Analysis on the Development Direction of Informatization of Water Conservancy Project Construction Management

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Abstract: With the rapid development of information technology, informatization of water conservancy project management has become a key way to ensure the rational utilization of water resources and improve the management level of project construction. Based on the connotation and characteristics of informatization of water conservancy project construction management, this paper analyzes the important significance of informatization in promoting the modernization process of water conservancy, improving management efficiency and giving full play to the role of water conservancy projects. In view of the shortcomings in current informatization construction management, this paper puts forward the development direction of optimizing information resources collection, perfecting information sharing mode, strengthening information infrastructure construction, cultivating water conservancy and information technology talents, strengthening the informatization and standardization development of water conservancy projects, and realizing the intelligent and safe informatization function, so as to provide theoretical guidance and security for water conservancy project construction management informatization.

Keywords: water conservancy project; engineering construction management; informatization

Water conservancy project is a key project to ensure the rational utilization of water resources. By integrating information technology into various stages such as construction, operation and maintenance, the management level of water conservancy projects can be greatly improved. Relying on information technology, water conservancy information can be shared, which not only helps to improve the utilization efficiency of water resources, but also effectively enhances the regional flood control and disaster reduction capabilities. Further, the integrated application of information technology can promote the in-depth development and efficient utilization of water conservancy information resources, build an all-round water conservancy information management system, and then improve the overall operation efficiency and performance of water conservancy industry [1]. Therefore, this paper will explore the development direction of information construction management according to the actual needs of water conservancy facilities construction and operation, in order to improve the construction quality and management efficiency and promote the development of water conservancy business.

1 The Connotation and Characteristics of Informatization of Water Conservancy Project Construction Management

In recent years, with the progress of science and technology, water conservancy projects are gradually evolving in the direction of digitalization and informatization, which has

given birth to the concept of "digital water conservancy". Workers in the water conservancy industry gradually realize the great impetus of information technology and computer network to the development of water conservancy projects, and actively promote the process of water conservancy informatization in China. In the construction and management of water conservancy projects, modern information technologies such as GPS, GIS and remote sensing are widely used, combined with advanced hardware equipment, which provides strong support for the information construction of water conservancy in China. The application of these technologies not only improves the quality and efficiency of research and development and utilization of information resources, but also realizes the networking of information transmission, the intelligence of information collection, and the digitalization and scientificity of management decision-making process, paving a broad road for the sustainable development of water conservancy in China. Comprehensive informatization has become an indispensable symbol of China's water conservancy modernization, which has shown a far-reaching positive impact on improving the quality and efficiency of water conservancy project construction [2].

The informatization of water conservancy project construction management has many characteristics, such as real-time, intelligence and resource sharing. Real-time is embodied in the ability to dynamically monitor and obtain water conservancy projects and water regime information in real time through information technology, and realize all aspects of information processing such as classification, query, calculation, processing, storage and printing in real time. Intelligentization means that after information collection, computer equipment can be used for intelligent classification and judgment to improve work efficiency. Resource sharing shows that within the scope of authority, water conservancy project managers and the public can use and share water conservancy information efficiently, and strengthen communication and cooperation between departments, thus further improving the efficiency of water conservancy work.

2 The Importance of Water Conservancy Project Construction Management Information

2.1 Conducive to Promoting the Modernization of Water Conservancy

Applying information technology to water conservancy project construction is an important measure to promote water conservancy modernization. First of all, the integration of information technology supports the construction of information networks and data centers needed for the development of water conservancy information resources, thus improving the monitoring efficiency of water conservancy conditions. This plays an important role in establishing and perfecting the water conservancy security system and ensuring the safety of people's lives and property. Secondly, the introduction of information technology provides a strong support for the construction of a comprehensive system of water conservancy information management, effectively alleviating the problem of lack of information resources and poor sharing, and providing a comprehensive and accurate decision-making basis for various activities in the water conservancy field. In addition, with the continuous progress and wide application of information technology, water conservancy project construction management has achieved a qualitative leap in all aspects of data processing, from collection and transmission to

storage and processing, and then to service provision. This all-round improvement of work level not only improves the scientificity and efficiency of engineering construction, but also injects new vitality and motivation into the sustainable and healthy development of water conservancy.

2.2 Conducive to Improving the Efficiency of Water Conservancy Project Construction Management

The construction of water conservancy projects is systematic and professional, and its management level is directly related to the project objectives and quality. The application of information technology can help managers to obtain real-time data information at all stages of the project and realize data sharing through the information platform. This helps the management department to plan the construction work as a whole and ensure the smooth progress of the construction, thus significantly improving the efficiency of the project construction management.

