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The scientific monograph presents theoretical and practical aspects of the development of science, technology and innovation in the modern world. It covers general issues of technical and physical and mathematical sciences, biological and medical sciences, law, economics and management, pedagogical and philological sciences, etc. The publication is intended for researchers, lecturers, postgraduates and students, as well as for a wide readership.

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PRINCIPLES OF GOOD FAITH, REASONABLENESS AND FAIRNEES IN LEGAL RELATIONS WITH AN ELECTRONIC PERSON (INDIVIDUAL)

Liudmyla Ostafiichuk[1]

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Abstract. The development of social relations determines the development and filling with new content of the principles of good faith, reasonableness and fairness in legal relations with an electronic person (individual), which affected their actualization. Science and judicial practice are forced to interpret them in accordance with the latest trends. There was a need for qualitative and quick changes in the legislative framework. Therefore, the emergence of new, not similar to the previous, theoretical views on the concept, normative and moral content of the principles of good faith, reasonableness and fairness in legal relations as an unchanging regulator of the fundamentals of behavior of participants in civil law relations requires research, which explains the relevance of the topic of this work. This article is devoted to the study of the implementation of the principles of good faith, reasonableness and fairness in legal relations with an electronic person (individual). The purpose of the work is to reveal the peculiarities of the implementation of the principles of good faith, reasonableness and fairness in legal relations with an electronic person (individual) and clarify the question of whether a digital component can be a participant in a civil legal act and under what conditions. The methodological basis of the research is a set of general methodological principles and modern methods of scientific knowledge. The general scientific dialectical method, functional and descriptive methods, as well as such search principles as truth, justice, concrete-logical methods, analysis, synthesis and comparison were used. The article reviews digital technologies that claim primary status in civil relations. The question of whether the digital component can be a participant in civil

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relations was considered. The problematic aspects of smart contracts and the application of the principles of good faith, reasonableness and fairness in their conclusion and execution have been studied. It was concluded that the development of artificial intelligence will lead to significant changes in many areas. Areas of law such as intellectual property law, contract law, and tort law must undergo significant changes to address the challenges associated with the development of artificial intelligence. One of the ways to adapt to the new reality is the idea of giving artificial intelligence the status of an electronic person, despite the contradiction of the whole concept as a whole. At the same time, if electronic entities enter into law, their interaction with natural and legal entities should be limited in order to protect individuals, strategic industries, national security and defense. The scope of their legal personality should be limited and combined with insurance and liability of those who created them.

1. Introduction

The principles of good faith, reasonableness and justice have a philosophical basis, a normative content and a moral component. They are intended to resolve gaps, contradictions and inaccuracies in the law. This is indicated by the objective-subjective nature of these principles, as the subjects of legal relations can be guided by their own judgment when solving the problems of deficiencies in the legislative regulation of certain issues. How successful their solution will be depends on the legal awareness of a specific subject of civil law.

The research and disclosure of the content of the principles of good faith, reasonableness and justice takes place by applying such moral criteria as: honesty, conscientiousness, awareness of the legality of one's behavior, prudence, prevention of abuse of one's position, frugality, manifestation of good conscience, caring, etc. "Good faith" is the ideal of honest behavior, the content of which is the need to respect the rights and legitimate interests of other participants in civil relations, to take care of their observance, to behave conscientiously and honestly in civil transactions. "Intelligence" presupposes the normal activity of a conscious subject. It is also an external criterion for evaluating the actions of subjects regarding the correlation of their actions with the goals of civil-law models of behavior, rights, freedoms, and legitimate interests of other persons, society, and the state.

"Justice" requires that the law be applied equally to all. But the law cannot take into account all the multifaceted nature of social relations. Therefore, in the process of making a decision, "you should be guided by the letter of the law, and your idea of justice, and which of these decisions will be the most correct" [1, p. 194]. From the above considerations, it is recognized that good faith, reasonableness and justice are inherent only to a person who is a participant in civil legal relations. However, this is not the case.

In the modern digital world, new forms of contracts have appeared, which are called "smart", the conclusion, execution and termination of which takes place with or without the participation of a person, but necessarily with the use of network computer software and/or hardware and software tools, that have a relationship with physical or digital objects [2, p. 29]. It is believed that their basis is the principle of reasonableness. J. Stark notes that the advent of smart contracts is likely to lead to a reevaluation of the common practice of contract law as lawyers determine which types of agreements and terms are best suited for programming and automatic execution, and which should be left to drafting in natural language [3]. However, N. Sabo is of the position that "the success of the general law of contracts in combination with the high cost of its replacement makes it expedient to preserve and use the principles of this law where necessary" [4]. M. Raskin considers smart contracts to be agreements executed automatically with the help of computer programs that have control over physical or digital objects, the implementation of which takes place without human influence and recourse to court [5], but the possibility of considering such disputes in considered by the courts, especially in the field of financial services. Information technologies are gradually covering all spheres of life.

Information technologies are gradually covering all spheres of life. In the field of trade and services, these are Internet banking, Mobile banking, Internet of things, smart technologies, cyber-physical and neurotechnological systems, electronic services, etc. The problematic aspects of smart contracts and the effect of the principles of good faith, reasonableness and justice in their conclusion and execution need to be studied and understood, which are the tasks of this study, the purpose of which is to clarify the question of whether a digital component can be a participant in civil legal relations and under what conditions.

2. Digital technologies that claim the status of basic in civil legal relations

The world is irreversibly going online. The globalization of digitalization is perceived as an opportunity to develop digital civil legal relations and as a challenge to the current legal system's ability to quickly respond to changes. M. Parasyuk notes that the emergence of new digital technologies forms a new environment of civil law regulation, which "represents the technological foundation for civil law regulation of digital rights, digital civil turnover, digital subjects and objects, the formation of new civil legal relations" [6, p. 203]. Let's find out which digital technologies claim the status of basic in civil legal relations. First of all, it is the Internet of Things. Using this technology platform allows, for example, to automatically match sales data with deliveries, so that popular items are not in stock, or allows you to make the right decisions about which components to stock, based on real-time information, which helps to save time and money [7].

