

The Reflection and Innovation of Algorithmic Governance Legislation in the Digital Society

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The advent of the digital society has profoundly disrupted and reconstructed the established thinking pattern, the way of behaving, and the lifestyle of the human society, and the intelligent technology represented by algorithms is innovating constantly breaking through in the digital society, leaving significant challenges on traditional legal system with their continuous expansion. The deeper problem behind it is the internal conflict between the algorithm and the law. Therefore, algorithmic governance in the digital society must return to its origin, rationality, and jurisprudent, and look beyond the appearance of the theoretical narrative that algorithms deviate from the rule of law. It is crucial to return to the root cause of the problem, which involves the internal conflict between the algorithm and the law, and to confront the objective contradictions between efficiency and fairness, scenario-based specificity and universality, and openness and closure. It is possible to appropriately handle the relationship between algorithm and the law by establishing dynamic balance mechanisms of fairness and efficiency, implementing hierarchical and classified governance of algorithms, and emphasizing governance of the algorithms' interface. This approach can make the relationship between algorithm and law go from conflict to integration and realize the innovative development of the algorithmic governance legislation of digital society.

Keywords: the digital society, algorithm, the governance of the digital society, the law

Introduction

Algorithms are a series of steps that operate independently of the human brain, expressed in code, carried out through programs, and aimed at solving specific problems. They vary based on factors such as data and environment, possessing essential characteristics of goal orientation, technicality, openness, and fundamentality (Zhang, 2024). With algorithms perpetually expanding and penetrating, innovating breakthroughs, and increasingly integrating with the Internet, big data, cloud computing, and artificial intelligence, etc., algorithms are driving social advancement broader and deeper rapidly and expressing a logic that fundamentally changes human production and ways of life. Simultaneously, the legislative issues of algorithms are catching the spotlight and becoming a global challenge. At present, academic discussions on algorithmic governance mainly focus on the prevention and control of algorithm risk, algorithmic power, algorithmic discrimination, and algorithmic

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collusion (Zhou, 2020). Although some scholars have focused on the relationship between algorithm and law, they pay more attention to how the law should respond and adjust to cope with various new situations and issues triggered by the expansion of algorithms from the perspective of normative jurisprudence. In some ways, this research on the “oughts” of legal adjustment and improvement more or less ignores a fundamental characteristic of algorithmic governance that the algorithmic governance is a complex social engineering so that it is difficult to achieve good governance effect through simple replication or slight improvements to the existing governance framework (Zhang, 2019).

“Digital Society” and “Algorithm” in Algorithmic Governance of the Digital Society

The rapid development trend of algorithms has led to evident conflicts and contradictions with the existing legal system, which directly arise within the general domain of the digital society. Therefore, it is necessary to specify what “digital society” and “algorithm” in algorithmic governance in the digital society and better resolve the conflict between algorithms and the law in the digital society based on that.

“Digital Society” of the Algorithmic Governance in the Digital Society

Algorithms, as the most influential and emblematic advanced productivity in the modern digital society (Zhang, 2020), are intricately linked to the expansion and innovation progress of the digital society. Therefore, the exploration of theoretical issues related to algorithmic legal governance necessarily builds on the vivid practical domain of the digital society, which has been spawned by the digital revolution. Using familiar and mature things to make a comparison is an essential analytical paradigm for understanding new things. As a new social formation shaped by the combination of artificial intelligence, algorithms, blockchain, and other technologies (Gao, 2020), the digital society, while belonging to the broader category of information society like the network society, possesses unique qualities. This can manifest in the following factors: (a) In terms of generating sources, different from that of the network society which began with the network, the digital society started with new technologies like algorithms and artificial intelligence. This involves the mutual integration of algorithms with artificial intelligence, big data, blockchain, and other technologies. It is a product and result of the action in the physical world under the global, intelligent, and modern economic environment and value choices. (b) In operational structural terms, different from the complex operational structure of “mechanical intelligence” in the network society (Zhang & Jin, 2021), the digital society is centered on algorithms, supported by the application of intelligent technologies like algorithms, big data, and artificial intelligence, presenting a more sophisticated operational structure of “artificial intelligence”. (c) In manifestation terms, different from the “cluttered phenomenon” of digital text, digital images, digital audio, and digital video in the internet society, the digital society is a social formation that intelligently integrates content based on the superpower of algorithms to realize precise feeds and personal customization which originates from the internet society and transcends it. The digital society realizes “the organized manner” of information with personalization, precision, and typification relying on algorithms. (d) In mechanism of action terms, different from the network society, the digital society is born and prospered by algorithms, constituting the core element and superpower of the digital society. In contrast to interactions in traditional society, intelligent interactions between machines and humans, virtual and real in the digital society require the mediation of algorithms to be realized.

