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LEGAL PERSONHOOD OF ARTIFICIAL INTELLIGENCE SYSTEMS: TO BE OR NOT TO BE?

Abstract. The *purpose of the article* is to examine the possibility of establishing legal personhood for artificial intelligence systems (robots).

Research methods. The methodology of this study includes such methods of scientific research as comprehensive system analysis, comparative legal analysis, and dialectic method. The method of comprehensive system analysis makes it possible to examine artificial intelligence systems as complex entities and determine the legal consequences of these systems' operation. Comparative legal analysis allows comparing different legal provisions and legal concepts applying to these systems. The dialectic method is used to assess the progress of artificial intelligence systems as well as the development of legal provisions and concepts applying to them.

Results. To a large extent, the concept of legal personhood is based on the idea that human beings are the only intelligent entities capable of reasoning and making decisions. However, autonomous robots are likely to become even smarter than humans due to the development of artificial intelligence. This trend gives rise to the concept of electronic persons. For the time being, it is too early to recognize robots as electronic persons. Nonetheless, over time, when artificial intelligence reaches the level of strong (general) intelligence, the need for recognizing autonomous robots as electronic persons may become apparent. Although the concept of electronic persons is controversial, it may provide some legal solutions with regards to the redress for the damage caused by autonomous robots, conclusion and performance of contracts as well as legal protection of intellectual property generated by artificial intelligence systems. However, there should be restrictions of electronic persons' rights in strategic industries and in the field of national security and defense. It might be sensible to forbid electronic persons to buy and sell farm land, drugs, nuclear fuel and other dangerous substances, firearms and other weapons as well as industrial facilities designed for their production.

Conclusions. Such areas of law as intellectual property law, contract law and legislation on tort liability will have to undergo significant changes in order to address the challenges posed by the development of artificial intelligence. One of the ways to adjust the existing legal landscape to a new reality is based on the idea of granting autonomous artificial intelligence systems legal personhood and turning them into electronic persons. In the future, when autonomous smart robots reach the level of artificial general intelligence, this concept may serve as a basis for a major legal transformation comparable to the emergence of legal persons. At the same time, electronic persons' rights have to be limited in the interests of protecting natural persons, strategic industries, national security and defense. Besides, limited scope of their legal personhood should be coupled with insurance cover as well as limited liability of those who created them.

Key words: artificial intelligence, legal personhood, electronic person, redress for the damage, intellectual property.

1. Introduction

Nowadays artificial intelligence seems (hereinafter – AI) to be a buzz word. And, it is so for a good reason, as humanity is standing on the doorstep of a new technological revolution. So far there have been some technological revolutions, including such important ones as the inventions of a print-

ing press, machine-tools, and computers. Each of these revolutions had a profound impact on the progress of civilization. The invention of a printing press by Johannes Gutenberg made it possible to disseminate information on a large scale thus contributing to the development of science, education and enlightenment in general. The industrial revolution and con-

sequently the advent of an industrial society took place after the introduction of machine-tools in the manufacturing sector. Advances in semi-conductor and digital technologies led to the creation and development of computers paving the way for information society, which is also referred to as post-industrial society.

These days we can witness another technological revolution, namely the development of AI technologies. These technologies are capable of providing numerous opportunities as well as causing a wide range of issues. Although the full potential of AI is hard to assess at the moment, it is already clear that sooner or later we are going to live alongside autonomous entities capable of thinking and making decisions on their own. Therefore, sooner or later we are going to face a serious legal issue, namely – how should the law treat such autonomous AI entities? Should they be regarded merely as things or products or as natural and legal persons with their rights and obligations?

In recent years these questions have been raised and discussed in European and American scientific literature by such legal scholars and practitioners as A. Bertolini, J. Delcker, J.J. Bryson, M.E. Diamantis, T.D. Grant, S. Chesterman, R.A. Maydanyk, N.I. Maydanyk, M.M. Velykanova, R. Free, M. Iglesias, S. Shamulia, and A. Anderberg. Although the academic debate over these issues has been going on for a while, it is still relevant as no practical solutions to these problems seem to have been found. Moreover, the quest for such solutions seems to be particularly relevant for Ukraine, where these issues have not been properly examined by the legal community. Therefore, the purpose of this study is to examine the possibility of establishing legal personhood for AI systems. Even though this study may seem largely theoretical at first sight, it is supposed to provide a scientific foundation for addressing practical tasks concerning the redress for damages caused by AI robots, the conclusion and performance of smart contracts with the participation of autonomous AI systems as well as intellectual property rights for assets created by such systems.

