Development of Cost Basic Data Auxiliary Analysis System Based on the B/S Structure in Power Grid Innovation Project

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Abstract

In recent years, with the increasing demand for electricity, China has further speeded up grid construction to continuously expand the scale of power grid construction in order to meet demand effectively. However, long-running condition of power equipment and facilities is directly related to quality of electricity consumption. Due to expansion of power grid construction scale and management problems existed in power grid project, it is difficult for project managers to manage the related basic cost data of power grid innovation project in a unified way and to conduct scientific analysis of these basic data so as to cause under-control over the cost of power grid innovation project, making the overspending phenomenon of power grid innovation project repeatedly and greatly increasing the overhaul cost of power grid innovation project. As continuous development of modern information technology had provided a new way for basic data analysis of power grid innovation project, this paper presented a basic data auxiliary analysis system based on B/S structure in power grid innovation project and made a in-depth study on the development idea, hoping to provide reliable technical support for the analysis of basic data on the cost of power grid innovation projects so as to enhance the cost control of power grid innovation project and to reduce technical cost of project.

Keywords: B/S Structure, Power Grid innovation, Project Cost, Basic Data, System Development.

1. RESEARCH BACKGROUND

1.1 Research overview

In the operation and management of power companies, ensuring the reliability of power grid operation has undoubtedly been a core objective. Moreover, the quality of operation and maintenance of power equipment and facilities has been an important foundation for ensuring the normal operation of the entire grid system. However, due to the incremented construction of power equipment and facilities and the ever increasing scale of construction have also led to a substantial increase in the management duties of managers, increasing the management difficulty of managers (Dai, 2017). In addition, power companies need to constantly adapt to changes in the actual situation through the management of power equipment and power conditioning, requiring power companies to transform, upgrade and maintain all kinds of power equipment and related support equipment through the power grid innovation project, which is also one of the important duties of power companies. In the power grid innovation project, a lot of content and work tasks are involved, which will undoubtedly generate direct or indirect costs, constituting a great number of basic cost data in power grid innovation project. If these basic cost data could not be controlled and analyzed in a scientific and unified way, it is bound to make the cost of power grid innovation project out of control, which will greatly increase the cost of the project. This is obviously not conducive to the management of power companies, thus increasing the waste of human and material resources (Wang, 2017). Therefore, it is necessary to realize the management of basic data on the cost of power grid innovation project by means of modern information technology so as to assist managers to conduct scientific analysis of these basic cost data, reduce the management difficulty of managers and streamline the work of managers, so that managers can conduct scientific and efficient management of power grid innovation project to improve the cost control level of power grid innovation project in order to ensure the smooth management of power grid innovation project. For this reason, modern information technology undoubtedly plays a crucial role. Therefore it is indispensable and imperative to use modern technology to develop a kind of auxiliary analysis system for the basic data of the cost of power grid innovation project.
1.2 Research purpose

This paper aims to improve the cost management of power grid innovation project and to realize the centralized and scientific management of the basic cost data of power grid innovation project so as to assist managers in scientific analysis of the basic data on the cost of power grid innovation project, judge and forecast the cost management level of power grid innovation project at the present stage based on the basic data of construction cost so as to find out the existing problems in the cost management of power grid innovation project and formulate the pertinent measures to solve these problems in order to achieve the goal of scientific and informatization management of the cost in power grid innovation project, reduce the management difficulty of the project managers and improve the cost management level of the power grid innovation project. To this end, this paper firstly discussed the necessity of technical innovation in power grid project, and analyzed the existing problems in the management of power grid innovation project. On this basis, a cost basic data auxiliary analysis system based on the B/S structure in power grid innovation project was proposed, specifying the development framework of this system, and making a in-depth study on the development of system function module.

