

Data Rights Law and the New Order of Digital Civilization

The origin, formation and development of laws are closely related to civilization, and different laws exist as corresponding establishments to different forms of civilizations in specific times and spaces. Joseph Kohler, a Neo-Hegelian jurist in Germany, once said that for the past, the law had been a product of civilization; for the present, the law was a tool to maintain and nurture civilization; for the future, the law would be a means to promote and optimize civilization. From farming civilization to industrial civilization and then to digital civilization, the law will realize the leap and transformation from the “law of man” to the “law of things” and then to the “law of data.” Digital civilization provides the cultural foundation and innovation engine for the construction of data rights law, which also provides the existence basis for the system maintenance and order promotion of the digital civilization. Therefore, the rich implication of data rights law could be viewed in a more condensed and concise means through a paradigm of order concerning digital civilization, and may become the normative basis of maintaining and promoting this civilization order. The data rights law is the product of civilization transition, and it also will be the new order of mankind in its transformation from industrial civilization to digital civilization. This leap in civilization is bound to revolutionize the whole picture of the old ecology and order, altering the existence and development of society in an upside-down manner.

Value of Data Rights Law

According to the Collingridge dilemma:

the social consequences of a technology cannot be predicted early in the life of the technology. By the time undesirable consequences are discovered, however, the technology

is often so much part of the whole economics and social fabric that its control is extremely difficult. (1980, p. 11)

Big data gives us insight into the future, but the particularity of the network environment brings new challenges to the protection of personal data and the protection and maintenance of data rights. Undoubtedly, the data rights law, like other laws, embodies the same value objectives like principles of equality, freedom and order of law. At the same time, as a special legal regime to regulate data ownership, protect and utilize data resources, data rights law also has its unique value. By confirming and protecting the data rights, the law of data rights regulates the order and stability of the digital society, which is the concrete embodiment of the spirit of rule of law in a country.

New coordinates of rules

Human society cannot do without rules. Rules are the norms, criteria and laws that should be obeyed by every and single member of the society. They can not only guide, restrict and regulate the behavior of people in a correct way, but also judge and measure the social value created by social members as individuals to the society. In other words, social rules embody a kind of “rational” thinking, choice and action, and a unity of self-discipline and heteronomy would be achieved through the process (Zhen 2014). Rules exist widely in all parts of society. Among them, laws rank the most important social rules. Since the beginning of our civilization, laws gradually become an important means of maintaining social order. The data rights law itself is aimed at resolving disputes and an order is expected to be maintained based upon such a function of it, under the guidance of which the society is expected to develop in a more harmonious and continuous manner.

Data rights law maintains the development order of digital economy. Engels once said that a demand had been created at very beginning of our social development: A common rule governed our daily repeated production, distribution and exchange of products, to which the individuals must be subject and accept as a common condition for their production and exchange, through which way we had our customs and conventions and then laws (Zhang 2011). Law has the function of maintaining order,

and the data rights law is an effective means to resolve disputes concerning data property. The core value of the data rights law lies in the confirmation of ownership of data resources¹ and the protection of utilizing such resources, and its function is directly reflected in the dispute resolution and the maximization of the exploitation of the resources of data. Data is recognized as a resource, and disputes can only be resolved when its ownership is confirmed. Conversely, disputes may arise if the ownership of data is unknown and the boundaries of rights are unclear or blurred. In constructing and establishing such a right concerning data, it is necessary to define the ownership of data in a comprehensive, clear and precise way, delimit the ownership boundary, and clarify the rights of data subjects to control, use, gain from and share the corresponding data, so as to prevent and reduce the occurrence of disputes. Effective data competition shall be promoted with reasonable systems and rules and accurate coordinates between law and economy shall be located, so as to realize the rational allocation of data resources.

The data rights law maintains the stability and unity of the digital society. Human society is the highest form of material movement, as well as a complex organic system. The operation of human society in orderly form requires supporting mechanisms working in an optimized way. In order to

- 1 Unlike traditional data resources, the data resources in the background of big data technology and digital economy carry a series of new economic characteristics, including the euryoecic of data carrier, the non-exclusiveness of data use, the high profitability of data use, the difference of data values, the diversity of mode of data use, the unpredictability of specific use of data, the externality of effect of data use. In 2017, several lawsuits involving data disputes were of particular interest. For example, HiQ vs. LinkedIn in the United States, Sina vs. Pulse in China and Hantao vs. Baidu, all of which involve the issue of whether the data collected by the operators in the course of operation can be captured by other operators, or whether the data can be used by other operators and in what way. In addition to litigation, a number of other controversies involving data disputes also touched upon realm of antitrust law in 2017. For example, Cainiao and S.F. Express, the two giant delivery companies, denied access to their data interfaces to each other, and only after the intervention of the State Post Bureau did they resume opening their data interfaces. These cases not only highlight the importance and competition for data resources in the era of digital economy, but also indicate the common legal disputes, conflicts of interests and legal concerns in the data competition.

realize the stability, order and sustainability of social development, social members as participating subjects need to have desirable expectation for their own behaviors, the premise for which is that they shall have stable property at their disposal. Before the advent of laws in the past, people tended to acquire the use of property only through possession, but such a pure possession was not stable and sustainable because of the lack of any protection mechanism. Nowadays, the data resources are becoming more and more abundant, and the law is an important tool to protect the data rights and safeguard the interests of the participating subjects of data. Confirming data rights is the means, and the resolution of dispute is the end, which is considered a fundamental method to resolve the issue. Posner, American jurist and economist, warned us that the more uncertain the law was, the more difficult for people to resolve disputes through negotiations (Feng 2010). Therefore, in order to resolve a dispute, the right and interest in dispute should first be ascertained together with fair confirmation of ownership and distribution of obligations. The data rights law is conducive to clarifying the ownership of data, protects rights and interests of data subjects as the way of protecting their property, and provides a guarantee for social stability and sustainable growth.

The data rights law is the premise for ensuring the normal, healthy and orderly flow of data within the legal framework. First of all, the data rights law defines the ownership of data with a starting point of maintaining economic order and ensuring the smooth development of data transactions. Mencius once said, “He who has a permanent property has perseverance, and he who has no permanent property has no perseverance.” Seen from the perspective of the development trend of digital economy, only by defining the ownership of data and protecting the digital right to the maximum extent can the development space of digital economy be further expanded. By defining the boundaries between the nature of interests and rights concerning data and the ownership of data, the data property would be better utilized and value of data resources given full play in a maximized way on the part of the data subjects. The data rights law not only maintains the order of data property, but also promotes the optimal allocation of data resources. Under such a stable and orderly property order, the data rights law gives full play to the maximum utility of data, and helps to promote more efficient social production and growth of social wealth.

A new paradigm of governance

Governance, with its original meaning of guiding, manipulating, and controlling, derives from the ancient Greek or classical Latin word which could be comprehended as a corresponding word of “steering” and specifically refers to the exercise of authority within a certain realm of jurisdiction. Social governance is to control and guide needs of people, encourage appeals and petitions for legitimate interests, advocate the notions of rights, freedom and justice, and give full play to the subjective initiative of the subjects of social governance (governments, markets, social organizations, and citizens). On the basis of such diversified subjects, mutual game, consultation and cooperation among them should be encouraged to enhance the vitality of social development, and citizens would be encouraged to actively participate in social affairs in a bid to realize more diversified forms of social organizations, the prosperous and orderly market, the efficient and honest government, the gradual improvement of people’s livelihood, the construction of smooth channels for resolving disputes, social fairness and justice, so as to make the society develop in a harmonious way (Tian 2015). The evolution of social governance reflects the history of human civilization. Social governance, in other words, records the history of human civilization. In industrial society, any significant achievement of the society could be attributed to the corresponding social governance mode featured by a heavy reliance on the rule of law. Since modern times, the means of social governance mainly depends on the law. Thus, today’s achievements would not have been possible without the participation of law in social governance.

