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*Article*

# The Path to Data Protection Governance in China Mainland

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**Abstract:** In the age of the digital economy, the security and privacy for multimedia systems issues are increasingly manifested in the form of data. The level of data protection governance capability determines whether the security and privacy of multimedia systems can be protected. In recent years, China has introduced laws and regulations on the protection of personal information, personal privacy, data security, and cybersecurity. Although data protection is still to be improved, China has been refining the provisions on data security management through practice and the adoption of supporting regulations.

**Keywords:** data protection; personal privacy; cybersecurity; data security

The regulation of Internet technology with artificial intelligence, social media, big data and other technologies, while promoting social development, has also brought unprecedented risks and challenges to human society. Today, China remains the world's most populous country, [1] by June 2023, with more than 1.08 billion Internet users. Meanwhile, internet penetration had increased to 76.4 percent. From the beginning of the Internet in China was only used in the field of education and scientific research, but nowadays, the Internet has become a necessary tool for socializing, office and leisure. More and more people enjoy the convenience brought by the development of digital technology through network applications and digital facilities. However, the security and privacy for multimedia systems issues brought about by the continuous development of Internet technology have attracted more and more attention.

In recent years, the Chinese government continues to promote digital industrialization and industrial digitization. When the digital economy has become an important part of the economy and society, the data security risks also have penetrated into all aspects of human life and work. With the development of digital technology, the security and privacy for multimedia systems issues such as personal information, personal privacy, and trade secret are constantly presented in the form of data, and data security issues come thick and fast, making it is no longer ignorable in the process of vigorously developing the digital economy in China. It is the key to solving this series of problems lies in the governance of data security.

## 1. China's Data Security Continues to be Emphasized in Mainland

Since the 13th Five-Year Plan, China has continued to develop the digital economy, continued to improve its digital infrastructure, accelerated the cultivation of new business forms and new models, and achieved positive results in promoting the industrialization of digital industries and the digitization of industries. By 2023, the added value of the core industries of the digital economy is account for 8.5 percent of China's gross domestic product, and the digital economy has provided a powerful impetus for sustained and healthy economic and social development.

At the same time, various types of personal information are an important source of data, and the main component. Enterprises can achieve the innovative development of goods, to provide personalized services for consumers through collecting massive data. However, the collection and use of data should not be borderless, coupled with information leakage, data leakage, privacy

infringement, and other risks occur from time to time, data security has become the development of the digital economy by the issues that must be considered.

With the advancement of algorithms, the increase of arithmetic power, the continuous emergence of digital products such as instant messaging software, online shopping platforms, and online travel software, and the emergence of new products and new forms of business, the relationship between citizens and Internet platforms is getting closer and closer, and data containing users' personal information, citizens' privacy and even commercial secrets are constantly exposed to Internet platforms, and the issue of data security and privacy protection has become particularly prominent in the era of the digital economy.

The digital era has not only revolutionized traditional security and privacy protection, but also brought unprecedented challenges to security and privacy protection. Based on the characteristics of the digital era, security and privacy protection, and data security issues are mutually exclusive, and the focus of the Chinese government's regulation of security and privacy protection is data security governance, while the key to data security governance lies in the protection of security and privacy, which mainly encompasses the security of personal information, privacy security, and national security issues.

One of the important features of the digital era is that data have become an important factor of production. Nowadays, data is ubiquitous and pervasive, and it is gradually becoming the "blood" of active beating in cyberspace and the "crude oil" of economic development. In fact, the identities, properties, and activities of all kinds of subjects are presented in the form of data, which determines that the data has multiple legal attributes. Data security is the concentration of personal information, privacy and even national security, while personal information and privacy protection are specific manifestations of data security. For this reason, the governance of security and privacy protection issues needs to be based on characteristic of "data".