“Algorithm” of the Algorithmic Governance in the Digital Society

Algorithmic governance is a core issue in the governance of digital society, reflecting the operational mechanism and basic logic of the digital society, and breaking down the existing governance mechanisms and framework systems formed in the domain of traditional industrial and commercial society. To ensure the proper handling of algorithmic governance issues in the digital society and effectively solve the contradiction between the norm of social order and the vitality of technological development, it is no longer sufficient to simply apply the logic of the theory and regulation of the modern jurisprudence, which is necessary and imperative to focus on the unique characteristics of algorithms as a new object of governance for theoretical interpretation and institutional design. Specifically, algorithms have the following fundamental characteristics: (a) Objective-oriented: Algorithms are the tools of humanity, not their masters (Xu, 2019). Taking the deep learning algorithm as an example, which serves as a mechanism that utilizes machines' deep self-learning abilities to automatically process a lot of sparse and fragmented data information in the real world (Zheng, 2021), it explores the path towards the specific goal. (b) Opacity: Algorithmic programs are made out of computer code, but the process of algorithmic program making from code is not simply a permutation. Instead, it's a relatively sophisticated and professional creative process, which the general public cannot understand the mechanism of algorithmic operation without getting professional knowledge and skills training. Specifically, sophisticated deep learning algorithms are like “black boxes”, in which individuals only know inputs and outputs, rather than understanding the internal structure and rationales of the “black box”. (c) Self learning: The underlying code of the algorithmic operation relies on the algorithms' designers. Its initial methods and processing steps of operation have certainty, but algorithms can self-learn and process massive data, which means that they can continuously optimize and adjust based on real-time data and feedback.

Rational Reflection on Algorithmic Governance Legislation

Correctly recognizing the reason is the key to solving problems. From the perspective of the basic theory of the rule of law and general logic, the legal system of algorithmic governance has various drawbacks influenced by multiple factors, such as social material situation, political and cultural foundations, administrative efficiency, levels of legislative skill, legislative process, and the balance of interests among stakeholders. Moreover, it is further constrained by the particularity of algorithms and the inherent conflict between the algorithm and the law. Rule of law, as the governance of regulation and manifestations of good laws, is the best choice and fundamental form of governance for modern civilized countries. To establish a scientific and complete system of algorithmic governance, and effectively eradicate the chronic problems of algorithmic governance, it is necessary to directly address the deep-rooted inhibiting factors of legislation, namely the inherent conflict between the algorithm and the law.

The Pursuit of “Higher Efficiency” in Algorithm Conflicts With the Legal Principle of “Priority of Fairness”

The rule of law and democracy are fundamental experiences and value propositions of modern civilization. All governance activities and every aspect of modern civilized society should inevitably be based on the values of fairness, freedom, and rights inherent in the concept of the rule of law. Therefore, as a fundamental value of law, fairness is the proper meaning in the legal governance of modern society. In contrast, the expansion and innovation of algorithms in the digital society represent a “limited, deterministic, and effective” approach of

