Big Data Collection and Object Participation Willingness: An Analytical Framework from the Perspective of Value Balance

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Abstract. The application of big data not only brings us great convenience, but also brings social problems such as big data "familiar", information leakage and so on, which seriously affects customers' willingness to participate and their satisfaction with the enterprise. How to collect customer information in order to improve customers' willingness to participate is an urgent topic to be discussed. This paper proposes an analytical framework, which considers that the decision-making of big data objects participating in the big data collection process is a process of comprehensive value balance, including four types of CO creation, inducement, dedication and fishing, involving two dimensions of activity value and data value, and the necessity of procedure, activity value, information sensitivity, process complexity, data security and procedure. From the six aspects of value judgment, this paper may provide useful enlightenment and reference for big data subjects to choose the target data collection method of big data application and improve the participation willingness of big data objects.

Keywords: Big Data, Willingness To Participate, Value Balance Perspective, Analytical Framework

1. The Origin of Research
Big data refers to the collection of massive data, and the analysis and research of the laws and phenomena contained in massive data, it is a statistical analysis technology to obtain valuable information to predict the future development of things [1]. The application of big data depends on the acquisition and analysis of massive data. With the development of the Internet, especially the mobile Internet, and the increasing popularity of e-commerce and online payment, it brings great convenience to people's daily life, at the same time, it also produces a variety of data all the time. This provides a very good condition for the collection and application of big data. Enterprises use massive data such as customer behavior obtained from various channels to analyze, accurately locate customer preferences and needs, conduct precision marketing, and provide customers with appropriate products and services. Therefore, the application of big data plays an important role in better matching supply and demand, reducing the waste of resources and time.
With the deepening and popularization of big data application, it is also found that the application of big data will bring a lot of economic, social and legal problems. In order to obtain a large amount of valuable data, some enterprises illegally collect consumers' personal information, which brings security risks to consumers and damages their rights and interests. Some enterprises in the access to massive data, poor data management, resulting in consumer personal information leakage, and even will contain consumer personal information illegal sales, resulting in consumer personal information leakage, consumer privacy information wantonly spread on the Internet, resulting in spam messages, harassing phone calls, accurate fraud frequency, seriously infringed on the personal and property safety of consumers, affect the quality of life We have established a normal social and economic order. Some enterprises will use their own data and platform advantages to "kill familiar", treat customers differently and infringe on the rights and interests of consumers. Some enterprises will illegally use consumers' personal information, such as sending commercial information to consumers without their consent, promoting business, selling goods and even harassing consumers through telemarketing. Some enterprises make use of data advantage and market power to make high profits higher than the competitive price by bidding up prices and price fraud, or crowd out other operators by low price dumping and price collusion, so as to achieve the purpose of monopoly [2].

Therefore, all sectors of the society and participants, especially the general public as the object of big data technology, are very vigilant about the application of big data. By means of big data technology, the words and deeds of the general public are transformed into data, which are collected, stored, analyzed and utilized by the main body of big data technology. Although they generate data, they do not possess data, have no data collection and processing ability, and do not enjoy the benefits of data. They even do not know how to dispose of the data they generate. They are in an absolutely passive position. They have a strong reaction to the disclosure of privacy information and being "killed" caused by big data applications, because it means that their rights are seriously violated and their security is improved A sharp decline in the sense of responsibility. These have seriously affected their willingness to participate in big data and their satisfaction with relevant enterprises, resulting in the "digital gap" between big data subject and big data technology object [3, 4].

The problem of "digital divide" has brought great challenges to the application of big data. How to collect customer information to improve customer participation intention is a topic that needs in-depth discussion. The existing research mainly focuses on the characteristics of big data, the impact of big data technology and Application on existing industries and enterprises, how to make better use of big data technology to help existing enterprises and businesses, how to improve the technology of big data collection, storage, analysis and application, how to use big data to open up new businesses or start new enterprises, and the social and legal impact of big data application However, few studies focus on how to optimize the data collection methods to solve the "digital gap" between big data subject and big data technology object.

