Research on Multi-Agent Cooperative Supply Mechanism in Public Digital Culture Service

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Abstract: The supply of public digital cultural services needs the government, enterprises, non-profit organizations and the public to establish a long-term and sustainable cooperation mechanism. This paper analyzes the constitution and connotation of multi-agent cooperation supply mechanism of public digital culture services, and puts forward some suggestions to perfect multi-agent cooperation supply mechanism of public digital culture services, so as to ensure multi-agent cooperation supply public digital culture services smoothly.

Keywords: Public Digital Culture; Multi-Agent Cooperation; Supply Mechanism

1. Raise of problem

Multi-agent cooperation supply mechanism for public digital cultural services is refers to the government, enterprises, voluntary organizations and civil main body, for fully implementing the resources sharing, public digital culture meet the demand of the public diversification, the precision of the digital culture, by making relevant rules and regulations and cooperation agreement, to establish a systematized and institutionalized cooperation mechanism, to ensure the long-term and lasting smooth operation of the cooperation system.

As the big data, 5G, cloud computing, chain blocks, such as the development of advanced science and technology, emerging technologies and the traditional public services depth fusion, public libraries, cultural centers, museums and other public cultural services focused on cultural products and cultural resources and the combination of digital technology, constantly enrich and innovative high quality public digital culture service. However, such digital products and resources independently provided by various public cultural service institutions are still difficult to meet the diverse and personalized spiritual and cultural needs of the public. Compared with each "information island", it is particularly important to make the integration and sharing of digital resources more convenient and efficient by integrating various digital cultural resources of relevant institutions and establishing a "one-stop" public digital cultural service platform.

Therefore, the resource integration and service provision of public digital culture depend on the cooperative supply of multiple subjects. This cooperative supply is not the cooperation of a single project of each subject, nor is it an occasional and temporary cooperation, but requires the establishment of a set of persistent and orderly multi-agent cooperation mechanism to provide the people with a diverse and accurate digital cultural experience.

2. Multi-agent cooperative supply mechanism of public digital cultural services: Composition and connotation

To study the multi-agent cooperation supply mechanism of public digital cultural services, it is necessary to design and formulate a set of operating mechanisms with the goal of solving many practical problems in the above discussion, so as to promote the multi-agent cooperation to provide public digital cultural services more efficiently and smoothly.

Consultation mechanisms: It refers to a management mechanism in which the government, enterprises, non-profit

organizations and the public communicate and negotiate on the goals and contents of cooperation they want to achieve in the supply of public digital culture services on the basis of equality, voluntarily, mutual benefit, so that the preferences of all parties can be basically reached, so as to form a cooperative consensus. The elements of the consultation mechanism are mainly composed of the subject, content and means of consultation. The participants include the government, enterprises, non-profit organizations and the public. The contents of the consultation are as follows: Firstly, the cooperation rules and regulations are established through multi-agent consultation, and the resources and services are reasonably distributed. At the same time, each subject clearly defines its own responsibilities and works together to complete the supply of services; second, in order to give full play to the role of social organizations, we should establish a decision-making mechanism based on independent decision-making of multiple subjects and supplemented by government decision-making. The means of consultation can be divided into formal institutionalized means and informal communicative means.

Commitment mechanism: In order to establish a good cooperation order, it is necessary to establish the cooperation consensus reached in the negotiation stage through the institutional guarantee, through the formal or informal form, so as to realize the smooth cooperation. The realization elements mainly include two points: the first is rigid commitment, that is, on the premise of cooperation agreement with legal effect among multiple subjects, the establishment of compliance rules and regulations that can be observed by all partners. The second is flexible commitment. This kind of commitment does not rely on formal laws and regulations, and requires the partners to fulfill the commitment through establishing reciprocity norms, establishing reputation mechanisms, and trusting each other.

Implementation mechanism: This refers to the process by which multi-agents implement the agreements and commitments of cooperation among multi-agents by utilizing and integrating digital resources. The executive subject refers to the overall supply system of public digital cultural services jointly composed of the government, enterprises, non-profit organizations and the public. The object of execution is the content and mode of the supply of public digital cultural services that multi-agents participate in. The content and mode of supply should be sufficient, high-quality and diverse. Implementation resource refers to the integration of digital cultural resources, broadening the coverage of digital culture, and promoting the co-construction and sharing of national public digital cultural resources and services in the process of multi-agent cooperation to provide public digital cultural services.

Supervision mechanism: Since each subject belongs to different interest groups, they will actively carry out cooperation in the interest of the organization and themselves when providing services, while they may be passive on the contrary. Therefore, a set of strong supervision mechanism is needed. The supervision subject is composed of mandatory supervision composed of relevant laws and mutual supervision among all subjects. Since public digital cultural services involve a large amount of digital information, the supervision subject must strengthen the supervision of the whole process. The objects of supervision include multiple entities providing digital cultural services. If there are multiple violations of laws and regulations, they will be subject to necessary penalties in accordance with relevant laws and regulations.