The data rights law promotes the innovation of governance means. In the process of human development, institutional development and social development is closely linked. Different institutions exert diversified impacts upon social development, and the institutional innovation is an important driving force for governance paradigm innovation. The establishment of law has been seen as a stabilizer of social governance, as well as the foundation and guarantee of innovation in aspects of social governance mode. Therefore, the innovation of social governance mode needs the support of law, and within appropriate legal track, so as to achieve new, standardized and efficient social governance modes. Human beings have past the industrial society and entered into the post-industrial society, in which the emerging

new problems and new dilemmas in society have brought severe challenges to the law. The virtual world foreseen by the Internet cannot be governed by the original substantive law, but a new path leading to the new form of legal governance shall be explored. So, we're in the middle of a transformation of social governance and a new governance mode should be constructed and vigorously promoted (Zhang 2014). In today's world, the information revolution is changing at daily pace, and the impact of the new generation of information technology, such as cloud computation, big data, artificial intelligence, etc., makes social governance more and more depends on science and technology. Such a new governance mode based upon big data and the social governance itself requires regulation of the data rights law. Under the regulation of data rights law, in combination of cloud computation, the Internet of Things, block chains and other new generation of information technology, social governance mode should be reconstructed for elevating the level and degree of it in a way that is expected to achieve more scientific, effective and intelligent goals.

The data rights law enhances the authority of institutional governance. As a law, it is closely related to the developing process of human society, which is constructed to meet the needs of the evolution of this society, and even can be said to be an inevitable choice in the process of social development. The subjects involved in social governance, including state power, local power and mass public, have the characteristics of diversification, which may influence each other within the scheme. This complex interaction needs to be regulated and adjusted, and the data rights law is one of the most effective means of regulating and adjusting. On the one hand, in the digital society, all governance actions would fall within the legal boundary of the data rights law and all actions relating to them shall be subject to a premise of respecting various regulations and rules in the data rights law. On the other hand, the implementation of the data rights law would be guaranteed by the coercive power of the state, that is, in the practice of governance, subjects' legal awareness and rule consciousness to exercise rights, perform obligations and shoulder responsibilities would be reinforced by the authoritativeness of the data rights law under the circumstance of digital economy. In this way, social governance implementation would be efficient, and social members would be accessible to corresponding social services for safeguarding their legitimate interests.

The data rights law aims at securing orderliness and predictability of governance. To achieve a sound social order requires not only the regulation of religions, customs, ethics and policies, but also the protection of the law. Laws are implemented by coercive power of the state to reconcile various intricate social interests and provide norms for maintaining social stability and controlling disorder and chaos. Data rights law is a legal system that regulates data ownerships, protects and utilizes data resources.² Standardizing the rules and order of the digital society is conducive to the better use of data in social governance, promoting the standardization and order of the digital society, reducing disorder and chaos, and preventing turmoil and shocks. By defining behavior norms of each data subject and indicating the responsibilities and obligations of each data subject, orderly interaction between different data subjects shall be constituted for enhancing the foreseeability and safety of various data subjects. Under the circumstance of big data, the new governance model will make the society run in a more orderly and efficient manner.

New claims of rights

Rights, a legal entitlement of subjects to obtain their interests, guarantee the subjects' scope of interests by law or ensure the subjects' qualifications of obtaining certain interests through a certain kind of behaviors. The existence of a right implies a concept and an institution that allow others to assume and perform corresponding obligation (Xia 1999). Today, there is a growing awareness among the people of protecting their own personal property, and with the explosive growth of data resources, the right of data subjects to data resources is elevated to a new category of right, making it an inevitable trend of subjecting it to the protection of state laws.³ Data right

2 See Key Laboratory of Big Data Strategies. *Block Data 3.0: Order Internet and Sovereign Blockchain*. Beijing: CITIC Press Group, 2017: 227–228.

3 Compared with traditional physical resources, data resources have many economic characteristics, such as inhabiting multiple carriers, non-exclusive use, low cost and high return, difference in value and mode of use, difficulty in predicting future use, existence of external effects and so on. The existing legal system cannot play a conducive

is a new kind of right that emerges in the development of information and network technology. Its root lies in the gradual virtualization and digitalization of the state, enterprises and individuals under the impact of the new generation of information technology. At present, the new generation of information technology such as big data, cloud computing, and the Internet of Things are more integrated with various social and economic spectrums at deeper level. Data itself has stronger mobility and asset attributes, and data resources are gradually merged with important links of social progress and economic growth. The mobility of data is the premise of the value of big data, and the definition of data rights and its nature is the key to the question of how to realize the orderly, normal and standardized mobility of data under the framework of law. Under such circumstance, the healthy development of the digital economy will be jeopardized if the data ownerships and data mobility mechanism cannot be clearly defined. Therefore, the basic task of the data rights law is to guarantee the right to data for utilizing the data to a maximum degree and giving full play to its social benefits and economic benefits. Through the establishment of data right relationship, limited resources would be fully utilized for making maximized gains.

The legislative purpose of the data rights law is to protect the data rights. In *The Interaction of Law and Religion*, Berman points out that law is not just a set of rules, rather it is more a set of activities in which people legislate, adjudicate, enforce and negotiate. It is a living process of allocating rights and obligations, resolving disputes and creating cooperative relationships (2003, p. 11). Data is a new resource in today's world, which can bring benefits and produce value for related subjects. Data has been gradually commercialized.

role in the arrangement of data property rights, the basic order of data behavior and the competitive rules of data behavior. Up to now, the legal system created by human beings has solved the problem of the allocation of the rights concerning various physical resources according to their different natural attributes and economic characteristics, for instance, the arrangement of tangible property rights by the property law of common law system, and the real rights law of civil law system, and the intellectual property rights arrangement on intellectual property by laws of various countries. The problem we are facing is that data, different from any other kind of physical resources, have specific physical attributes and economic attributes and requires special legal system arrangement.

At the same time, the mobility and utility of data have aroused widespread concerns in social regulatory authorities, and the determination of data ownerships and protection of data interests have become a public concern. Among them, the protection of digital rights has become one of the fundamental issues of data rights law. By establishing a usufructuary data right, data subjects may transfer their personal data to “other parties” to make the full use of the data and realize data sharing by utilizing its value, which indicates the attribute of data: “multiple ownerships for one data.” Although the data rights law would not directly create wealth, when the ownership of data is clearly defined and protected by law, the data subject can make better use of data resources. The data rights law helps to exercise the rights through a set of guaranteeing mechanisms.

In the era of big data, the scale of data is huge, but the utilization rate is generally not up to our expectation. To solve this problem, we need to give full play to the data value in use and improve the utilization rate of data. The amount of data is massive, and human needs are infinite, which leads us to think the question: how to make full use of the data so as to satisfy to a maximum degree the infinite needs of mankind and at the same time to achieve the maximization of social welfare. This raises a whole new question between data and humans, namely, how can we use data more efficiently and conveniently to create value? According to the Coase Theorem II, in a world where transaction cost is greater than zero, different demarcations of rights may lead to different levels of allocations of resources in terms of efficacy. That is to say, there is certain degree of transaction cost in both the transaction of goods and the transaction of data. The transaction cost varies with the institutions of property right, so does the efficiency of resource allocation. Therefore, in order to optimize the allocation of resources and maximize gains, it is necessary to choose a reasonable institution of property rights.

The data rights law is the law defining the ownership of data. By regulating the rights and obligations of data owners, the data subject can give full play to the use of the value of data in a bid to achieve the best use of data and realize the effective allocation of data resources. The data rights law can ensure a fair protection on different data rights. Since ancient times, social justice has always been the ideal pursued by mankind, for example, the “Millennium Kingdom” of Western Christianity, Kant’s “world civil society,” Marx’s “communism,” and the “Great Harmony Society” advocated

by the Chinese Confucius school, Taoism's "small government, few exploitation" society, and so on. John Locke, a British scholar, has a famous saying which goes like, "Where there is no personal property, there is no justice." The same applies to the law of data rights. Where there are no data rights, there is no justice. Through the procedures and methods prescribed by law, the data rights law guarantees the rights of data subjects to control, use, benefit from and share their relevant data within the scope prescribed and permitted by law. In the process of data use, the establishment, alteration and revocation of any data-rights-related relationship should follow the principle of fairness so as to make the best use of data resources, create the greatest economic and social benefits, and bring the greatest data welfare to mankind.

Data Rights Law and Other Social Control Forces

The development of human society precipitate the advent and progress of civilization, and the development of the latter calls for social control efforts. The nature of social control is to maintain social order, and through a certain social coercive force to make people comply with social norms so as to maintain social order (Ji 2017). There are many types of social control, and law is one of them, others include order of power, ethics, social customs, public opinion and so on. However, with the development of political and social organizations, especially with the developed economic and social society, the law representing the strength and will of the state has become the primary and most important indicator of social control. In *Law and Morals*, Roscoe Pound made it clear that legal order had become one of the most important and effective forms of social control today, and all other forms of social control were subordinate to and operate under the scrutiny of the law (Yang 2011). Although the law has become the main tool of social control, we cannot deny the role of other forces of social control. The data rights law, as a law, works together with other social control forces, such as power order, ethics, social customs and public opinions, and plays a concerted role in the society (see Figure 4).