## 2. The Fundamental Legal Framework of Data Governance in China Mainland

China's digital economy has been developing rapidly, with new forms, modes, and industries emerging thick and fast, and some platform companies developing into industry giants in just a few years. These companies have accumulated a large amount of data during their development, which also includes a lot of personal information, user personal data, and other sensitive information. Therefore, the protection of data security requires active government action. In recent years, China has enacted and amended a series of laws, such as the *Civil Code*, the *Data Security Law*, the *Cyber Security Law*, and the *Personal Information Protection Law*, as well as regulations such as the *Data Exit Security Assessment*, the *Regulations for the Administration of Network Data Security (Draft)*, the *Ministry of Industry and Information Technology of Issuing the Administrative Measures for Data Security in the Field of Industry and Information Technology (for Trial Implementation)*, and national standards such as the *Information Security Technology-Personal Information Security Specification* to address the issue of data security, including personal information, privacy, national security. By combing through the Chinese government's thoughts on data security governance, it can be found that its governance of data security is mainly reflected in the construction of the institutional level of data collection, data processing, data circulation, and assumption of responsibility.

### 2.1. Focus on Improving Data-Processing Systems

Data processing is the most important data activity carried out by data processors in the digital era, which includes the collection, storage, use, processing, transmission, provision and disclosure of data. Data processing activities are the beginning of the circulation and utilization of data, and reasonable regulation of data processing activities can avoid the emergence of security risks from the source. According to the *Civil Code*, the *Personal Information Protection Law*, the *Data Security Law* and other laws and regulations, there are three main principles in China's regulations on the handling of personal information and other data and information: The principle of minimum necessary, the principles of openness and transparency, and the principle of informed consent.

### 2.1.1. The Principle of Minimum Necessary

In the 1970s, the U.S. Fair Information Practice Principles (FIPPs) established rules on collection limitations, use limitations, disclosure limitations, etc., which provided the ideological source for the establishment and development of the principle of minimum necessary. China has made provisions in the Civil Code and the *Personal Information Protection Law*. According to Article 6 of the *Personal Information Protection Law*, "Personal information processing shall be based on explicit and reasonable purposes and directly related to those purposes and shall exert the minimum impacts on the rights and interests of individuals." The principle of minimum necessary is mainly that the type and scope of data collected, such as personal information, shall be directly related to the provision of services, and the purpose of the service cannot be realized without the collection of the corresponding data of the individual; the amount of personal data collected shall be the minimum necessary for the realization of the purpose of the service; in addition, the relevant service subject shall not provide services based on the excessive collection of information that is not agreed to by the provider of the personal information [2,3].

### 2.1.2. The Principles of Openness and Transparency

According to Article 7 of the *Personal Information Protection Law*, "The principles of openness and transparency shall be observed in the processing of personal information, the rules for processing personal information shall be disclosed, and the purposes, means, and scope of processing shall be explicitly indicated." In terms of the principles of openness and transparency, the case of APPs mainly includes several aspects: first, the disclosure should be complete, for example, there should be both a privacy policy and rules for the collection and use of personal information in the APP, and the scope of the purpose and method of the collection and use of personal information should be made explicit; second, these disclosed rules should be made available to the individual through an appropriate way so that he or she can understand them conveniently.

### 2.1.3. The Principle of Informed Consent

The principle of informed consent is that the information collector should obtain individuals' consent. According to article 14 of the *Personal Information Protection Law* "**Where personal information is handled based on individual consent, said consent shall be given by individuals under the precondition of full knowledge, and in a voluntary and explicit statement.**" The provisions on the principle of informed consent in China's laws and regulations can be summarized at four levels. Firstly, information handlers can only collect information after individuals have expressly consented to it, and handlers cannot collect information after they have explicitly indicated that they do not consent to it, nor can they frequently ask for individuals' consent or interfere with individuals' normal use of it. Secondly, individuals should be provided with the means and ways to withdraw their consent to the collection of information; Thirdly, information should be collected in a proper manner, and users should not be misled into consenting to it. Fourthly, information should not be collected beyond the scope of consent, such as collecting information beyond the scope of individuals' authorization in violation of the applicable rules on collection announced.

