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Research on Public Participation in Public Procurement: In the Context of Digital Economy

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ABSTRACT

Public participation in public procurement is an important guarantee for its sustainable and healthy operation. In the era of digital economy and big data, public participation in information disclosure, service quality, and service pricing in public procurement plays an important role. Public private partnerships are an innovative form of public procurement. This study sorts out the issues of public participation in PPP projects, and puts forward several suggestions based on data thinking. In terms of public procurement project information disclosure, big data technology is used to improve the timeliness and breadth of information disclosure, and enhance the professionalism of information disclosure. Performance-oriented public procurement focuses on service quality, and guarantees service security through information platforms and professional third parties. The stakeholders use big data to supervise social organizations, so that they actively represent the public to file lawsuits in public procurement and relieve the public's damaged rights and interests. The protection of the public's right to know, suggest and supervise is inseparable from the training of professional talents by universities. Colleges and universities attach great importance to the cultivation of big data-oriented public procurement professionals, which includes improving teachers' teaching ability, building a new knowledge system that combines big data and public procurement, and setting professional courses for students at different learning stages through connotative development.

1. Introduction

An important aspect of fiscal expenditure, public procurement should meet the new requirements of national governance and digital economy^[1-3]. Public procurement pursues value-for-money goals, fairness and transparency^[4]. The governance

principles of public procurement include: (1) Participation: to ensure that stakeholders have the opportunity and in-depth participation; (2) Sustainable and green procurement; (3) Transparency: the procurement process and decision-making are open; (4) Attributable Responsibility: Public procurement officials bear adverse consequences

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for their actions; (5) Fairness: Public procurement rules apply fairly to all participating suppliers; (6) Efficiency: Procurement of projects, goods and services for the public in a timely manner within the budget constraints and prescribed time limit^[5-6]. It can be seen that public participation is the primary principle of good governance in public procurement. Academically, there is little research on the connotation, methods, content, characteristics and goals of public participation in public procurement. In the context of digital economy and big data, public participation in public procurement is a manifestation of its sustainable development and legitimacy. In terms of the theoretical and practical innovation of public procurement, public participation has become an important topic. The convenience of public participation in public procurement to obtain key procurement information, and the typical practice of the government using big data technology to protect the public's right to know and supervisory rights. This research focuses on remedies for damage to public interests in public procurement, and the role of public participation in the sustainable operation of public procurement throughout its life cycle.

2. Literature Review

In terms of the connotation of public participation, in order to obtain scientific decision-making, the government enables the public to participate in major matters involving public interest or self-interest by making suggestions, providing information, and making comments^[7-8]. Effective communication between the government and the public to enhance the fairness, legitimacy and rationality of major decisions. Public participation in public procurement emphasizes interaction and feedback. Public participation in public procurement, governments and enterprises use big data technology to ensure that the public understands procurement project information; diversified participation enhances procurement effectiveness^[9].

Public participation enables public procurement to achieve its social policy goals. The core goal of public procurement is to meet public needs and enhance public value. Procurers who lack supervision cannot effectively represent public interests, and public participation is the key. The basic connotation of public interest in public procurement includes: providing equalized public services, reasonably pricing services, ensuring project quality and safety, ensuring efficiency and fair competition, effectively achieving overall social economic welfare, and promoting sustainable development^[10].

Public participation in public procurement is conducive to improving fiscal efficiency and better safeguarding their own interests. Public participation makes public

procurement projects not only focus on economic benefits, but also social benefits. Public procurement must meet the requirements of value for money evaluation, and public participation in project evaluation can enhance the scientific nature of procurement decisions^[11-12].

Public participation enhances good governance of public procurement^[13]. Good governance includes three major contents: people-oriented, legal governance, and public governance. Good governance of public procurement means good cooperation between the government and the public. Good governance relies on citizens' voluntary cooperation and conscious recognition of authority. Without the active participation and cooperation of citizens, it is difficult to achieve good governance in public procurement. Public participation is an important content of national governance. In public procurement, citizens' right to know, express, participate, make decisions, and supervise are protected by law^[14]. Public participation in public procurement can play a good demonstration effect. It is conducive to solving the political risks of public procurement projects and consolidating social consensus.

Public participation helps alleviate government regulatory risks in public procurement and prevent regulatory capture^[15]. Regulatory capture is based on the theory of interest groups. The government has self-interested motives and is easily controlled by interest groups. Regulatory failure is based on the theory of public choice. As a rational "economic man", the government pursues the maximization of personal benefits, and does not take the maximization of public interest as the primary goal.