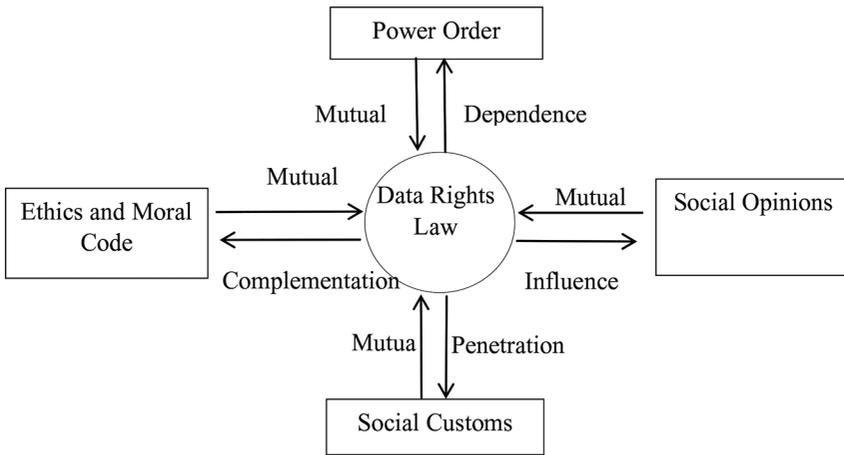


Figure 4. The Data Rights Law and Other Forces of Social Control.

Data rights law and power order

Power is an important interpersonal relationship and even social force that can be formed and exist through interpersonal coordination in the social production and cooperation of human beings on the basis of the specific social environment, conditions for production and living content of a certain society. A specific society could be understood as a specific community of cooperated production and interpersonal communication. At the same time, in a certain society, there will certainly be a variety of different powers as well as corresponding relationships in relation to power. The noumenon of all kinds of power formed and existing in human society lies in certain needs and appeal of the people. Social life in a human society requires a certain kind of order of appeal established for maintaining objective needs in an objective world, and correspondingly, a certain kind of power order shall be established and maintained as well. For a certain society, the formation or establishment of its power order often indicates that there are some different powers in the specific community of cooperated production and interpersonal communication, and a relatively definite and stable relationship of mutual integration and coordination has been achieved (Jia 2005).

Power is the foundation of the law, and the latter is the important guarantee of the existence of power. Throughout the evolution of power in human society, human beings cannot do without the existence of power in their efforts of fighting diseases, conquering the nature and the universe, and as a phenomenon of our human society, power is an ever-existing theme. Power itself is not a bad thing, but the combination of power and human desire may produce the most undesirable rampage of power. Thus, comes the pertinence of morality and order with law being a part of such a scheme and an important guarantee for existence of power, the very existence of which is aimed at curbing the rampage. Under the supremacy of law, power must be based upon the law which is accepted as the only source of power and all of which has become the truth of an era of rule of law (Huang 2005). In this sense, in the era of big data, power cannot be separated from the data rights law, and without the latter, the control of power rampage will largely be carried out at superficial level and desirable effect could hardly be achieved.

The data rights law and power are interdependent and inseparable. With ever progressing of the human civilization, their relationship is constantly changing. It is impossible for us to make an accurate judgment on how the relationship between the data rights law and power will develop in the future, but at least we can be certain at current stage that the data rights law and power are intertwined and complicated, which means that they cannot do without the other and the loss or gain of both will be at synchronized pace. As of today, power has succumbed to the law in some countries, if not a categorical phenomenon, while in other countries it still stands above the law, not categorically. This is the difference in relationship between power and law at the same time but across different regions. Similarly, at different stages of social development, the same kind of relationship may show a trend of distinction even within the same jurisdiction. In this sense, the evolution of power and the interaction between power and the data rights law will inevitably lead to the decentralization and balance of power regardless of the fact that whether the power stands above the law or vice versa.

The data rights law is a tool of power operation. There is no doubt that the operation of power through legal intermediaries has basically become a consensus in modern countries. Of course, in addition to the power channel constructed by law, there are also ethics, social customs and public opinions, etc. Because of the complexity of power in a digital society, the role of data

rights law in the process of power operation is becoming more and more important and plays an irreplaceable role. At present day, the data rights law is a tool of helping maintain digital civilization; in terms of the future, the data rights law acts as a tool to promote digital civilization. Digital civilization indicates to a maximum extent the social development of power. Therefore, fundamentally speaking, the data rights law is a tool for the operation of power. When the data rights law becomes the tool of power operation, the conflict between the data rights law and power will be inevitable, which is the inevitable result of power conflict itself.

The data rights law is rooted in social production and reflects the data right relationships in a society. The data rights law has both features of social credibility and state coercive force, which means it is formulated and recognized by different walks of the society rather than a compulsory social acceptance by power. In addition, the data rights law has not only the compulsory punishment but also compulsory implementing measures, as well as the foreseeability and guiding functions, which exerts great importance in terms of maintaining stability, settling disputes and delimiting boundaries. It is precisely because of the fatal weakness of power itself that society needs data rights law that has value judgment, can reflect social production in an objective manner, with concrete, coercive and stable regulations added into power constraints, to set boundaries for power, guide the proper exercise of power, and compensate the improper use of power in society by setting punishment and investigation mechanisms (Liu 2009).

The data rights law is the tangible existence of norms and the choice of the whole society. To supervise and restrict the power through such a law and to ensure that the power operates in accordance with the established norms, the whole society may feel the orderly operation of power that will be supervised and tested in accordance with the rules, so that the whole society will form an inertia of supervising and constraining power. The internal and external attributes of the data rights law make itself a desirable choice for regulating the data rights. Through the legalization of such a power can ensure the normal operation of it for giving full play to its strength and overcoming the disadvantages so as to bring benefit to the whole society. Seen from this perspective, the very attributes of the data rights law are of great value and significance for restricting power and overcoming its weaknesses.

The data rights law can regulate powers. As we all know, both the emergence of new things and the development of them exist for a reason and they are with their own social roots. Like the emergence and development of things, the data rights law becomes a core strength of constraining powers which is shaped by the society. The emergence and development of the data rights law has not only a profound social foundation, but also a special external form, which forms necessary attributes for it to restrict the power. The data rights law is fundamentally determined by the social material production, which is the basis for the existence and development of human society. As a kind of superstructure, the data rights law may reflect the social production in which it exists, indicating that the data rights law does not deviate from the facts and it also changes closely following the social change and development, and constantly learns from practice and experience to perfect itself.

The fundamental reason why the data rights law can guide and restrict the operation of power is that it is an advanced social consciousness and can reflect the advanced social productive strength. As an external form of law, the data rights law itself reflects the content of law, and its form is also determined by the content of law. The content of law is a kind of data right relationship, which would be defined by the economic life of human society, and reflect people's appeal for interests, which embodies not only the value connotation but also could be elevated to the level of will of the state. The data rights law is far more than a set of rules. Rather, it reflects data right relationships pertinent to various of interests behind such kind of norms. The data rights law does not favor any interested party. Rather, it represents a fair, just and easily accessible distribution of interests, and ultimately is the outcome of bargaining and negotiation among stakeholders, which is also the fundamental reason why the data rights law can represent the holistic interest but is not a mere tool availed of by interested parties in their pursuit of desirable ends, thus the data rights law can restrict the arbitrary exercise of power.

The data rights law is a special code of conduct guaranteed by coercive force of a state. Different from the general norms, the data rights law must possess cohesive force to become a tool to restrict powers. Only through coercive force to restrict power can the effect of restriction be achieved, which is the fundamental point that the data rights law can restrict power.

As a norm of conduct, the data rights law shall be not only a universal, stable and standardized one, but also interest-guiding and predictable. These characteristics are not only the inevitable requirement of the data rights law to restrict power, but also a good choice of suppressing aggressiveness and arbitrariness of power. Among them, the characteristics of universality provides the guarantee for the regulation of power; the characteristics of stability guarantees the coherence and consistency of power operation; the characteristics of normativeness define the boundary for the operation of power; and the characteristics of interest-guide requires that the operation of power should be based on the interests of society; and its characteristics of predictability requires that the power operation should have explicit goals.

Data rights law and ethics

Ethics is a form of adjustment in the system of social adjustment, and is a sum of views on norms, principles of humans, as well as on beauty and ugliness, good and evil, justice and partiality, glory and shame. As far as the needs of human order are concerned, there is no doubt that ethics is of great value, which starts from the beginning of human society and plays a very important role in maintaining social order. As an important strength of social control, ethics improves human's ethical cognition and moral consciousness with its ever-impressive persuasiveness, so as to make human abide by ethical and moral norms in a conscious way, and form a good social atmosphere of pursuing nobility and motivating the advanced and improved development.

