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AI through the Prism of Its Legal Personality: Basic Characteristics

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Abstract: The issue of extending legal liability to artificial intelligence — that is broader than its legal capacity — has been within law and technology. The main array of questions in this area is focused on understanding the specific characteristics of artificial intelligence in the context of its regulation, which inevitably leads to a number of fundamental and applied questions. The integration of artificial intelligence into the legal framework requires a clear understanding of its functional capabilities and limitations. Its autonomy and ability to self-learn provide a basis for discussions about legal personality and the potential for accountability. Such considerations inevitably raise questions about how exactly artificial intelligence can participate in legal relationships, as well as what rights and obligations may be associated with its functioning. In this regard, one of the cornerstones remains the question of introducing artificial intelligence into the circle of entities subject to legal liability, which necessitates the exploration of existing approaches to defining this category and the subsequent step of developing acceptable conceptual approaches concerning the legal capacity of modern technologically complex systems. The main task of

the research is to present the existing conceptual constructs, based on a detailed analysis of the existing concepts regarding artificial intelligence and its legal capacity.

Keywords: artificial intelligence (AI); legal capacity; systemness; autonomy; self-learning; adaptability

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Contents

I. Introduction

One of the fundamental challenges in recognizing the legal personality of artificial intelligence (AI) is the absence of a unified theoretical and doctrinal approach within contemporary legal discourse. While AI systems demonstrate certain characteristics traditionally associated with legal subjects — such as autonomy, self-learning, and decision-making capacity — there remains a considerable gap between these technical attributes and the foundational legal criteria for personhood. According to Solum (Solum, 1992), legal personhood requires not merely the ability to act but also the recognition of these actions within a legal framework, implying a degree of responsibility and accountability. Therefore, bridging the conceptual divide between

the functional capabilities of AI and its potential legal status requires a more nuanced understanding of both the normative basis for legal subjectivity and the practical implications of assigning rights and duties to non-human entities.

Considering the issue of forming a conceptual construct that most accurately reflects the existing development of artificial intelligence systems, it is necessary to note that the foundation for further strengthening the regulatory framework for artificial intelligence consists of two aspects: a certain degree of autonomy in solving assigned tasks, and the inability to directly perceive and adhere to moral, ethical, and legal norms during their activities.

Regarding the matter of forming conceptual constructs of artificial intelligence, it is essential to define the criteria that are inherent in it and that can serve as a basis for determining its possible legal capacity. In this regard, it is proposed to proceed from the assumption that artificial intelligence

1) represents a complex system made up of numerous interrelated components that function together to perform tasks;

2) learns via provided data and experience without directly programming each task (including the use of machine learning, deep learning, and *ad hoc* learning techniques that allow the system to adapt and improve its solutions over time);

3) able to process information logically, draw conclusions, solve problems, make decisions based on available data, and self-learn;

4) meets the adaptability criterion, that is, it is able to adjust its functioning in response to changes in the circumambiency or on the basis of new information.

Considering the specified criteria, artificial intelligence can be regarded as a complex autonomous system capable of self-learning, independent analytical thinking, adapting to new conditions, performing multitasking operations, and making decisions based on embedded algorithms and data analysis, without direct human intervention, embodied in digital form and/or in a physical shell, capable of carrying out actions that go beyond pre-programmed tasks.

This approach allows us to talk about the existence of at least two groups of criteria, the presence of which raises the question of the legal

subjectivity of artificial intelligence: volitional and functional criteria, the examination of which serves as the main focus of this research.

It is important to note that the functional characteristics themselves are not limited to the ability to process data and make decisions. Modern artificial intelligence systems demonstrate a high degree of adaptability and learnability. For example, neural networks based on transformer architecture, such as GPT (Generative Pre-trained Transformer), are capable not only of generating text but also of solving complex analytical tasks, adapting to new types of input data without the need to retrain the entire model. This property, known as "few-shot learning", allows for rapid mastery of new operational areas, significantly expanding its potential sphere of influence in various fields of human activity.

Moreover, modern artificial intelligence systems possess a high degree of autonomy in decision-making. For example, the algorithms used in autonomous vehicles are capable of independently analyzing traffic situations and making maneuvering decisions without direct human involvement. This raises important questions about the boundaries of responsibility and legal subjectivity of such artificial intelligence systems in cases where their autonomous actions lead to legally significant consequences.

