# Transformation of Legal Personality in the Context of the Development of Modern Digital Technologies

**Roman Amelin[1], Sergey Channov[2,3], Marina Dobrobaba[4,5], Larisa Kalinina[5] and Elena Kholodnaya[4]**

*sciencedept@mail.ru*

[1]N.G. Chernyshevsky Saratov National Research State University, Saratov, Russia
[2]Volga Region Institute of Management named after P.A. Stolypin - branch of Russian Academy of National
Economy and Public Administration, Saratov, Russia
[3]Saratov State Law Academy, Saratov, Russia
[4]O.E. Kutafin Moscow State Law University, Moscow, Russia
[5]Russian Customs Academy, Moscow, Russia

## Summary

The article explores the prospects and trends for the transformation of some basic concepts of law associated with the development of artificial intelligence systems and the problems of liability for harm caused by a robot. The prospects, conditions and consequences of vesting robots with partial (quasi) or full legal personality are explored. This process should lead to a revision of the concepts of will, subjective side and legal responsibility in the direction of their greater universalization. The legally significant signs of will, legal personality, legal liability in relation to robots, artificial intelligence systems and other complex automated information systems are clarified. The author identifies the following essential factors of legal qualification of an act committed by a robot: goals, reasons for setting goals, connections between the planned result and the action taken, the actual result, the reasons for the difference between the actual result and the planned one. The article pays special attention to the preventive function of legal liability, which, when applied to robot subjects, can be expressed in the following basic procedures. 1. Accounting for legal requirements in the behavior of the robot. 2. Timely adaptation of the robot to changes in legislation and other regulatory legal acts that affect its behavior. 3. Accounting for incidents. 4. Destruction of a series of robots whose actions lead to unacceptable consequences.

*Keywords:*
*robot, artificial intelligence, legal responsibility, subjective side, free will.*

## 1. Introduction

When a discussion arises about a possibility of endowing robots with the status of legal person, the main argument of the opponents of this approach is the robot's lack of will, self-awareness, desires and emotions, as well as other exclusively human qualities. These qualities for many centuries were reflected in legal norms, legal principles and the very philosophy of law, since law was intended to regulate relations exclusively between people and their teams.

Yu. Gracheva and A. Aryamov [1, p. 176] argue that "until the robot has "consciousness" and "own will" as necessary conditions for capacity, it will be impossible to recognize the robot as a legal person, or to extend other legal constructions to it by analogy". According to D. Karlash [2, p. 13], "the legal status of robots should be determined on the basis of taking into account the main differences that are inherent in people: the ability to experience pain and empathy, self-awareness, moral assessment of actions. As a result, the recognition of robots as legal person is currently unreasonable". E. Ponomareva [3, p. 11] comes to the conclusion that robots cannot be considered as legal person, because "they do not have will in the legal sense, they do not have their own interests, they cannot form a subjective attitude towards the acts committed, they cannot bear legal responsibility due to the absence of a sense of guilt". V. Arkhipov and V. Naumov [4, p. 157] refer to the indispensable signs of the legal personality of the phenomenon (capable of autonomous action) emotions, by which they understand "the ability to experience interdependent and mutually determined rights and obligations".

The relevance of the discussion about the legal personality of robots is primarily related to the problem of legal liability for harm caused by the actions of the robot [5-7], The genesis of the problem is due to the three most important features of robots, which, according to researchers, fundamentally distinguish them from the class of other software and hardware systems. Firstly, autonomy - the robot is designed (or able) to function without human intervention, including independently determining goals, making decisions and performing actions aimed at their implementation. Secondly, self-learning - the decisions and actions of the robot are determined not so much by the algorithms embedded in it, but by the internal state, which is formed under the influence of a huge amount of data, including data processed during the autonomous functioning of the robot [8]. Thus, the developer, operator, owner of the robot, as well as other subjects, in some cases, are not able to predict the decisions and actions of the robot and influence them. Self-learning correlates very closely with inexplicability. The most effective artificial intelligence algorithms are a "black box" from the point of

view of a human (even their developer). They do not allow us to understand why the robot made a certain decision or performed a certain action and in any way trace the chain of cause-and-effect relationships that led to this action and/or decision [9, p. 363]. Finally, a robot is usually viewed as a cyber-physical system operating in the real world. He is able to exercise physical influence on people and objects. This is at the heart of predictions and concerns about robots causing harm to property, health and even human life - and precedents are already beginning to accumulate [10]. However, the problem appears to be broader. Complex information systems (including but not limited to artificial intelligence systems) may have those properties of robots that are associated with the problem of their responsibility. First of all, unpredictability (the impossibility to foresee the result of work in each case), while for robots and artificial intelligence systems it is due to the objective properties of the algorithm (for example, the mechanics of the operation of a deep neural network has no explainable relationship with the categories of the real world, for which it finds predictions and relationships), for "ordinary" deterministic systems and algorithms, it is due to the subjective complexity of comprehensive analysis and perception by the human brain. This is the reason for the occurrence of anomalies in situations that were not foreseen at the stage of development of such systems [11, pp. 28-32]. In addition, information systems can cause significant harm to third parties, but not by physical interaction with them, unlike robots, but by violating other rights. Thousands of British Post employees were unfairly fired, fined or prosecuted for theft based on data from the Postal Information System. The "biased" attitude of the examination information system contributed to the unfair expulsion of a number of students. Incorrectly working application "Social monitoring" wrote out a lot of unreasonable administrative fines [12]. Not to mention countless violations of subjective information rights due to failures and incorrect behavior of various information systems. In most cases, the harm caused by the violation of rights is quite difficult to compensate due to the lack of a proper subject, for the same reasons that are true for robots. Therefore, it is promising to study a universal approach to this problem, in particular, the prospects and conditions for endowing legal personality (quasi-legal personality) to individually defined information systems, primarily state information systems (SIS).