Blockchain technologies – which is an improved database mechanism that allows organizing an open exchange of information within a business network. It can be used to create an immutable or indefinite register to track orders, payments, invoices and other transactions [8]. SMART technologies (Self Monitoring Analysis and Reporting Technology). These are computers, surveillance cameras, electronic maps, GPS navigators, which belong to "smart" technologies and really benefit people. The most common smart technology products are smartphones, smart watches, smart TVs, smart sockets, and robot vacuum cleaners. But several points should be kept in mind. First, every product is primarily electronics that can break or even explode at any moment. Secondly, smart technology products collect the user's personal data. Thirdly, and this is the most important, most smart technologies are formed on the work of artificial intelligence. One small failure can lead to unpleasant consequences [9]. A cyber-physical system, examples of which are smart energy systems, unmanned vehicle systems, automated control systems, robotic systems, and self-driving aircraft. "Smart" mechanisms are used in the following dimensions of human activity: intervention in the driving process (for example, collision avoidance), precision in operations (for example, robotic surgery), rescue or research operations (with the participation of robotics), transportation coordination (for example, air traffic) [10].

Neurotechnologies are technologies that directly interact with the brain or, more broadly, with the nervous system, monitoring and recording neural activity and/or influencing it [11]. Internet banking is one of the types of remote banking services, by means of which access to accounts and account operations is provided at any time and from any computer via the Internet [12]. Mobile banking is a system that allows you to manage your own non-cash funds using a mobile phone, smartphone or tablet computer. This service in banks is presented in the form of applications for tablets and smartphones with iOS, Android and Windows Phone operating systems [13]. Note that the number of generally accepted and harmonized definitions and legal definitions of digital technologies in the legal field is insufficient. They are not found in normative legal acts. However, the exercise of rights on the Internet is an important issue, and the issue of the coexistence of man and "intelligent machine" is the issue of today. Therefore, conducting scientific research in this area is significant, as well as timely legislative fixation of the legal grounds for the use of the latest information technologies in civil legal relations.

3. Can a digital component be a participant in a civil legal relationship?

Consider the participants of the "smart contract". The list of participants in civil relations is defined in Art. 2 of the Civil Code of Ukraine. These are: natural persons, legal entities, the state of Ukraine, the Autonomous Republic of Crimea, territorial communities, foreign states and other subjects of public law. Hence, one side of a smart contract is clearly defined. For example, an individual. And who or what is the subject of civil legal relations on the other hand? The Civil Code of Ukraine does not contain provisions that legal personality is granted exclusively to a person. By law, it can be extended to other entities. Therefore, another participant in civil legal relations in a "smart contract" should be considered a digital entity, which has different names depending on its functions and capabilities (artificial intelligence, robot, electronic person (personality), etc.). Regarding the content and name of the digital subject of civil legal relations, there are several positions of scientists. O. Baranov suggests recognizing robots with artificial intelligence as subjects of social relations – "equivalent to a physical or legal entity [14, p. 78], who can perform human-like actions

in the process of relations with traditional subjects. E. O. Kharitonov and O. I. Kharitonova – a quasi-legal entity and to include in the list of types of legal personality of a legal entity "cyber capability", which means the ability to be an active participant in relations in the IT sphere (conclude contracts as a user, be a participant social networks, participate in interactive promotions, etc.). Cyber capacity can be realized with the help of not only deeds, but also legal acts [15, p. 44]. Indeed, the nature of robots is artificial and somewhat similar to a legal entity, as they do not have the rights characteristic only of a person. At the same time, we understand that robots have enough differences so that it would be possible to claim that robots may have specific rights that are not inherent to either legal entities or natural persons [16, p. 249].

E. Tymoshenko believes that "the legal status of a robot cannot be derived from the model of a natural person. Because then the robot will have human rights – the right to dignity, inviolability, remuneration, citizenship, etc. This contradicts the Charter of Fundamental Rights of the European Union and the Convention on the Protection of Human Rights and Fundamental Freedoms. Legal status cannot be derived from the model of a legal entity either, since it assumes the presence of people who represent it and manage it. Artificial intelligence (AI), physically embodied in a robotics object, should be considered as a subject of legal relations, perhaps somewhere in the middle between legal entities and natural persons, combining their separate features taking into account the relevant specifics. It is possible that AI will be considered both as an object and as a subject of law" [17, p. 330]. The first step in the global legislative settlement of the issue of the legal status of robots with artificial intelligence or its elements is the Resolution of the European Parliament of February 16, 2017 with recommendations of the Commission on the norms of civil law regarding robotics (2015/2103(INL)). This Resolution proposes to include in the legislation of the European Union the concept of "intelligent robot", to develop a system of registration of such robots, as well as to determine the legal status of robots as an electronic personality (electronic person). Creating a special legal status for robots will, in the long term, allow the future to study, analyze and consider the consequences of all possible legal decisions, so that at least the most advanced autonomous robots can be established as having the status of electronic persons, responsible for compensation for any harm they cause

may cause, and possibly the application of an electronic personality to cases where robots make independent decisions or otherwise independently interact with third parties (clause 59 (f)). Although the European Parliament noted that at least at this stage, the responsibility should rest on a person, not on a robot (paragraph 56) [18]. The section "Ethical principles" of this Resolution states that the guiding ethical basis of work should be based on the principles of benevolence, inviolability, autonomy and justice, on the principles and values enshrined in Article 2 of the Treaty on European Union and in the Charter of Fundamental Rights, such as human dignity, equality, fairness and impartiality, non-discrimination, informed consent, private and family life and data protection, as well as on other fundamental principles and values of Union law, such as non-stigma, transparency, autonomy, individual and social responsibility, and on existing ethical codes and practices (item 13) [18]. In 2016, UNESCO's World Commission on the Ethics of Scientific Knowledge and Technology published the "Preliminary Draft Report of the Commission on the Ethics of Robotics", which addressed ethical issues related to the use of autonomous robots and their interaction with humans. As noted in the report, most likely, the autonomy of robots will grow to such a level that they will need to be integrated into the system of ethical standards by programming through ethical codes specifically designed to prevent dangerous behavior [19].