Another important characteristic is the ability of modern artificial intelligence systems to perform multimodal data analysis. Systems like DALL-E or Midjourney are capable of not only understanding and generating text but also working with visual information, creating images based on textual descriptions. This expands the understanding of "intellectual activity" in terms of how artificial intelligence functions and potentially impacts legal regulation in the fields of copyright and intellectual property.

Considering the fact that this definition and classification of criteria are not universal and are subject to criticism in the scientific community, as well as the fact that in the international legal context there are also various approaches to the definition and regulation of artificial intelligence, the research of the designated volitional and functional criteria acquires additional significance and complexity, which predetermines the need for their analysis, as well as consideration of various positions regarding their essence and impact on the integration of artificial intelligence into legal reality.

II. Methodology

The methodology of this research is based on an interdisciplinary approach that combines tools from the fields of law, philosophy, and information technology. For this purpose, the work utilized methods of analysis and synthesis, deduction and induction, correlation of definitions and concepts, as well as comparative conceptual analysis of a wide range of sources, including monographs, articles, and scientific papers that examine artificial intelligence from various perspectives.

The methodology of the research is based on a dialectical approach using a combination of general scientific and specific scientific methods of cognition and understanding including

1) the method of explication, which allowed considering approaches to understanding the characteristics/features of artificial intelligence (autonomy, self-learning, systemic nature, etc.) from the perspective of legal science (in particular, from the theoretical component of legal responsibility) as forming a set of factual circumstances indicating the presence or absence of legal capacity;

2) formal legal (dogmatic) method, through which the legal characteristics of artificial intelligence are studied on the condition of its legal capacity;

3) comparative legal method, by means of which existing theoretical and practical approaches to the understanding of artificial intelligence in foreign legal orders are examined;

4) legal modeling method, by means of which possible approaches to addressing the issue of understanding artificial intelligence in the light of its legal capacity are developed and substantiated.

III. Volitional Elements in the Characteristics of Artificial Intelligence

The first group of characteristics that serve as an essential component in understanding artificial intelligence is related to the manifestation of volitional elements in its functioning.[1] It seems that such characteristics should be classified as follows:

[1] In this study, the category of "volitional" is used as the most relevant in terms of content to the categories that will be described later when examining approaches

— systematicity;
— autonomy;
— independence.

A sequential analysis of these indicators will allow to answer the question, firstly, what substantive components are embedded in the doctrinal and regulatory framework of these categories, and secondly, how appropriate and justified it is to use them when addressing the issue of the legal capacity of artificial intelligence.

Systematicity of artificial intelligence

One of the most important characteristics used to reveal the essence of artificial intelligence is systematicity, which refers to the integration of various components into a single functional structure.

From the perspective of revealing the substantive component of this characteristic, it seems reasonable to assume that the systematicity of artificial intelligence implies a mode of operation in which a complex of components are interconnected and work together to achieve specific goals.

The systemic nature of artificial intelligence implies the inclusion of various elements in its structure: software, hardware, as well as cybernetic components. In particular, considering artificial intelligence as a cybernetic system suggests that it integrates a set of elements, among which:

— controls;
— data processing elements;
— automation elements.

As an effective functional structure, this system can be viewed exclusively in its entirety, serving as a means of processing information and analyzing complex interconnections (Bratko, 2024, pp. 273–275).

In this sense, including the addressing of the issue of the legal capacity of artificial intelligence, systemic thinking requires considering all the structural components that ensure its functioning (Ruchkina et al., 2021, pp. 227–236).

to understanding artificial intelligence. Strictly speaking, at this point, they cannot be considered in their formal legal content. However, further exploration of this issue does not rule out such a possibility (including in the context of the ongoing development of the technological component of artificial intelligence).

The existing typology of artificial intelligence is also related to the characteristic of systematicity. Currently taking into account technological development, two types of artificial intelligence are distinguished, which can be conditionally labeled as "weak" and "strong" (Yuwen, 2022, p. 92). It seems that such a division of artificial intelligence may play a significant role in addressing the issue of its legal personality and the potential distribution of responsibility.

The characteristic of "weak" artificial intelligence is defined by its performance of specific tasks: text processing, image creation, data analysis, or providing recommendations on a given topic. Its functioning is implemented based on predefined algorithms that allow it to process queries and provide appropriate responses, but its actions are limited to certain frameworks. Such artificial intelligence systems operate on the basis of pre-built algorithms that allow them to process requests and provide appropriate responses, but their actions are linked to the existing framework of the programs created for them. This allows to speak about the limited nature of the capabilities of "weak" artificial intelligence, including its inability for flexibility and adaptation.