## 2. Materials and Methods

We use the method of legal modeling and forecasting in order to trace the possible evolution of approaches to solving the problem of liability of robots and justify the prospect of giving them legal personality [13].
We use the methods of theoretical legal analysis, the historical and comparative legal method to show the role

and significance of such concepts as "will", "legal personality", "subjective side" and "legal responsibility" for law in order to separate their essential attributes from those characteristics that can evolve and transform in the conditions of the development of modern digital technologies [14].

Finally, we use particular analytical methods of information law and computer science to identify the essential features of robots and other software and hardware systems that are important for solving the problem of legal regulation of the sphere of their creation and operation.

## 3. Results

### 3.1 Ways to Solve the Problem of Legal Responsibility for the Actions and Decisions of Robots

Before considering the prerequisites for the transformation of the legal concepts of free will and the subjective side in the context of the development of modern digital technologies, we will consider what, in principle, can cause the need to give the robot the status of a legal person and what alternative options for the development of legislation can be predicted at the moment.
Technically, there are three approaches to solving the problem of robot responsibility, each of which requires an increasingly radical transformation of legislation and even a revision of established legal concepts.
*1. Distribution of responsibility for the harm caused by the robot between the persons involved in its creation and use*
It should be recognized that the robot and the forces driving it (software algorithms and internal state are derived from human actions in any case), no matter how complex and unpredictable they are [15]. People participate at every stage of the development and implementation of technologies based on artificial intelligence: putting forward ideas and proposals, modeling, design, data processing, implementation, testing, operation [16]. There is a position that "an artificial intelligence carrier, a robotics object must initially be developed or trained by the creator in such a way as to exclude the possibility of harm to life, human health, the environment, etc.", respectively, the developer is responsible for his actions, "taking into account the observance of the three laws of robotics during development", or the user (a profit-making entity), or other entities [17].
Even if there are no grounds to establish guilt in the form of direct or indirect intent aimed at committing harmful acts by a robot, we can talk about guilt in the form of negligence. In particular, the robot developer can (and should) foresee the full range of consequences of possible actions of the robot, based on its physical characteristics, control mechanisms, learning and decision-making algorithms, etc.

[7, p. 20]. A stationary chess robot can, in the worst case, cause minor bodily harm to a person, while the incorrect behavior of an unmanned vehicle can lead to serious bodily harm or death. The robot, which does not have a physical embodiment and carries out electronic transactions in the financial market, risks only the property of its owner. Accordingly, the developer of a potentially dangerous robot must provide control mechanisms that block "antisocial" behavior and consciously accept responsibility in situations where such mechanisms do not work.

The responsibility distribution mechanism can be more complex, since in addition to the developer, the owner (operator, user) as well as other persons involved in the incident can influence the behavior of the robot. The court can establish the guilt of these subjects in each specific case, and the most universal precedents can be enshrined in legislation. Thus, the passenger of an unmanned vehicle with manual control mechanisms is likely to be responsible for the consequences of the decision to transfer control to the car, and the person who ordered the launch of an autonomous military drone will be responsible for all possible consequences of his actions. In addition, regardless of guilt, it may be taken into account that the owner (or manufacturer) of the robot uses it to obtain certain benefits and, together with these benefits (profits), incurs costs, including compensation for harm caused by the robot.

This approach organically fits into the system of Anglo-Saxon law based on precedent, as it allows accumulating and systematizing models of distribution of responsibility while robots and artificial intelligence systems proliferate and judicial decisions accumulate [9, p. 391]. For Romano-Germanic law, it will be quite difficult to provide a comprehensive universal model. But in both cases, the "contribution of the robot itself" (the influence of its internal state formed as a result of machine learning during functioning) to the actions it performs will become the most significant factor. Cases when a person could not and should not have foreseen and/or prevented the illegal actions of a self-learning robot can be considered in such a model as force majeure circumstances. However, as robots proliferate and become more complex, such force majeure events will occur frequently enough to adversely affect legal certainty. Therefore, although the approach of distributing responsibility for the actions of a robot between the involved entities seems to us to be quite effective for the current stage of development of information technology and law, it is limited in a historical perspective.