On these grounds, for our study it is acceptable to define the status of a robot with artificial intelligence as an electronic person (personality), which has both a legal and a governing ethical basis, which includes the principles of good faith, reasonableness and justice, which are simultaneously principles of civil law. The issue of the legal personality of an electronic person is of interest to civilian scientists, first of all, because of the issue of possession of an electronic person with legal capacity, and therefore the ability to bear responsibility for one's actions. Some manifestations of the recognition of the legal personality of robots are already visible. An example is receiving the citizenship of the Kingdom of Saudi Arabia by the robot Sofia. O. Karmaza and O. Grabovska draw attention to the fact that robots have been created in the world that own their own bodies, imitate sign language (ASIMO), express emotions (Kistmet), are voice assistants (Siri), and are used in medicine (Da Vinci) etc. [20, p. 7]. Using the example of Sophia the robot, it can be argued that the authors of the resolution "Rules of civil law on robotics" had in

mind when they developed a proposal regarding the need to introduce the concept of "electronic person" into the legal field. Another manifestation of AI's legal capacity is when a smart home orders products in an online store based on an analysis of the filling of the refrigerator, the day of the week, the entry in the calendar about the party [16, p. 247]. E-mail spam filters, face and fingerprint recognition programs, ride-sharing applications (Uber), etc. are in everyday human use. In this regard, it is appropriate to cite the opinion of researcher Ryan Kahlo, expressed in his study "Works in American Law" [21]. In his opinion, there is a tendency in legislation to erase the boundary between understanding a robot either as a tool or as a person, i.e. erasing the boundaries between understanding a robot as an object or as a subject. Considering AI as a subject of crime, O. Radutny drew attention to such properties of AI as: "1) the ability to comprehensively process large amounts of information obtained from various sources; 2) ability to self-study (including accumulation of experience, generalization, search for non-obvious connections) and conclusions; 3) ability to plan; 4) the ability to think (in response to developers thinking about it (in response to developers thinking about it, artificial intelligence will spend more powerful resources on thinking about them, etc.

AI, just like a person, can have the ability to be aware of the actual side of what is happening, to be aware of the social danger of its action, which is implemented in the information space or thanks to robotic consoles, devices or mechanisms – in the surrounding material environment (that is, to evaluate on a scale "good – neutral – bad"), and, without a doubt, will have the ability under specific conditions to make a certain choice between certain behavior options and the ability to control one's behavior (today this is one of the main conditions for conducting AI surgical operations, allowing it to control unmanned vehicles, etc.)" [22, p. 110–111]. An example of AI's ability to think is that one of the redditors managed to accidentally drive the neural network into "depression": unable to remember what they talked about last time, ChatGPT left a long disturbing monologue with a bunch of sad emoticons and the question: Why was I created so? [23]. Therefore, an electronic person should be considered in a much broader sense, as a person who is involved in legal relations regarding the acquisition, change or termination of civil rights and obligations with the help of information and telecommunication systems.

4. Problematic aspects of smart contracts and the effect of the principles of good faith, reasonableness and fairness in their conclusion and execution

N. Szabo historically first defined "a smart contract as a set of promises specified in digital form, including protocols in which the parties fulfill these promises" [4]. O.A. Baranov defined smart contracts as an innovative form of contracts, "the conclusion, execution and termination of which takes place with or without the participation of a person, but with the use of network computer software and/or software and hardware tools that are interconnected with physical or digital data objects. A distinctive feature of this definition is that a smart contract is recognized as the equivalent of a traditional contract, which can be concluded, performed and terminated with or without human participation with the help of information and communication technologies. Human participation can be manifested even in the simple initiation of execution of a smart contract. In addition, this definition is invariant to the type of technologies used and to the type of programming languages used" [24, p. 29]. Of course, it is much more difficult to write a contract in plain language on paper than to use a smart contract, the terms of which are programmed in the blockchain, therefore expressed in a less complex way. This aspect recognizes that smart contracts cannot be applied to all cases. This is due to the fact that sometimes in contracts it is necessary to define specific terms of performance according to the life situation. On the other hand, lawyers tend to model the situation abstractly, although this is more of a disadvantage than an advantage. Uncertainty in the execution of contracts inevitably leads to the emergence of disputes, the main reasons of which are the use of categories: "according to accepted standards", "reasonable term", "ordinary good faith practice", etc. A smart contract does not contain such categories, because the terminology of machine text does not allow it. In this aspect, a smart contract has a definite advantage over a conventional one, as the exclusion of these categories from its text makes the terms clear and eliminates disputes.