## 2.2. Focus on Improving the Environment of Data Circulation

Emphasizing data security does not mean prohibiting data circulation. In terms of national policy, the Chinese Government encourages data trading and circulation, as reflected in the *Electronic Commerce Law* and the *Data Security Law*. In fact, for the data industry, data circulation is also a necessary choice to realize the value of data elements. Building a reasonable data circulation system is not only conducive to the prosperity of the data industry, but also helps to realize data security. At present, China's data circulation system mainly focuses on domestic and cross-border circulation.

### 2.2.1. Improving the Regulation of Data Localization



In the context of the digital economy, economic globalization remains a major trend, and cross-border data flows have become an important form and pathway for data and information exchanges and economic and trade exchanges among countries or regions. While the explosive growth of cross-border circulation of data promotes the prosperity of international digital trade, it also brings challenges to the security of personal information, the development of the data industry and even national data security. Especially after the "Prism Gate" program of the United States in 2013, data localization has become a trend sweeping the world.

In 2017, China's *Cybersecurity Law* came into force, which stipulates that personal information and important data collected and generated by operators of critical information infrastructures in their operations within China should be stored within the country. The *Data Security Law*, which came into force in China in 2021, explicitly states that, unless approved by the competent authorities in China, organizations and individuals within the country shall not provide foreign judicial or law enforcement agencies with data stored in China.

For example, the Guiding Opinions on Encouraging and Regulating the Development of Internet Rental Bicycles issued by the Ministry of Transportation and Communications (MOTC), the Administrative Measures for Scientific Data issued by the Ministry of Science and Technology (MOST), the Guidelines on Internet Personal Information Security Protection and the Guiding Opinions on Implementing the Cybersecurity Multi-Level Protection System and Critical Information Infrastructure Security Protection System issued by the Ministry of Public Security (MPS), the Measures for Data Security Management in the Industrial and Information Sector (for Trial Implementation) issued by the Ministry of Industry and Information Technology, and other relevant regulations and documents, all emphasize that personal information or important data generated within China should be stored within the country, and that exit from the country is subject to the approval of the national competent authorities [4].

## 2.2.2. Improvement of Regulation of Cross-Border Flow of Data

Completely blocking the cross-border circulation and trading of data is neither in line with the objective law nor possible, so the adoption of a data localization policy meets the current practical needs. The data exit security has gained more and more attention and importance at all levels, and data security has become an important issue in national digital governance [5]. In terms of data flows, many countries have generally adopted a more conservative and strict governance model for cross-border flows of data. A report by the U.S. Information Technology and Innovation Foundation (ITIF) shows that since 2017, the number of countries restricting cross-border data flows has risen from 35 to 62, and the number of data localization measures implemented has risen from 67 to 144 [6]. China is one of the main victims of data leakage and cyber-attacks. According to the Report on Analysis of China's Internet Cybersecurity Monitoring Data, released in July 2021, China's exposure to cyberattacks from outside the country is becoming an increasingly serious problem, and the sovereignty and security of national data are facing unprecedented challenges.

Although cross-border flow of data brings challenges to data security protection, the Chinese government has been building a reasonable system to facilitate cross-border flow of data. In 2022, the State Internet Information Office published the *Data Exit Security Assessment*, which provides specific regulations on the management measures for exit security assessment of personal information and important data. This is an important practice for China to explore the supervision of cross-border flow of data, which is not only a detailed implementation of the provisions on data exit security assessment in the *Cybersecurity Law*, the *Data Security Law*, and the *Protection of Personal Information Law* and other laws and regulations, but also a key measure for the protection of China's basic strategic resources and national security in the context of internationalized data circulation and sharing [7].

After the implementation of the *Data Exit Security Assessment*, the first cross-border data transfer case approved under these new rules has been issued by the Beijing office of the Cyberspace Administration of China (Beijing CAC), approving a data export by the Beijing Friendship Hospital

of the Capital Medical University. In this case, the data will be received by Amsterdam University Medical Center for purposes of a joint multi-center clinical research project in colorectal medicine [8].