From the perspective of value balance of big data object, this paper attempts to construct a model, which can provide useful enlightenment and reference for the research and practice of big data application.

2. The Presentation of Analytical Framework
Every actor must make a decision according to his own interests, and then make a decision in favor of himself. Therefore, in order to improve the enthusiasm of big data objects to participate in the data collection of big data subjects, we need to understand the various interest concerns of big data objects in the data collection process of big data subjects, that is, we can investigate the participation decision-making and participation behavior of big data objects from the Perspective of interest balance.

(1) Decision making considerations
When big data objects participate in the decision-making process of big data, they mainly consider the following factors:
① Procedural necessity
If the process of big data collection is just the necessary procedure for the big data object to carry out other economic or social activities, in order to achieve its goal, the big data object can only accept the data input requirements, regardless of whether it is willing or not. On the contrary, if the data collection process is not required by the big data object to carry out other activities, or needs to add other actions in addition to the program needs, the big data object may not be willing to participate in the data collection process. For example, in the process of shopping on the e-commerce platform, in order to complete the transaction, consumers must input the necessary identity information and the information of the purchased object whether they are willing or not, so consumers have to accept that the data is collected. However, if the platform requires the input of personal information such as height and weight, which has nothing to do with the transaction, or requires additional income, purchase frequency and other consumption intention information, then consumers are often reluctant to participate.

② Activity value
If the process of big data collection is just the necessary procedure for the big data object to carry out other economic or social activities, and the results of these economic or social activities bring great utility and satisfaction to the big data object, it will promote the big data object to complete this process. The stronger the willingness to complete these economic or social activities, the stronger the motivation to participate in the big data collection process.

③ Information sensitivity
If the big data object thinks that the required data is private information, it is often reluctant to participate. On the contrary, it is easier to be persuaded to participate in data collection. For example, if big data objects are required to input information such as marital status, family income level and sexual orientation, it may cause big data objects to be very vigilant or even disgusted.

④ Process complexity
If the big data object is required to input a lot of information, or the input process is complex and cumbersome, or the input information needs certain knowledge and ability to identify and judge, which costs a lot of time and energy, it may greatly reduce its willingness and enthusiasm to participate.

⑤ Data security
If the information that big data objects are required to input is not sensitive information such as private privacy, but if big data objects think that big data subjects may abuse these private information when analyzing and using them, or worry that big data subjects may cause information leakage when storing data, which will eventually damage their rights and interests, the participation of big data objects may be greatly reduced Wish and enthusiasm.

⑥ Data value
If the big data object thinks that its participation in the big data collection process will bring value to the big data subject, but it will also bring value to itself, that is, it will create a win-win situation, or even a multi win situation, then the big data object will have more willingness and enthusiasm to participate. The higher the potential value of big data objects, the stronger their motivation to participate in the big data collection process.

(2) Analysis framework dimension
These six big data object considerations can be divided into two categories according to the different objects of concern: the first category focuses on the economic or social activities carried out simultaneously with big data collection, and the balance is the income and cost brought by the economic or social activities. The benefits of economic or social activities can be measured by activity value, while the costs of economic or social activities can be measured by procedural necessity. When the program necessity and activity value are high, the big data object has the highest evaluation on the value of economic or social activities. When the necessity of procedure is low and the value of activity is high, or the necessity of procedure is high and the value of activity is low, the evaluation of big data
The second type focuses on big data itself, weighing the benefits and costs brought by the collection and application of big data. The benefits brought by big data can be measured by data value, while the costs brought by big data can be measured by information sensitivity, process complexity and data security. When data value and data security are high, and information sensitivity and process complexity are low, big data objects have the highest evaluation of big data value. When the data value and data security are low, and the information sensitivity and process complexity are high; or when the data value and data security are low, and the information sensitivity and process complexity are high, the evaluation of big data object for big data value is the lowest.