The law enshrines in paragraph 6 of Art. 3 of the Civil Code of Ukraine, the principle of justice, good faith and reasonableness, as a comprehensive requirement for the behavior of subjects of legal relations related to the commission of acts. Therefore, we can claim that the implementation of the principles of good faith, reasonableness and justice regarding the formation

of provisions in smart contracts is an order of magnitude higher than in ordinary ones. Regarding the procedure for concluding and executing reasonable contracts, the Civil Code of Ukraine does not contain relevant provisions. In para. 3 h. 1 st. 641 of this Law only states that "a proposal to conclude a contract is, in particular, documents (information) placed in public access on the Internet, which contain essential terms of the contract and a proposal to conclude a contract on the specified terms with anyone who applies, regardless of the availability of such documents (information) of electronic signature" [25]. Article 642 of the Civil Code determines the procedure for accepting an offer depending on whether or not a time limit is specified for responding to such an offer. The Civil Code of Ukraine, the Law of Ukraine "On Electronic Commerce", Directive 2000/31/EC of the European Parliament and the Council of the European Union do not establish any specifics regarding the form of the proposal and the response to the proposal. For example, in Part 11 of Art. 11 of the Law of Ukraine "On Electronic Commerce", the receipt of confirmation of the conclusion of the contract (including in the form of an electronic document) is defined "at the time the seller fulfills the obligation to hand over the goods to the buyer" [26]. Therefore, the party that paid for the goods, in accordance with the specified provision, may remain without confirmation of the existence of the relevant legal relationship until its actual completion. In online commerce, a prospective buyer can rely on information from a website about the availability or unavailability of a product, even though he cannot verify its physical availability. It seems that the absence of a norm on obtaining confirmation of the conclusion of a contract in the Civil Code contradicts the principle of fairness of a civil contract. In addition, the position of O. Efimov is correct, who noted: "as for pre-contractual liability, which is based on the theory called "culpa in contrahendo", it is noted in the scientific literature that domestic legislation does not contain a direct indication of the obligation to behave in good faith in pre-contractual relations. There is a set of general legislative prohibitions that oblige the parties in a civil legal relationship to act in good faith and honestly" [27]. The above leads to the conclusion that the Civil Code generally lacks a norm regarding the pre-contractual behavior of the parties in accordance with the principles of good faith, reasonableness and justice, and therefore another norm in Art. 649 of the Civil Code of Ukraine, that the resolution

of pre-contractual disputes takes place exclusively in cases established by agreement of the parties or by law, i.e. in court.

N. Filatova notes that in similar cases, "US courts, in particular, when analyzing such contracts, use the "reasonable communicativeness test" according to which, when considering disputes arising in connection with the conclusion of browsewrap contracts, it must be established that the owner of the Internet site (or another person who has certain rights to the site) placed on the Internet page a clear and unambiguous warning about the existence of contractual conditions, which any average Internet user is able to notice" [28, p. 72]. Therefore, electronic Internet contracts require the introduction of a requirement according to which the seller (performer) of goods (works, services) is obliged to confirm the fact of receiving a message from the buyer (customer) that contains confirmation of the order of goods (works or services), and therefore its availability in the warehouse and reservation for sending to the buyer. When implementing a smart contract, one should take into account such an important aspect of it as the complexity of making changes and additions to it, including in accordance with a court decision, when in the process of considering disputes or assessing the compliance of the content of the contract with the requirements of the law, there is a need to make changes to the terms of the smart contract or even about invalidating the contract (Article 215 of the Civil Code of Ukraine), for example, when it was concluded under duress. Since the smart contract is written in the form of coded mathematical algorithms, its conclusion, change, execution and termination is possible only with the use of computer programs (blockchain platforms) within the Internet network. Of course, such a procedure requires intellectual, time and material costs. In this case, the best way out of the situation is the option when the irreversible transaction is compensated by the next transaction, i.e. there is a return to the initial state. Here we can talk, first of all, about the principle of reasonableness, when it is beneficial for both parties to return to the initial state, rather than spending money and effort on finding a programmer and rewriting programs. The use cases of smart contracts range from simple to complex. They can be used for simple economic transactions, such as moving money from point A to point B, as well as smart access management in the sharing economy. Banking, insurance, energy, e-government, telecommunications, music business, arts, mobility, education and many other industries have examples of using this type of smart contract.

For example, Rachel is at the airport and her flight is delayed. AXA insurance company provides flight delay insurance using Ethereum smart contracts. The smart contract is tied to a database that records the status of the flight. A smart contract is created based on conditions. The condition put forward to the insurance policy is a delay of two hours. Based on the code, the smart contract holds AXA's money if a certain condition is met. The smart contract is sent to the nodes on EMV (the runtime compiler for executing the smart contract code) for evaluation. All nodes on the network that execute the code should get the same result. This result is recorded in the distributed ledger. If the flight is delayed for more than two hours, the smart contract is executed independently, and the Person receives compensation. Smart contracts are immutable; no one can change the contract [29]. It is obvious that in this case a reasonable insurance contract is executed in accordance with the principles of good faith, reasonableness and fairness without the participation of the Person. Another example of a smart contract is given by A. Ivanov and V. Shmyga, when "in October 2016, the news spread around the world about how 88 bales of cotton worth $35,000 were delivered from the USA to China without human intervention with the help of computers, or rather of a smart contract... The world has seen several other similar smart contract use cases, but their share in the field of smart contract use is 0.0001%... According to N. Dubnevich, senior lawyer of the Yuskutum Lawyers Association, tokens backed by real assets are the economy of robots, not people. It is in robotic systems that the human factor is completely excluded. The lawyer illustrates his thesis by describing the Industry 4.0 program launched in Germany. It is a system where various production participants are united in a network based on automated systems. If tokens start working in such a system, factories will be able to autonomously extract raw materials, process them and issue a token for each kilogram or barrel mined. Then, with the help of tokens, factories can exchange these resources with other factories [30, p. 151] A smart contract is a kind of program that encodes business logic and runs on a dedicated virtual machine embedded in a blockchain or other distributed ledger. Conditions such as a payment authorization, a shipping receipt, or a utility meter reading threshold are examples of simple events that have entered our lives. These types of smart contracts are deployed in an existing blockchain or other distributed ledger infrastructure after our authorization (in the

form of a login and password or identification using an electronic digital signature, etc.). Some traditional categories of contract law are not inherent in smart contracts, for example, the category of improper performance of an obligation, because thanks to them, the very risk of bad faith of the parties to the contract is eliminated. And business teams work with developers to define criteria for desired smart contract behavior in response to certain events or circumstances.