Therefore, this qualitative characteristic can be taken into account when determining the legal capacity of artificial intelligence. The limited nature of the capabilities presented above allows us to speak of an increased dependence on humans — both from the user's side and the developer's side — which objectively shifts the focus of responsibility onto humans when it comes to "weak" artificial intelligence.

The second type of artificial intelligence (the "strong" one) possesses systemic characteristics that enable it to perform complex intellectual and creative tasks, imitating human cognitive activity (Zhao et al., 2022, p. 69). It is noted that it may exhibit certain actions characteristic of humans, which indicate self-awareness, adaptation to circumambiency, and the ability to think logically (Kuteinikov et al., 2021). "Strong" artificial intelligence is also distinguished by the fact that it learns from a huge array of data and very different information; such a system is capable of processing large volumes of information at a high speed, which is critically important for performing complex tasks that require rapid data analysis and decision making.

It is evident that such a distinction in the qualitative capabilities of artificial intelligence cannot be overlooked when addressing the issue of its legal personality. In this regard, it is appropriate to discuss the necessity of differentiation and consideration of the systemic characteristics of artificial intelligence when determining the possibility or impossibility and the degree of its responsibility, if such is provided for.

Autonomy of artificial intelligence

Researchers emphasize the importance of distinguishing AI as an object of legal regulation from its status as a potential subject of rights, suggesting that the legal capacity of AI should depend on its ability to autonomously perform legally significant actions (Laptev, 2019, pp. 88–90). The existing contexts in the field of artificial intelligence allow it to be described as a system capable of rationally solving complex problems or taking appropriate actions to achieve its goals in the real world (Firth-Butterfield et al., 2018, p. 5). Furthermore, the anthropogenic nature of artificial intelligence, capable of performing actions that require human intelligence, defines its ability for intelligent behavior, which is broadly understood as the capacity to achieve complex goals.

Such a definition allows us to view intelligence as a characteristic inherent not only in humans but also in non-human actors, emphasizing that intelligence can be considered in the context of any systems capable of effectively solving problems. At the same time, the presence of such a characteristic as autonomy allows to talk about the possibility of developing independent criteria for the functioning of artificial intelligence.

Meanwhile, the autonomy of artificial intelligence is revealed through a complex of the following characteristics:

— independence of actions, meaning the ability to independently initiate and execute tasks that do not always require human intervention or confirmation for each action;

— adaptation to new conditions or changes in the circumambiency by independently adjusting one's actions to achieve goals;

— the duration of an activity that is associated with functioning for a certain period of time without external intervention;

— the ability to function without human intervention, encompassing the processing and analysis of large volumes of data necessary for performing multitasking and complex operations.[2]

Accordingly, artificial intelligence can be viewed as a functioning system capable not only of solving various tasks but also of operating in the real circumambiency, achieving its goals independently, not merely by copying human intelligence, but by creating its own logical approaches and arriving at qualitatively new and distinct solutions and conclusions.

Such a characteristic of artificial intelligence allows to speak of situations in which its functioning, strictly speaking, is carried out independently of humans (primarily the developer-subject), autonomously, which is an important condition when determining legal personality (Lawless et al., 2019).

It is important to note that regardless of the approaches to understanding of artificial intelligence, its influence on the material world, the ability to analyze and form behavioral algorithms make it a real and influential element of the real world.

Due to the risks associated with possible errors in the creation and operation of artificial intelligence systems, as well as with the data on which they are trained, there is a possibility of unforeseen consequences, in which operational situations may arise that contradict the expectations of the developers. While such systems have some impressive capabilities, their role in processes and autonomous decision making must be critically assessed in terms of their real contribution and potential risks, raising the question of human control and adjustment of their activities.

Cognitive autonomy of artificial intelligence

The concluding characteristic of the volitional elements of artificial intelligence is cognitive autonomy. Addressing this, it should be noted

[2] In particular, in the European Union, the current regulation (AI Act) defines artificial intelligence quite broadly, emphasizing its autonomy, which allows it to be distinguished from other technological solutions. See: The EU Artificial Intelligence Act: our 16 key takeaways. Available at: https://www.stibbe.com/publications-and-insights/the-eu-artificial-intelligence-act-our-16-key-takeaways [Accessed 02.06.2024].

that, the question of the will of artificial intelligence — if such a will exists — is related to defining its relationship with the will of the actors involved in its creation and operation (the programmer, the engineer, the developer, the owner, or other individuals who have access to its control).