solving problems through computer language. This problem-oriented operation model and attitude towards the way of things determine that when people utilize algorithms to establish cognitive models and make decisions, they tend to minimize the cognitive burden of algorithms as much as possible and control them within the scope of purpose to enhance the efficiency of algorithmic operations. That is, “emphasizing efficiency” is the initial value of algorithms. Although driven by concepts like digital justice, with “fairness and impartiality” becoming an algorithm’s fundamental principle, the value of algorithms has gradually shifted towards algorithmic fairness, and a series of technologies are dedicated to promoting the realization of algorithmic fairness, it is still “hollowing out” essentially. Algorithmic fairness includes both outcome fairness and procedural fairness. However, at present, both academia and practice tend to generally define algorithmic fairness as outcome fairness, lacking attention to procedural fairness. This neglect of factors such as fair data acquisition, fair design, and fair implementation greatly impacts the effectiveness of outcome fairness. The opacity, complexity, and inevitable errors of algorithms further contribute to algorithmic fairness remaining “an impossible task”. Therefore, the basic principle of “higher efficiency” still remains crucial in the actual operation of algorithms. This often creates a certain tension with the fairness principle pursued by the law, which can be manifested as follows: (a) Although fairness and efficiency are both fundamental values pursued by the law, when they conflict, according to the value hierarchy of law, their relationship must be “giving priority to fairness with due consideration to efficiency”. And in the case of the algorithms, their purpose from the very beginning of design is to reconcile the intertwined interests in society. The “higher efficiency” pursued by algorithms makes itself unable to emphasize “giving priority to fairness” like the law that prioritizes fairness over efficiency in the complex interplay and balance of interests among various parties in the digital society. (b) Due to the concept that “fairness is vague”, fairness is a value judgment, which is difficult to quantify. In fact, computer languages are not only unlikely but also never unable to understand what is fairness. As a product of the technological revolution, algorithms may only be able to comprehend people and objects in the digital society from the perspective of technology through computation. Alternatively, algorithms that prioritize efficiency may never pursue or prioritize fairness in their goals and capabilities. During the process where algorithms bury human ideals and purpose within the virtual world of intelligence, as they operate in the realm of code execution and electronic computation, their pursuit of operation mechanism with “higher efficiency” often conflicts with the legal concept of “giving priority to fairness”, which encompasses sympathy for vulnerable groups and other ethical human purposes. So the algorithms’ ultimate pursuit of efficiency presents a significant challenge to the legal principle of “giving priority to fairness” in the digital society. Therefore, legislators should attach great significance to the tension between “higher efficiency” pursued by algorithms and the legal principle of “giving priority to fairness”. Based on the admission of the objective existence of this tension, legislators should balance and straighten out these two values correctly by fully tapping algorithmic expansion’s underlying logic and advanced governance experience in the digital society to achieve “good governance” of the algorithms through “good laws”.

The Incompatibility Between the Universal Application of the Law and the Scenario-Based Applicability of Algorithms

The scenario of algorithmic applicability is called materialization. In the process of rapid and deep infiltration expansion and innovation, as new steps and methods for precise resolution of problems, algorithms

are often applied to short-term tasks or aimed at achieving specific goals. In various scenarios of the digital society, there is a big difference in the users, targets, and related issues of algorithms. Due to being widely used by different users and embedded into different contexts (Yi, 2021), the algorithms' applicability in the digital society is always objectified and scenario-based. The algorithmic application showing unique characteristics is a result of the constraints of the current physical upper limit and technical boundaries of algorithmic models (Li, 2021). Well contrary to the scenario-based application of algorithms in the digital society, the law, as one of the most significant social norms, possesses universality and enforceability application as its fundamental property. The so-called universality of the law refers to the necessity of maximizing the inclusion of public affairs in politics, economics, culture, and society, as well as individual social life into the legal framework, and obtaining universal compliance (Hu, 2019). The universality has two dimensions: the universal application and the universal effectiveness. The universal application means that legal norms apply to anyone in a state or region. Universal effectiveness means that the laws have broad binding force within a state or region and can gain the recognition of all members of society. The reason why the law can be universally applied and effective is its abstract rules. Essentially, the formation of law is a procedural deduction from concretion to abstraction. The reason why the law can be abstracted from countless concrete things is that the objects regulated by traditional social law are relatively fixed or predictable. However, algorithms are different. The algorithms' application in the co-construction with the digital society is extremely widespread and embedded scenarios are often diverse and complex. The diversification of scenarios makes the subjects, behaviors, norms, and values of algorithmic operations different, and it is difficult to factorize out "common subexpressions", let alone extract the type of rules that law requires from countless specific algorithm practices for universal application. Correspondingly, the law may not be able to accurately and effectively regulate algorithms with diverse scenarios and unique content. In a way, algorithms and the law almost present a situation of "going moved in opposite directions" in terms of application. Therefore, how to comprehensively, effectively, and systematically regulate algorithms through legislation under the universal application of the law and the integration of algorithms and the digital society has become the primary task at this stage to promote the legalization of algorithmic governance.