## 2. Giving a robot quasi-personality in terms of responsibility for causing harm

In the progressive works of domestic and foreign specialists in information (computer) law, the idea has long been expressed that a robot with artificial intelligence should itself be responsible for its actions (and, first of all, for the harm caused to it). Due to its complexity, autonomy, self-learning and unpredictability (inexplicability) for the

human mind, in most cases it will be unfair to lay responsibility on a human [4, 18-20]. In addition, as robots and artificial intelligence systems proliferate, the problem of determining the proper subject will be actualized, since it will probably not always be possible to determine the owner (and, possibly, even the manufacturer) of the offending robot.

Most of the supporters of this approach adhere to the position that the prospects for the implementation of the responsibility of the robot for its actions are associated with endowing it with quasi-personality.

Quasi-personality it is the limited ability of a certain entity to have rights (duties) and acquire them by its actions - within the framework established by law. The prefix "quasi" emphasizes the artificial nature of this status, that is, in fact, the quasi-person is not a legal person, but for a certain, very limited range of legal relations, it is convenient to consider it as one of their participants, artificially, at the discretion of the legislator, allowing him to have rights and obligations under these legal relations [21, p. 269]. As noted by A.V. Myskin [22, p. 6], "such substances are endowed with certain prototypes of will, independent interests, legal personality and other attributes characteristic of any legal person". Thus, embryos, families, nations fighting for self-determination, branches of legal entities, brigades of labor collectives, etc. are considered as quasi-persons [23, p. 342; 24, p. 263]. However, when analyzing the frequency of publications that are more or less devoted to the problem of quasi-personality, it should be noted that the vast majority of them (more than 80%) belong to the last decade and are associated specifically with robots and artificial intelligence algorithms, which indicates the urgent need to universalize the concept of "legal person" and to expanse it beyond the anthropocentric approach.

Making a distinction between legal person and quasi-person, many authors call for help "common sense" and point to the exceptional artificiality of endowing quasi-persons with "prototypes" of will, interests, etc. Although it is difficult to disagree that classical legal entity also received these qualities artificially and at the discretion of the Roman jurists. It is believed that the will and interests of a legal entity, state, international organization and other entities are somehow derived from the interests of their participants - people, "natural" subjects of law. But the main difference is the universality of their legal personality (within a certain area / branch of law). While according to E. Ponomareva [3, p. 9], a quasi-person, in principle, can only have rights, "unlike a real legal person, which also has legal obligations, is able to fulfill them independently or through its representatives".

Despite the fact that the latter position is not generally accepted, it emphasizes the nature of the problem that arises as a result of the recognition of the robot as a quasi-person. The robot needs precisely the ability to acquire and fulfill obligations - starting with the obligation of material

compensation for the harm that he caused. But how can this ability be put into practice?

One of the widely discussed proposals for organizing practical compensation for harm is to form a special insurance fund, the budget of which will be filled by robot manufacturers and spent on paying compensation to victims [25]. However, despite the attractiveness of the idea as a whole, it encounters many obstacles in detail, ranging from the circle of participants in such a fund (as we noted above, the risk of harm varies significantly for different types of robots) and ending with the assessment of the required amount of contributions, which, given the unpredictability of behavior robots is a non-trivial task.

Much more interesting, in our opinion, is the idea of localizing such an insurance fund in relation to a certain series of robots or even a specific robot. Taking into account the known software, hardware and physical characteristics of the robot, the scope of its application, the ability to control its actions, etc. it is possible to develop a methodology for determining the size of the fund sufficient to make the necessary insurance payments. The formation of the fund can be carried out at the expense of the manufacturer and/or the owner of the robot. A prerequisite for the activation (operation) of the robot is the availability of a specified amount of money. Obviously, when using the funds to compensate for the harm caused by the robot, replenishment will be required to continue its operation, and in tort relations the robot will be able to act as their subject (this is precisely what its quasi personality will consist of). In civil law relations, robots-quasi-persons may be responsible jointly/subsidiarily with their owner [26, p. 86]. Further development of this concept inevitably leads to a number of the following assumptions, which simplify the legal relations arising in connection with the operation of the robot. First, it makes sense for a robot to have limited ownership of the property of its insurance fund, since due to the autonomy of the robot, its connection with the owner (and the actual manager of the fund) can be broken. The second step follows logically - giving the robot more rights to dispose of this property - not only its use in order to compensate for harm, but also the acquisition of new property in the form of cash and, possibly, other values (probably, first of all, of a digital nature: cryptocurrencies, NFT objects, etc., and subsequently without restrictions). It is assumed that the robot can not only cause harm, but also create some benefits. It is expected that the robot creates a subjective benefit for its owner (in the form of providing services, creating wealth, making money, etc.), otherwise the expediency of its operation and the formation of an insurance fund raises big questions. The literature often raises the question of the possibility of granting a robot rights to its results of intellectual and creative activity. This question is not of acute relevance today and is mostly speculative. But it can be considered in the context of the property independence of the robot as a solution to the problem of its responsibility. If, when a robot is recognized as the nominal owner of some property, it is reasonable to allow him to acquire this property through his actions, performing work, providing services, creating new property, or as a result of other legal relations in which the law would allow the participation of a robot, as well as to alienate it beyond the minimum amount for ensure their own operation. However, such an approach will inevitably lead to a chain reaction requiring the recognition of the robot as a subject of an ever wider range of legal relations.