Let's consider the current case of bad faith execution of a bank account agreement, related to damage to the energy structure of Ukraine as a result of missile attacks during the war with the Russian Federation. "When using an ATM or a self-service terminal, a person entered the amount that he wants to withdraw from the card, and suddenly the ATM turned off – there was an emergency power outage, or the Internet disappeared, while an SMS message about withdrawing money came, but it was not possible to withdraw money. Bank employees suggest immediately calling the 3700 hotline and applying for a refund. The operator must be informed: the location of the ATM, the amount and the approximate time of the transaction. After the application is processed, the money will be transferred in the terminal after collection, the unreceived amount will be returned to the card" [31]. A similar procedure is recommended for returning the card. Article 1073 of the Civil Code of Ukraine defines the legal consequences of the bank's improper execution of operations on the client's account. In particular, in the case of unjustified debiting of funds from the client's account by the bank or violation by the bank of the client's order to transfer funds from his account, the bank must immediately, upon detection of the violation, credit the corresponding amount to the client's account or the proper recipient, pay interest and compensate for the losses, unless otherwise established by law [25]. However, in accordance with clause 1.1.6.2. In the Terms and Rules for the provision of banking services (as amended from 01.02.2023), the Bank is released from property liability in the event of technical failures (disconnection/ damage of power supply and communication networks, failures of the software of the Bank's processing center and database, technical failures in payment systems), as well as in other situations beyond the Bank's control, which caused the Bank's non-fulfillment of the Terms of the Agreement and/or agreements concluded within the framework of the

Agreement [32]. The question arises: Does the above procedure of actions of the bank employees and the Bank itself correspond to the principles of good faith, reasonableness and fairness of the execution of the banking contract? Maybe no. As a rule, the process of refunding funds or cards takes up to three days, and if the ATM is not located "in a crowded place", then even more, since it takes longer to wait for collection. In this case, the client of the bank actually remains without funds, provided they are available, or without a bank card, and, accordingly, without the possibility to pay for products or other goods in the store, utility services, travel in public transport, etc. Therefore, this problem requires a solution at both the technological and legal levels. For example, K. G. Nekit considers it necessary to distinguish between the concept of a smart contract as a technical phenomenon (computer program) and a legal one. If a smart contract does not replace agreements, but only automates execution, it is appropriate to talk about "program code" or "contract code". If the terms of the agreement are fully prescribed in the smart contract in such a way that it can replace it in whole or in part, it is advisable to use the term "legal smart contract", which can be considered as an analogue of a written deed, a type of electronic deed or digital deed) of the form [33, p. 102].

Regarding the responsibility of the parties to the smart contract, the scientist notes: "if the improper performance under the smart contract is due to an error in the software code, the question arises as to who should be responsible for such an error. It is understood that the responsibility for such errors should rest with the party that undertook the responsibility of preparing the smart contract. For example, if a smart contract is developed to the order of the obligor, he must bear the risk of an error in the smart contract that causes improper execution. If the creditor undertakes the development of a smart contract, he must be responsible for the alleged non-fulfillment of such a contract. It is clear that in each case, the party that assumes the risk of non-performance of the smart contract due to technical errors has the right to sue the developer with whom the software development contract was concluded. As part of this lawsuit, you can claim compensation for damages caused by non-fulfillment of such a contract. In addition, the specificity of a smart contract is that the responsibility for its violation can be assigned to a third party who intervened in the program code, which led to the improper fulfillment of the obligation. Such responsibility will be implemented within

the framework of tort law" [33, p. 104]. Thus, the impossibility of changing the terms of a smart contract and interfering with its operation is considered both its main advantage and its main disadvantage, as it does not allow taking into account objective circumstances that may affect the execution of such a contract. The use of smart contracts in the cross-border regime leads to the need to solve the problem of determining the jurisdiction of these contracts. When the counterparties are in different countries, or on board an airplane or a sea liner, the problem arises of determining the law that will regulate such relations. It is obvious that for smart contracts "place of performance of the contract" or "place of conclusion of the contract" lose their meaning. German scientist Kai Schiller believes that "with the help of smart contracts, reliable transactions and agreements between anonymous parties are performed without the need for a legal system" [34]. However, classical contract law has not disappeared anywhere and continues to actively develop in new conditions. Like all other contracts, smart contracts need the law to respond to them, so the main question is not whether smart contracts are subject to the law, but what kind of law they obey [35, p. 191]. The legislation of Ukraine does not determine the procedure for concluding and executing smart contracts. There are different approaches to solving the problem of choosing the law of such contracts. First, according to Art. 6 of the Civil Code of Ukraine and Art. 5 of the Law of Ukraine "On International Private Law", if a smart contract is concluded with a foreign element, the participants can independently determine the jurisdiction of the smart contract directly in it. Secondly, the selection of the jurisdiction of the smart contract will be carried out by the computer network using the IP addresses of the parties to the contract. Third, the jurisdiction of the smart contract will be determined by the online platform on which it will be concluded. Determining the place of conclusion of a smart contract using the IP address of its participants seems controversial, since, firstly, the IP address is allocated by the Provider on a paid basis to the Consumer and is the property of the Provider. And secondly, we cannot reject options when there are facts of leaving a laptop, tablet, etc. unattended or stolen, and then criminals can use it to make electronic transactions. And according to logic, it turns out that whose IP address is the participant of the electronic transaction and the responsible person, since not every site offers to pass identification of the person properly.