The Open and Open-Source Nature of Algorithms Stands in Stark Contrast to the Closed and Independent Nature of the Law

Openness refers to the characteristic of things continuously exchanging material, energy, or information with the external environment. In the process of continuous expansion and innovation, the openness of algorithms and the technical systems organized by them are mainly reflected in the public availability of their source code, known as "open-source algorithms". In the digital society, algorithmic open source is the foundation of data sharing and a significant driver for technological innovation and product iteration. In practice, algorithm developers often share some of their designed foundational algorithmic codes in open-source communities, allowing other developers to independently embed these open-source algorithmic codes into different programs based on their needs. It is precisely this limited openness that propels technological iteration and the continuous emergence of numerous modern "new products". In a sense, algorithms are the source of the chain of artificial intelligence technology, and openness is the intrinsic requirement of algorithms, which occupies a primary position in the digital and intelligent society. In contrast to the open-sourcing of algorithms, the legal system has

a stronger sense of closure because it is a social normative system with state coercive power. Behind this lies the state's intervention and restraint over civil society, aiming to prevent the damage to individual rights, fairness, justice, and other values caused by the arbitrary exercise of public power. To avoid such outcomes, the law should be closed, strictly applying the norms within the legal system and not exceeding the boundaries between the internal and external. This is the essence of modern rule of law. To some extent, the law, as an internally closed and independent system, while ensuring its stability, inevitably exhibits a certain degree of rigidity, making it unable to respond promptly to unforeseen external environmental changes beyond its normative system. In conclusion, the closed legal systems originating from traditional industrial societies are destined to be ineffective in responding to the new expectations and demands of the legal system in the digital society. This is because algorithmic open source is an inclusive and highly changeable process. Based on the transparency and multi-dimensionality in handling information, as well as the abandonment of inherent ideas, experiences, habits, and changes in logic demonstrated by this algorithmic openness, entirely new challenges are posed to the closed legal system.

In addition, the fundamental values of law include order, freedom, fairness, justice, etc. In the digital society, algorithmic governance not only pursues the general values of the law like order, freedom, fairness, and justice, but also strives for technical innovation, security, trustworthiness, and application standardization. The current abstract legal system often fails to meet the governance needs of the digital society brought by the revolution in intelligent technologies constrained by its material foundation, social environment, and historical context, which cannot effectively balance the “complexity” of algorithmic justice, security, and innovation values. In practice, due to the lack of technical and compound value goals of the law, as well as the inherent profit-seeking nature of enterprises, algorithm operators and controllers often exploit the “technical advantages” of algorithm, leading to various phenomena of algorithmic abuse during their application expansion. The spatiotemporal construction of algorithms is like an “invisible cage” or “Truman's world”. These are objective and fundamental theoretical challenges that legislation on algorithmic governance must confront directly.

Innovative Development of Legislation on the Algorithmic Governance

The digital society is facing a profound legal revolution, and the issue of algorithmic governance cannot be superficially explored with a “band-aid” approach. To effectively solve problems in algorithmic governance and ensure that the expansion and regulation of algorithms align with the rule of law, it is required to return to their origin, rationality, and legal principles. By properly dealing with the relationship between algorithms and the law, and transitioning from conflict to mutual integration, we can achieve innovative legislative development in the area of algorithmic governance within the digital society.