Public participation can help alleviate government regulatory risks in public procurement. Public participation plays the role of external supervision to prevent the deviation of supervision objectives or lack of supervision in public procurement. The public promotes the effectiveness of public procurement supervision through complaints, reports, and information. Professional monitoring agencies and environmental protection organizations participate in the supervision of public procurement to achieve effective supervision of public procurement regulators^[16-17].

3. Analysis on the Theoretical and Practical Issues of Public Participation in Public Procurement

3.1 The Theory and Connotation of Public Participation in Public Procurement

According to the ladder theory of public participation, based on whether the public participates substantially, it

can be divided into participation and non-participation, and can be further subdivided into eight ladders^[18]. Public participation in public procurement includes six aspects: (1) Notification: information notification, one-way process; (2) Consultation: discovering public needs and paying attention to listening; (3) Appeasement: accepting suggestions from the public; (4) Partnership: the public Participate in negotiation and assume responsibility; (5) Delegation of power: empower citizens with decision-making and accountability powers; (6) Citizen control: empower citizens with financial responsibility for decision-making and execution. Non-participation includes two levels of manipulation and treatment. These two types of citizen participation are essentially manipulated and are considered non-participation. Citizen participation ladder theory is helpful to understand the basic connotation of public procurement and public participation.

Public participation in public procurement reflects the protection of the public's right to know, suggest, and supervise. It requires timely disclosure of information in public procurement to meet public needs, ensure public supervision throughout the process, and provide timely feedback on public participation (table 1).

Table 1. Basic requirements for public participation in public procurement

Contents	Requirements
Right to know	The information in public procurement is required to have accessibility, timeliness, completeness and reliability.
Right to suggest	In public procurement, the government listens to the voice of the people, incorporates public needs into decision-making, and provides effective information for decision-makers.
Supervisory rights	The entire life cycle of public procurement guarantees public participation.
Effective feedback	Set up public participation feedback procedures to ensure that participants have the opportunity to comment on the results of the feedback.

The full life cycle of public procurement includes multiple stages of bidding, contract management, and contract acceptance, involving multiple requirements and different standards. The public participates in appropriate ways at different stages of public procurement. According to the characteristics of public participation, different ways of participation can maximize the effect of public procurement.

3.2 Practical Issues of Public Participation in Public Procurement

3.2.1 Information Disclosure and Supervision Feedback in Public Procurement

Big data technology promotes the government's digital transformation, but information disclosure in public procurement still needs to be further improved. Public procurement contract information is not disclosed in a timely manner and insufficiently damages the public's right to know. Public procurement contracts clarify the rights and obligations of the government and suppliers. If the contract is not disclosed in a timely manner or key information is concealed, it will be difficult for the public to supervise public procurement. In the case of public procurement, the government or suppliers used "state secrets and trade secrets" as an excuse to not disclose or delay the disclosure of contracts. In this case, data technology is more difficult to play the role of information disclosure. The public participates in project service quality supervision through complaints. The lack of timely feedback procedures in the supervision of public participation in project procurement makes it difficult to guarantee the effect of public participation in supervision. In public procurement, the efficiency and method of government feedback to public complaints can be further improved and optimized with the help of electronic platforms and big data technology.

3.2.2 Insufficient Public Participation in Public Procurement Cost Accounting and Fiscal Payment

Suppliers in public procurement have profitability requirements, and effective price regulation is the key to ensuring that companies are "profitable without huge profits". The price adjustment of public procurement directly affects the vital interests of the public, so service costs and prices must be monitored through hearing procedures. In user-paid PPP projects, the public hopes that PPP project companies can guarantee or improve the quality and safety of public services and products without increasing payment pressure. According to the "Price Law", the subjects applying for price adjustments include the government, price departments, operators, and consumers. According to practical cases, almost all applicants for price adjustments in PPP projects are PPP project companies. The ability to disperse consumers is limited, and it is difficult to propose a countermeasure against it. Therefore, once the price increase application submitted by the operator is approved by the government, the final result is often a price increase. The price hearing procedure lacks operat-

ing rules, and neither the participants of the hearing nor the public who did not participate in the hearing are not satisfied.

There are two standards for price regulation adjustment: cost-plus mode and price ceiling mode. China's PPP model adopts a cost-plus price regulation mode. In practice, there is information asymmetry, and the cost of enterprises under the cost-plus model is not easy to determine. The pricing of public procurement projects is a process of bargaining between price authorities and suppliers, and public participation is more difficult. The law imposes lighter regulations on operators' responsibility for price adjustments. The impact assessment mechanism of public project price adjustment decisions needs to be improved. The lack of evaluation of public project price adjustment will affect the scientific nature of pricing. The pricing of public utilities and public projects rarely introduces big data technology, which is not conducive to ensuring the public's supervision of pricing.