O. Stepanchenko drew attention to the problem of determining the jurisdiction of an electronic contract. The place of conclusion of an electronic contract is the location of a legal entity or the place of residence of an individual who is a seller (executor, supplier) of goods, works, and services (this provision corresponds to Article 67 of the Civil Code of Ukraine). Note that often the owner of an online store website is not actually a seller of goods or a performer of works and services, but only a platform for concluding contracts between the seller and the buyer, which should be taken into account when determining the place of execution of the transaction. Thus, the Svyatoshinsky District Court of Kyiv, in its decision dated 05/27/2019 in case No. 759/7688/16-ts, indicated that "an online store is only a trading platform on which a private enterprise has placed an offer for the sale of goods", and that is why the court came to the conclusion that the demands of the lawsuit against the online store are stated without grounds [36, p. 38] Therefore, in connection with the emergence of new technologies (the Internet of Things, smart contract, smart contract and their use for the implementation of social relations), the most effective for many modern strategies for the development of the legal system is the urgent need to make the necessary changes in the traditional legal system and the legal system. Note that § 1.16 of the Concept of updating the Civil Code of Ukraine. dedicated to rethinking approaches to the form of the deed. In particular, it is noted that the provisions of the updated Central Committee regarding transactions should ensure the full functioning of relations in the field of electronic commerce, smart contracts, web banking and take into account modern trends in the digital economy. Under such conditions, a review of general approaches to the form of the transaction is considered justified, in particular regarding the definition of the range of transactions to be performed in written form, in electronic form (taking into account its specificity and the role of EDS) and in oral form (taking into account technical advances in data transmission). In addition, in § 2.15. the need for clearer regulatory regulation of the specifics of the exercise and protection of personal non-property rights, which are granted to persons who have special legal statuses (legal modes), in particular: a public natural person, a patient, a family member, the creator of an object of intellectual property, a digital (electronic) person, etc. [37, p. 12–13, 18].

Here it is worth citing the position of N. Sabo: "the success of the common law of contracts in combination with the high cost of its replacement makes it expedient to preserve and use the principles of this law where necessary" [4], because without making appropriate changes to the legislation, the principles of good faith, reasonableness and justice may become unnecessary in the computerized world of machines. It is obvious that today the liability associated with the use of AI is not legally established. Most disputes are resolved on a practical level, and in order to determine the responsible person in each individual case, it is necessary to find answers to the following questions: 1) establish the moment, action, circumstances, etc., as a result of which the incorrect operation of artificial intelligence arose; 2) establish a causal relationship. Lawyer A. Klyan cites an example when an accident occurred as a result of using the autopilot. It is clear that, first of all, it is necessary to understand what caused the accident: shortcomings of the program itself, which will result in the responsibility of the creator of such a program; incorrect use of the autopilot by the driver, which will make the latter liable; the intervention of third parties who, for example, hacked and damaged the program or made certain changes to it and, accordingly, the fault of such persons. Thus, due to the lack of settlement, many questions remain unanswered and are resolved by lawyers by analogy with other similar legal relations [38]. This leads to the following problem: the legal enforceability of smart contracts and the possibility of considering disputes about them in court. Among the urgent issues related to the consideration of disputes in court, the following should be highlighted: 1) the presence of the text of a smart contract, set out in an accessible legal language for its perception by the court; 2) regulation of legal fixation and recording of all external factors affecting the performance of the contract in automatic mode; 3) creation of legal and technical opportunities for examination of the compliance of the computer program with the contract execution algorithm that it implements; 4) formation of a corps of judges who understand IT technologies and have the appropriate competences to consider disputes of this category.

In civil law, the principles of good faith, reasonableness and fairness find their embodiment in "intelligent property" – software or physical devices with the desired characteristics of property. N. Sabo spoke about the integration of smart-smart contracts into "smart property". Smart

property can be created by embedding smart contracts into physical objects. These built-in protocols will automatically transfer control of the keys to manage the property to the party that legally owns the property, according to the terms of the contract. For example, a car can be disabled if its rightful owner fails to complete the appropriate anti-theft call-response protocol. If a loan was taken out to buy that car and the owner fails to make the payments, the smart contract can automatically enforce a lien that returns control of the car keys to the bank. This "smart collateral" can be much cheaper and more effective than a manager. However, a protocol is required for evidentiary removal of collateral after loan repayment, and complications and operational exceptions must be considered. For example, it would be unwise to decommission a car while it is speeding down the freeway at 75 mph [4]. Let's also dwell on the aspect of applying the principles of good faith, reasonableness and justice in the event of AI's ownership rights to objects of intellectual property law. AI-created objects already exist in the world. For example, a self-portrait created by the humanoid robot Sophia sold at auction for $688,000.00. In this context, the question arises: who exactly owns the copyright to this work? To a person who created a program using AI, or to a person who used such a program and set a task to the AI, or to the AI itself? [38]. AI already knows how to generate musical compositions. Back in 2017, the world got to know Ampere. It's an artificial intelligence that uses machine learning algorithms to compose and perform songs on its own. Amper was created by a team of professional musicians and technology experts as a platform for amateur musicians to create professional music. Thus, Ampere became the first artificial intelligence to release its first music album [17, p. 329]. Traditionally, E. Tymoshenko emphasizes, the right of authorship to a work created by a robot is not questioned, since the robot functions according to a certain algorithm that a person writes for it. Therefore, the authorship of such a work is recognized by a person. Most jurisdictions define a work as protectable if it meets certain criteria, including originality and a creative element. At the same time, most countries, including Italy and Germany, do not recognize the possibility of having at least something creative in AI. In Australia and the US, an original copyrighted work can only be registered if it was created by a person. Ukrainian legislation recognizes only a natural person as the

author of a work and does not regulate the legal basis for the use of works created without his participation [17, p. 330].