*3. Giving a robot legal personality within a wide (potentially unlimited) range of legal relations*

The above scenario seems to us the most likely (although, of course, not inevitable) way to recognize the robot as a legal person. At the same time, in our opinion, the key and fundamental feature that determines the difference and the phase transition between the quasi-legal personality and legal personality of the robot is its *property isolation*.

In this paradigm, robots that do not have individual certainty (which must be assigned during a special registration procedure) and do not have separate property that meets legally established requirements will not be legal persons. The subjects of legal relations related to the operation of such a robot, including the infliction of harm or the acquisition of benefits as a result of its actions, will be its developers, owners and operators.

Another important feature is universality - the ability of robots to participate in different social relations. We are not talking about the emergence of a universal robot that can learn and engage in any activity. There are no such algorithms in computer science yet. Consequently, each type (and even model) of robots de facto will be able to act as a subject of only a limited range of relations, determined by the specification of the model. We mean that the set of these types and models will be so large and diverse that the development of special legislation and special quasi-personality for each of them will be devoid of practical sense, although the initial steps to form the legal status of robots will be taken precisely in the context of their individual types. Thus, research is currently underway in the field of legal regulation of medical robots, unmanned vehicles, combat drones, etc. [27-29].

Thus, the acquisition by robots (as a class) of the property of universality and the assignment of property isolation (independence) to them can contribute to their recognition as subjects of law capable of acquiring and exercising rights and obligations within a wide (indefinite) range of legal relations. But at the same time, by their nature, robots will remain inanimate tools created by people in accordance with their design and needs, they will not have human qualities, such as will, self-awareness, desires, emotions and interests. Meanwhile, these qualities occupy an important place in the concept of legal personality, which has been developed and established in law today. Therefore, giving a robot legal personality is impossible without

revising or at least clarifying this concept.

## 3.2 Transformation of the Subjective Side and Related Concepts

As mentioned above, when there is a discussion about the possibility of endowing robots with legal personality, the main argument of the opponents of this approach is the lack of will, self-awareness, desires and emotions in the robot, as well as other exclusively human qualities, which for many centuries have been reflected in legal norms, legal principles and the very philosophy of law, which was intended to regulate relations exclusively between people and their collectives.

Such a partly dogmatic position is due, in our opinion, to several basic premises. First, it is the principle of *free will*, which is the cornerstone of private law. Secondly, a deeply developed and well-established concept of the *subjective side* of the crime, which is defined as the internal mental attitude of a person to the act he performs. This concept includes the will, awareness of the action, motives and emotions of the person - qualities that the most perfect robot will not have soon.

Finally, for practical reasons, giving robots any broad legal personality should not require the creation of "parallel legislation" regulating relations with their participation, most of the existing rules should be applicable to robot actors in the paradigm of legal personality that will be chosen for them. Consequently, the need to endow robots with the status of a subject (due primarily to expediency) must inevitably lead to some revision (universalization) of these important legal concepts that are inextricably linked with legal personality.

Law, like other social regulators, sets certain boundaries and vectors of human activity. It curbs the primary behavioral stimuli dictated by instincts, desires and emotions. *The will* manifests itself in a reasonable and conscious counteraction of a person to these incentives. Assessing the consequences of following one's desires (which may be associated with pangs of conscience, social condemnation, or, if it is a question of law, with legal responsibility), a human makes a *choice*. The presence of this choice, free will largely determines the essence of human from the point of view of philosophy, psychology and religion. The very philosophy of law is imbued with these principles. Even in Roman private law, the idea was developed that legal liability is directly related to the will of the person who committed the unlawful act. In Roman criminal law, only one form of guilt was singled out - intent, but later, under the influence of Christian teaching, the legislator begins to pay more attention not to the harm caused by the act (outer side), but to the manifestation of criminal will (inner side) [30, p. 88].

One should ask whether the legal relationship will change if the actions of some of its subjects become more determined than traditionally assumed (including at the stage of rule-making). Even without entering into a philosophical dispute about the predestination of human behavioral acts (and one of the philosophical directions just states the inevitability, the necessity of events in nature and society [31, p. 14]), one should answer this question in the negative. The legal status of other subjects will not fundamentally change, including their ability to exercise their own will. We can agree with the following criticism of the idea of a robot as a judge: "To assign the right punishment, you need to understand all the nuances of the life situation. This means that the judge must have the brains to think everything over, the soul to understand everything, and the will to make a decision" [32, p. 6]. However, for the content of the overwhelming number of legal relations, the presence of a soul and other human qualities is not essential. Returning to the determination of artificial subjects, it should be noted that although the robot acts according to well-defined algorithms, they can be very complex, and in addition, these actions will be significantly influenced by the internal state of the robot, which is the result of long-term processing of huge data arrays. Therefore, for an outside observer, the behavior of a robot (a complex intellectual system) can be unpredictable, including going beyond the legal, only it will be formed not under the influence of emotions, desires, instincts and reason, but in a completely different way.

