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Analysis of the Status of Artificial Intelligence as the Subject of Law from the Perspective of Autopoiesis

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Abstract

The large-scale application of artificial intelligence in social life has brought about new legal issues such as the attribution of rights and the definition of responsibilities. It is necessary to discuss whether artificial intelligence can be used as a legal subject. Taking the legal subject as an autopoietic system means that whether AI can become the legal subject does not depend on itself, nor on the person acting as the legal subject, but on the future autopoietic scenario of the legal subject system. There is possibility that AI becomes legal subject. On the other hand, there remains uncertainty for AI to become legal subject.

Keywords

Artificial Intelligence, Legal Subject, Legal Fiction, Legal Person

1. Introduction

Marked by the emergence of AlphaGo and ChatGPT, recent years have witnessed a new wave of development of artificial intelligence (AI). Although various disciplines have shown strong interest in the study of AI, there has been no consensus on its definition. The development of AI has gone through three major stages: logical reasoning, probabilistic reasoning, and causal reasoning. In terms of types, AI can be categorized into Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI) (Searle, 1986). Currently, despite its widespread application in different technical fields, AI still exists as ANI. The extensive application of AI in real life inevitably brings social risks and legal challenges. The law should not only address the normative application in specific scenarios but also clarify the legal status of AI

so as to comprehensively respond to the various challenges posed by AI. The legal status of AI has attracted much attention from legal academia, but the conclusions are diverse. The viewpoints for the legal subjectivity of AI mainly include the agent theory, the fiction theory, the limited legal personality theory, the cyborg theory, and the right theory, while the opinions upholding AI as a legal object include the tool theory, the special object theory, the act theory, and the animal-like theory. To address the legal status of AI, it is necessary to prioritize the understanding of the legal subject by building a dynamic cognitive framework, based on that, forming an understanding of the legal subjectivity of AI. This requires further transformation of the reasoning method and research perspective on the basis of existing research.

2. New Visual Angle: Legal Subject as an Autopoietic System

The traditional research on the legal subject is mainly carried out from the empirical and normative levels, among which the right is the core content of the concept of legal subject, representing the subject's qualification in law, reflecting the subject's personal autonomy within the scope of law, and realizing the circular argument between law and subject. Legal personality is another important concept related to legal subject. It is a concept that abstracts the subject of law from human beings in reality. Based on legal personality comes right capacity, which is a further abstraction from legal subjects by separating them from their human characteristics. When concrete persons are abstracted into rational persons, the legal subject can be applied for both individuals and groups, thus realizing the equal status of different legal subjects. The study of legal subject in traditional theory from the empirical and normative perspectives presents a tangled and blurred state of law and ethics, reflecting the "dual characteristics" of legal subject. The research on legal subjects from such perspectives cannot respond well to the issue of the legal subject status of AI because they both belong to first-order observation and have limitations due to observation blind spots. Therefore, it is necessary to switch to the second-order observation perspective and view the law as an autopoietic system with the help of social system theory.

The autopoiesis theory has gone through four development stages: closed system theory, open system theory, self-organizing system theory, and autopoietic system theory. Autopoiesis refers to the self-creation, self-reproduction, and self-formation of a system to develop from nothing without specific external intervention. The concept of autopoietic is further clarified in legal Sociology as "self creation, self production and self formation of the system from scratch without specific external force intervention" (Teubner, 1993). Viewing law as an autopoietic system means that "the law itself determines what law is" (Luhmann, 2004). The legal subject system, subordinate to the legal system, is also autopoietic, which generates itself through social differentiation in response to social complexity. From the reductionist perspective, the differentiation of the legal subject system is to reduce social complexity. In the differentiation process, the independence of the legal subject system is based on its core function that dis-

tinguishes it from other systems. The core function of the legal system is to stabilize normative expectations in society, with which the function of the subject system of law is intrinsically consistent, and specifically manifested in stabilizing the normative expectations of the parties of legal relations and the implementer of legal acts The subject system of law achieves self-generation through autopoiesis, manifested as a continuous recursive cycle operation through self-reference using codes and outlines. On the other hand, AI as a part of the environment of the legal subject system, has the possibility of being selected by the system through communication and operation, because "the environment observed by the system is only a product of its own operation" (Luhmann, 1990). Although this selection process is unidirectional and random.