The fact that data can realize cross-border flows lies fundamentally in the guarantee of the underlying system. Prior to the release of the Data Exit Security Assessment, the *Cybersecurity Law*, the *Data Security Law*, and the *Personal Information Protection Law* had established data exit assessment mechanisms at a preliminary level, and constructed a scientific and systematic legal system for data exit in cyberspace field. In addition, the Chinese Government adheres to the combination of prior assessment and continuous supervision, and to the combination of risk self-assessment and security assessment, providing a relatively complete institutional support for the cross-border flow of data.

### 2.3. Focusing on the System of Assuming Responsibility for Data Security

Regarding behaviors that threaten data security, China mainly pursues responsibility for the relevant responsible parties in the three areas of civil liability, administrative liability and criminal liability. Data security responsibilities are reflected in the *Civil Code*, *Criminal Law*, *Data Security Law*, *Personal Information Protection Law* and other laws and regulations, and the liability systems in different fields of laws and regulations jointly build a data security responsibility mechanism, which provides a legal basis for the pursuit of data security responsibilities.

#### 2.3.1. Civil Liability

In terms of civil liability, the assumption of responsibility for data security is mainly embodied in *Data Security Law*, and the scope of civil liability under the *Data Security Law* mainly covers two aspects. Firstly, enterprises engaging in data-related business activities shall bear civil liability for data security incidents caused by failure to take necessary security measures by regulations. Enterprises engaged in data-related business activities in accordance with the provisions of Article 27 of the *Data Security Law* shall establish and improve a comprehensive security system and take the necessary technical or other measures to protect data security. When an enterprise fails to take the necessary security measures as required and a data security incident occurs, the enterprise shall bear civil liability. Second, individuals who damage data security should also bear civil liability. According to the provisions of the *Data Security Law*, an individual shall be civilly liable if he or she intentionally destroys data security, steals, alters, or destroys data, or illegally uses or maliciously uses data, or illegally leaks data. In addition, individuals may also be civilly liable if they negligently cause a data security incident to occur. In addition to this, there are provisions in the *Civil Code*, the *Personal Information Protection Act* and other laws and regulations on infringement of personal information, personal privacy and other data security.

#### 2.3.2. Administrative Liability

In addition to civil liability, administrative authorities can also take administrative enforcement measures to impose administrative penalties for violations of data security, and after the promulgation and implementation of the *Cybersecurity Law*, a large number of administrative enforcement cases in the field of data security have been published by administrative authorities such as the Cyberspace Administration of China. Among administrative responsibilities, the issue of data security can be categorized into the national level of safeguarding data sovereignty, the enterprise level of enhancing the competitiveness of enterprises and promoting the development of the digital economy, and the individual level of safeguarding the rights of personal data [9].

First, at the level of national data sovereignty and data security, data handlers have failed to comply with regulations on the security of data transactions and have provided important data outside the country without authorization. Some of the data collected by enterprises may belong to important State intelligence, and the leakage of such data will seriously jeopardize national security. The data classification regulations need to be improved, and the protection of data needs to be strengthened.

Secondly, at the level of enterprise data security, the data security guarantee obligations of data processors represented by platform enterprises include three dimensions, including data security management system, fulfillment of the obligation to protect the rights of personal information, and the obligation to cooperate in supervision [10]. For enterprises' failure to fulfill their obligations to build a data security management system and to fulfill their obligations to protect the rights of personal information, the administrative authorities can impose corresponding penalties.

Finally, at the level of personal information, in the Internet sector, platform companies are prone to data security problems by over-collecting sensitive personal data, which mainly includes names, genders, identity card numbers and medication use. In China, if a data processor fails to fulfill its data security protection obligations, fails to take any technical measures such as anti-tampering, anti-leakage and anti-intrusion, and fails to take technical protection measures such as de-identification and encryption measures for sensitive data, which results in the leakage of data from the platform or the risk of data leakage, the law enforcement authorities may penalize such acts in accordance with the *Data Security Law*.