3.2.3 Analysis of Public Participation in the Quality and Safety of Public Procurement Projects

Service quality supervision is an important aspect of public participation. Suppliers or supervisory departments of public procurement failed to disclose quality and safety information in a timely manner. The implementation unit of the public procurement project shall file the public service quality with the competent unit. When the project has quality and safety issues, the regulatory agencies usually disclose the information, which will delay the efficiency of emergency information disclosure. In cases where the pollutants of tap water exceed the standard, the public is not aware of the water quality and the condition of water supply facilities. When tap water is polluted, the public is aware of the major hidden dangers in water quality safety. The project company and the government conceal important information about water quality testing, damaging the personal and property safety of the public^[20]. Professional third-party institutions for quality and safety testing of public procurement projects need to be cultivated. The lack of professional and neutral test results is insufficient to guarantee the safety and quality of the project. The safety of public projects is related to the public's right to life and health, which is the most important aspect of public participation.

It is difficult for the public to use legal procedures to supervise the quality and safety of public procurement projects. The public supervises the quality and safety of public projects through public interest litigation and urges

the government to provide better public services through procurement. In the judicial process, the subject who is eligible to initiate public interest litigation must be a social organization. If the social organization fails to perform its duty of initiating public interest litigation, it will be more difficult to protect the damaged public interest through judicial procedures.

4. Suggestions for Improving Public Participation in Public Procurement

4.1 Big Data Technology Improves the Efficiency and Scope of Information Disclosure in Public Procurement

Disclosure of public procurement project agreements helps the public fully understand the use of financial funds and the value of the project. During the entire life cycle of public procurement, both parties must strictly perform the contract in accordance with the contract. To better participate in public procurement projects, the public must have a more comprehensive understanding of the rights and obligations of the government and social capital. The government uses electronic procurement platforms and big data technology to enable the public to better participate in project procurement and ensure the enthusiasm of public participation. Big data and blockchain technologies are conducive to the authenticity and timeliness of public procurement information disclosure. The government of digital transformation will use professional technology to effectively manage public procurement contracts. The government uses big data technology to monitor abnormal situations in the execution of contracts. The public can promptly question the abnormal situations and urge the government and suppliers to correct them in time. Disclosure of public procurement contracts will improve transaction efficiency and supplier competitiveness, and the public's right to know, participate and monitor will be effectively implemented. In addition, the Chinese government should emphasize the importance and value of public procurement contracts in the law, and encourage governments at all levels to use big data technology to promote information disclosure.

Regarding the scope of disclosure of public procurement contracts, China should make strict textual and systematic interpretations of the "State Secrets and Commercial Secrets" provisions to prevent the government and suppliers from evading information disclosure. Public procurement uses big data technology to provide feedback on public participation. The government uses big data and artificial intelligence information network platforms to im-

prove feedback efficiency. If the supervisory department fails to give feedback to the public's questions in time, the public can provide relief through legal channels.

4.2 Combination of Digital Economy and Price Monitoring of Public Procurement

The digital economy emphasizes the mining of digital assets. The digital economy places innovative demands on traditional pricing methods. The scientific pricing of services in public procurement under the digital economy requires continuous improvement of consumers' ability to participate in government pricing adjustments. Through the digital platform, individual and decentralized citizens are organized, and the combination of professional institutions and the public can make reasonable prices for services. In public procurement, big digital technology is used to improve the cost investigation and review system before government pricing. The scientific cost supervision and review report has become the fundamental basis for the government to set prices, which will ensure the value for money of procurement and enhance the effect of public participation in supervision. The government must implement the cost supervision and review investigation system and clarify the project company's cost supervision and review obligations.

In the case of public procurement pricing and guide price adjustments, professional investigators are conducive to obtaining public opinions and will effectively improve the dilemma of bargaining between the competent department and the operator in cost supervision and review. In order to better protect the public interest and enhance the effect of public participation in price supervision, the government should focus on clarifying the obligations of suppliers. On the one hand, the obligation of operators to disclose pricing information is enhanced. On the other hand, it is necessary to strengthen the responsibility of operators to apply for price adjustments.

For user-paid projects, the government should make prior assessments when making price decisions. The evaluation of public procurement price adjustment decisions supported by digital technology includes: whether the price adjustment takes into account the interests of all parties; the mass acceptability; the rescue plan for the group that cannot afford the price; the publicity of the price adjustment decision and the degree of expression of the public's true willingness. The improvement of the price hearing procedure in public procurement mainly includes two aspects. First, clarify the procedures and conditions for the selection of price hearing participants. Second, improve public participation in price supervision methods.