3. Self-Production and Evolution of Legal Subject System

3.1. Self-Production of Legal Subject System

The general features of the legal subject system are also self-creation, self-production and self-formation. Under the autopoiesis theory, the generation process of the legal subject system involves at least two major steps: first, the self-construction of the subject system through self-reference, and second, the self-reproduction in the interaction between the legal subject system and the subject system as the environment. The subject system, as a psychological system, is the environment of the legal subject system and also a system that self-reproduces itself through self-reference. Descartes created the subject/object distinction through the idea "Cogito, ergo sum" (I think, therefore I am), and it is through such distinction that the subject system initiates the process of self-demarcation. Starting from the distinction put forward by Descartes, Kant constructed two self-described observation clues of reason and will with pure reason and practical reason. The subject system continually defines its boundaries through distinction, and re-enters the distinction into the subject/object distinction, creating an autopoietic system of unified recursion and circular production. The legal system realizes its own hermetic operation through the legal/illegal code, while the legal subject system realizes its operation through code of the legal system, concretizes the code legal/illegal with/without right, and achieves specification closure through this code based on its own special function. The unity of the system is produced and reproduced by the operation of the system (Luhmann, 2004). At the same time, the legal subject system maintains cognitive openness to the environment through the "if... then" conditional outline that matches the code, which allows for communication with the environment based on the exhibited openness through other-self reference in the system operation, so as to continuously self-reproduce and realize the recursive operation of closed yet open line circulation. There is a structural coupling relationship between the legal subject system and the subject system as its environment. The subject system establishes a connection with the legal subject system by emitting disturbances, which are perceived by the operation within the system and thus are incorporated into the self-reproduction of the legal subject system.

In the operation of the legal subject, "I think", the basis of "self" in the subject system, is removed. As an environment, human beings are placed outside the system, and the legal subject system becomes an "empty" system.

3.2. Evolution of Legal Subject System

As an autopoietic system, the legal subject system constantly carries out recursive cycle operation of self-reference and is capable of self-regeneration, self-evolution and self-development. The process of system evolution is divided into three main step nodes, namely "mutation/selection/re stabilization": mutation involves various elements, selection involves various structures, and stabilization involves the unity of the system (Luhmann, 2004). One of the "milestones" of the evolution of the legal subject system is the emergence of legal person. Some scholars believe that artificial intelligence is similar to legal persons. Since legal persons can have legal personalities, artificial intelligence should also have legal personality (Davies, 2011). Legal fiction is a closed and open technical means in the evolution of legal subject. Legal person is incorporated into the legal subject system by means of legal fiction in the operation of the system through its structural coupling with the economic system. From the perspective of legal history, the evolution of legal subject can be divided into three stages: multiple subject, unitary subject and post-unitary subject. Legal persons become legal subjects through the accumulation of individual cases into legal materials, after hundreds of years of development and historical precipitation. For AI to become a legal subject, it also requires the accumulation of law-related materials through separate events, so that it may become the perceivable disturbance of the legal subject system. Furthermore, only if the legal subject system forms a structural coupling with its scientific system in the evolution, AI can turn into a legal subject.

4. The Possibility of Artificial Intelligence Constituting the Subject of Law

Taking the legal subject as an autopoietic system means that whether AI can become the legal subject does not depend on itself, nor on the person acting as the legal subject, but on the future autopoietic scenario of the legal subject system.

4.1. Possibility of Antinomy and Phylogeny

The antinomy of auto-referential of the Law Subject System (hereinafter referred to as the "System") brings about the self-production ability of the System. When autopoietic systems, such as the System, observe, marked and unmarked differentiation will separate the world. Re-entry of the differentiation makes it a recursive cycle of auto-referential, which produces the complexity and closure of the System. At the same time, autopoietic system will and can only reproduce within itself the images of the environment. Every time the System observes, the unobservability will always be reproduced at the same time. Therefore, observers can only be indicated by continuous differentiation, which is the "creation"

and "self-production" of the System. This means that antinomy actually finds itself through self-denial, while tautology constantly produces itself through auto-referential, that is, self-affirmation. But if it only conducts ongoing auto-referential at the same level, the System will then be just an empty and meaningless form. Therefore, the System must also acquire its own rich possibilities through hetero-referential, as well as the possibility of realizing its self-evolution from the environment through cognitive expectations.