The methodology of this study includes such methods of scientific research as comprehensive system analysis, comparative legal analysis and dialectic method. The method of comprehensive system analysis makes it possible to examine AI systems as complex entities and determine the legal consequences of these systems' operation. Comparative legal analysis allows to compare different legal provisions and legal concepts applying to these systems. The dialectic method is used to assess the progress of AI systems as well as the development

of legal provisions and concepts applying to them.

2. Legal personhood and electronic persons

The concept of legal personhood (legal personality) is pivotal for all legal systems. It basically comes down to questions like – what entities can have rights and duties or what entities can take part in legal relations? Nowadays the ascription of legal personhood is based on the assumptions that all legal relations take place among natural person and artificial legal person, such as corporations (Avila Negri, 2021, p. 2). Even though legal persons are not human entities themselves they can be regarded as aggregations of humans. After all, corporations do not make any decisions or engage in any activities themselves. Instead, there are always some people acting on behalf of corporations. Hence, in one way or another the modern concept of legal personhood (legal personality) hinges on the human origin of rights and duties. To a large extent this is due to the fact that until recently a human being has been the only entity capable of logical reasoning and making decisions, which is absolutely essential for exercising rights and performing duties.

However, due to the advances in AI technologies the situation is about to change. Although we still live in times of the so-called “weak or narrow AI”, when artificial intelligence systems are capable of performing only certain tasks, like playing chess, recognizing speech or translating texts, sooner or later we are going to live side by side with “strong or general AI”, capable of learning and performing various intellectual tasks at the level equal to human. Ultimately, AI will surpass human intelligence in all possible aspects – from creativity to problem-solving and general wisdom, reaching the level of artificial superintelligence (Padaliya, 2019). In other words, pretty soon we are going to live alongside entities with the level of intelligence comparable to ours or even higher than our own. It basically means that human monopoly on intelligence will be lost to smart machines.

In such circumstances, unsurprisingly, legislators and legal scholars are starting to realize that humans are no longer the only intelligent creatures capable of acting and making decisions on their own. As a result, in recent years there have been attempts to assess the implications of AI for civil law. In 2017 a very significant step in this area was taken by the European Parliament in its Resolution with recommendations to the Commission on Civil Law Rules on Robotics, suggesting to consider the implications of all possible legal solutions regarding smart robots, including the possibility of creating a specific legal status for robots in the long

run, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons responsible for making good any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently (European Parliament, 2017). This report stirred a lively debate on whether or not it would be worthwhile to establish the legal personhood (legal personality) of smart robots powered by AI.

The standpoint of those in favor of granting autonomous robots legal personhood is well exemplified by the statement of a Milan-based corporate lawyer Stefania Lucchetti, who said: "In a scenario where an algorithm can take autonomous decision, then who should be responsible for these decisions?" According to her the current model, in which either the manufacturer, the owner, or both are liable, would become defunct in an age of fully autonomous robots, and the EU should give robots some sort of legal personality "like companies have" (Delcker, 2018).

An important practical reason for giving AI systems some sort of legal personhood is the need to ensure proper compensation of damage caused by such systems. The thing is that modern AI systems are very complex. Their creation and operation involve a lot of participants such as software developers, manufactures, owners, operators etc., making it quite difficult for a victim to sue the right person for damages. As a result, it becomes increasingly difficult for a victim to get compensation. So, among many reasons for granting autonomous robots legal personhood the need to identify a single entry point for litigation, as it is described in Artificial Intelligence and Civil Liability Report (Bertolini, 2020), appears to be noteworthy. In light of this practical necessity the idea of smart robots becoming electronic persons does not seem improbable.