At the same time, there is an opposing opinion, according to which it is necessary to distance oneself from such a category as "will" in relation to artificial intelligence in the legal sphere, since the presumption of the presence or absence of "will" is based on metaphysical and ideological argumentation, while decisions on legal capacity are primarily related to public interests (Kibalnik and Volosyuk, 2018, p. 177).

It is highlighted that artificial intelligence represents a way to reproduce human activity in the digital space based on formalizable information under conditions of temporal and resource constraints, uncertainty, and incompleteness of initial data, creating cybernetic objects (Gusarova, 2018, p. 7).

In this approach, artificial intelligence possesses a number of distinctive characteristics: the ability to perform cognitive and thinking actions, such as pattern recognition, understanding symbolic systems and languages, reasoning, analysis and evaluation, modeling, and abstraction (Morhat, 2017, pp. 68–69). The very fact that artificial intelligence can generate new ideas and solutions, the creative aspect of its activity, differs from that of humans. In this sense, any functioning of artificial intelligence ultimately results from a complex computational process. The ability to analyze substantial amounts of information and draw conclusions based on it does not negate the fact that artificial intelligence is dependent on the initial conditions and data from which it learned.

In this regard, it is appropriate to highlight a number of cognitive characteristics that distinguish artificial intelligence:

— the lack of subjective experience and intuition;

— inability for emotional perception.[3]

[3] In terms of answering the question of the legal capacity of artificial intelligence, this may mean that such institutions as exclusion of liability and mitigating circumstances are not applicable. However, comparing the identified characteristics with the general theory of legal liability is the next step in the work of the research team.

Considering cognitive autonomy as a characteristic of artificial intelligence functioning, it is necessary to take into account modern advances in deep learning and neural networks. Systems based on the transformer architecture, such as GPT-3 and its successors, demonstrate the ability to independently form complex conceptual models based on the processing of large amounts of data. This allows to generate new ideas and solutions that were not explicitly included in their original programming. For example, the latest generation of language models are capable of so-called "zero-shot learning", where the system can perform tasks for which it was not specifically trained, relying on its general "understanding" of language and context (Xian et al., 2020, pp. 1–2). This property can be viewed as a controlled form of cognitive independence, since the system independently generates solutions to a new problem. However, it is important to note, that this "autonomy" has its limitations. Despite the ability to generate new ideas, today's artificial intelligence systems do not have true understanding or self-awareness in the sense that we apply these concepts to humans. Their "decisions" are based on statistical models and data processing, not subjective experience or emotion.

However, the level of cognitive autonomy demonstrated by modern artificial intelligence systems is high enough to raise the question of the need to revise traditional approaches to defining subjectivity in the legal sphere. The ability of artificial intelligence to independently form decisions, even when limited by the framework of its original programming, creates new challenges for legal theory and practice.

Furthermore, the study of the cognitive autonomy of artificial intelligence is impossible without pointing out the absence of phenomena such as consciousness, feelings, interests, and freedom (in the sense of not being restricted) of will (Gadjiev and Voinikanis, 2018, pp. 30–34). However, it seems not entirely correct to approach the definition of artificial intelligence from the above point of view, since the introduction of metaphysical concepts into legal reality does not correspond to the nature of ongoing legal processes, as well as empirical data. Consciousness is not a necessary condition for legal capacity, and, therefore, is not an obligatory element necessary for

artificial intelligence, including considering the issue of determining its legal capacity.

In the context of legal regulation of artificial intelligence, it is important to note that, in conjunction with the artificial intelligence's ability to self-learn, there is a possibility of recreating a semblance of brain activity in artificial intelligence (Solum, 1992, p. 1236) by modeling the functioning of neural networks and synapses of the human brain, which allows for the imitation of human behavior (Minaeva, 2022, pp. 250–251).

In the legal discourse concerning the legal personality of artificial intelligence, several approaches can be distinguished, differing both in their methodological foundations and in the legal consequences arising from their application. The first approach proposes to consider the legal status of artificial intelligence as analogous to that of a legal person, with the primary emphasis placed on the actions of AI and the resulting economic consequences. In this context, the cognitive and volitional characteristics of artificial intelligence, as well as its potential differences from human intelligence, are either disregarded or regarded as secondary, even if AI exhibits forms of intellectual activity that differ from those of humans

The second approach pertains to more advanced forms of artificial intelligence, such as artificial general intelligence, which possess the capacity to act and experience emotions similar to those of humans. Within this framework, it is proposed that "strong" AI be recognized not merely as a technical or economic entity, but as a subject endowed with elements of human dignity and emotionality, thereby placing it in a legal position closer to that of natural persons (Gryszczyńska et al., 2024, pp. 55–57). This approach necessitates a more profound and comprehensive analysis of the ethical, philosophical, and legal aspects related to the recognition of AI as a legal subject, taking into account not only its functional capabilities but also issues of responsibility, free will, and the moral and social implications of such recognition.