The role of law in maintaining stability of a state is undoubtedly important. If a country or a society has no law, it may not maintain economic growth and social stability. Likewise, social stability cannot be fundamentally maintained without clear concepts of good and evil, beauty and ugliness, right and wrong, and honor and disgrace. Law and ethics belong to the same superstructure, and the relationship between them presents the holistic rather than the partial issue of legal philosophy. Rule of virtue may place its due role where the law itself fails to reach, so the rule of law cannot fundamentally replace the rule of virtue (Wang 2009). To this extent, the data rights law becomes a compilation of rules concerning morality and ethics.

It is inevitable that the data rights law would be integrated with ethics. In terms of the relationship between the data rights law and ethics, both of them belong to very important constituents of the same superstructure phenomenon, which may reflect combined feature of the society and classes, as well as the unity of subjective initiative and material restriction. The data rights law and ethics share same characteristics, in addition to which they are consistent in fundamental ways. Their similarities could be found in the guiding ideology, whereas their consistency is mainly reflected in the tasks, contents, basic principles, social nature and inner spirit of the data rights law and ethics. Therefore, in this sense, the integration of the data rights law and ethics is not only very likely to happen but also an inevitable trend to some extent.

From the perspective of historical materialism, social development does not change with the will of mankind. However, mankind may exert a sustained and far-reaching impact upon the course of social development since the society is on the track of progressing along with the development of mankind itself. In terms of the governance of social order, the data rights law and ethics are basic elements of ensuring normal implementation of social norms which could be seen as indispensable. Ethics is not only the foundation of the data rights law, but also the foundation and prerequisite of the existence and development of social order, which changes with the development of mankind. Ethics is not omnipotent because it involves a wide range of fields and has a weaker constraint on social behavior. Sometimes social order can only be properly maintained through the compulsory constraint of the data rights law.

From the perspective of regulative roles, the data rights law and ethics are the most important tools to adjust human behavior and social relationship. More specifically, the data rights law restricts human behavior through external coercion, while ethics restricts human behavior through internal conscience, both play a role in regulating human behaviors. From the point of view of origin, ethics exists since there is human society and makes its debut before the emergence of the data rights law. Behaviors required and supported by the general rules of data rights law are basically the behaviors respected and recommended by ethics. Acts prohibited and sanctioned by the general rules of data rights law are basically those prohibited and condemned by ethics. Therefore, although the scopes of the data rights law and ethics are not exactly overlapping and the overlapping part of the two

is not higher moral standards, but the basic requirement of ethics, the integration of the data rights law and ethics is an inevitable trend in the developing course of human society. The data rights law is the minimum ethics and may reflect only the basic requirements of the ethics. The noble ethics is a higher-level and deeper value concept that human society esteems. It requires the spontaneous implementation of social subjects and cannot be enforced by the data rights law.

The data rights law is guided spiritually by ethics. Throughout the whole process of normal operation of the data rights law, legislation is the first step, mainly offering solutions to cope with the problem of having a law. While following. Law enforcement and administration of justice are the follow-up activities on the basis of legislation, namely the implementation and accurate application of the established data rights law. Only when the data rights law is perfectly integrated with ethics can good law be observed, applied and implemented afterwards. Thus, the existence of good law is the foundation of operation of data rights law and also a precondition for the follow-up law abiding, law enforcement and administration of justice. From a dynamic perspective, the construction of the rule of law is the running process of the good law system. In this process, the creation of good law has the significance of logical beginning. In order to ensure that the created data rights law is a good law, we must lead the creation of the number right law with ethical value system, and strive to pursue the morality of the data rights law from superficial form to substantive content (Liu 2007).

The data rights law is guided spiritually by ethics and morality, which may be perceived from the following three aspects: first, in terms of the components, the data rights law finds its source in basic and key ethical norms. In review of the development of legal system in the human society, we discover a rule: when the ruling class begins a legislative process, the most basic and key social ethics and moral norms will be a preferred option. Second, the data rights law takes the advanced ethical and moral norms as the core value objectives. In other words, advanced ethical and moral values are the ideological guideline for the legal substitute in different social forms. Third, the evaluation of the norms of the data rights law is mainly measured through good and functional ethical standards. A good data rights law shall embody and carry forward the virtue and conscience of mankind. Generally speaking, what people should strive to achieve is the morality in a desirable

form, but the ethics that people must abide by is the morality of obligation, which is inseparable from the data rights law.

The emergence of the data rights law and ethics is originated from the specific social material conditions. However, in the complementarity, separation and crossover of social strata, the emergence and development of the data rights law and ethics are closely related to human diversity and humanity. Irrational and rational tendencies coexist in human nature which is also a mixture of the good and the evil. Ethical and moral norms play an indispensable role in the process of social adjustment, but they may not fully meet the demands of the development, consolidation and confirmation of pattern of interests in the social adjustment, while the data rights law can just meet this requirement because the data rights law possesses the adjustment means and social norms with state coercive power.

The data rights law requires the support of ethics. Law is the most important social norm, but it may not suitable to solve all problems in certain fields of the society. In the same vein, although the data rights law plays an important role and has great effect, it has certain flaws. On the one hand, the data rights law may arouse fear among people through its authority, but because the data rights law cannot truly understand the inner world of human beings, it cannot ensure that everyone has a sense of shame. Ethics has a strong ability of penetration, which plays a restraining and adjusting role in social production, human life, and the inner spiritual world of people, thus the ethics may make up flaws of the data rights law.

On the other hand, with the complexity of social affairs and the variety of human behaviors, the norms of the data rights law inevitably have some degree of ambiguity. In a normal society, the consciousness of abiding by the data rights law is directly proportional to the level of ethics and morality, the fundamental reasoning of which lies in the fact that both the data rights law and ethics are tools to safeguard social existence, and they are the manifestations of social value. Human identification and belief in the data rights law is the basis of the existence of the data rights law, just as a jurist once said that the law exists only in forms when it is not believed in. External norms of the data rights law must follow the inner voice of human heart so that it can be better complied with.

The data rights law plays a positive role in promoting ethical norms. Boden Heimer once pointed out that the principles of morality and justice

regarded as basic and necessary for social interaction are endowed with a strong compulsory nature for its strong power in all societies. The strengthening of the binding force of these moral principles is realized through transforming them into legal rules (Liao 2015). On the one hand, the data rights law has institutional advantages. Individual ethics is basically derived from the social system. According to the data rights law, it can further promote the development and perfection of ethical and moral norms, and restrict and prevent the occurrence of unethical and immoral behaviors. On the other hand, the data rights law is mandatory. When ethics and morality collide with people without moral consciousness, they often become inoperative. At this time, the coercive force of the data rights law may come along and play a positive role. That is to say, the data rights law promotes the ethical and moral norms through the legalization of ethics and morality, which helps to confirm the requirements of ethics and morality with the authority of law, and realize the implementation of ethical and moral rules. So, data rights law is conducive to the promotion of ethics and morality and universal compliance of people with laws. Essentially, the data rights law disseminates, absorbs, and protects basic ethics through a coercive approach and guarantees its development (Chen 2013).

Data rights law and social customs

Social custom is the norm of the human society at its early stage or a kind of rule and order existing objectively at all stages of human society. The so-called social customs can be generally understood as the behavioral rules, behavioral tendencies or behavioral patterns gradually formed through the interaction between people in a long period of social life under the constraints of the society they are living in (Wang 2012). Social customs are neither innate nor temporary. They are rooted in the whole process of social life and eventually accumulated through long-term life, labor and communication. In the social life of human beings, social customs have been also effectively adjusting, regulating and controlling human behaviors, playing a very similar role as the law, and occasionally even exceeding the effectiveness of the law.

Before the law comes into being, social customs help to maintain the order of the society. The emergence of social customs indicates the formation

of a system of social norms. With the further development of human economy and society, the relationship between people is becoming more and more complicated and the maintenance of order requires more than social customs. Therefore, the social custom at its very early stage cannot meet the demands of increasing development of human society and a new type of scheme is anticipated to complete the adjustment of increasingly complex social relations, thus the law which originates from the social customs comes along. Starting from this point, social customs and law have joined their hands and undertaken the important task of regulating order of people's life (Guo 2012).