2.3 Conducive to Give full Play to the Role of Water Conservancy Projects

Water is an indispensable resource in production and life, and natural disasters related to water can have a serious impact on human life. The application of information technology can effectively solve the problem of flood disaster, ensure the stability of production and reduce the waste of water resources. At the same time, information technology is helpful to prevent soil erosion and promote regional sustainable development. Informatization construction management is also an important means to solve the problems of water pollution and regional environmental pollution, which has far-reaching significance for social and economic

prosperity, improvement of people's quality of life and protection of natural environment. Facing the complex situation of water resources management and natural disaster prevention and control in the new era, the field of water conservancy project construction management needs the deep integration of information technology. Therefore, departments at all levels and local governments should fully realize the importance of information technology and make clear the specific objectives and tasks of information construction, so as to promote the intelligent and efficient transformation of water conservancy project construction management.

3 Deficiencies in the Management of Information Construction of Water Conservancy Projects

3.1 The Information Resources of Water Conservancy Projects and Water Conservancy Work are Relatively Short

In the traditional management mode of water conservancy project construction, information data usually exist in paper form, and it is easy to miss or make mistakes when digitizing these data, which leads to the shortage of information resources. In addition, at present, China's water conservancy informatization project has insufficient ability in collecting dynamic information, and the collection, integration and utilization of some water conservancy information have not yet reached a mature stage. At the same time, due to the influence of human and technical factors, the authenticity of data collected on the spot and behavior data may also be questioned. In the process of accumulation of water conservancy information resources, there are still problems of low standardization and limited coverage. It is very important for the effective management and application of water conservancy projects and

related information resources, and for the modernization drive. Therefore, the government and enterprises should regard information resources as the core task in the management of water conservancy project construction, so as to further improve the level of modernization.

3.2 Water Information Data Sharing is Difficult

In the practice of sharing water conservancy information resources at this stage, the following problems are particularly prominent: First, the information and measured data generated in the construction and management of water conservancy projects are huge. In order to deeply analyze the regional water conservancy situation and extract valuable information, it is necessary to share and mine a large number of data. However, the goal of water conservancy informatization construction in some areas is too single, which leads to the decentralized state of information collection, and it is difficult to form a unified information application and sharing system, which further limits the promotion of information sharing. Secondly, in the process of information collection and reporting, due to the lack of unified standards and norms, there are information differences in actual operation. Furthermore, under the traditional management mode, some areas lack effective statistical methods for macro data, which makes it difficult to effectively implement actual work. In addition, the construction of information sharing mechanism in some areas is lagging behind, and there are information barriers between different regions and departments, which seriously restricts the sharing and circulation of information. Finally, the sharing of water conservancy information resources depends on the support of corresponding information equipment, but the equipment construction in some areas is not sufficient, and it is not updated and upgraded to the latest information technology and equipment in time, resulting in low efficiency of information exchange and difficulty in achieving efficient information sharing.

3.3 Water Conservancy Project Information Base is Relatively Weak

In the construction and management of water conservancy projects, the application of information technology depends on the soundness of information infrastructure, which is the key to determine the effectiveness of information technology application. In the process of promoting the informatization of water conservancy project construction management, some units lack perfect water conservancy project construction management model and corresponding application software. In addition, the relevant departments lack the ability in the development and utilization of information resources, and the informatization practice also faces problems such as high cost and complex maintenance, which together lead to the inability to meet the needs of long-term operation [3].

3.4 Insufficient Training of Water Conservancy Talents and Information Technology Talents

In the process of informatization of water conservancy project construction management, information technology and water conservancy professionals play a core role, and the implementation of informatization construction tasks in many aspects depends on the support of this professional talent team. However, in the actual practice of construction management, professional water conservancy and information technology talents are relatively scarce, and it is difficult to build an efficient management and

technical team, which has adversely affected the informatization process of water conservancy project construction management [4]. Facing the challenge of the new era, the traditional construction management methods can no longer meet the needs of the development of water conservancy projects. Relevant departments must attach importance to the application of information technology in water conservancy projects, and strengthen the training of talents and the improvement of technical equipment according to the actual situation, so as to gradually improve the efficiency and quality of water conservancy project construction management, promote the rational utilization of water resources and effectively prevent natural disasters.

4 Development Direction of Water Conservancy Project Construction Management Informatization

Based on the related problems existing in the informatization construction and management of water conservancy projects, the development direction of informatization construction and management of water conservancy projects is further clarified.

4.1 Optimize the Collection and Arrangement of Information Resources

In the practice of promoting the informatization of water conservancy project construction management, the effective use of information resources constitutes the core of management work. Therefore, it is necessary to improve the efficiency of collection, integration and analysis of information resources in order to realize the convenient and efficient application and management of information resources. The primary task is to optimize the collection mechanism of water conservancy dynamic information. Technicians and responsible units need to accurately capture and record water conservancy dynamic information with the help of advanced collection tools and data analysis technology according to regional characteristics to make up for the shortage of professional resources. Secondly, strengthen the standardized accumulation of water conservancy information, broaden the information coverage by building a comprehensive database and information platform, and provide solid information support for water conservancy project construction management. Finally, it is necessary to strengthen information security measures to prevent the emergence of information risks and ensure the safe use of information resources.