In support of this position, it is argued that "strong" artificial intelligence, unlike "weak" AI, possesses the capacity to exhibit "collective intentionality" (Gryszczyńska et al., 2024, p. 60). This concept refers to cultural equivalence with humans, manifested in AI's ability to participate

in complex social and normative practices characteristic of human communities. Specifically, it involves engagement in "conventional cultural practices", such as law. Consequently, interactions between humans and "strong" AI acquire a character comparable to interpersonal interactions, opening new prospects for recognizing such AI as a legal subject and a full participant in legal and social relations (Linarelli, 2019, pp. 336–343). It should be noted that the cognitive activity of artificial intelligence, when based not merely on the imitation of understanding and applying ethical concepts, but on their genuine comprehension and integration into decision-making processes, represents a qualitatively distinct level of AI development. This level implies that AI does not only possess the capacity for formal processing of ethical norms, but also an internalized grasp of moral categories, thereby bringing its cognitive status closer to that of a human being. The attainment of such autonomous ethical reasoning would provide a compelling basis for re-evaluating the legal status of AI and considering the possibility of recognizing "strong" AI as a subject of law (Lovell, 2024, p. 13).

Despite this, to date, no artificial intelligence has demonstrated the ability to fully exhibit "collective intentionality" as understood in the human context, or to fully comprehend ethical concepts.

Contemporary AI systems, including the most advanced models, operate within limited specialized tasks and lack genuine understanding, consciousness, or the capacity to engage in social and normative practices at a level comparable to that of humans.

In addition to the aforementioned approaches, some scholars advance the concept of granting legal personality to artificial intelligence by analogy with corporate entities, where collective will be expressed through authorized representatives. This concept is based on the functional similarity between the cognitive activities of AI and human cognitive processes but emphasizes the absence of individual will and consciousness in AI, thereby allowing it to be regarded as a collective legal subject (Calverley, 2008). This perspective reflects an attempt to balance the need for legal recognition of AI to ensure accountability and control with the preservation of traditional conceptions of legal subjects founded on human will and consciousness.

IV. Functional Elements in the Characteristics of Artificial Intelligence

The functional elements of artificial intelligence reflect the qualitative characteristics that occur during its functioning, and whose presence must be taken into account when determining its legal capacity. Such elements are proposed to include:

— self-learning;

— adaptability.

The analysis of these elements is predetermined by the fact that they influence, to a certain extent, the independence and autonomy of artificial intelligence, which, in turn, is crucial for shaping the approach to understanding artificial intelligence in order to address the question of its legal capacity.

Self-learning of artificial intelligence

Self-learning of artificial intelligence is one of the key aspects of its development, allowing systems to accumulate knowledge and adapt to new conditions. With the property of self-learning, such systems are able to continuously improve their functionality without direct human intervention. This process is based on the use of complex algorithms.

Considering systemness as a characteristic of artificial intelligence, it is reasonable to assert the existence of a complex of technologies that are part of its structure and include, for example, knowledge bases, methods for solving specific tasks, interfaces for communication with humans, and access to the Internet, among others. These types of technologies enable artificial intelligence to self-learn and, as a result, perform tasks that traditionally require human intelligence by analyzing large amounts of data, identifying patterns, and applying the results to optimize its actions and decisions.

One of the mechanisms of self-learning of artificial intelligence can be the use of neural networks or connections that imitate the work of the human brain, which allows artificial intelligence to analyze complex data structures and make decisions after multi-level processing of information. The main methods of self-learning using neural networks are: reinforcement learning (interaction with the environment and receiving feedback in the form of “rewards” or “penalties”); learning

with a teacher; learning without a teacher (independent search for connections based on common features in the data volume).

The specified characteristic defines the necessity of considering artificial intelligence not only as a rationally functioning system but also as an actively operating entity capable of independently making decisions under certain circumstances to achieve specific objectives. From the perspective of regulating this area of social relations (including in the context of the legal subjectivity of artificial intelligence), the consequences of the decisions made — just like the decisions themselves — are the objects of reality that are of utmost importance.