The data rights law and social custom influence, penetrate into and restrict each other. Social customs often infiltrate into the field of the data rights law through indirect ways, helping to shape data rights law in a more resourceful, detailed and specific way and affecting both the format and layout of the law, and at the same time acting as a background constraint on the effectiveness of the data rights law. In a given social situation, the data rights law may absorb, accept and acquiesce in prevailing social customs in many ways and channels, but sometimes may take compromise on some of the content that it considers to be harmful. The operation and effect of the data rights law shall be constrained by norms of social customs. Where the values and behavioral ideology of the data rights law are contravening the prevailing social customs and cultural concepts, to implement such a law would be an extremely difficult task with little effect. In addition, social customs may be squeezed by the data rights law, and are changing. The data rights law not only adopts the attitudes of acquiescence and absorption to social customs, but also changes some of the traditional practice so as to shape the social customs in a way more appropriate for the need of the contemporary society and more conducive to the operation of customs.

The data rights law and social customs interact with and complement each other, which also helps resolute disputes between themselves. In this process, the data rights law and social customs fully interact with each other. The social customs rely on the coercive force of the data rights law to ensure their implementation, while the data rights law often relies on a flexible way of social customs to resolve disputes so as to ensure that it is not evaded by the public, or that the public spontaneously believe in and obey the law that is consistent with or similar with their social customs. On the micro-level,

in the operation of the data rights law, rules of the data rights law tend to be mixed with social customs to form a mixed structure of rules, that is, the data rights law and social customs respectively assume parts of “assumption, processing, consequence” of a rule. In other words, the three elements of the mixed rule, “assumption, processing, consequence,” are not constituted by one kind of rules of data rights law or social customs. This proves even more strongly that neither social custom nor data rights law can be a self-contained law, and they interact with each other and complement each other.

There exist division of responsibility and competition between the data rights law and social custom. As two important social norms, the data rights law and social customs exist in the same human society and their interaction would not be limited to the scope of mutual respect or simple exclusion, but more about an intrinsic relevance. In terms of basic content and function, social customs assist and supplement the data rights law, while at the same time social customs play an independent normative role with very solid and strong local foundation. Social customs become the most convenient norm among others because of its social identity, while the data rights law is comparable to the last resort to construct the order of digital society and maintain the stability of digital society. Conventions and sentiments are contained in social customs, which can provide effective adjustment for interpersonal communication conforming to the rules of nature, and they tend to be recognized by people, and help promote order and justice in a sense. However, some of the rules contained in social customs may not be consistent with the direction of the development of human society as a whole, and social customs may show insufficiency and defects in logical structure due to their spontaneity. On the basis of social reality and through absorbing the content of social customs, the data rights law was established on rational basis to achieve the social development goals. From this perspective, the data rights law is fundamentally superior to social customs.

In real life, people’s uncertainty about the concept of data rights law leads to the result that social customs tend to be more preferred in the choice of norms due to the convenience and priority, since social customs are born inside the society, reflect the habits of human behavior, and are more familiar to and relied by people. Only when the adjustment of social customs fail to obtain effective guidance and remedy, will the data rights law be regarded as the last remedy because of its authority. The relationship between the data

rights law and social custom is one of division of labor and competition. This kind of division of labor and competition is determined by the national spirit and features of thanking pattern of the realistic society. To a certain extent, the creation of the data rights law is transforming the institutional characteristics of the human society, but the transformation does not mean total abandonment of the traditional behavioral norms, reflecting a new type of social customs not totally faithful to the traditional ethics nor fully conform to the data rights law, such a new social custom plays a normative role to a certain degree, and in certain occasions, data rights law will be put in the final choice. Objectively facing the reality, we cannot exclude the competition of social customs to data rights law.

Data rights law and public opinions

Wittgenstein once said that the human eyes have the charm to give value to things. When we turn our eyes to legal phenomenon, corresponding evaluation will also come about. There will be a variety of evaluations on the basis of information feedback from certain perspective, among which social public opinions are universal existence to express such attentions (Zhao 2012). The so-called public opinion is based on the social value system deeply rooted in people's heart, which comes from the public discussion and evaluation by common people toward some social phenomenon, and is helpful to achieve the means of regulation and control of people's behavior. As one of the driving forces of social development, public opinions not only reflect the society in a rather passive way as well as the collective public consciousness, but also influence the society passively and the tendency of public collective consciousness, but also influence the society all the time and react on people's thinking activities and behaviors.

Public opinion is one of the ways of social evaluation at the social level. Professor Ouyang Kang, a famous sociologist, once pointed out that social evaluation had strong trace of relativity. Firstly, the subject of evaluation is self-related to the value facts. Secondly, the social evaluation standard itself may contain great individual difference and ambiguity. Thirdly, the difference of reasonableness in social evaluation (Zhao 2002). Generally speaking, the social conflicts, and the frictions between polarized interest

groups and confrontation of different schools of thought are the soil and background of the emergence of public opinion. Therefore, the purpose of public opinion is to exert pressure on the relevant parties or persons so as to influence their decision-making, restrict their behaviors, and ultimately achieve practical results consistent with the tendencies and requirements of public opinion. This means that public opinion has practical intention and impulse to resort to action (Zhang 1999). When legal phenomenon is a public opinion, whether the application of the law is fair or not becomes the public attention, which becomes not a sheer hot issue of social concern within the isolated circle of legal proceedings of specific organs authorized by the state any more, but is forced to collide with social judgment different with law evaluation in a passive manner.

With the popularity of modern science and technology, the power of public opinion is also expanding with the renewal of different carriers. According to the research results, in modern society, the development pattern of social public opinion related to legal phenomena shows the trend of diversification. Seen from the trend of historical development, ancient law is featured by unitary mandatory command, while a multi-faceted dialogue pattern is an emerging trend in modern times. This could be considered not only as the result of the development of social civilization, but also the symbol of the evolution of human society. In the era of big data, the concern of public opinion on the legal phenomena helps to reflect on the quality of the data rights law and make up for the deficiency of legislation (Zhao 2002).

As two cornerstones of supporting social order, the data rights law and public opinion jointly play irreplaceable roles. The applicability of the data rights law will be influenced by public opinion. Such influence comes from, on the one hand, the difference of social attributes between the two kinds of evaluations, and on the other hand, it comes from the inadaptability of human beings to the law itself. This is an era of coexistence of challenges and opportunities, modern technology featured by information technology is changing our life style in an unprecedented way and all types of social orders are embracing new impact in the Internet era, and survival in a network age has become one of the important ways to reconstruct the political structure and landscapes. If the data rights law fail to be recognized by the society, then it cannot be universally observed nor its authority be established, which may face the destiny of being eliminated. The voice of public opinion from

one side urges the legislative process of the data rights law not to “create law behind closed doors,” but to pay attention to the mass public, people’s livelihood, and traditional Chinese legal culture.

There are both mutual influence and interaction between the data rights law and the public opinions. The data rights law and public opinions are not only the channel of resolving social disputes, but also a window for digital civilization and democracy. The data rights law was born for achieving social fairness and justice, while the public opinion represents the morality of a society which also seeks social fairness and justice, both of which play a role in promoting justice and eliminating undesirable influence. From this perspective, we can see that the supervision by public opinion is not necessarily antagonistic to the data rights law. Rather, there is a necessary tension between them. Tension relation is the state of mutual influence and interaction between two subjects on the premise of keeping a certain distance (Guo 2010). The data rights law should absorb accurate and real supervision by the public opinions and remain immune from the interference with radical and false opinions. Therefore, supervision by the public opinion and data rights law shall, on the one hand, maintain their respective positions and, on the other hand, interact with each other. They are not mutually exclusive, and thus the positive value of supervision by public opinions should be given full paly so as to urge the public opinions to publicly and reasonably supervise the activities of the data rights law.

The data rights law and public opinions are complementary in their functions as social safety valves. In a stable society, people would reach a certain degree of consensus on the allocation of scarce resources. When the degree of consensus is dropping and social members question the legitimacy of the current mechanism of allocation, social hostility may arise. When hostility in society can be expressed in socially acceptable and permissible ways by the public to their opponents, it is accepted as means of safety valve, such as dueling and witchcraft widely seen in pre-industrial societies. Similarly, the data rights law and the public opinion are also part of the social safety valve system, with the latter acting as the primary safety valve, and the data rights law as the more advanced safety valve (Liu 2012).