This brings us to the second dimension of the concept of will as an integral feature of the legal person - associated with ideas about the subjective side of legally significant actions. The concept of the subjective side has received the greatest development in criminal and administrative law, in which it is defined as the internal mental attitude of a person to a socially dangerous act committed by him and, in addition to the will, includes awareness of the action (underlying the form of guilt), the motives and emotions of the subject, as well as in private law (parties' will is important element of the deal). Will, as some quintessence of the subjective side, includes awareness of one's act, emotions and motives that prompted one to commit it, and allows one to fully characterize the intention of a person, including the reasons for the formation of this intention. A legal entity (the second classical subject known to law) does not have a "natural" will, but also does not perform actions directly. The actions of a legal entity are actually expressed in the actions of its participants - people, therefore the will and interests of a legal entity can be reduced to the will and interests (as well as motives, etc.) of its participants. A robot or other artificial system a priori has no will in the psychological sense, just as it does not have emotions and interests. For a robot, there is no potential conflict between desire and will, which leads to the formation of an intention to perform a certain action, in other words, in the case of a robot, one can put an equal sign between the will, intention and purpose of the action.

Thus, it seems that for the legal qualification of an act committed by a robot, it is first necessary to establish the following factors:

– goal – the planned result of the committed action or, in other words, the state of the environment predicted by the robot, which should have occurred as a result of the execution of its decision;

– the reasons why the specified state was marked by the robot as a target;

– the logic according to which the action should have led to the target result;

– coincidence or difference between the actual result of the robot's action and the target result;

– the reasons due to which the result was different from the target (in the case when this happened).

The above factors sufficiently exhaustively characterize the subjective side for the qualification of the committed act. The most significant problem is related to the possibility of their establishment.

When evaluating the technologies currently used, one should separate:

a) classical deterministic algorithms and explainable artificial intelligence [33], in which each decision can be reduced to human-understandable initial data (prerequisites) and a chain of cause-and-effect relationships (commands) that led to the final result.

b) deep neural networks, as well as other algorithms that represent a "black box" for a person, but demonstrate the most effective practical results in terms of self-learning and the quality of generated solutions; They will not allow to ensure the proper qualification of the act in the usual way. A legal fiction will be required, a priori setting the goal = intentions = intent of the robot to coincide with the actual result and, as a result, imposing full responsibility on it.

The role of error in the case of a robot is also transformed. The meaning of an error in the program code or hardware of the robot will differ depending on whether the programmer or the robot is the subject of the law. A programmer's error testifies to the differences between his will (intention) and the result obtained, and can only indicate negligence. An error in the software and hardware design of a robot as a subject of law is its constructive characteristic, an inherent defect that affects behavior; actions committed under the influence of such an error will be qualified as unconditionally guilty, and the harm caused by them will be subject to compensation. Another meaning is the error caused by the incompleteness or inaccuracy of the data at the disposal of the robot, such cases will require special qualification and establishment: a) how the robot was able to detect or prevent this kind of error; b) how much the actions of other persons, including participants in the legal relationship in question, influenced this error; c) how likely is it to repeat such a mistake in the future.

It should be taken into account that the attention to the subjective side of legally significant actions (including will,

desires, motives, emotions and other aspects characterizing the internal state of a person) largely stems from the principle of *justice*. We believe it would be overly categorical to say that fairness towards robots does not and will not matter, but definitely, it will take third place in the list of priorities important for legal regulation and law enforcement, after fairness towards "human" participants in legal relations, as well as economic feasibility.

In addition to implementing the principle of justice and restoring the status quo, the main function of legal responsibility is the general and particular prevention of socially dangerous (socially harmful) acts, which is achieved by influencing the mental attitude of a person to his behavior through awareness of the consequences associated with legal responsibility [34, p. 374]. Software and hardware systems (including robots) that do not have a mental state, of course, will not be corrected by applying the educational function [35]. In this case, the mechanisms that control them - algorithms and internal state - should be subjected to corrective action. However, as quite rightly noted by V. Arkhipov and V. Naumov [4, p. 161] "from an external point of view, the dynamics of the algorithm that determines the actions of the robot (which has the ability to independently determine goals) coincides with the process of forming the legal will of a human". In other words, for the surrounding subjects it is not important how exactly the internal correction of the behavior of a human, a legal entity or a robot takes place - as a result of mental processes or algorithmic calculations - only the result is important, namely, socially acceptable behavior in the future (under which, in the very first approximation it is enough to understand the strict adherence to the requirements of the law).

Regardless of whether we are talking about autonomous robots with artificial intelligence or information systems of any complexity, their development begins with the identification of requirements, which, in addition to the needs of the customer and users, the features of business processes, the environment, etc., necessarily include requirements resulting from laws and by-laws. The developer is directly obliged to take into account these requirements, moreover, when legal requirements change, the information system must be properly modified or decommissioned.