At the same time, there are many opponents of turning robots into electronic persons. In a letter to the European Commission, 156 artificial intelligence experts hailing from 14 European countries, including computer scientists, law professors and CEOs, warn that granting robots legal personhood would be "inappropriate" from a "legal and ethical perspective". According to Nathalie Navejans, a French law professor, who was the driving force behind the letter: "<...> by adopting legal personhood, we are going to erase the responsibility of manufacturers" (Delcker, 2018). This view is shared by other legal scholars. In particular, J.J. Bryson, M.E. Diamantis, T.D. Grant claim that although it is completely possible to declare "a

machine a legal person <...>, an electronic person by contrast might prove to be a legal black hole, an entity that absorbs a human actor's legal responsibilities and from which no glint of accountability is seen". Unfortunately, there is no question that such a readily-manufacturable legal lacuna would be exploited as a mechanism for avoiding and displacing legal liabilities and obligations (Bryson, Diamantis, Grant, 2017, p. 289).

Besides, the opposition to the idea of granting AI systems legal personality has a moral argument. The attribution of legal personhood (legal personality) to humans and human communities (corporations, organizations) has a lot to do with the fact that law in general has a moral foundation and therefore rights and duties are the reflection of moral values. Since human being is the only entity capable of distinguishing between good and evil, right and wrong, justice and injustice it is natural that the capacity to have rights and duties and take part in legal relations (legal personhood) is attributed to individual humans and human communities (corporations, organizations etc.).

However, we cannot rule out the possibility that in the future thanks to machine learning AI systems may become capable of perceiving moral values. Even more so, what if autonomous robots learn to stick to moral values better than humans do? After all, unlike human beings, robots are not prone to corruption and other forms of moral degradation. Thus, despite the fact that today this moral criterion is still quite valid it is not clear if it will stand the test of time.

As we can see there are arguments both for and against granting legal personhood to robots. However, for the time being it seems that it is too early to recognize robots as electronic persons, although there are no technical obstacles for that. After all, a legal person is also an artificial legal character. Nonetheless, over time when AI reaches the level of strong (general) intelligence the need for recognizing autonomous robots as electronic persons (granting them legal personhood) may become apparent. In this regard it is also possible to agree with O.V. Kokhanovska, who says that, "it is necessary to "make haste slowly", bearing in mind that the legal consolidation of processes occurring in society in the development of information society should be based on well-being of people as the highest virtue" (Kokhanovska, 2020, p. 159). Thus, in any case the recognition of electronic persons must ultimately depend on the interests of people.

Another important question regarding the legal personhood (legal personality) of AI systems is what kind of rights and duties should

be given to such electronic persons? In this respect the closest analogy that can be used is that of a legal person. As S. Chesterman points out, in the case of corporations, personality typically means the capacity to sue and be sued, to enter into contracts, to incur debt, to own property, and to be convicted of crimes. On the rights side, the extent to which corporations enjoy constitutional protections comparable to natural persons is the subject of ongoing debate (Chesterman, 2020, p. 825). Overall, this approach appears to be acceptable to autonomous AI systems subject to further deliberations on the redress for damages, contractual relations and intellectual property rights.

3. Redress for the damage caused by AI

Among numerous concerns arising in connection with the emergence of AI the issue of redressing the damage caused by AI systems appears to be a very significant one. As it has already been mentioned the main problem in this regard is to identify a person liable for the damage caused by an autonomous AI system.

At first sight everything seems pretty clear from a legal perspective. Since there are no specific rules on redressing the damage caused by AI systems it may seem appropriate to apply tort liability rules on the compensation of damage caused by a source of increased danger. In accordance with article 1187 of the Civil Code of Ukraine damage caused by a source of increased danger shall be redressed by a person who on a relevant legal basis (ownership, contract, lease, etc.) is in possession of a vehicle, mechanism, other object, the use, storage or maintenance of which creates increased danger. Therefore, *prima facie* damage caused by an AI system has to be redressed by the operator of such a system.

However, as R.A. Maydanyk, N.I. Maydanyk and M.M. Velykanova rightly point out, when it comes to compensation for damage caused by a source of increased danger, such damage occurs in the case of using a certain vehicle, mechanism, equipment, which, although they can get out of human control, however, cannot make autonomous decisions. A distinctive feature of AI is its ability to make decisions unassisted. Therefore, this refers not only to the lack of submission to a person's control, but also to the unpredictability of its actions and causing damage (Maydanyk, Maydanyk, Velykanova, 2021, p. 156). In light of this, the application of tort liability rules on the compensation of damage caused by a source of increased danger to the damage caused by AI systems does not seem quite justified.