### 2.3.1. Criminal liability

At the level of criminal liability, China has mainly adopted the idea of combining criminal law and non-criminal law regulation. the *Criminal Law* and judicial interpretations can be broadly categorized into two ways of regulating crimes involving data security: firstly, based on the essential attributes of the data, they are protected as information; secondly, based on the technical characteristics of the data, they are protected as an intrinsic part of the computer system. The former mainly includes the crimes of stealing, spying, bribing and illegally providing state secrets and intelligence for an organization, institution, or personnel outside the country, infringing on trade secret, infringing on citizens' personal information, and illegally deleting, altering, or adding the data or application programs installed in or processed and transmitted by the computer systems, while the latter mainly includes the crimes of destroying computer information systems and failing to perform the obligation of information network security management. At the level of non-criminal laws and regulations, in addition to the regulation of behaviors endangering data security in criminal laws and regulations represented by the *Criminal Law*, the subsidiary criminal law norms in non-criminal laws, such as the *Data Security Law*, also have relevant provisions on related behaviors. According to Article 45 of the *Data Security Law*, data handlers who violate the data management system and jeopardize the country's sovereignty, security, and development interests will also face criminal liability.

## 3. Data Security Governance Practices in China Mainland

Over the past decade, China's governance of data security issues has not only made certain achievements at the level of institutional construction but also, with the implementation of relevant laws and regulations, the Chinese government has accumulated a wealth of practical experience in data security governance. As China's attention to data security and privacy protection continues to deepen, in the process of governing data security issues, China has responded from three latitudes: legislation, law enforcement, and justice.

### 3.1. Legislative Practice and Achievements

In legislative practice, China has always insisted on continuously improving relevant laws and regulations to provide more comprehensive protection for data security, which is now **mainly reflected in the Civil Code, Criminal Law, Data Security Law, Personal Information Protection Law, Cybersecurity Law** and other legislations. As mentioned above, China has regulated the infringement of data security at different levels in the laws and regulations on civil, administrative and criminal liability, and the promulgation and implementation of the *Data Security Law* has filled the gap in China's data security protection legislation and pointed out the development direction for the establishment of a sound data security governance system. There are some differences between the *Data Security Law* and the *Personal Information Protection Law*. The *Data Security Law* aims to

safeguard data security in terms of national security and social public interests. The Personal Information Protection Law, on the other hand, focuses on the security of personal information and is more focused on private rights and interests, and is designed to safeguard the privacy, personality, property and other interests of individual citizens. The two laws complement each other and improve China's protection of various types of data. In addition, at the legislative level, China has also focused on strengthening the connection between specific systems and the overall governance framework and has further strengthened the connection with the *Cybersecurity* Law and other laws in terms of basic definitions, data security management, data categorization and classification, and the exit of important data, in order to improve the construction of China's legal system for data governance.

### 3.2. *The Administrative Law Enforcement and Improvement*

The issue of data security is fundamental to the development of the digital economy, a view that is particularly evident in law enforcement practices involving data security. In the context of the digital economy, the most significant feature of the platform operators is the possession of massive amounts of data, and the manner in which platform enterprises handle and utilize data has a bearing on whether data security can be protected. In administrative enforcement practice, on July 21, 2022, China's National Internet Information Office imposed the fine of over 8 billion yuan (\$1.19 billion) on ride-hailing giant Didi Global Inc in accordance with the *Cybersecurity* Law, the *Data Security* Law, the *Personal Information Protection* Law, and the *Administrative Penalties* Law, which is by far the highest fine imposed in China on an operator for a violation of data security. These illegal activities mainly include illegal collection of 11.9639 million pieces of screenshot information from users' mobile phone photo albums; excessive collection of 8.323 billion pieces of user clipboard and application list information; excessive collection of 167 million pieces of precise location information; inaccurate and unclear explanation of 19 personal information handling purposes and other illegal activities.