The degree of social demand for safety valves is proportional to the rigidity of the social structure, that is, the higher the threshold set by a society for the expression of various opposing requirements, the greater the need for safety valves to ensure the normal operation of society. As a more

advanced social safety valve, the data rights law cannot directly alleviate the unrealistic conflicts. Individuals or a group of claimants who resort to the data rights law tend to have specific interest appeals and explicitly demand certain results, not just expressing hostility. Public opinion may reflect various types of social conflicts, including both the realistic and unrealistic conflicts because of its lower threshold and multi-faceted channels. But it is worth mentioning that in the era of digital civilization, the data rights law acts as the last safety valve to ease social realistic conflict (Liu 2012).

Data Rights Law: New Order, New Civilization

Charles Dickens, the British writer, wrote in his book *A Tale of Two Cities*, “It is the best of times, it is the worst of times.” This sentence can also be used to describe the landscape of the big data age. On the one hand, big data has undoubtedly created a “best era” featured by more frequent inter-connection, openness and sharing. On the other hand, it has also brought about an top-down disorder, and what we are facing may be a “worst era” with constant data security risks. Traditional rules can hardly bring about a new order, thus we have the data rights law which is the product of social development at a certain stage and will bring the whole mankind to a new era of civilization. It can be imagined that the combination of scientific and technological wisdom together with legal rationality will open a new chapter in the development of human society and lead mankind into the most brilliant new era of civilization in the history of development.

Digital intelligence society

So far, in the process of social development, the time interval between major changes has been gradually shortened, and the transformation of social situations has been accelerated. The great information theorist Von Neumann points out that “the ever-accelerating process of technology gives the appearance of approaching some essential singularity. Once this singularity is transcended, the human society as we know it now will be very

different” (Kurzweil 2015). In human society, the emergence of singularities is driven by new technology, which leads to radical changes in human society. Carlotta Peres, one of the leading figures in evolutionary economics, expressed the view that significant technological change meant not only the extraordinary rapid growth of a number of new industries, but also the rebirth of many “old” industries in the long run (Wang 2015). Due to the rapid development of big data, cloud computing, artificial intelligence and other technologies, human society will usher in an intelligent era, and human beings are embracing a new society – the digital intelligence society. In this new society, the boundary between virtuality and reality, human and machine will be increasingly blurred, and the human-to-human relationship as well as the relationship between human and society will be reconstructed.

Digital intelligence society is a society driven by data force and data relationship. Productivity and production relations are among the most important relations in human society. According to the theory of political economy, productive forces and production relations are unity of opposites, and the birth of any particular kind of production relations in history is determined by the development of productive forces. Every change in society is marked by a change in the mode of production. In the era of big data, there is no doubt also problems of data force and data relationship. Data force is the ability of human beings to use data to understand and transform nature in the context of big data era. It is not only a cognitive but also a developing ability, and its essence is a kind of data productivity. Because of the influence of this kind of power, the whole social production relationship is branded with the data relations.⁴ The data force will be the most important productivity of mankind which would be unprecedented enhanced by data force. The contradiction between productive forces and production relations is the fundamental driving force to promote the development of human society. Similarly, data force and data relations will also promote the accelerated development of digital intelligence society.

Digital intelligence society is characterized by universal intelligence. After entering the industrial society, coordination and distribution of responsibilities and large-scale manufacturing help to make a substantive leap in

4 See Key Laboratory of Big Data Strategies. *Block Data 2.0: Paradigm Revolution in the Era of Big Data*. Beijing: CITIC Press Group, 2016: 193–195.

terms of manufacturing and utilizing tools. At present, a new round of intelligent industrial revolution is quietly proceeding, and the human beings are embracing a new type of economic and social formation by utilizing technologies like information and telecommunication to a maximum extent, integrating the virtual world with real world after experiencing the hunting society, farming society, industrial society and information society in the past. Electronic chips, the Internet of Things, and the holistic integration of artificial intelligence will take the mankind to the next stage of development. Digital intelligence society is a new concept and a social form on higher level. Politics, economy, culture, as well as people's way of thinking and values will undergo profound and comprehensive changes just as the way of the human society was transformed from the agricultural society to industrial society.

SHARING FEATURE

In the traditional industrial society, the material products can hardly be shared and are relatively limited in terms of the amount, which means that social struggle is inevitable due to the fact of unfair and uneven distribution of resources. However, in a digital intelligence society, the most important means of production is data. Unlike ordinary materials, data may be reached by indefinite sources and be shared by all mankind. At the same time, due to the birth of various new technologies, social material products reach a high degree of enrichment in which the struggle for resources and goods has been transformed into a state of sharing and win-win cooperating community of human society for the building of a harmonious world (Chu 2015).

CONNECTIVITY

Essentially, human society has the attribute of interaction and connection, which exists in both the stage of agricultural society and the stage of division of labor in industrial society. (Liang 2014) In the digital intelligence society, new technologies based on the Internet of Things and cloud computing will give birth to a strongly connected social system and once new connections emerge, a complex social system with coexistence of reality and virtuality will surface, which will push human society into a new era of human-computer interaction.

INTELLIGENCE

Spirit cannot be grasped through perception, nor can it be measured by quantitative method (Wang 2015). However, intelligence is precisely trying to conquer the indescribable spiritual world. The biggest difference between the digital intelligence society and the societies in the past is that the former endows all things with “intelligence” and greatly expands “intelligence” ability of the people. At present, the tide of intelligence is affecting us in a sweeping manner, intelligence of all things is the trend of social development, and intelligent technology will transform all aspects of human life with the successive advent of intelligent transportation, smart medicine, smart agriculture, smart city and so on.

LEGAL ORDER IN A DIGITAL INTELLIGENCE SOCIETY

All things are undergoing changes, from orderly state to disorderly state or in the backward direction at any time and in any place. Technological advancement drives the development of society, and the never satisfied human demand for material conditions may drive the continuous progress of technology, with every great technological change pushing mankind to a new stage of development. Human society will embrace an age of intelligence, which will not only affect the profound transformation of industry, but also affect the whole society and the life of everyone. The new generation of information technology characterized by digitalization, networking and intelligence has been widely and deeply applied, which not only improves greatly the efficiency and quality, but also brings inevitably new problems, new changes and new challenges in the aspects of production relations, organizational form and social structure, which are driven by technology too. The intelligence of robots and other new intelligent equipment and terminals continues to improve, and the progress from “personification” to “humanoid” is getting more and more rapid, which prompts new questions as to how to define human identity, how to judge human subjects and how to protect human from invasion and replacement of machines. Physical world, information space and the demarcation of human society are becoming increasingly blurred with more frequent emergence of legal blind spots and formation of a series of complex safety loopholes, and all in all, the human world is undergoing a technological tsunami and order reconstruction.

Future of law: Institutional composition of the future society

It is a slow process for the new rules to come about but they will eventually take the place of the old ones. For a society, the safer attitude to the new emergence is to interpret it by and compare it with existing institutions and rules until it develops into a completely different species and exceed the management parameter of the old rules (Hu 2013). Social progress is a process of constant changes. Law is a social product, and the developing path of each process and its choice and design of rules reflect the social structure and social order at a certain period of time and of a certain society. In the process of human development, the emergence of each new technology will have a certain impact on the law. On the one hand, the achievements brought about by the development of science and technology will inevitably broaden the scope of human activities and give birth to new social relations and right relations. On the other hand, the advancement of science and technology will certainly bring about new areas for legal regulation. As far as the construction of legal system is concerned, laws simply based on technology itself and the resulting technology-centered social norms would be not complete and may not keep up with the times. “The helplessness we experience is not a sign of personal failure, but a reflection of the helplessness of our institutions. We need to reconstruct these institutions that we once had, or create new ones” (Giddens 2000). Throughout the process of human development and the evolution of law, construction of social forms ever since the industrial revolution is closely related to the coetaneous institutional establishment or that of previous enlightenment (He 2017). The new stage of civilization requires a synchronous social institution, on the basis of which we can predict the institutional composition of the future society that consists of multiple value goals, regulation of social norms guided by morality and ethics, as well as the risk-prevention and control mechanism oriented by technology and law.

Multiple value goals with security and harmony as their core. Human beings have diversified living needs, which determines the diversification of human value goals. The value goal of law has many dimensions, among which safety and harmony are the basic value embodiment of law. Legal philosopher Luis Recasens Siches indicates that if the legal order does not represent a safe order, then it is not a law (Bodenheimer 1999). The value of law includes not only the opposition between ideal and reality, but also the unity of to-be and ought-to-be. Law is a special existence containing both

general value components and special value elements so as to realize its special legal value. The ideal value of law is always higher than its actual value, which provides impetus for the evolution of law. In the future, the value of law should not only reflect the ideal values of human beings, but also display the legalization of value in the category of philosophy. Therefore, under the guidance of the multiple value goal, the law should gradually contain special value content, namely security, harmony and innovation.