So, what if the general rules of tort liability are applied to the damage caused by an auton-

omous AI system? As it stems from article 1166 of the Civil Code of Ukraine, it has to be proven that the damage is a result of a person's fault in order for that person to be held liable for the damage. So, it turns out that an autonomous robot's operator will only be liable for the damage caused by the robot if the damage is a result of the operator's fault. However, in most cases the damage will result from the decisions of an AI algorithm, rather than the decisions of the operator. In such a case it may be the fault of a software developer or a hardware manufacturer. So, the question remains open – who is going to be held liable for the damage?

It is clear that the current civil legislation on tort liability is not quite ready to deal with AI and it is clear why. The reason is that the current legislation was adopted on the presumption that only a human being is an intelligent creature capable of reasoning and making decisions. Naturally, this legislation was designed for intelligent human beings who were in control of machines without any signs of their own intelligence. In light of this it doesn't seem quite right to apply tort liability rules designed only for intelligent human beings to situations where intelligent things like autonomous robots are also involved.

Considering the inconsistency of the existing civil legislation on tort liability with the current trends in AI the European Parliament put forward a number of ideas on how to deal with tort liability issues involving autonomous robots powered by AI. In 2020 the European Parliament passed a resolution with recommendations to the Commission on a civil liability regime for artificial intelligence suggesting to differentiate civil liability of AI systems' operators depending on the degree of risk posed by such systems. According to this resolution there should be strict liability for the operators of high-risk AI-systems without the possibility to exonerate themselves from liability by arguing that they acted with due diligence or that the harm or damage was caused by an autonomous activity, device or process driven by their AI-system, whereas civil liability of other AI-systems' operators should be enforced depending on their fault (fault-based liability) (European Parliament, 2020). Clearly, the EU is trying to work out some specific rules on tort liability for the damage caused by AI systems using a risk-based approach.

Tort liability should not be regarded as the only way of providing compensation for the damage caused by AI systems. Another effective way of redressing the damage is insurance cover. That's why in its Resolution with recommendations to the Commission on Civil Law Rules on Robotics the European Parlia-

ment suggested that it might make sense to consider such legal solutions as establishing a compulsory insurance scheme whereby producers and owners of certain categories of robots would be required to take out insurance for the damage caused by their robots; establishing a compensation fund that would guarantee a compensation even if the damage caused by a robot was not covered by insurance; allowing the manufacturer, the programmer, the owner or the user to benefit from limited liability if they contribute to the compensation fund or if they jointly take out insurance to guarantee compensation where damage is caused by a robot (European Parliament, 2017).

Although these recommendations are coupled with the idea of granting the most sophisticated autonomous robots their own legal personality (creating a specific legal status of electronic persons), they may have a positive practical impact of their own, even without apply the concept of electronic persons. On the one hand, they may help settle the issues of compensation thanks to a compensation fund in cases where it is difficult of impossible to identify a natural or legal person liable for the damage caused by an autonomous robot. On the other hand, insurance and the benefit of limited liability lower economic risks for the manufacturers, software developers and operators of AI systems in cases of their machines' malfunctioning, thus providing incentives for further development and improvement of such smart systems.

4. Contracts and AI systems

AI facilitates workflow in many professional areas and legal area is not an exception. It is especially evident when it comes to dealing with contracts where AI is used in various contract management systems. According to Sean Heck artificial intelligence in contract management is designed to "enable contract professionals to focus on strategizing and making informed decisions with an enhanced understanding of contract risk and the positive and negative relationships between data, contract language, and contract processes... It is designed to streamline data insertion, data extraction, data protection measures, and risk identification tasks with automated data entry and risk assessment mapping. AI-powered contract management software transforms static contract documents and contract data into dynamic building blocks that contract management professionals need for improved contract oversight, proactive opportunity identification, and risk mitigation" (Heck, 2021). These applications of AI in contract management do not replace human professionals when it comes to nego-

tiating, concluding and performing contracts. They merely facilitate contract workflow.