Since 2021, China's law enforcement departments at all levels of net information and other law enforcement agencies have carried out law enforcement in the field of data security in accordance with the law, and in response to the serious problem of illegal collection and use of personal information in dozens of mobile apps such as Didi, notified platform operators to take down the relevant apps in accordance with the law, and required the relevant operators to strictly comply with the legal requirements for safeguarding the security of personal information of users. In addition, the establishment of China's National Data Bureau in 2023 marks a new stage in China's efforts to utilize, protect, develop and regulate data elements. It also means that the administrative authorities will continue to increase *Cybersecurity* Law enforcement in the field of data security, and the main problems of law enforcement in the field of data security that will be addressed include platforms operators that collect and use personal information in a serious illegal and unlawful manner by means of coercion, enticement, fraud, and other illegal means. In addition, such as failing to carry out security assessments as required and having potential security problems, among other things will be focused on.

### 2.3. *Judicial Practice and Emphasis*

In the judicial practice, China's governance of data security is mainly reflected in the punishment of crimes related to data security. In practice, data-related crimes generally include a wide range of criminal acts with personal information, privacy rights and other legal good. Through searches, the scope of "data" as the object of crimes includes not only traditional property such as network virtual property and cryptocurrency, which are associated with property crimes, but also personal information such as candidate information and household registration information, which can identify specific natural persons. There is an overlapping between data related crimes and traditional crimes in terms of the scope of infringement, such as the act of generating virtual currencies for profit by cracking the instruction codes of virtual currency service providers [11]. Or the act of collecting victims' personal information, such as users' name, ID number, bank card number, and phone number, by database cracking [12]. This means that although laws such as the *Data Security* Law and



the *Personal Information Protection Law* have their own focus on protecting different types of data in their legislation, the concept of "data" is often interpreted broadly in the context of data crimes, as personal information and privacy are often carried as "data", and there is an overlapping between the various concepts. The concept of "data" is often interpreted broadly. Especially in the digital age, the intertwining of data and personal information, privacy and even national security are becoming more and more obvious, and it is difficult to distinguish them in judicial practice, and the protection of the rights and interests of all of them is categorized under the protection of data security, which is also the path of the current judicial practice in China Mainland.

#### 4. China's Data Security and Privacy Protection Path

##### 4.1. Improvement of Laws and Regulations

In recent years, China has actively explored the field of data security, and has regulated data security issues including personal information, privacy protection, national security and many other issues through legislation. The enactment and implementation of a series of laws and regulations, such as the *Civil Code*, the *Personal Information Protection Law*, and the *Cybersecurity Law*, have effectively solved some of the data security problems that need to be addressed, and have provided a good guarantee of the rule of law for the development of the data industry, but in the process of practice, there are still many places that need to be optimized and improved in order to address the data security issues.

In terms of legislative refinement, the *Data Security Law*, for example, still needs to be strengthened in terms of clarifying the main security risks faced by each type of data exit, as well as in terms of fine-grained governance, and there are deficiencies in terms of dynamically responding to changes in internal and external data security risks [13]. Although the *Data Security Law* puts forward principled requirements for the design of a security risk system in the flow of data, it does not put forward targeted measures for security risks in the process of data flow. In terms of the interface between law and law, such aspects as the *Civil Code*, the *Criminal Law*, the *Data Security Law*, and the *Personal Information Protection Law* are all reflected in respect of data security issues, but the interface between the civil, criminal and criminal law is not very smooth, ultimately resulting in some violations not being able to be effectively dealt with.

##### 4.2. Improving the Data Infrastructure

###### 4.2.1. Improvement of Data Grounded Theory

At some level, the imperfect data-related fundamental institutions allow technology-based enterprises to collect, analyze, and use data arbitrarily, which is also one of the reasons for data security risks and privacy infringement. The lack of clarity about the legal attributes of data has made it impossible for regulators to effectively regulate issues related to data security, as a result, it is necessary to explore the foundational theory system of data. Liu liehong, the head of NDB, made the remarks at a forum at the second Global Digital Trade Expo. He said the administration is pressing ahead with a series of works, such as improving the basic systems for data, promoting the circulation, transaction and utilization of data, bolstering data infrastructure construction, advancing research of key technologies in the data field, and strengthening data security governance. Subsequently, on January 4, 2024, the National Data Bureau collaborate with relevant departments to explore the implementation of a "Data Element X" plan for 2024-2026. These initiatives are important to bring the digital economy into a deeper stage of development and to provide theoretical foundational support for data security.