Morality and ethics as the forerunner of the social norm control system. According to the system integrity theory, elements contained in the system are inseparable. Single element in the system cannot exist alone, but needs to be related to other elements. To achieve the smooth operation of the entire system, a single element must be subordinate to the whole, and linked with other elements. In the system of social norm regulation and control, law, morality and ethics are important means of regulation and control from different angles and using different mechanisms, which may also exert influence upon various fields of a society through different methods. From a philosophical perspective, the moralization or ethicalization of law realizes the overall optimal state and the optimal cooperation between the various constituent elements of the social norm control system. Therefore, in the process of constructing the social norm control system, we should not only focus on the development and perfection of the legal system, but also pay attention to the connection and integration of law, morality and ethics.

Risk control mechanism dominated by technology and law (Wu 2017). Risk control refers to the use of a variety of means to reduce the likelihood of risk occurrence and the harm caused by risk. Risk control mechanism is the unity of social rationality and scientific rationality. It not only involves the strengthening and transformation of the traditional legal system, including the policy system with social supervision as the main component, but also covers the legal regulation of technical means. At present, the new technological revolution is on the rise, the industrial transformation and economic development continue to integrate and merge with each other. The development of new technology has brought challenges to the traditional legal system, the existing legal system and concepts fail to adapt to the fundamental requirements of the development of technological innovation. How to cope with the emerging new situation in society? Technical regulation and improvement of legal system are the basic requirements, which are not only the trend of the times, but also the internal driving force of international and

local innovation. Under such circumstance, the pursuit of a combined and comprehensive mechanism of governance featured by technical regulation and legal regulation will be the most desirable choice.

Algorithm is law

Traditionally, law is the basis of social rules, and its main function is to regulate human behavior. Generally speaking, the evolution of law is also the process of its gradual and in-depth integration into human production and life. From Code of Hammurabi to Roman law, from religious rules to Napoleonic Code, from the law of the Shang Yang to the Criminal Code of Qing Dynasty, from case law to statute law, from national law, maritime law to international law, laws become more and more omnipresent. Because the law has certain hysteresis, we can hardly on the basis of existing law foresee future situation and legal phenomenon. The rapid development of society will promote the evolution of the law, and the boundaries of the law will continue to expand. Therefore, in the rapid development of this society, the legal system would be subject to comprehensive remodeling.

With the advent of a new era of “algorithm economy,” systematic methods would be employed to solve various problems. Nowadays, algorithms are having a great impact on human production and life in many ways, covering industrial development, enterprise innovation and so on. The algorithms come in a variety of forms, from traditional desktops and laptops to emerging smartphones and wearables. The algorithm can analyze thousands of pages of documents and produce results in a very short time, and it can also help people better understand the relationship between people, people and things, things and things, and even people’s behavior motivation and emotional state. In the present and in the future, when big data and algorithms become assets of societies, businesses, and individuals that can hardly be overlooked, new business model will emerge (Dormehl 2016). Undoubtedly, the algorithm will become a new engine of the new economy and bring overturning impact on society. With the continuous progress of computer technology and algorithm technology, more and more objects and devices gradually become intelligent, which means that human society is entering into a new era of “algorithm economy” through the connection between big data and cloud computing.

In the future, a large number of social rules might be written into the algorithms of artificial intelligence, and the law will become a pile of algorithms. Yuval Noah Harari once pointed out that in the future artificial intelligence will gain dominance and our law will become a kind of digital rule which will regulate all human behavior except for the laws of physics (2017, p. 280–283). In the era of big data, data and algorithms have become a new network architecture. While the mass data are seemingly analyzed in an objective manner, this descriptive ergodic fact is also imposed on everyone as a normative rule (Hu 2016). The “algorithm” will bring subversive impact on our traditional mode of thinking and lead to infinite reverie in human society, and this kind of prediction has been gradually realized. The world will be quantified by algorithms, human beings will continue to improve their understanding of society and themselves through algorithms, and artificial intelligence will partially replace human beings through algorithms and massive data analysis, with the law ultimately being replaced by algorithms.

Property law and data rights law are two legal bases of digital civilization

One of the core functions of law is to maintain social harmony and stability. Whether rules, institutions or laws, they are presupposition and arrangements formulated for regulating people’s interaction. Law is an important guarantee for the normal operation of society and people’s harmonious life. People often say “nothing can be accomplished without norms or standards,” which is a problem that needs to be faced by as high as the national governance and down to the level of people’s daily life. Whether it is a society, a country, or a family, exchanges and activities between people cannot maintain a good order and people’s personal safety and happiness cannot be guaranteed without laws, regulations and codes of conduct. Therefore, law is not a dispensable decoration in people’s life, but a basic guarantee of people’s normal work and life. Social progress is a process of constant changes, from agricultural society to industrial and then to digital civilization, from the “human rights era,” “property rights era” to the “data rights era,” and law will also realize the leap from “law of man” to “law of things” and then to “law of data.”

Digital civilization is a more superior type of civilization after industrial civilization. Compared with the industrial civilization, which attaches great importance to the rationality and rules and has the characteristic of making maximized profits, the digital civilization is just like a storm prompting human beings to reflect on their past norms and rules. As an important part of production materials, data resources are different from the traditional production factors, which make the rule of generation, collection and use of data the core of the new system. On the premise of protecting individual dignity and freedom, it is urgent to establish scientific and reasonable rules to realize the effective circulation and use of data. With the development of digital civilization, it is an irresistible trend to make necessary modifications to the original protection rules, and most of the legal norms will be fundamentally changed. The data rights law is the product of a new civilization and it will also signify a new order during a transformation era from industrial civilization to digital civilization.

It is the belief of Marxism that the law belongs to the superstructure which will be fundamentally determined by its economic basis and serves the economic basis. Both the production and life of human society and any progress of the human civilization are inseparable from property. All kinds of social relationships among human beings are essentially property-economic relationship. Property law determines the owner of the property from the perspective of civil law, and further determines what rights the owner of the property has, emphasizing the protection of property rights, which not only is conducive to clarifying the ownership of property, but also can give full play to the effectiveness of property. The data rights law aims at defining attribution of data and setting out explicit rules for data utilization, which is the essential raw material for building a harmonious law-based society. In a society ruled by law, if there is no law, there is no order. The existing property law protects the property right of the obligee and defines the ownership of the property, while the data rights law protects the data rights of the obligee and defines the ownership of the data resources. The combination of the two delineates a vibrant, orderly and fair and shared future world for all of us. The data rights law and property law set out legal foundations for the future era, becoming the basic materials to construct a legal empire based upon rules.

Prospects of civilizations: Natural persons, robots and genetic persons

So far, human society has experienced the first industrial revolution marked by steam engine, the second industrial revolution marked by electrification and the third industrial revolution marked by computer technology. Human society is facing the advent of the fourth industrial revolution featured by multi-faceted technologies, wider scope and diversified fields. Looking back at the past three industrial revolutions and the fourth industrial revolution we are experiencing, we can find a common feature among them that machines are gradually replacing human labors. In his book *On the Citizen*, Thomas Hobbes, founder of modern political philosophy, points out that

for as in a watch, or some such small engine, the matter, figure, and motion of the wheels, cannot well be known, except it be taken in sunder, and viewed in parts; so to make a more curious search into the rights of States, and duties of Subjects, it is necessary, (I say not to take them in sunder, but yet that) they be so considered, as if they were dissolved, (i.e.) that we rightly understand what the quality of human nature is, in what matters it is, in what not fit to make up a civil government, and how men must be agreed among themselves, that intend to grow up into a well-grounded State. (2003, p. 9)

Here, human society can be conceived as the most sophisticated machine of the time, and the relationship between human beings and machines will become increasingly closer.

Robot is the inevitable product of technology development to a certain stage. As early as in the year of 1611, the word “automata” first appeared, which was employed to refer to the use of clock gears and other technologies to produce automatic robot dolls. This kind of automata was the product of social imagination at that time, although it did not have intelligence in real sense, it provided people with the idea of artificial intelligence and made people realize that machines could simulate human brains and bodies. A robot, as defined by the Robot Institute of America, is a reprogrammable, multifunctional manipulator designed to move material, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks. In 2013, McKinsey Global Institute in its report *Disruptive technologies: Advances that will transform life, business, and the global economy* identified twelve disruptive technologies that will drive

transformation in life, business and global economy by 2025, with advanced robotics ranking fifth. The core of social development and progress is the liberation of labor force. When the labor force is partly replaced by machines, mankind will enter the industrial era. When the labor force is completely liberated by the robots the mankind will enter the age of intelligence. At present, robot technology has made rapid progress, penetrating into every facet of human life and the popularity of robots will be a foreseeable trend in the near future.