Guarantee mechanism: It is divided into financial investment mechanism and talent mechanism. First of all, it is necessary to maximize the use of digital resources owned by multiple subjects and reduce the cost of public digital cultural services. Especially, it is necessary to increase the investment of funds for the construction of a large number of infrastructures in the early stage of cooperation. Secondly, there are big problems in personnel protection in the construction of public digital culture services, and it is necessary to construct multi-level personnel service system to adapt to the new situation and new task of cultural digitalization. We will explore multi-agent cooperation to supply talents for various digital cultural services, establish a sound talent cultivation mechanism, and form an open and mobile talent system.

2. Improving our country's public digital culture services multi-agent cooperation supply mechanism: breakthrough and path

2.1 Establishing a consultation mechanism for multi-agent cooperation supply

In terms of the supply of public digital cultural services, a coordination agency led by local governments and jointly

organized by relevant departments such as cultural centers, libraries, and museums should be established. These agencies are responsible for the organization and coordination of national digital cultural service cooperation. They should promote horizontal cooperation between different organizations and make overall plans for key public digital cultural service cooperation projects. On the other hand, a permanent management body such as the board of directors should be established among the main bodies to promote the integration of their functions. In accordance with the principle of separating government from enterprise and government from business, we will integrate the functions of different participants to reduce the number of branches and overlapping functions between departments. At the same time, the established consultation mechanism should play the role of consultation linkage communication among all subjects, and gradually realize the integration of management and comprehensive decision-making.

2.2 Establishing a multi-agent cooperative supply commitment mechanism

First of all, we should cultivate a common value system and a shared vision of cooperation among multi-agent. The government as a public service "conductor" of the digital culture should be combed through cultivating partners common value system, build the image of integrity. This is not only of great significance to the citizens it serves, but also has a profound impact on the smooth realization of digital cultural services between different subjects. Secondly, the principle of reciprocity should be developed. In the process of providing public digital cultural services, different subjects will take into account their own interests. The establishment of reciprocity norms of co-construction and sharing can effectively promote their cooperation on the basis of voluntary equality. Finally, the rigid constraints of cooperation commitments should be strengthened. By clarifying the legal status of rigid commitments, for example, relevant laws and regulations can be formulated to guarantee the constraints.

2.3 Improving the implementation mechanism of multi-agent cooperation supply

On the one hand, in order to realize the comprehensive development of public digital cultural services in my country and maximize the value of digital cultural resources, we must strengthen the integration of resources across institutions. By signing a co-construction and sharing agreement among multiple entities, we can strengthen the effective integration of digital resources such as cultural centers, libraries, and museums in our country, so that various institutions can communicate with each other and learn from each other's strengths. On the other hand, to integrate the public digital cultural resource platform construction system, it is necessary to continuously improve the working mechanism of social forces participating in the development, resource sharing, operation and management of the public digital cultural resource integration platform. We should encourage and guide social forces to participate in the construction of integrated platforms by providing resources, cooperative research and development, and entrusted management, and jointly promote public digital cultural resources and products.

2.4 Optimizing the supervision mechanism of multi-agent cooperation supply

The first is to improve the supervision mechanism. We need to build diversified supervisory bodies, that is, supervisory bodies at the central level and supervisory bodies at the local government level, and increase the supervision of social media and citizens. In addition, it is necessary to improve the information disclosure system, timely and accurately announce the cooperation decision-making and implementation status through the government website. Second, we should establish a scientific and effective performance evaluation mechanism. Under the premise of scientific and effective research, we should establish the content design of the index system for multi-agent cooperation and supply. While evaluating the resource construction and funding investment of each agent, we should also focus on the evaluation of service quality and service types. An effective monitoring and evaluation mechanism will promote the good operation of public digital cultural cooperation services.

2.5 Strengthening the mechanism for ensuring multi-agent cooperation in supply

The guarantee mechanism of multi-agent cooperation to provide public digital cultural services mainly includes the establishment of financial investment guarantee mechanism and talent guarantee system. First of all, the funds needed by the government to purchase public digital culture services and resources should be included in the fiscal budgets of the central and local finance, and the investment proportion of the digital culture funds provided by the cooperation of various subjects

should be reasonably planned. Secondly, it is necessary to construct a multi-level public digital culture service talent system, to introduce relevant welfare policies to attract more talents to join the ranks of digital culture construction, and formulate relevant laws, regulations and policies such as talent introduction, cultivation and use. The construction of public welfare volunteer team is also indispensable. Through professional and standardized education training mechanism, the digital cultural literacy and level of public welfare cultural volunteers can be improved, and the sustainable development of public digital culture voluntary organizations can be promoted.

3. Conclusion

This study analyzes the supply mechanism of public digital cultural services from the perspective of multi-agent cooperation supply. On the one hand, it indicates that more social organizations should be encouraged to participate in the supply of public digital cultural services. On the other hand, it proves the effectiveness of multi-agent cooperation, which is helpful to further explore its operating mechanism. There are still some shortcomings in this study, for example, the supply content and supply mode are not included in the scope of investigation. These factors also play a pivotal role in the study, and future studies can focus on them to put forward more optimized measures.

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