###### 4.2.2. Improvement of Data Classification Regulations

According to the requirements of Article 21 of the *Data Security Law*, "The State is to establish a categorized and graded protection system for data, implementing categorized and graded protection according to the data's degree of importance in economic and social development, as well as the

degree of danger to national security, public interests, or the lawful rights and interests of individuals or organizations brought about if it is altered, destroyed, leaked, or illegally obtained or used.” The *Practice Guidelines for Cybersecurity Standards — Guidelines for Network Data Classification and Grading* subsequently promulgated classify data into three levels, from low to high, namely, ordinary data, important data and core data, but since general data covers a wide range of data, the same level of security protection may not be able to meet the security needs of different types of data. Data handlers give priority to grading in accordance with the basic framework, and on the basis of grading in the basic framework, they can also combine with the industry data classification rules or the organization's production and operation needs to refine the grading of general data.

However, there are also many challenges in the implementation of the regulations of data classification. For example, Article 40 of China's Constitution establishes a strict system for the protection of private communications, which is mainly regulated by telecommunication carriers and state organs, but modern Internet communication tools and exchange platforms form the problem that the content of communications can be easily forwarded, and the boundaries between private communication contacts and public information dissemination are unclear, which is not conducive to the establishment of a security and protection order that is appropriate for the type of data. Therefore, it is necessary to distinguish between private communications and public information in Internet communication scenarios, so as to make it easy for network operators and users to clarify the private or public attributes of the network socialization scenarios in which they are engaged, and thus to establish network data security norms of strict confidentiality for private communications and orderly management of public information in accordance with the idea of categorization and management [14].

#### 4.3. Improvement of Supporting Measures

To solve the current data security problems, not only need to continue to improve the laws and regulations, consolidate the basic theory of data, optimize and innovate the regulatory measures, but also to strengthen the data-related infrastructure facilities to meet the urgent need to achieve the security of data flow. Firstly, data resources and data products in the current market are complex and diverse, which should be categorized based on data attribute categories, importance, risk level and other factors. Second, in establishing a data property rights system guaranteeing rights and interests and compliant use, the system of structural separation of data property rights is at the core. According to *Opinions of the CPC Central Committee and the State Council on Establishing a Data Base System to Maximize a Better Role of Data Elements*, A classified and hierarchal ownership affirmation and authorization system for public data, corporate data and personal data shall be established. According to the characteristics of data sources and data generation, the legal rights enjoyed by each participant in the process of data production, circulation and use shall be defined respectively, and a property right operation mechanism with ownership of data resources. Shenzhen in South China's Guangdong Province released *Data exchange Management Regulations (for Trial Implementation)* at the city level. It has taken the lead in exploring the concrete practice of structural separation of data property rights and standardizing the data exchange mechanism [15].

Finally, the focus is on compliance data exchange system. The compliance data exchange system is the key for optimizing the data circulation environment and strengthening data security, especially the system for cross-border flow of data, which is even more important in the context of the current data security game among countries. Compliance and security are the red lines of data exchange, and the security compliance system can reduce the risk of leakage of personal information and national secrets.

## 5. Summary

Data security, whether from the national level, social level or individual level, has an extremely close relationship with national sovereign security, social stability, individual rights and interests, etc. On the one hand, data security is more closely linked to personal information, personal privacy, national security protection and other issues, and the data security issue has become the centralized

manifestation of these issues. On the other hand, data as a carrier of various types of information, coupled with the non-exclusivity and renewability of data, has posed higher challenges to data security. Effective management of data security issues cannot be separated from the continuous improvement of the theoretical system, but also needs to build a set of laws and regulations throughout the data collection, use, circulation, and other aspects of the system.

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