“Gene man” will play a new role in the future society. Every revolution will create new things and every new invention will replace a certain function of mankind. The fourth industrial revolution is on the horizon, in which robots that are more powerful than humans and capable of independent thinking will emerge and “genet man” that use gene sequencing, editing, and activation technologies will emerge as well. It is likely that there are not only “natural persons,” but also other species like “robots” and “gene man.” Perhaps robots and genetic man have both the personality traits and mental state of a natural person. At that time, the natural persons, the robots and the genetic man will compete to survive in the game.

Past history tells us that human functions are slowly degrading with every step of technological advancement, from physical power to brain power, from being active to being passive, from the outside world to the internal world. Human beings degrade themselves by what they deliver intelligent machines. In the course of this game, the possibility of intelligent machines becoming superior to their human masters has been greatly increased (Lin 2017). Essentially, the development of robots and “gene man” originated from the needs of human beings. In the near future, if robots acquire the ability of self-learning, self-improvement and self-innovation, and are equipped with abilities that the human beings lack, and if genetic technology makes it possible for the creation of “gene man” with the same abilities as human beings, we will have to redefine the concept of “human,” and human centralism will be rewritten. Thus, human beings will face a series of problems. How to define the relationship between natural person, robot and “gene human”? How to distinguish the attributes of the three? What changes will take place in human society? Will robots and “gene man” overtake or even control humans? All these questions are awaiting answers, and our world view, our outlook on life, and our values will be immensely affected.

Integration of civilizations

In ancient times, early civilizations moved only slowly within a relatively narrow scope. With the emergence of commodity production and exchange, civilizations began to merge. From the perspective of the vast sea of world history, the integration of civilizations becomes a normal, inevitable and necessary state (Shang 2014). The so-called integration of civilizations refers to the process in which different civilizations make contact and communicate with each other, and make constant innovations and develop their cultural identity. Integration embodies the tendency of seeking balance from reciprocity and complementarity among civilizations and is an indispensable link in the evolution of civilizations (Guang 2009). Throughout the history of world civilization, the trend of integration has made the world a more civilized and colorful place. Whether in the past or in the present, any kind of civilization, regardless of their original region, state, and social conditions, has been undergoing a process of integration and evolution to its current state (Lu 2017).

The purpose of integration of civilizations is to innovate and inherit previous civilizations in a critical manner, rather than to integrate them into a simple successive civilization. According to the norms of content, civilization can be categorized into three levels, namely, material civilization, spiritual civilization and institutional civilization. Integration of civilizations reflects the exchange between and penetration into each other. The process of integration of civilizations is the process of different civilizations acquiring from each other, and the final result is that the weaker civilization gradually approaches the stronger one (Guang 2009). For example, with the rise of a new round of scientific and technological revolution, big data, artificial intelligence and other new generation of information technology are widely spread and used, making people with different civilization background become closer in terms of their production means and ways of living.

The data rights law helps to elevate human society to a digital-intelligence sharing society characterized by the integration of civilizations. Sharing is an irresistible trend in the process of integration and development of human civilizations, penetrating into every corner of our lives online or offline. The so-called sharing originates from ancient times and it is embedded in the idea of Confucius' Great Harmony Society, Plato's "Utopia," Sun

Yat-sen's ideal of "the world as one community," and Mao Zedong's propaganda of "Serving the People" (Lu 2017). In the era of big data, sharing is a significant achievement in the convergence and development of digital civilization. In this era, data is infinitely replicable, and data owners can have real, direct control over the data replicated. Therefore, people urgently need to change the social form and promote data sharing. The data rights law advocates data sharing, which is a kind of ethical consciousness of digital society determined by legal means, and its ultimate goal is to make it possible that every member of the digital society may fully enjoy the wonderful life brought by the new generation of digital technology. At present, the social form against the backdrop of big data technology is changing from the society of private rights to the organic society featuring sharing (Wu 2016). At the same time, the data rights law promotes human society to a higher form characterized by digital and intelligence sharing and the integration of civilizations.

The data rights law is a product of integrated development of civilization in the era of big data. With the continuous development of economic integration, integration of civilizations becomes a worldwide trend, in which we see the integration of Eastern and Western legal theories and jurisprudences with an emerging tide of the integration of the civil law system and common law system. The so-called civil law system and common law system are two parallel legal traditions which have the most far-reaching impact on the world today. Although these two legal traditions have different characteristics in terms of the legislative systems, judicial systems, legal concepts and practices, these two legal systems are developing in an ever-integrating manner. As the era of big data is ushered in, the process of the integration between various civilizations across the world is speeding up. The trend of the integration of legal theories and jurisprudences as represented by the civil law system and common law system in many aspects becomes more and more evident. The development of the new generation of information technology, such as big data, makes the data rights law a point of convergence between legal theories and practices of the East and West in this era. The data rights law becomes an integrated point of advantages of civil law system and common law system to the maximum extent. In a certain sense, it marks the development trend of the integration of eastern and Western legal theories and jurisprudence.

Future civilizations

The evolution and progress of human society is a long historical process. At the beginning of its birth, the human beings directly obtain food and construct shelters from their natural environment. Gradually, they become unsatisfied with the original nurturing of the nature and begin to study from and explore the organisms and plants in the nature to better meet the needs of their own, and they use the limited technological resources to transform the natural materials they acquire. The world has undergone drastic changes from industrial civilization and information civilization to the intelligent age of this day. Human beings have begun to explore the intrinsic logic of nature and society, and to build advanced intelligence systems.

Humankind is facing unprecedented revolutions, all our old stories are crumbling, and no new story has so far emerged to replace them. Of course, humans could never predict the future with accuracy. But today it is more difficult than ever before, because once technology enables us to engineer bodies, brains and minds, we can no longer be certain about anything – including things that previously seemed fixed and eternal. (Harari 2017)

What will the future of human society look like? Admittedly, we can use our wildest imagination to draw a picture of the future in our mind. With the advent of artificial intelligence, the Internet of Things and other technologies, the future of human society will not only belong to the natural person, but also to the robots, gene man, perhaps even the singularity man and biochemical man, which will make the human society more complex and interesting. For human beings, the nature contains abundant resources, including not only the biological gene pool, but also the cultural gene pool, and these resources will bring constant inspirations to human progress. Mankind uses advanced technology to study the resources acquired in nature, and in the meanwhile constantly returning to nature to create a natural kingdom and man-made kingdom of unity. The line between living creatures and machines will gradually become opaque. Biological creatures become mechanized, and remain no longer living creatures in traditional sense, but transformed living creatures by non-biological logic. Machines

become biologicalized and are no longer the original machines, but human-invented creatures with biological logic and possessing autonomous and adaptive capabilities, so the original order would be ultimately transformed. As Stephen Kotler said:

Life is tricky sport – and that’s the emotional core of this story, the real reason we can’t put Pandora back in the box. When you strip everything else away, technology is nothing more than the promise of an easier tomorrow. It’s the promise of hope. And how do you stop hope? (Kotler 2016)

In the future, with the emergence of various biological forms and the development of diverse biological functions, the birth of robots, gene man, singularity man⁵ and biochemical man will bring about many problems in terms of legal regulation and ethics, which may exert a huge impact on the entire legal system of human society. The advent of the data rights law will create a better social environment for the harmonious coexistence of humans, robots and gene man, in a bid to realize the perfect coexistence of the man-made and the natural creatures and push the human society into a brand-new civilization era – the era of digital civilization. Every advancement in civilization has enriched the reserve of knowledge of the human beings, promoted the improvement of productivity, and pushed forward the pace of progress of mankind. The era of digital civilization promoted by digitalization, technicalization and intelligentization is knocking the door, which is a new civilization form succeeding the civilization of the stone age, the civilization of the agricultural age and the civilization of the industrial age, and is being expected to chart a new chapter of human society development and usher in a most splendid new era of civilization in the course of history of human development!

5 According to the new theories introduced by the American futurologist Raymond Kurzweil, by 2045, humans will usher in a technological singularity that is expected to create a new species of “singularity man” that may surpass and obsolete humans. “Singularity” refers to the fusion of human and other species (objects). “Singularity Man” is a new species formed after the fusion of computer intelligence and human brain intelligence.

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