Establishing a Dynamic Balance Mechanism Between Fairness and Efficiency

Algorithms are a “limited, deterministic, and effective” way of dealing with problems (Zheng, 2021) through computer languages. The strong purpose orientation drives its ultimate pursuit of efficiency. In contrast, as a microcosm of the application of state power, algorithmic governance emphasizes even more the realization of social fairness values and public interests. This requires algorithmic legal governance to be on a case-by-case basis and emphasizes the establishment of dynamic balance mechanisms of fairness and efficiency. Firstly, those responsible for governing algorithms are required to reasonably prioritize different types of fairness based on

different scenarios. In some scenarios, procedural fairness must be emphasized more than outcome fairness, such as when algorithms provide more lottery chances to active users. In addition, some scenarios can show that group fairness can be emphasized more than individual fairness, such as when algorithms prioritize providing special protection or services to the elderly, the weak, the sick, or people with disabilities. Secondly, based on the determination of categories for protecting fairness in the priority, algorithmic governors must integrate factors like mainstream values and public policies, for example, they can determine the priority between fairness and efficiency based on the core socialist values. By comparing the differences that “algorithmic fairness priority” or “algorithmic efficiency priority” may cause and reflect in the public interest, public opinion, and social effects, algorithmic governors can balance the interests between fairness and efficiency. This leads to further adjustments in the prioritization order of fairness and efficiency in specific scenarios, seeking the optimal intersection of fairness and efficiency under specific conditions, and establishing a mechanism for “dynamic balance between fairness and efficiency” (Liu, 2020). In practice, legislative, executive, and judicial bodies must focus on the impact of specific scenarios on the relationship between fairness and efficiency, and look over the relationship between fairness and efficiency in specific scenarios with a dynamic balance mindset.

Implementing Hierarchical and Classified Governance of Algorithms

The cyberspace encompasses myriad elements, and tiered classification management is a prevalent principle in the governance of networks and information (Zhang, 2022). Algorithms, as the product of the modern intelligent technology revolution, are no exception. Algorithms vary greatly due to factors such as data and environment, and their application scenarios are diverse in the social relationships of participants, which are constantly evolving. Therefore, algorithmic legal governance must be based on the classification of the algorithm internal elements and the hierarchical risk assessment of external factors to implement a tiered and categorized approach to governance.

Firstly, the governance of algorithms should be based on the classification of their internal elements. Theoretically, algorithms can be abstracted from deployment to transition to operation, which allows for the deconstruction of algorithms into three dimensions: development, data, and interface. This approach provides a stable legal framework for the classification and governance of algorithms. Governors must use the theoretical framework of these three dimensions of algorithmic internal elements to implement classified governance, highlighting the differences in tasks, basic characteristics, and operational logic across various structures of governing systems. For example, governance of the data dimension, which algorithms rely on, can be executed through three aspects: regulation of data sources, regulation of data processing, and regulation of data generation (Xu, 2022a).

Secondly, based on the hierarchical governance of external risks of algorithms, in practice, due to significant differences of different types of algorithms in automation, model robustness, and application scenarios, which often show differentiated risk patterns, based on this, governance bodies must classify different algorithms into three levels: high risk, medium risk, and low risk. Determining the extent of regulatory measures depends on the different risk levels. As for low-risk algorithms, governance bodies can implement post-review mechanisms, and they can be available after filing, like algorithms with a slight impact on the rights and obligations of the individual. As for the medium-risk and high-risk algorithms, pre-review is required, specifically for high-risk

algorithms that must obtain approval from the executive before being available (Ren, 2021), such as algorithmic recommendation services involving the public right to know, national security, and social interests. In addition, it is necessary to establish and improve corresponding supporting mechanisms including “algorithmic self-assessment, algorithmic record, and algorithmic security assessment” (Zhang, 2022, p. 120).