However, sooner or later we shall face a situation when autonomous AI systems will be able to negotiate, work out contractual terms, conclude and perform contracts with very little or without human intervention. In such a case it is important to ensure that the legal system is ready to adjust to a new reality involving autonomous robots as participants of contractual relations.

Modern contract law has been built on the idea that only human beings or their communities (corporations or other legal persons) can take part in contractual relations. That's why basic provisions of contract law reflect human categories such as the will of a contracting party and the expression of will. In particular, according to article 203 of the Civil Code of Ukraine the expression of will has to be consistent with the will itself in order for the contract or any other legal act to be valid. As a legal category will has a human origin and human nature. It cannot be attributed to a machine, even though a machine may be fully autonomous and have powerful AI. It virtually means that the existing rules of contract law will be an obstacle for the conclusion of valid contracts by autonomous AI systems. It also means that when AI systems become fully capable of entering into contracts on their own the rules of contract law will have to be modified in order to adjust the existing legal framework to a new reality.

Although it is not yet clear what those rules will be like, it is possible to assume that they may be based on the concept of electronic person. In that case it would make sense to establish certain restrictions of electronic persons' contractual rights. Such restrictions could help protect the interests of natural persons as intellectually weaker parties to contracts. Restrictions of electronic persons' rights might also be necessary in strategic industries and in the field of national security and defense. For instance, it might be sensible to forbid electronic persons to buy and sell farm land, drugs, nuclear fuel and other dangerous substances, firearms and other weapons as well as industrial facilities designed for their production. Ownership of such assets by electronic persons should also be banned.

5. Intellectual property created by AI systems

Until recently creativity has been a solely human attribute. However, the development AI shows that smart robots can be creative too. In recent years we have seen numerous examples of AI systems creating works of art such as paintings, poems, music etc. Moreover, these systems are even used for inventing new drugs.

The creativity of AI systems poses serious questions in the domain of law, first of all in the area of intellectual property law. The most important and the most difficult of these questions is how should the creations and inventions generated by AI be protected by the law of intellectual property?

One of the main pillars of the existing intellectual property law is the presumption that only a human being can be creative and therefore only a human being can be an author or an inventor. Thus, all intellectual property rights stem from the creative works and inventions produced by human authors/inventors. In Ukraine, for instance, the requirements of human authorship/inventorship are enshrined in the Law of Ukraine "On copyright and related rights" and the Law of Ukraine "On the protection of rights to inventions and utility models". The same requirements can be found in the legislation of many other countries. In light of this creations and inventions generated by autonomous AI systems cannot be protected by intellectual property law. As Dr. Rachel Free points out, "the current IP laws and systems do not offer an answer to a situation where IP rights cannot protect assets that are a product of autonomous AI. It is also not sensible or practical to continue with an approach where no one owns the potential intangible assets created. The situation is generally the same in many countries around the world" (Free, 2018).

In the copyright realm, certain countries, such as the UK, South Africa, Hong Kong, India, Ireland, and New Zealand, have set up laws that can provide protection for computer-generated works. This protection would be granted to the person who set up the arrangements necessary for the creation of the work (Iglesias, Shamuilia, Anderberg, 2021, p. 13). So, the main idea of this approach is to identify a person behind a computer (in our case – an artificial intelligence system) who will ultimately benefit from the legal protection of the assets created by AI. Although, this approach appears to be pretty simple, it nevertheless raises some questions. In particular, there is an issue of machine learning. An AI system can produce intellectual property assets if it has enough data to study and learn from. Different pieces of data or datasets may belong to different persons who may be even unaware that their data are used by a smart robot. So, the question arises whether it's fair that only the manufacturer or the owner of an AI system can benefit from the legal protection of assets created by such a system. What about the owners of data used for teaching an AI

system? Why can't they benefit from the assets created by an AI system?

Another issue arising in connection with this approach is the issue of liability. When studying various datasets and using them for its own purposes an AI system may violate other persons' intellectual property rights. So, who is going to be responsible for such violations, taking into account the fact that these violations are the consequence of the decisions made by an autonomous system? Would it be fair to make a person, who set up the arrangements necessary for the creation of a computer-generated work, liable for such violations?