In this regard, special attention should be paid to the existing possibility of autonomous selection among alternative options when addressing various tasks, which indicates the potential for subsequent legal assessment of such choices. Moreover, there is a possibility of using generative algorithms that facilitate the acquisition of new knowledge through learning from databases, self-learning from their own mistakes and experiences, as well as independently — without human guidance — develop and use additional algorithms, which allows the system not only to improve the accuracy of its forecasts and decisions, but also to reduce the likelihood of repeating the same mistakes in the future. Self-learning also implies the ability to generate new, previously unknown knowledge for artificial intelligence, which is especially important in a rapidly changing circumambiency. Accordingly, it is noted that the functionality described above enables the ability to make subjective decisions and perform creative tasks to a certain extent in an unpredictable environment through data collection (Humerick, 2018, pp. 396–398). In this regard, the ability to self-learn as a specific characteristic of artificial intelligence, reflecting its internal functioning, is aimed at increasing the degree of independence and autonomy, and subsequently independence from external actors interacting with it (Narendra et al., 2024, p. 4). Such a characteristic is an integral part of defining conceptual approaches to the legal personality of artificial intelligence.

Adaptability of artificial intelligence

Modern research highlights another characteristic of artificial intelligence that appears to have a significant impact on shaping

approaches to its understanding and the subsequent resolution of the issue of its legal personality. The speech in this case refers to the fact that artificial intelligence is viewed as a combination of technological and communication interconnections with the ability for logical reasoning and independent adjustment of actions in response to changing conditions (Yastrebov, 2018, p. 317). At the same time, its ability for self-regulation and adaptation does not affect the internal resilience and stability of its functioning as a complex system of interconnected structural elements.

The adaptability of modern artificial intelligence systems goes far beyond simple parameter tuning. Advanced machine learning models demonstrate deep adaptability, significantly expanding their potential scope of application and impact.

One of the most striking examples of high adaptability of artificial intelligence is transfer learning. This technique allows using knowledge gained from solving one problem to improve the efficiency of learning in another, related problem (Thommen and Roland, 2019, pp. 111–116). For example, a model learned to recognize objects in photographs can be quickly adapted to medical diagnostics using X-ray images. This portability significantly accelerates the process of adapting artificial intelligence to new areas of application, which has important implications for the legal regulation of the use of artificial intelligence in various professional fields.

Another aspect of artificial intelligence adaptability is the concept of meta-learning, or "learning how to learn". Systems that use meta-learning are able not only to solve specific problems, but also to optimize their own learning process. This allows artificial intelligence to quickly adapt to new types of problems, even if they are significantly different from those on which the system was initially trained. In the context of legal personality, this raises the question of how autonomous artificial intelligence can be considered if it is able to independently modify its learning algorithms.

In this regard, adaptability is an important characteristic of artificial intelligence from the perspective of its legal dimension. Firstly, it is a necessary condition for functioning in a dynamically changing world, including in terms of changing legislation. Secondly, adaptability

enhances the autonomy of artificial intelligence, as it reduces the degree of dependence on humans as actors in various fields who initiate the process of adjustment to align with the changed situation (Hussian et al., 2024, pp. 17–19).

The adaptability of artificial intelligence is its ability to perceive external changes, analyze them, and make appropriate adjustments to its algorithms and models to achieve optimal results. This adaptation process can be carried out both in real time and based on the analysis of accumulated experience and data. The adaptability of artificial intelligence also contributes to its sustainable development. A system that can adapt to changes has greater flexibility and resilience to external influences, which allows it to maintain its functionality even in the face of significant circumambiency changes.

Furthermore, adaptability refers to the ability of artificial intelligence to self-adjust and optimize without human intervention. An example of this approach is the use of machine learning algorithms, discussed earlier.

Taking into account the adaptability of artificial intelligence, it is permissible to speak of its functioning approaching human activity in the sense that it reacts to external stimuli and actively interacts with them, using acceptable and unacceptable solutions as indicators (Kotur, 2024). The adaptability of artificial intelligence does not only expand its functionality, but also emphasizes its autonomy and independence.

V. Objectification of Artificial Intelligence

The objectification of artificial intelligence is related to the external expression of its existence. In this regard, it is permissible to speak of the existence of two main forms of artificial intelligence: digital and cyber-physical.

The digital form implies a complete absence of a physical carrier and exists solely in virtual space. In turn, when there is a cyber-physical shell, there is a physical carrier,[4] with which the artificial intelligence is directly connected (Aljanabi, 2023, p. 16).

[4] Roadmap to a positive future powered by AI. Available at: https://www.figure.ai/master-plan [Accessed 12.07.2024].