The auto-referential of each autopoietic system originates from the internal antinomy of the system and the tautology within it, which makes it impossible for the system busy with auto-referential to observe the real uniformity of the system and the environment, but only the fictional uniformity. Therefore, for an autopoietic system, the next step would be not ignoring or avoiding the existence of antinomy and tautology, but finding a way to get rid of the reflection of auto-referential, so as to avoid the inconvenience caused by pure tautology and antinomy and give auto-referential real meanings. This requires efforts to explore some approaches to subtly conceal antinomy and tautology temporarily. The approaches cannot be found only within the self-referential system, but also with the help of the environment outside the system, which introduces openness of system cognition. As a result, the communication and operation within the system will no longer be self-sufficient based on auto-referential, but one which, by establishing some indirect connections with the environment of the system, could cause itself to acquire the energy of evolution and development from the idling auto-referential, through which the System shifts from the meaningless idling caused by the system antinomy and realizes its self-reproduction with increasingly complicated structures. With the help of the conditional programme of "if ... then", the differentiation between the codes of right and rightlessness used by the System can be temporarily replaced by the differentiation of another system in the environment of the System, such as using the efficiency/inefficiency of the economic system when the legal person is proposed as a subject of law. The replacement will not affect the auto-referential of the System itself. Instead, the System will still maintain its own function thanks to the programme. With the replacement temporary in nature, the new differentiation provided by another system as the environment of the System is only an expedient measure to enable observers to realize the special needs of better observation. The special needs refer to the concern of the general public out of their own interests, including political, religious, economic and scientific expectations. Introduction of other differentiation can help temporarily get rid of the influence of the antinomy within the System. For "get rid of", it actually means to temporarily conceal the antinomy of the legal system through the replacement of differentiation. If the System can continuously explore new and imaginative differentiation in the environment, the antinomy can be well concealed by replacing the differentiation, and when the System can conduct meaningful communications in this process, then the antinomy, if concealed, will become a source of creativity. This kind of creativity can certainly bring the possibility of artificial intelligence being a sub-

ject of law. And such a possibility lies in that artificial intelligence, as the external environment of the System, can stimulate the special needs of the System as an observer in reality, that is, the public's expectations of artificial intelligence in economy, science or other aspects, then artificial intelligence may create a fresh and imaginative differentiation. If the differentiation can be perceived by the System with the help of the conditional programmes and used to replace the right/rightlessness code of the System, the original antinomy of auto-referential in the System will be temporarily concealed, and the System will break away from the auto-referential tautology to realize a meaningful communication, and start its own evolution program, which will make it possible to incorporate artificial intelligence into the structure of the System.

4.2. The Possibility of Law Subject System and Artificial Intelligence

As an autopoietic system, the subject of law has a self-referential (or self-justified) mechanical mechanism, which leads to an "a and -a" mutually causal antinomy, such as legality and illegality, and right and rightlessness. This antinomy appears in a contradictory form on the surface, but behind it, a more complicated structure can be discovered. In this complex structure, it is a conflict outwardly, which represents the contradiction between different valid claims, that is, either a or -a, such as legal or illegal, or a subject of law or a non-subject of law. But at the same time, when we further question about the subject of law which is self-determined, we will see that the subject of law and non-subject of law are in a mutually causal and entwined state, which makes the autopoietic system a dynamic and energetic system. Antinomy provides subject of law, an autopoietic system, with continuous impetus of self-production and self-creation. To further illustrate, antinomy will not hinder, but on the contrary, provide the possibility conditions for the operation of the system. The self-reproduction of operation needs to realize various possibilities by operation of differences due to replacement of differentiation. As an autopoiesis-based system, the subject of law has the following two advantages:

First, as an autopoietic system, the subject of law realizes the circulation of internal communication of the System, which maintains the constant closure and uniformity of the System so as to avoid direct short-circuit with other systems serving as the environment. Autopoiesis reveals the crisis of de-differentiation faced by modern law: if the political system, moral system and economic system in modern society were utilized to complete some tasks that should be completed by the legal system, the independence of the legal system would be undermined. Similarly, without closure and uniformity, the System will be short-circuited with other systems, which will lead to the blurring of the boundaries and the anti-modernity consequence of "de-differentiation", and may eventually cause self-extinction of the subject of law. In the era of artificial intelligence, the society is increasingly complicated, which provides the driving force to reduce complexity for social differentiation. Social differentiation not only promotes the

complexity of autopoietic system of the subject of law to enable the System to maintain its own closeness and uniformity, but also makes it possible to cultivate new forms to reduce complexity.