So, the implementation of the preventive function of legal liability as applied to robot subjects can be expressed in the following main procedures:

*1. Accounting for legal requirements in the behavior of the robot.* The rules of action in certain circumstances dictated by the law should take precedence over other rules dictated by economic feasibility, the interests of the user, concern for the safety of the robot, etc. (but should not take precedence over rules and actions aimed at preserving human life and health). Depending on the algorithms, these priorities should be laid down in the form of instructions or

reflected in training examples, and the developer should bear strict and unconditional responsibility for this.

*2. Timely adaptation of the robot to changes in legislation and other regulatory legal acts that affect its behavior* (it should be expected that such changes will occur quite intensively in the initial period of widespread distribution of robots). With the appearance of universal robots capable of performing the widest possible range of tasks, one can also expect them to develop the ability to independently study the current legislation and take into account its changes. At the current stage, it is reasonable to require a controlled availability of a mechanism for timely reconfiguration (reprogramming or relearning), the developer must be responsible for the availability and performance of this mechanism.

*3. Accounting for incidents.* Specialized courts or administrative bodies ("incident review committee") must decide whether similar incidents can be prevented in the future (through relearning and with some guarantee), whether such incidents are acceptable (with low probability/frequency and a compensatory mechanism is in place) or unacceptable, which should mean the destruction of the corresponding series of robots.

*4. The destruction of a series of robots whose actions lead to unacceptable consequences,* such as human's death, is a measure of individual and general prevention, akin to *punishment.* Punishment is directly related to the impact on the psychological attitudes of the subject and for this reason it is not applicable to robots [36, p. 117]. For a human, his own life and freedom are natural priorities, and criminal law uses this circumstance. All values and priorities of the robot are formed by programming or learning and when it is impossible or ineffective, the physical destruction of the robot will be the only preventive measure.

## 4. Discussion

As justified above, in a scenario where the solution to the problem of responsibility of robots and intelligent systems will be associated with giving them legal personality, it will be necessary to transform the concepts associated with the subject and the subjective side in the direction of universalization. In particular, a change in the approach to the concept of will will be required, including a reduction in the importance of the principle of free will in some digital relations.

Ascertaining the debatability of this issue for the theory of law, it is worth noting that even now, with the development of modern digital technologies, technical and legal constructions are becoming popular, which in certain aspects restrict free will, moreover, this restriction is considered as a desired good. We are talking, first of all, about a smart contract, which is a self-executing program code on the blockchain platform, designed for the automated fulfillment of obligations [37, p. 2901]. The following two features of a smart contract are of fundamental importance:

1. A smart contract contains the essential terms of the contract, including the terms of accession, in its program code.

2. A smart contract provides automatic, without human intervention, the fulfillment of the terms of the contract upon the occurrence of certain circumstances. At this stage of development of technologies and programming languages for smart contracts, it can only provide for operations with digital assets, mainly within the same blockchain platform: cryptocurrencies, tokens, NFT objects, etc., the same applies to circumstances which the smart contract can fix with a certain reliability. One of the promising areas for the development of smart contracts is the development of so-called oracles that can certify legally significant facts of the real world in a digital environment: the supply of goods of proper quality, the provision of services, etc. It is likely that such oracles in the near future will take the form of robots that monitor and enforce the terms of the contract [6].

The self-execution of a smart contract logically and inevitably entails a restriction on the freedom of the contract, at least in terms of refusing to fulfill its conditions (and in some cases, in terms of withdrawing the offer for its initiator). According to A. Akhmedov [38, p. 23], "from the moment the basis for the execution of a smart contract arises, the will of its parties is not taken into account in any way and has absolutely no value". Churilov [39, p. 25] notes that "automated execution eliminates the need for a separate declaration of will aimed at fulfilling an obligation, which raises the question of the validity of such a legal action". The reasoning of S. Kuznetsova [40, p. 140] is also fair: "The peculiarities of smart contract technology are manifested in the fact that after the development of an appropriate electronic protocol based on a distributed ledger, its execution is completely separated from the will of the parties: the fulfillment of obligations is in no way conditioned by the need for volitional actions on the part of the obligated party, and changing the content of a smart contract, suspending its execution or early termination during its operation in a decentralized blockchain with a large number of storage nodes is virtually impossible. Thus, the recognition of a smart contract as an independent type of contract, which can be concluded exclusively in electronic form, leads to a derogation of the constitutional freedom of the contract".

On the one hand, a smart contract can be drawn up as flexibly as possible, including the possibility of terminating it at the initiative of any of the parties (at least in some short term, as technologies and languages for forming smart contracts develop). On the other hand, aside from the issue of failures in a smart contract due to cyberattacks or software bugs, limiting the ability to influence the terms of

a smart contract and their execution is seen as a boon that contributes to the predictability and sustainability of relationships over digital objects. In particular, it is noted that "smart contracts allow solving such problems as the unpredictability and ambiguity of judicial interpretation of the terms of the contract", as well as "one of the main problems of contract law, namely the problem of improper performance of obligations", since "smart contracts allow you to fulfill obligations properly, regardless of the will of the debtor" [41, p. 81].