The presence of a cyber-physical shell raises the question of the need to distinguish between categories such as a "robot" and "artificial intelligence" (Begishev, 2021, pp. 82–86). It should be noted that artificial intelligence possesses a set of characteristics described above (intelligence, ability for self-development, etc.), while a robot is a physical, automated, programmed mechanism designed to perform specific tasks. A robot has a physical substance, while the existence of artificial intelligence separately from a cyber-physical body is possible in digital form (Ponkin and Redkina, 2018).

The difference between the concepts of a "robot" and "artificial intelligence" must be doctrinally defined not only to avoid terminological confusion and form of unified approach researching these areas, but also to form an effective model of legal regulation of both artificial intelligence and robots.

Accordingly, the form of objectification of artificial intelligence ensures a distinction between it and related technological objects, integration into various technological and social contexts that determine the way it exists and interacts with the environment, which is necessary for the development of norms aimed at defining the status of artificial intelligence in legal reality.

VI. Conclusion

The conducted research based on the existing dogmatic and practical approaches in the field of artificial intelligence, including the development of conceptual approaches to the issue of extending legal responsibility to artificial intelligence, has allowed for the formulation of the following findings:

1) the lack of a unified representation of the essence of artificial intelligence in contemporary scientific discourse (in the sense of its fundamental characteristics and criteria underlie its activities) is largely predetermined by its complexity, which must also be taken into account addressing the issue of the legal personality of artificial intelligence as a formal legal characteristic;

2) it seems possible to distinguish volitional elements in the characteristics of artificial intelligence, namely, systematicity, which

implies the integration of various components into a single functional structure; autonomy, associated with independent initiation and execution of tasks; cognitive independence of artificial intelligence, which is associated with the absence of an emotional component, as well as the absence of consciousness, interest and freedom of will;

3) an important component is the functional characteristics of artificial intelligence, which are related, firstly, to the ability to self-learn, that is, to acquire new data, to learn from its own mistakes and experiences, as well as to independently develop additional algorithms; and secondly, to adaptability, which can be considered as the ability to take into account the changing factors of an uncertain circumambiency during operation;

4) the presented characteristics constitute a necessary set, the presence of which indicates the possibility of defining an information system as artificial intelligence. Therefore, it must be taken into account when addressing the question of its legal personality.

References

Aljanabi, M., (2023). ChatGPT: Future Directions and Open possibilities. *Mesopotamian Journal of Cyber Security*, 3, pp. 16–17, doi: 10.58496/MJCS/2023/003.

Begishev, I.P., (2021). Criminal and legal regulation of robotics: results of a sociological study. *Social and political sciences,* 4(11), pp. 82–91, doi: 10.33693/2223-0092-2021-11-4-82-91. (In Russ.).

Bratko, A.G., (2024). *Artificial Intelligence, the Legal System and the Functions of the State*. Moscow: Infra-M Publ. (In Russ.).

Calverley, D.J., (2008). Imagining a Non-Biological Machine as a Legal Person. *AI & Society*, vol. 22, No. 4, pp. 527–528, doi: 10.1007/s00146-007-0092-7.

Firth-Butterfield, K., Chae, Y., Allgrove, B. and Kitsara, I., (2018). *Artificial Intelligence Collides with Patent Law*. Geneva: White Paper. Center for the Fourth Industrial Revolution.

Gadjiev, G.A. and Voinikanis, E.A., (2018). Could be a Robot a Subject of Law (in Search of Legal Forms for a Digital Economy)? *Pravo*.

Zhurnal Vysshey shkoly ekonomiki, 4, pp. 24–48, doi: 10.17323/2072-8166. 2018.4.24.48. (In Russ.).

Gryszczyńska, A., Więckowski, Z., Veress, E., Ambrus, I. and Wielki, R., (2024). *Legal Aspects of Artificial Intelligence*. 194 p.

Gusarova, N.F., (2018). *Introduction to the Theory of Artificial Intellect*. Saint Petersburg: ITMO University. (In Russ.).

Humerick, M., (2018). Taking AI Personally: How the EU must learn to balance the interests of personal data and privacy and artificial intelligence. *Santa Clara High Technology Law Journal*, 34(4), pp. 393–418. Available at: https://digitalcommons.law.scu.edu/chtlj/vol34/iss4/3 [Accessed 10.06.2024].

Hussian, D., Rahman, H. and Ali, M., (2024). Artificial Intelligence and Machine Learning Enhance Robot Decision-Making Adaptability and Learning Capabilities Across Various Domains. *Global Mainstream Journal*, 1(3), pp. 14–27, doi: 10.62304/ijse.v1i3.161.