Secondly, the autopoiesis-based Law Subject System, has always been open to the environment in cognition, in the way that the System operates the environment outside through the closed auto-referential operation inside. Although the legal theory-autopoiesis takes some important thoughts from the Husserl's phenomenology, autopoiesis regards the existence of external environment as a prerequisite for the existence of the system, while Husserl suspended the object world outside consciousness by bracketing it in his theory. The environment in concept is not a residue outside the system, but a constituent condition for the system to establish itself. That is to say, the importance of the environment is not only to maintain the system, supplement energy and information. For an autopoietic system based on self-referential, the environment is the premise for the system to achieve dynamic uniformity, which the system realizes by constantly defining the differences between itself and the environment. For an autopoietic system, which is constantly self-producing, it is the constant communication and operation of the system that make the events in the system suspend at every moment, where subsequently the events need to be generated by reconfirmation of the system and the environment. The System also repeatedly confirms the difference between itself and the environment in every operation related to the event, so as to define the boundary of the System. However, whether artificial intelligence can become a subject of law is not determined by the one-time difference confirmation of the System, but by repeated operation and difference confirmation of the System. Moreover, interference from the environment is a necessary condition for the legal system to realize the recursive reproduction of auto-referential. Otherwise, the legal system will not be able to obtain fresh information to maintain its continuous communication. Therefore, artificial intelligence, as the external environment of the System, is not subject to natural rejection by it. Instead, the System expects to obtain useful information from the environment, including artificial intelligence, to continuously realize its communication and operation and promote the evolution of itself. This brings about the possibility of artificial intelligence constituting the subject of law under the autopoiesis theory.

5. The Uncertainty of Artificial Intelligence Constituting the Subject of Law

As the subject of law exists as a self-referential and constantly circulating autopoietic system due to its own antinomy, we may have to admit a disappointing fact: the evolution of the System may be blind, meaning that the direction that the System is moving is undefined. In other words, we can't draw an exact conclusion, or even a relatively affirmed inference according to the development structure of subject of law before artificial intelligence's real transformation from the environment into the Law Subject System.

5.1. Blindness and Uncertainty of Interaction between the System and Environment

As a development mechanism of the legal system, the System interacts among variation, selection and re-stability within the System. Variation refers to the change of an element of the System based on autopoiesis with respect to the inherent mode of the System. Selection refers to the System's choice of new possibilities brought about by variation, which not only consolidates the System structure, but also provides preconditions for development. Re-stability means that the System absorbs the selected variation and incorporates it into the System structure to stabilize it in the System, which maintains the stability and uniformity of the System and lays the foundation for further changes of the System. But the interaction between the aforementioned three processes itself is blind. Social system also has an equivalent functional mechanism similar to the variation, selection and stability of organisms. Therefore, as part of the social system, the Law Subject System may also have structure changes in the development process, and the System will select new changes that can enhance the adaptability of the System and internalize it into the structure of the System. That is to say, if the System gains new communication forms from the environment in the hetero-referential process, the new forms which can help the System better realize its own functions in social development will be included into the System structure as a new component of the System. "In the process of production and reproduction, the System has a self-protection function for its stability and accuracy, so as to make sure that its existence will not be affected due to the turbulent environment." As the structure improving the System's adaptability to changes exists in the process of the formation of symbols and communication media in the System itself, and because that the communication is not defined but accidental and undefined, and the operation code used by the System in communication is also binary (or double-edged), the contingency and uncertainty of the change of the System are further increased.

As to the status of subject of law of artificial intelligence, the blindness of the development of the Law Subject System can be further understood from the specific events that trigger the interaction between the System and the environment. In August 2018, Tencent posted a financial article automatically composed by Tencent's artificial intelligence robot Dreamwriter on its website, which was released on the same day by Yingxun Technology on its website without authorization. Tencent claimed the copyright of this article composed by artificial intelligence involved in the case, and accused Yingxun Technology of infringing the right to spread information on the Internet and engaging in unfair competition. In January 2020, the Nanshan District Court in Shenzhen found in its final instance that the article involved is written work protected by the Copyright Law in China and constitutes a corporate work created by the plaintiff. Although the judgment does not clearly affirm artificial intelligence's status as a subject of law, it did recognize to some extent that the artificial intelligence writing robot developed by Tencent is entitled to copyright. Another court, however, held diffe-

rently in another similar case. In May 2019, Beijing Internet Court publicly heard the case of Beijing Feilin Law Firm v. Beijing Baidu Netcom Technology Co., Ltd. concerning the infringement of the right of signature, the right to protect the integrity of works and the right to spread information on the Internet. In this case, the court held that according to the current law, written works should be created by natural persons, thus the article involved generated by computer software intelligence does not constitute works. However, at the same time, the Court pointed out that the related information of the article should not be used without authorization. Based on the legal cases related to intellectual property rights of artificial intelligence in foreign countries, the United Kingdom, the United States, Japan and other countries have also made different attempts, each with its own advantages and disadvantages. Therefore, as FENG Xiang put it: "In a specific case, winning or losing depends only on the temporary strength of the social forces behind the parties, the temporary preference of policies and strategies, and the temporary belief of the judge/decision maker." Having said that, as a specific event is accidental, and thus the development of the System formed through communication on the basis of these specific events is blind. Just as Teubner believed it, the complex hypercycle system in history does not develop according to a predictable model, nor will it move towards a specific goal.