The influence direction and size of the big data object's attention object and attention dimension on the big data object's participation intention can be summarized in the following table:

**Table 1. Summary of the influence of object on big data attention dimension and big data participation willingness**

| Focus on          | Focus on dimensions | Degree of degree | Direction of influence |
|-------------------|---------------------|------------------|------------------------|
| Economic or       | Procedural necessity| Low willingness  | Positive(+)            |
| social activities | Activity value      | to participate   |                        |
|                   | Information sensitivity| High willingness | Negative(-)            |
| big data          | Process complexity  | to participate   |                        |
|                   | Data security       | Low willingness  | Positive(+)            |
|                   | Procedural value    | to participate   |                        |

(3) Big data collection type

Taking the value judgment of big data objects on two concerned objects as the classification basis, big data collection methods can be classified (as shown in Figure 1).
themselves, so it is a "co creation" data collection process. When the big data object has a high evaluation on the value of activities but a low evaluation on the value of data, the object will think that the data collection process has little to do with its own value, and participating in the data collection process is mainly to help the big data subject to create value, so it is a "dedication" data collection process. When the big data object has a low evaluation on the value of the activity but a high evaluation on the value of the data, the object's participation in the big data collection process is mainly attracted by the promised interests of the big data subject or the future value of the big data application, so it is a "inducement" data collection process. When the evaluation of big data object on activity value and data value is low, the object does not have any motivation to participate in the big data collection process, which is mainly induced by the big data subject through other means, so it is a "fishing" data collection process.

(4) Analysis Framework

Based on the above analysis, we propose a "factor type Willingness" analysis framework (see Figure 2)

![Figure 2. Analysis framework from the perspective of value balance](image)

The different degree of each value influencing factor will lead to different types of data collection, which will lead to different degrees of participation willingness of big data objects. According to the analysis, it can be concluded that the object participation willingness of "co creation type" data collection type is the highest, that of "fishing type" data collection type is the lowest, and that of "dedication type" and "inducement type" is in the middle. Big data subjects can switch the data receipt types among the four types by adjusting the purpose of big data application and the means of data collection, so as to change the object's willingness to participate in the big data object.

3. Conclusion and Prospect

The application of technology should be people-oriented\(^5\). The application of big data brings us great convenience and welfare, but at the same time, it also produces a lot of serious social problems. These problems cause more and more serious "data gap" between the subject and object of big data, which has seriously affected the application and development of big data. It is necessary to systematically and deeply study how to improve the satisfaction of the object and its willingness to participate in the process of big data information collection. This paper attempts to view big data collection and application from the perspective of big data object. From the perspective of value balance, it holds that the decision-making of big data object participating in big data collection process is a process of comprehensive value balance, which includes four types: CO creation type, inducement type, dedication type and fishing type, involving two dimensions of activity value and data value as well as the necessity of procedure Activity value, information sensitivity, process complexity, data security and program value judgment. This analysis framework not only considers the value evaluation of the big data object on the big data itself, but also the value evaluation of the economic or social activities...
of the object in the process of data collection; it considers the evaluation of the big data object on the benefits and benefits, and its perception of the corresponding costs and costs; it also considers the evaluation of the real value of the big data object, It also considers its estimation of future value and integrates it with appropriate logic, which is more comprehensive and systematic. Therefore, this paper may provide useful enlightenment and reference for big data subjects in how to choose big data application goals and big data collection methods, improve the participation willingness of big data objects, and for the research of big data application \[6-10\].

However, this analysis framework is only a qualitative analysis framework proposed in theory, which is far from the level of quantitative analysis. There is still a lack of quantitative data and actual data test on the extent to which each influencing factor will lead to different types of data collection, and then how much it will affect the participation willingness of big data objects. In addition, this analysis framework only puts forward different value influencing factors of big data objects, but it does not further explore what factors lead to the degree of change of these influencing factors. All these need to be further studied in the future.

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