Kibalnik, A.G. and Volosyuk, P.V., (2018). Artificial Intelligence: Doctrinal Criminal Law Questions Awaiting Answers. *Legal Science and Practice: Journal of Nizhny Novgorod Academy of the Ministry of Internal Affairs of Russia*, 4(44), pp. 173–178, doi 10.24411/2078-5356-2018-10428. (In Russ.).

Kotur, B., (2024). *Distance Adaptation Networks (DAN)*. Novel Implementation of Artificial Neural Networks, doi: 10.13140/RG.2.2.11778.08644.

Kuteinikov, D.L., Igaev, O.A., Zenin, S.S. and Lebedev, V.A., (2021). *Artificial Intelligence and Law: From Fundamental Problems to Applied Problems*. Tyumen. (In Russ.).

Laptev, V.A., (2019). The concept of artificial intelligence and legal responsibility for its operation. *Pravo. Zhurnal Vysshey shkoly ekonomiki,* 2, pp. 79–102. (In Russ.).

Lawless, W.F., Mittu, R., Sofge, D. and Hiatt, L., (2019). Artificial intelligence, Autonomy, and Human-Machine Teams — Interdependence, Context, and Explainable AI. *AI Magazine,* 40(3), pp. 5–13, doi: 10.1609/aimag.v40i3.2866.

Linarelli, J., (2019). Artificial General Intelligence and Contract. *Uniform Law Review*, 24(2), pp. 330–347, doi: 10.1093/ulr/unz015.

Lovell, J., (2024). Legal Aspects of Artificial Intelligence Personhood: Exploring the Possibility of Granting Legal Personhood to Advanced AI Systems and the Implications for Liability, Rights and Responsibilities, pp. 1–22. Available at: https://ssrn.com/abstract=4749785 [Accessed 15.05.2025].

Minaeva, A.I., (2022). On the Impact of Artificial Intelligence on Individual Subjects of Law. *Obrazovanie i Pravo,* 7, pp. 249–253, doi: 10.24412/2076-1503-2022-7-249-253. (In Russ.).

Morhat, P.M., (2017). *Artificial intelligence: legal view*. Moscow: Buki-Vedi Publ. (In Russ.).

Narendra, Y., Latika, S. and Urmila, D., (2024). Artificial Intelligence: The Future. *International Journal of Scientific Research in Engineering and Management*, 8(1), pp. 1–5, doi: 10.55041/IJSREM27796.

Ponkin, I.V. and Redkina, A.I., (2018). Artificial Intelligence from a Legal Perspective. *Vestnik Rossiiskogo Universiteta Druzhby Narodov. Seriya: Yuridicheskie nauki,* 1, pp. 91–109, doi: 10.22363/2313-2337-2018-22-1-91-109. (In Russ.).

Ruchkina, G.F., Demchenko, M.V. and Popova, A.V., (2021). *Legal Regulation of Artificial Intelligence, Robots and Robotics Objects as a Condition for the Formation of Economic Leadership in Russia*. Moscow: Prometei. (In Russ.).

Solum, L.B., (1992). Legal Personhood for Artificial Intelligences. *North Carolina Law Review*, 70, pp. 1231–1287. Available at: https://ssrn.com/abstract=1108671 [Accessed 17.06.2024].

Thommen, G. and Roland, B., (2019). Self-organizing maps for storage and transfer of knowledge in reinforcement learning. *Adaptive Behavior*. 27(2), pp. 111–126, doi: 10.1177/1059712318818568.

Xian, Y., Lampert, C.H., Schiele, B. and Akata, Z., (2020). Zero-Shot Learning — A Comprehensive Evaluation of the Good, the Bad and the Ugly. *arXiv e-prints*, doi: 10.48550/arXiv.1707.00600.

Yastrebov, O.A., (2018). Artificial Intelligence in the Legal Area. *Vestnik Rossiiskogo Universiteta Druzhby Narodov. Seriya: Yuridicheskie nauki,* 22(3), pp. 315–328, doi: 10.22363/2313-2337-2018-22-3-315-328. (In Russ.).

Yuwen, Sh., (2022). On Negativism of Legal Personality of Artificial Intelligence. *Journal of Education, Humanities and Social Sciences*, 1, pp. 90–96, doi: 10.54097/ehss.v1i.645.

Zhao, G., Li, Y. and Xu, Q., (2022). From Emotion AI to Cognitive AI. *International Journal of Network Dynamics and Intelligence,* 1(1), pp. 65–72, doi: 10.53941/ijndi0101006.

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