5.2. Blindness and Uncertainty of Individuals and the Whole System

As the basic unit of the development of the legal system, the System constitutes the uniformity of the legal system or the social system itself and the individuality and integrity it contains. In the development process of itself as an autopoietic system, the System includes the individual and independent development of legal system promoted by the communication based on hetero-referential between the system and environment, as well as the development of legal system brought about by the structural changes of society as a whole or of social subsystems such as legal system. They are not in the relationship between an individual and society, but in the relationship between a specific case and the legal system. For the former, the individual system development is reflected in the interaction of specific legal cases. In the judgment involving a specific event mentioned above, there is an operation mechanism of change and selection, which brings short-term "memory" to the system by the system's self-maintenance to realize case interaction. When the system itself or the functional subsystems within the system intervenes in the system development promoted by case interaction through the maintenance mechanism, the short-term "memory" can be internalized into a long-term stable structure in the system, and the legal system will realize its own development. The intervention process is reflected in the interaction between legal culture and individual judgment, which combines the development mode of individuality and integrity of the legal system and forms the recursive operation of system communication. The circulation between the two communication cycles formed by the mutual connection and interaction be-

tween the change mechanism and the selection mechanism of the legal system development brings blindness to the development of the legal system. In this regard, Teubner generally believed that on the one hand, the decision-making in the legal process forms a reference for the future norms of the legal system, and on the other hand, it is also a new starting point for the development of the legal system embodied in the legal culture.

5.3. Blindness and Uncertainty of Co-Evolution

Development of law is not an isolated process of self-development, but co-evolution with society and other social subsystems. This evolution is embodied in "the development of autonomous evolutionary mechanism in the structural coupling of multiple closed systems and their interaction". The autopoiesis-based development and evolution of the legal system, including the subject of law, firstly needs to form a new recursive cycle of auto-referential, which is the premise and foundation for the formation of a higher-level autopoietic system. Therefore, although the evolution of the System is closely related to person, it is not the individual person or the organization in the form of a group of people that plays a fundamental role, but the System itself composed of communication and operation as an element. The co-evolution mechanism among each autopoietic system is basically the same as that of a single autopoietic system, including co-change (same as the variation in the evolution of a single system), co-selection (selection) and co-maintenance (re-stability): co-change is triggered by the excitation of changes received by each single system as the basic unit participating in the co-evolution, which firstly triggers a single interaction, and then forms the pressure of interacting with other systems. Co-selection refers the development caused by the structure formed in the process of system interaction being driven into selection by the autopoietic system. Co-maintenance is a process in which the common expectations selected in interaction among systems are combined into each system for consistent maintenance. Autopoietic systems have different cultures. Their positions on the world on the basis of their respective cognitive assumptions can be completely incompatible, but accord with each other in the expected results of a specific co-evolution interaction. For instance, the view that the subject under the System is vested with the right to choose freely is not necessarily the same on the cognitive assumption level as that the market regulates the economic operation in the economic system, however, they agree with each other in terms of freedom of contract and good faith. It is also recognized under the autopoietic system theory that co-evolution of multiple systems and the self-evolution of a single system are complementary and mutually supportive. Therefore, in the co-evolution process of the system, the autopoiesis of other systems serving as the environment of the Law Subject System (such as the scientific system which artificial intelligence is related to) and of the society influences the choice of change of the System through co-evolution. Such indirect influence is true for all systems serving as the envi-

ronment, so there is no strong intervention that can absolutely affect the development direction of the evolution of the System, which manifests the blindness of the evolution of the subject of law. Such blindness in turn demonstrates the possibility, but not the definiteness, that artificial intelligence will constitute a subject of law.

6. Conclusion

Taking the legal subject as an autopoietic system means that whether AI can become the legal subject does not depend on itself, nor on the person acting as the legal subject, but on the future autopoietic scenario of the legal subject system. AI now is the environment of the legal subject system. There is possibility that AI becomes legal subject. However, the blindness of evolution of the legal subject system means that it is still uncertain whether AI will become the legal subject.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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