мети було здійснено аналіз *acquis communautaire* національного законодавства країн – членів ЄС та основних положень законодавства України в зазначеній сфері. За результатами дослідження виокремлено основні підходи до правового регулювання цифрових об'єктів в ЄС, визначено чотири основні види цифрових об'єктів, що потребують різних правових режимів. Встановлено, що до об'єктів, які можуть існувати в цифровій та аналоговій формах, можуть застосовувати традиційне правове регулювання з огляду на специфіку використання цифрових об'єктів. Окрему групу становлять виключно цифрові об'єкти, що потребують розроблення спеціального правового регулювання. Також засвідчено відсутність специфічного підходу до регулювання цифрових об'єктів національним законодавством країн – членів ЄС і зауважено, що розвиток національного законодавства України відповідає європейським стандартам. Національне законодавство України щодо регулювання цифрових об'єктів розвивається на підставі положень *acquis communautaire* через європейські прагнення України й виконання нею взятих на себе зобов'язань щодо узгодження національного законодавства із законодавством Європейського Союзу. Причому розвиток національного законодавства відбувається не лише шляхом розширення регулювання щодо специфіки використання цифрових об'єктів, а й шляхом прийняття спеціальних цифрових законів, що містять об'єднавчі положення для всіх цифрових об'єктів. Такий підхід вбачається вдалим з позиції створення правових актів, що відображають усі специфічні аспекти правового регулювання відносин, що виникають у зв'язку зі створенням і використанням цифрових об'єктів. Результати цього дослідження може бути застосовано для розроблення ефективної законодавчої бази з регулювання цифрових об'єктів в Україні, що забезпечить відповідність як європейським, так і національним стандартам

■ **Ключові слова:** штучний інтелект; база даних; інформація; авторське право; віртуальна власність; криптовалюта; *acquis communautaire*