For example, a smart contract that provides for the sale of digital assets or payment for digital services will function until its expiration date or until the corresponding assets or finances in the account associated with it are exhausted (in the latter case, one can see some analogy with the above-discussed way of connecting the functioning of the robot with his financial backing).

Thus, although a smart contract is developed and put into operation by its owner in full accordance with his will, later this will may change and the smart contract may be in the role of a representative of its owner, autonomously acting on his behalf and in accordance with previously received instructions. but against his will. Among the concepts of a smart contract accepted by the legislation and scientists of various countries (a special type of contract, a form of a contract, a way to fulfill contractual obligations), there is still no concept of a smart contract as a quasi-person, but going beyond the blockchain and integrating with autonomously functioning physical devices can force enough to seriously consider this idea.

## 5. Conclusion

The transformation of legal responsibility in the context of the development of digital technologies will require a universal approach.
On the one hand, further legal research is needed. The universal concept of legal responsibility needs further theoretical study. It should include: a) a prevention mechanism aimed at prioritizing socially desirable behavior; b) a retrospective prevention mechanism aimed at preventing the repetition of socially dangerous (harmful) behavior of a particular subject or group of subjects; c) compensatory mechanisms, mechanisms for restoring the status quo. At the same time, the universal approach involves abstracting from the nature of the corresponding mechanisms that will affect subjects of different nature in different ways - people, their teams, robots and other artificial entities.
In practice, it is advisable to clarify the existing legislative norms of criminal, civil and tort law in the direction of eliminating restrictions that prevent their application to artificial legal persons (quasi-persons).

Finally, in the technical field of production and operation of robots, in addition to the further development of explainable artificial intelligence technologies, the implementation of the approaches described above is relevant. At a minimum, the development of technologies is required that allow: a) fixing in retrospect the results planned by the robot; b) identify flaws that contribute to illegal behavior; c) carry out behavior correction (by relearning or in other ways).

## References

[1] Gracheva, Y. V., Aryamov, A. A.: *Robotization and artificial intelligence: Criminal and legal risks in the field of public security*. Actual Problems of Russian Law 15(6), 169–178 (2020) https://doi.org/10.17803/1994-1471.2020.115.6.169-178

[2] Karlash, D. S.: *Law of robots: Metaphysical and socio-economic aspects*. Entrepreneurial Law. Appendix "Law and Business" 4, 9–14 (2018).

[3] Ponomareva, E. V.: *Subjects and quasi-subjects of law: theoretical and legal problems of differentiation*. PhD theses, Ural State Law University, Yekaterinburg (2019).

[4] Arkhipov, V. V., Naumov, V. B.: On some issues of theoretical foundations for the development of legislation on robotics: Aspects of will and legal personality. *Law* 5, 157–170 (2017).

[5] Mikhaleva, E. S., Shubina, E. A.: *Problems and prospects of legal regulation of robotics*. Actual problems of Russian law 12, 26–35 (2016).

[6] Neznamov, A. V., Naumov, V. B.: *Strategy for regulation of robotics and cyber-physical systems*. Law 2, 69–89 (2018).

[7] Yeung, K.: *Responsibility and AI*. Council of Europe Study DGI (2019). https://rm.coe.int/responsibility-and-ai-en/168097d9c5 (access date: September 16, 2022).

[8] Russell, S. J., Norvig, P.: *Artificial intelligence: A modern approach*. Pearson Education Limited, Malaysia (2016).

[9] Scherer, M. U.: *Regulating artificial intelligence systems: Risks challenges competencies and strategies*. Harvard Journal of Law & Technology 29(2), 354–400 (2016) http://dx.doi.org/10.2139/ssrn.2609777

[10] Begishev, I. R.: *Limits of criminal law regulation of robotics*. Bulletin of St. Petersburg University. Law 12(3), 522–543 (2021) https://doi.org/10.21638/spbu14.2021.303

[11] Shubinsky, I. B.: *Functional reliability of information systems: Analysis methods*. Reliability, Moscow (2012).

[12] Kovaleva, N. N. (ed.): *Problems and challenges of the digital society: Trends in the development of legal regulation of digital transformations*, vol. 2. Saratov State Law Academy, Saratov (2020).

[13] Armstrong, J., Green, K.: *Forecasting methods and principles: Evidence-based checklists*. Journal of Global Scholars of Marketing Science 28(2), 103–159 (2018) http://dx.doi.org/10.1080/21639159.2018.1441735

[14] Tyler, T. R.: *Methodology in legal research*. Utrecht Law Review 13(3), 130–141 (2017) http://doi.org/10.18352/ulr.410

[15] European Commission, Directorate-General for Justice and Consumers: *Liability for artificial intelligence and other emerging digital technologies*. Publications Office (2019). https://data.europa.eu/doi/10.2838/573689 (access date: September 16, 2022).

[16] Bryson, J. J.., Theodorou, A.: *How society can maintain human-centric artificial intelligence*. In: Toivonen, M., Saari, E. (eds.) Human-centered digitalization and services, Translational systems sciences, vol. 19, pp. 305–323. Springer, Singapore (2019) https://doi.org/10.1007/978-981-13-7725-9_16

[17] Barakina, E. Y.: *Regulatory platforms in the field of legal regulation of the use of artificial intelligence*. Actual problems of Russian law 6, 77–87 (2021).