4.2 Improve the Information Sharing Model

Constructing a scientific and reasonable information sharing system for water conservancy projects is very important for information construction management. On the basis of collecting and sorting out water conservancy related information data, a standardized information sharing system must be established to ensure that water conservancy information can be effectively used in the construction and management of water conservancy projects in various places. First of all, we should expand the service scope of local water conservancy information facilities, prevent information collection from being decentralized, and enhance the integrity of water conservancy information. Secondly, in the stage of information collection and reporting, scientific standards should be established to prevent differences in information sharing. Furthermore, we should build a sound data sharing mechanism, improve the efficiency and accuracy of sharing, and establish clear sharing rules to eliminate information barriers. Finally, promote the digitization of traditional paper

materials, and build an electronic database system based on the professional information technology team to provide solid technical support for the efficient sharing of data and promote the overall improvement of the level of economic management informatization.

4.3 Strengthen Information Infrastructure Construction

The key to the success of informatization of water conservancy project construction management lies in the improvement of information infrastructure. The water conservancy management department should deeply study and improve the existing information model, software tools and the development and application system of information resources to ensure that these infrastructures can adapt to and meet the needs of current and future water conservancy project construction management. Specifically, we should increase the investment in information infrastructure, introduce advanced information technology and management system, improve the ability of data processing and analysis, and provide scientific basis for the decision-making of water conservancy project construction management. At the same time, pay attention to the maintenance and renewal of information infrastructure, ensure its long-term effectiveness and stability in the construction and management of water conservancy projects, and lay a solid foundation for the sustainable development of water conservancy projects.

4.4 Training Water Conservancy Talents and Information Talents

The efficient implementation of water conservancy construction and information management depends on professional water conservancy and information technology talents. Therefore, in promoting the work, we must focus on the cultivation and development of talent team to improve the efficiency and quality of water conservancy construction management informatization. Management institutions should incorporate information sharing, information collection and analysis, intelligence and big data technology into the core curriculum of personnel training according to the specific needs of water conservancy information system construction, and gradually form a team that can meet the information needs of water conservancy project construction management. At the same time, management agencies should gradually adopt new technologies and new equipment to enhance the professional skills of technicians and ensure that the informatization of water conservancy projects can keep up with the pace of the times and meet the needs of social development [5].

4.5 Strengthen the Development of Informatization and Standardization of Water Conservancy Projects

Senior leaders of water conservancy management institutions need to pay more attention to the construction of water conservancy informatization. In the process of promoting water conservancy informatization, standardization should be regarded as the fundamental premise and foundation to ensure a clear understanding of the management objectives of water conservancy project construction. Through the continuous introduction of water conservancy project information technology, it aims to build an information application platform efficiently, provide reliable support for project management and internal management, and serve as an important basis for management. Standardization development is a key direction in the informatization process of water conservancy project construction management. In addition, the staff of water conservancy management units

should follow the provisions of the National Water Conservancy Informatization Plan when performing their tasks, and take this plan as a guide for information construction. At the same time, all departments within the unit should clarify their responsibilities and set up special information construction management departments to ensure the implementation of information construction tasks, so as to improve the effectiveness and efficiency of information management of water conservancy project construction. Furthermore, internal management activities should also be included in the information construction management plan, so as to monitor the working status of water conservancy personnel, managers and construction management responsible persons in real time, effectively urge them to correct their working attitudes, give full play to their management role in the information construction management process, and improve the quality of water conservancy project management.

4.6 Realize the Intelligent and Secure Information Function

Intelligentization and security is another important development direction of information construction of water conservancy projects, which is helpful to give full play to the functions of information construction. Specifically, this direction involves two levels: the first is intelligence. Network is the core of water conservancy information management, and most of the data related to water conservancy projects are stored in the network, which provides convenience for management. For example, through information construction, water conservancy projects can use the network to monitor water resources in real time and intelligently allocate irrigation information. Second, it is security. Monitoring equipment plays an indispensable role in the development and use of water resources. The information monitoring system can not only monitor in real time, but also fully grasp the actual situation of irrigation areas, accurately identify problems and risks, and feed them back to the staff in time, so as to take effective measures quickly and ensure safety. In addition, in the process of construction and operation, in case of natural disasters, the information monitoring system can transmit the status of water resources to the data center in real time, effectively guide the utilization of water resources, and realize saving and safety.

5 Conclusion

The fundamental purpose of informatization of water conservancy project construction management is to build an intelligent water conservancy management system. In this system, the information of water resources and water conservancy projects can be shared, which will greatly improve the efficiency of water conservancy work. In view of this, management and government departments need to pay attention to technical progress and talent cultivation, gradually overcome the problems encountered in the process of informatization of water conservancy project construction management, and establish a scientific and professional information collection, sharing and application mechanism to pave the way for a solid foundation of water conservancy work, thus promoting the steady growth of regional economy.

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