4.3 Consistency of Performance Procurement and Service-oriented Procurement

Public participation in public procurement is conducive to the realization of the efficiency, safety, health, environment, and development goals of public services. To achieve this goal, the government should promote quality and safety information disclosure, cultivate professional third-party institutions, and improve judicial supervision channels. Government departments and public utilities have a tendency to "secret" for short-term interests. Procurement performance is based on information disclosure, effective quality and safety. In the entire life cycle of public procurement, it is important to ensure the quality and safety of its services, which is the basic requirement for meeting public needs. Public procurement laws and guidelines should stipulate the timeliness of emergency response when public service quality safety occurs, and strengthen the responsibility of the competent authority.

The quality and safety of public procurement projects are of great importance. This study suggests that each procurement unit should have full-time personnel responsible for information disclosure, and take the initiative to disclose important issues of quality and service performance to the public through information channels. China's large-scale public procurement projects are related to the national economy and people's livelihood, and information disclosure should be promoted with performance procurement as the goal.

The government should promote public performance evaluation with quality and safety as the core. Public procurement establishes a comprehensive quality and safety evaluation system that includes the participation of diversified entities such as government, enterprises, and the public. The evaluation system includes indicators for project operation, use of financial funds, public service quality and safety, and public satisfaction. The publicity of procurement performance evaluation results is conducive to public participation in supervision. In PPP projects, the financial department can encourage partners to improve public services and product quality and safety as their core goals by adjusting prices or increasing or reducing subsidies. Regulatory agencies can establish dynamic monitoring of service indicators of PPP projects and scientific quality and safety technical evaluation standards; public opinions and satisfaction should be introduced into the social evaluation and supervision system, so that the public, regulatory agencies and other entities can jointly monitor service quality and safety.

Professional social organizations are conducive to the sustainability of the quality and safety of the PPP

model. The public has a more convenient, true and comprehensive understanding of the quality and safety of public services through independent third-party agencies. The combination of third-party testing agencies and government regulatory agencies will minimize quality and safety hazards and safeguard public interests.

The obstacles for the public to participate in the supervision of the service quality of public procurement through judicial channels are the qualifications of plaintiffs in public interest litigation and the supervision of the public's prosecution of social organizations. In the context of big data, digital channels can be used to protect the public through judicial means to relieve public interests, and to strengthen supervision of social organizations through network platforms.

4.4 The Cultivation of Big Data-oriented Public Procurement Professionals

Big data and digital economy provide new opportunities for public procurement innovation and sustainable development. As an important tool of fiscal policy and national governance, public procurement plays an important role in the realization of common prosperity goals, the promotion of rural revitalization strategies, and the effective response to major emergencies. Public procurement is the core goal of satisfying public interests. To ensure the value for money of fiscal funds, the government needs to use information technology and data thinking. The effect of public participation depends on the improvement of the public's professionalism. This requires Chinese universities to effectively integrate big data and public procurement when cultivating public procurement professionals. Colleges and universities focus on several aspects in the cultivation of big data-oriented public procurement talents: First, strengthen the training of teachers, enable public procurement teachers to establish big data thinking, and combine professional application scenarios such as procurement supply chain and green procurement with big data technology; Second, the public procurement knowledge of undergraduates is systematic, which relies on the setting of public procurement and big data courses. In terms of discipline setting, economics and law disciplines can effectively combine big data and public procurement; Third, combine public procurement employment with curriculum and training goals. Professionals with practical knowledge of public procurement teach courses to college students. Systematic arrangements are made for the different levels of knowledge of undergraduates, graduates, and doctoral students. Through the training of professional talents, the effectiveness and sustainability of public participation in

public procurement will be improved. In the context of the digital economy, colleges and universities should strengthen the training of professional talents that combine big data with public procurement, specifically focusing on teacher data thinking, subject construction, and undergraduate students' public procurement knowledge system.

5. Conclusion

Public procurement requires transparent procedures to ensure public participation and respect public interests. In the context of the digital economy, public procurement uses big data to promote information disclosure, promote contract disclosure, improve the efficiency and quality of public feedback, and ensure the effectiveness of public participation. In public procurement, big data technology is used to improve the scientific nature of pricing adjustment, effectively implement the cost supervision, review and investigation system, and meet public needs; use information platforms to improve the pre-assessment of public procurement pricing decisions. In terms of public participation in the quality of public procurement services, a commissioner shall be set up to be responsible for the information disclosure of the enterprise to reduce the delay in information disclosure. The government should strengthen performance evaluation centered on quality and safety, and make public satisfaction with public services or products an important criterion for performance evaluation. The public supervises social organizations to perform public interest litigation duties through digital platforms.

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