As an alternative there is an option of giving autonomous AI systems a legal status of electronic persons capable of having intellectual property rights. In this case the author or the inventor of intangible assets would be an autonomous AI system itself. This approach may turn out to be an effective solution, provided there is also an insurance cover for the damages resulting from the intellectual property rights violations of such an autonomous system as well as limited liability of those who created this system itself.

6. Conclusions

Summing up what has been said, it is possible to make a conclusion that the development of AI is going to bring about significant changes in many areas, including the domain of law. Such areas of law as intellectual property law, contract law and legislation on tort liability will have to undergo significant changes in order to address the challenges posed by the development of AI. One of the ways to adjust the existing legal landscape to a new reality is based on the idea of granting autonomous AI systems legal personhood and turning them into the so-called electronic persons. Although the concept of electronic person is still new and controversial it should not be discarded as irrelevant. In the future when autonomous smart robots reach the level of strong (general) AI, which is equal to human intelligence, this concept may serve as a basis for a major legal transformation. If the concept of electronic person is ever implemented it will be one of the most important changes in the history of law comparable to the introduction of legal persons. At the same time, if electronic persons eventually appear on the legal horizon their interaction with natural and legal persons has to have certain limitations in the interests of protecting natural persons, strategic industries, national security and defense. That's why the scope of their legal personhood will have to be limited and coupled with insurance cover as well as limited liability of those who created them.

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ПРАВОСУБ'ЄКТНІСТЬ СИСТЕМ ШТУЧНОГО ІНТЕЛЕКТУ: БУТИ ЧИ НЕ БУТИ?

Анотація. *Метою статті* є дослідження можливості визнання правосуб'єктності систем штучного інтелекту (роботів).

Методи дослідження. Методологія роботи включає такі методи наукового дослідження, як системний аналіз, порівняльно-правовий аналіз та діалектичний метод. Метод системного аналізу дає змогу розглянути системи штучного інтелекту як комплексні сутності та визначити правові наслідки їх функціонування. Порівняльно-правовий аналіз дає можливість порівняти різні правові положення та правові концепції, що застосовуються до зазначених систем. Діалектичний метод використовується для оцінки розвитку систем штучного інтелекту, а також розроблення правових положень і концепцій, що застосовуються до них.

Результати. Значною мірою концепція правосуб'єктності базується на ідеї, що люди є єдиними розумними істотами, здатними мислити та приймати рішення. Однак завдяки розвитку штучного інтелекту автономні роботи рано чи пізно стануть навіть розумнішими за людей. Ця тенденція породжує концепцію електронних осіб. Поки що визнавати роботів електронними особами зарано.

Однак із часом, коли штучний інтелект досягне рівня сильного (загального) інтелекту, може стати очевидною необхідність визнання автономних роботів електронними особами. Хоча концепція електронних осіб є суперечливою, вона може надати певні правові рішення щодо відшкодування шкоди, заподіяної автономними роботами, укладання та виконання контрактів, а також правового захисту інтелектуальної власності, створеної системами штучного інтелекту. Проте мають бути обмеження прав електронних осіб у стратегічних галузях та у сфері національної безпеки й оборони. Можливо, було би розумно заборонити електронним особам купувати та продавати сільськогосподарські землі, наркотики, ядерне паливо та інші небезпечні речовини, вогнепальну та іншу зброю, а також промислові об'єкти, призначені для їх виробництва.

Висновки. Такі галузі права, як право інтелектуальної власності, договірне право, а також законодавство про деліктну відповідальність можуть зазнати суттєвих змін через необхідність вирішити виклики, пов'язані з розвитком штучного інтелекту. Одним із шляхів адаптації наявного правового поля до нової реальності є ідея надання автономним системам штучного інтелекту правосуб'єктності та перетворення їх на електронних осіб. У майбутньому, коли автономні розумні роботи досягнуть рівня штучного загального інтелекту, ця концепція може стати основою для масштабної правової трансформації, подібної до появи юридичних осіб. Водночас права електронних осіб мають бути обмежені в інтересах захисту фізичних осіб, стратегічних галузей, національної безпеки та оборони. Крім того, обмеженість їхньої правосуб'єктності має бути поєднана зі страховим покриттям, а також обмеженою відповідальністю тих, хто їх створив.

Ключові слова: штучний інтелект, правосуб'єктність, електронна особа, відшкодування шкоди, інтелектуальна власність.

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