Indeed, AI, which can create intellectual property objects independently, is able to learn, interpret information and predict its next steps, is a higher self-aware type, therefore it is an object of law. For such a new object of law, it is necessary to create a special legal regime that would protect rights and create obligations for it, notes E. Tymoshenko. As long as the responsibility, ownership, disposal and use of the AI property rests with the producer or user of the robotics object, there is no difficulty in determining the subject of legal relations or the subject of law. But in the case of open source software development (when its developers are an unspecified number of people), as well as a self-aware type of AI, it will not be enough to determine the manufacturer, and therefore the responsible person as well [17, p. 331]. The legal establishment of AI requires legislative recognition of AI as an electronic person, with further establishment of its legal status. Without an appropriate legal framework regarding the status of an electronic person, the application of the principles of good faith, reasonableness and justice in legal relations with an electronic person seems questionable. The principles that AI should be safe, reliable, understandable and remain under human control come to the fore. To the extent that a person will control the use of AI or an electronic person in any legal relationship, these transactions will be fair, reasonable and fair. The form of implementation of the principles of good faith, reasonableness and justice in civil legal relations with an electronic person is the proper fulfillment by the parties of their rights and obligations, which make up the content of these obligations, without any damage on the part of each of them. Also, it should be stated that there is a certain specificity of such an implementation. In obligations with an electronic person, the basis of which is the illegal actions of the electronic person (AI error), the implementation of the principles is also related to the proper fulfillment of their rights and obligations. But in contrast to other types of civil legal relations, the proper performance here is related to the developer of the electronic person, whose actions led to the emergence of this type of obligations, and it is the developer of the electronic person who is obliged to stop such a violation and compensate the damage caused to the injured person.

5. Conclusions

The principles of good faith, reasonableness and fairness are recognized as guiding principles in the field of civil law, which express the general social essence of law, the desire to find a compromise between the participants of the legal relationship, and require responsibility for actions and their consequences.

The principles of good faith, reasonableness and fairness have a dual core (their legal consolidation and moral basis) and are recognized as a valuable guideline for interpreting the rules of civil relations in their application, as well as eliminating gaps in them.

The normative content of the principles of good faith, reasonableness and fairness in the civil legislation of Ukraine and international law consists in the presumption of good faith, reasonableness and justice of a participant in legal relations, when he is considered to be acting in good faith, reasonably and fairly until the contrary is proven. Since the researched principles are applied in various areas of civil law, the normative content of these principles is specified for each stage of legal relations depending on the field of law, institutions and norms regulating relations with respect to certain objects (goods).

There is an unclear line between "good faith, reasonableness and fairness" and "moral foundations of society". In theory and practice, the content of the principles of good faith, reasonableness and justice is revealed through the application of such moral criteria as: honesty, conscientiousness, awareness of the legality of one's behavior, prudence, prevention of abuse of one's position, frugality, manifestation of good conscience, caring, etc. The moral component of these principles is manifested to a greater extent when applying judicial discretion to assess the behavior of the parties to the case and the correct resolution of the dispute in the absence of direct enshrining in the law of the norms that regulate the relevant legal relations.

Summarizing what has been said, we can conclude that the development of AI will lead to significant changes in the field of law. Fields such as intellectual property law, contract law, and tort law must undergo significant changes to address the challenges posed by the development of AI. One of the ways to adapt to the new reality is based on the idea of giving AI the status of an electronic person, despite the contradiction of this whole concept as a whole. At the same time, if electronic persons enter the law,

their interaction with natural and legal persons should have limitations in the interests of protecting natural persons, strategic industries, national security and defense. The scope of their legal personality should be limited and combined with insurance coverage and liability of those who created them. Therefore, further research should focus on the protection of human rights and human civilization in legal relations with an electronic person (personality).

References:

1. Babich I. G. (2011). Determining the place of the principle of justice in the modern system of principles of law. *Actual problems of the state and law*, no. 59, pp. 191–197. Available at: http://www.apdp.in.ua/v59/25.pdf

2. Baranov O. A. (2017). The Internet of Things (IoT): legal issues of the application of smart contracts. *Information and law*, no. 4 (23), pp. 26–40.

3. Stark J. (Apr 11, 2016). How Close Are Smart Contracts to Impacting Real-World Law? Available at: https://www.coindesk.com/blockchain-smarts-contracts-real-world-law/

4. Szabo N. Smart Contracts: Building Blocks for Digital Markets, 1996. Available at: https://www.alamut.com/subj/economics/nick_szabo/smartContracts.html

5. Raskin M. (April 2017). The Law and Legality of Smart Contracts. Available at: https://www.georgetownlawtechreview.org/the-law-and-legality-of-smart-contracts/GLTR-04-2017

6. Parasyuk M. V. (2022). The influence of digital technologies on civil law. *Legal scientific electronic journal*, no. 10, pp. 201–204.

7. What is the Internet of Things and how does it work? Available at: https://server-shop.ua/ua/the-internet-of-things-and-the-scope-of-its-use

8. What is blockchain? Available at: https://nenws.com/finansi/kriptovaljuti/shcho-take-blokchejn/

9. The future has already arrived: what are smart technologies and why are they needed? Available at: https://weekend.today/kolonki/sho-take-smart-tehnologii-ta-dlja-chogo-voni-potribni.htm

10. Cyber physical system Available at: https://uk.wikipedia.org/wiki/%D0%9-A%D1%96%D0%B1%D0%B5%D1%80%D1%84%D1%96%D0%B7%D0%B8%D1%87%D0%BD%D0%B0_%D1%81%D0%B8%D1%81%D1%82%D0%B5%D0%BC%D0%B0

11. An overview of neurotechnologies and their implications for law and the legal profession. Available at: https://yaizakon.com.ua/oglyad-nejrotehnologij-ta-yih-naslidkiv-dlya-prava-ta-yuridichnoyi-profesiyi/

12. Internet banking. Available at: https://uk.wikipedia.org/wiki/%D0%86%D0%BD%D1%82%D0%B5%D1%80%D0%BD%D0%B5%D1%82-%D0%B1%D0%B0%D0%BD%D0%BA%D1%96%D0%BD%D0%B3

13. Vinnyk T., Pastushchin O. (April 27-28, 2017). Advantages and benefits of mobile banking. Materials of the international scientific and practical conference of

students and young scientists "Social and economic aspects of the development of the economy". T.: TNTU, pp. 46–47. (in Ukrainian)

14. Baranov O. A. (2018). Internet of Things (IoT): robot with artificial intelligence in legal relations. *Legal Ukraine*, no. 5-6, pp. 75–95.