[18] Cerka, P., Grigiene, J., Sirbikyte, G.: *Is it possible to grant legal personality to artificial intelligence software systems?* Computer Law & Security Review 33(5), 685–699 (2017).

[19] Hallevy, G.: *The criminal liability of artificial intelligence entities - From science fiction to legal social control*. Akron Intellectual Property Journal 4(2), 171–220 (2010).

[20] Kapitonov, A., Lonshakov, S., Bulatov, V., Montazam, B. K., White, J.: *Robot-as-a-Service: From cloud to peering technologies*. Frontiers in Robotics and AI 8, 560829 (2021) https://doi.org/10.3389/frobt.2021.560829

[21] Meng, G.: *Ancient law, its connection with the ancient history of society and its relation to the latest ideas*. D.E. Kozhanchikov, St. Petersburg (1873).

[22] Myskin, A. V.: *Branch of a legal entity as a quasi-subject of civil law*. Civil Law 1, 6–9 (2014).

[23] Babajanov, I. H.: *Human life and death as institutional and legal categories (theoretical-axiological and private law analysis)*. PhD theses, Tajik National University, Dushanbe (2014).

[24] Belov, V. A., Blinkovsky, K. A.: *Civil law regulation of corporate relations with the participation of civilly incompetent (without legal personality) organizations*. In: Belov, V. A. (ed.) Corporate law: Actual problems of theory and practice, pp. 162–225. Yurayt, Moscow (2009).

[25] European Parliament resolution of February 16, 2017. Civil law rules on robotics. https://robotrends.ru/images/1725/66137/201706722_Resolution_and_Charter_EU_RoboTrendsru.pdf (access date: September 16, 2022).

[26] Neznamov, A. V. (ed.): *Regulation of robotics: An introduction to "robolaw". Legal aspects of the development of robotics and artificial intelligence technologies*. Infotropic Media, Moscow (2018).

[27] Antonov, A. A.: *Unmanned vehicles as sources of increased danger*. Transport Law 4, 7–10 (2021).

[28] Efremov, E. V., Koltykov, A. N., Kokhan, V. V.: *Development of proposals for the classification of medical robotic complexes for military purposes*. National Security and Strategic Planning 2, 87–90 (2017).

[29] Gabov, A. V., Khavanova, I. A.: *Autonomy of combat robots and law*. Perm Legal Almanac 2, 361–378 (2019).

[30] Skvoznikov, A. N.: *On free will and the ability to imputation in Russian legal science in the 19th - early 20th centuries*. Legal Bulletin of Samara University 6(1), 87–92 (2020) https://doi.org/10.18287/2542-047X-2020-6-1-87-92

[31] Vitushko, V. A.: *The concept and meaning of freedom of will in law*. In: Mankovsky, I. A. (ed.) Society, law, personality: Issues of interaction in the modern world, pp 13–18. International University "MITSO", Minsk (2017).

[32] Rumak, V.: *The so-called optimization is the road to nowhere [Interview with V.M. Zhuikov]*. Law 1, 6–17 (2018).

[33] Goebel, R.: *Explainable artificial intelligence: Concepts, applications, research challenges and visions*. In: Holzinger, A., Kieseberg, P., Tjoa, A., Weippl, E. (eds.) Machine learning and knowledge extraction. CD-MAKE 2020. Lecture notes in computer science, vol. 12279, pp. 1–16. Springer, Cham (2020) https://doi.org/10.1007/978-3-030-57321-8_1

[34] Alekseev, S. S.: *Problems of the theory of law*, vol. 1. Yuridicheskaya literatura, Moscow (1982).

[35] Dugenets, A. S.: *Administrative responsibility in Russian law*. PhD theses, Russian Law Academy of the Ministry of Justice of the Russian Federation, Moscow (2005).

[36] Vasilyev, A.: *Ethical and legal aspects of robotics: A European perspective*. The central European Journal of Social Sciences and Humanities 1(5), 113–120 (2019).

[37] Khan, S. N., Loukil, F., Ghedira-Guegan, C., Benkhelifa, E., Bani-Hani, A.: *Blockchain smart contracts: Applications, challenges, and future trends*. Peer-to-Peer Networking and Applications 14, 2901–2925 (2021).

[38] Akhmedov, A. Y.: *On the issue of the signs of a smart contract as a contractual structure*. Law and Digital Economy 2, 22–25 (2020).

[39] Churilov, A. Y.: *On the problem of the concept and legal nature of a smart contract*. Lawyer 7, 25–30 (2020).

[40] Kuznetsova, S. S.: *Topical issues of implementation and protection of human rights in the practice of using smart contract technology*. Enforcement 6(1), 134–149 (2022) https://doi.org/10.52468/2542-1514.2022.6(1).134-149

[41] Somova, E. V.: *Smart contract in contract law*. Journal of Foreign Legislation and Comparative Law 2, 79–85 (2019).