Thirdly, proficiency in the use of technological tools is essential. The hierarchical and classified governance of algorithms emphasizes dynamic variability, neutrality, professionalism, and the complexity of governance. It is necessary to fully leverage governance tools that are more scenario-specific and granular (Zhang, 2021) and to implement more nuanced governance measures. For example, skilled use of databases, coding, light flow-based video face anonymization technology (Bak et al., 2016), privacy protection filters (Barhm, Qwasmi, Qureshi, & El-Khatib, 2011), and other methods and resources can be advantageous. Integrating these new technologies and tools into the legal governance framework of algorithms not only empowers governance through technical means but also fosters algorithmic “self-governance” and “governance with technology”. Moreover, this integration aids in advancing the hierarchical and classified governance of algorithms, enhancing the level of rule of law and modernization in algorithmic governance. By combining general and specific governance strategies, we can establish a normative system for the hierarchical and classified governance of algorithms which is essential for this purpose, achieving the scientific and effective regulation of algorithms with diverse scenarios and complex content.

Placing a Focus on the Interface of Algorithms

Algorithmic legal governance is the activity of using legal means to realize that algorithms serve the general interests of human society. Due to its technical nature and the existence of the “algorithm black box”, algorithms possess strong professionalism. With increased the ability of artificial intelligence’s self-learning, algorithm technology is constantly expanding and iteratively upgrading without stopping (Shi, 2022). Traditional governance methods that treat algorithms as technical processes exhibit characteristics such as roughness and lag, posing risks of failing to timely and effectively meet needs in reality, which not only hinders the expansion and innovation of algorithms but also is detrimental to the realization of the goal that the better human society in the future is served by algorithms. Therefore, whether it is using legal means to solve the conflicts of algorithmic expansion or dealing with algorithmic expansion, algorithmic legal governance is required to be “comprehensive and focused” (Zhang, 2022). Specifically, firstly, the algorithmic legal governance needs to shift perspectives appropriately, which not only considers the general algorithmic governance but also focuses on key governance issues. Algorithmic legal governance needs to stand on the principle of combining key and comprehensive, which means that algorithms should not only be the main focus of attention and regulation in digital social governance but also need more governance efforts revolving around the algorithmic interface. Secondly, it is necessary to establish the diverse co-governance mechanism of the interface side of algorithms, through reasonably determining the rights and obligations of different entities such as algorithm operators, algorithm users, regulators, and the public at the interface level of algorithm applications. This involves four aspects: individual algorithm users, platform entities, societal communities, and government oversight bodies, to establish mechanisms to protect the legal rights of algorithm users, the effective self-governance for algorithm enterprises, mechanisms for social supervision, and mechanisms for government regulation, to realize “multiple” governance on the

interface side of algorithms (Zhang, 2022). Thirdly, it is necessary to strengthen the regulation concerning the “processed data” “output results” “the measure of interventions and protection”, and “rights granted to users” in the interface of the algorithmic application, enhancing intervention in specific outputs and related protective as well as remedial measures at the interface of algorithm applications, through legal means in practice, regulating the “human-machine interaction” interface of specific algorithm application (Xu, 2022b), promoting the legality and the regulation of outputs and actions of algorithmic interface’s related applications and algorithms for good, to effectively respond reasonable concerns of society regarding the algorithmic governance.

Conclusions

As the “core and soul” of the digital society, algorithms not only profoundly influence every aspect of social life, but also are crucial for future development. Therefore, it is very important to legally transform and “tame” algorithms, which are the iconic productivity and superpower of the digital society. Though the tension of the relationship between the algorithm and the law is an undeniable fact, it is not necessary to conclude that algorithms need not be or cannot be taken into the scope of the rule of law, and cannot realize effective governance of the law. For algorithmic governors, the algorithmic governance in the digital society is required to return to its origin, rationality, and legality. Based on the in-depth analysis of the relationship between the algorithm and the law, it is imperative to drive algorithms to be “tamed” totally, making algorithms shift from something strange and potentially dangerous to something that can fit into the modern civilization and daily life and realize the ultimate goal of algorithmic governance, which is to serve a better future for human society.

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