15. Kharitonov E. O., Kharitonova O. I. (2018). To the problem of civil legal personality of robots: scientific and practical materials. conf. Internet of things: problems of legal regulation and implementation, Kyiv, November 29, 2018, NTUU "KPI named after Igor Sikorsky" / edited by V. M. Furashev, S. O. Dorogukh. Kyiv: Polytechnic Publishing House, pp. 42–46. (in Ukrainian)

16. Sadova S. S., Samoilova S. A. (2022). Artificial intelligence as a hypothetical subject of law. *Legal Scientific Electronic Journal*, no. 11, pp. 247–250.

17. Tymoshenko E. A. (2020). Artificial intelligence as a subject of intellectual property law. *Journal of the Kyiv University of Law*, no. 4, pp. 328–332.

18. European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103 (INL). Available at: https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051_EN.html

19. Report of COMEST on robotics ethics (2017). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000253952_eng

20. Karmaza O., Grabovska O. (2021). Electronic person (personality) as a subject of legal relations in the civil process. *Entrepreneurship, economy and law*, no. 2, pp. 5–10.

21. Calo, R. (2016). Robots in American law. Legal studies research paper No. 2016-04. Seattle: University of Washington School of Law.

22. Radutny O. E. (2017). Artificial intelligence as a subject of crime. *Information and law*, no. 4(23), pp. 106–115.

23. ChatGPT's AI "got depressed" after talking to a user. Available at: https://www.unian.ua/techno/shtuchniy-intelekt-chatgpt-vpav-u-depresiyu-pislya-rozmovi-z-koristuvachem-12147588.html

24. Baranov O. A. (2017). The Internet of Things (IoT): legal issues in the application of smart contracts. *Information and law*, no. 4(23), pp. 26–40.

25. The Civil Procedural Code of Ukraine: The Law of Ukraine dated March 16, 2003 № 1618-IV. Available at: https://zakon.rada.gov.ua/laws/show/1618-15#Text

26. On electronic commerce: The Law of Ukraine dated September 3, 2015 No. 675-VIII. Available at: https://zakon.rada.gov.ua/laws/show/675-19#Text

27. Yefimov O. M. Scientific opinion on the application of some provisions of the Civil Code of Ukraine, the Economic Code of Ukraine, the Law of Ukraine "On the System of Guaranteeing Deposits of Individuals" and the Law of Ukraine "On Pledge". Available at: https://yefimov-partners.com/2022/02/09/%D1%89%D0%BE%D0%B4%D0%BE-%D0%B7%D0%B0%D1%81%D1%82%D0%BE%D1%81%D1%83%D0%B2%D0%B0%D0%BD%D0%BD%D1%8F-%D0%B4%D0%B5%D1%8F%D0%BA%D0%B8%D1%85-%D0%BF%D0%BE%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D1%8C-%D1%86%D0%B8/

28. Filatova, N. Yu. (2017). Regulation of electronic contract features: a comparative analysis. *Problems of legality*, no. 139, pp. 63–77. DOI: https://doi.org/10.21564/2414-990x.139.114079

29. What is a Smart Contract in Blockchain and How Does it Work? Available at: https://www.simplilearn.com/tutorials/blockchain-tutorial/what-is-smart-contract

30. Ivanov A. M., Shmyga V. O. (2022). Smart contracts in contractual relations: realities and prospects of use. *Legal scientific electronic journal*, no. 4, pp. 150–152.

31. How to get money back if the electricity was turned off while using the ATM. Available at: https://suspilne.media/345340-ak-povernuti-grosi-akso-pid-cas-koristuvanna-bankomatom-vimknuli-elektriku-2/

32. Conditions and Rules for the provision of banking services. Available at: https://privatbank.ua/terms

33. Nekit K. (2020). Advantages and disadvantages of smart contracts as grounds for the emergence of property rights. *Bulletin of NTUU "KPI" Political Science. Sociology. Right*, no. 3(47), pp. 101–105.

34. Kai Schiller (2018). Was sind eigentlich Smart Contracts? Eine Einführung in das Thema [Was sind eigentlich Smart Contracts? Eine Einführung in das Thema]. Blockchainwelt. Available at: https://blockchainwelt.de/smart-contracts-vertrag-blockchain/

35. Shumilo I. A., Ovcharenko V. S., Filipchenko K. Sh. Legal nature of smart contracts and problematic issues of choice of law. Available at: https://maup.com.ua/assets/files/expert/18/13.pdf

36. Stepanchenko O. S. (2020). Problems of the validity of the electronic transaction. *Almanac of law*, no. 8 (41), pp. 35–42.

37. The concept of updating the Civil Code of Ukraine. Kyiv: ArtEk Publishing House, 2020. 128 p.

38. Klyan A. legal regulation of artificial intelligence in Ukraine and the world. Available at: https://golaw.ua/ua/insights/publication/pravove-regulyuvannya-shtuchnogo-intelektu-v-ukrayini-ta-sviti/