2. NECESSITY FOR TECHNICAL INNOVATION OF POWER GRID PROJECT

At present, a large number of power equipment and ancillary facilities has been installed in the construction of power grid system, and the operation level of power equipment and ancillary facilities has directly affected the power quality, requiring these power equipment and ancillary facilities for long-term operation. In order to prolong the service life without affect of the normal use of power equipment and ancillary facilities, and ensure reliable and safe operation of the power equipment and ancillary facilities, it is necessary to perform corresponding overhaul and technological modification on these power equipment and facilities (Liu et al., 2017). The so-called overhaul and technological modification refers to renew, renovate and maintain the power equipment and facilities, including construction equipment, materials equipment and various production vehicles. In the repair of these power equipment and facilities, it is necessary to carry out regular replacement, maintenance and repair to ensure that power grid system can be operated in an orderly manner and that the power industry in our country can be developed steadily and reliably (Liu et al., 2016).

3. MANAGEMENT PROBLEMS EXISTED IN POWER GRID INNOVATION PROJECT

3.1 Non-standardized management of power grid innovation projects

At the present stage, although the power companies have made the continuous improvement of the internal management system, and developed management system and work processes of power grid innovation project according to their actual situations. However, due to a certain gap of technicians in professional competency and theoretical knowledge in power grid innovation project, management of power grid innovation project may have greater uncertainties, resulting in some technical staff unable to carry out scientific project management in accordance with the prescribed work process and rules and regulations, and making hard to give full play to the guiding and constraining forces of rules and regulations (Tang, 2016). In addition, power companies have lacked of assessment on the related knowledge of the rules and regulations to relevant personnel in the power grid innovation project, thus making management quality and work progress of power grid innovation project greatly affected. Besides, there exists some difference of management level and comprehensive quality among managers, resulting in the cost of power grid innovation project hard to be effectively standardized and managed sophisticatedly.

3.2 Lack of awareness of cost control in power grid innovation project

At present, managers and top executives in the majority of power enterprises have relatively had weak awareness of cost control, causing it hard to effectively implement in the entire power-grid innovation project. In the process of approval and initiation of power grid renovation project, problems including lack of rigorous attitude and in-depth analysis of the construction cost without consideration of idleness of resources, shortage of scientific evaluation and analysis of economic benefit and cost of power grid innovation project have existed, leading to losing control over the cost of power grid innovation project and producing a lot of waste of project resources (Guo et al., 2015). Due to the lack of cost control awareness of related personnel, the project cost has not been effectively controlled and managed. In addition, all the basic data on construction cost, such as procurement of project materials, engineering design and construction settlement, have not been strictly controlled. As a result, the gap between actual cost of the project and the estimated cost is large. At the same
time, the management of the basic data of project cost is not strict, and the attitude is not rigorous, resulting in the cost level of power grid innovation project to keep in an inflated state. All of these problems are in urgent need for a solution. It is difficult to guarantee the cost control quality of power grid innovation project by merely using outdated project cost control methods and management systems, which will greatly affect the cost control of power grid innovation project (Yang et al., 2014).

3.3 Unbalanced management in power grid innovation project

In the management of power grid innovation project, the management mode of “slack now to strict later” has been followed. However, this management mode has not been implemented in all phases of the project management. When the project cost control strategy is formulated, the strategy has lacked strong pertinence and failed to effectively combine with power grid innovation project. The management personnel have performed their duties according to their own experience, rather than the project control plan. In addition, they have lacked the capacity to respond to emergencies. All of these have contributed to the unbalanced management in power grid innovation project (Gao, 2014).

3.4 Unsatisfactory informatization system of power grid innovation project

In the cost management of power grid innovation project, although power companies have begun to use modern management methods to control the various management links of the project, making management level improved. However, there are still many problems in the management system at this present stage, especially in lack of corresponding functions in the basis cost data collection. Other deficiencies have included system instability and cumbersome operation. All of these have affected greatly the collection and analysis of basic cost data (Guo, 2015).

4. DEVELOPMENT OF COST BASIC DATA AUXILIARY ANALYSIS SYSTEM BASED ON THE B/S STRUCTURE IN POWER GRID INNOVATION PROJECT

4.1 System architecture development

In order to effectively solve existing problems in the cost management and improve the cost control of the power grid innovation project, this paper presented a cost basic data auxiliary analysis system based on the B/S structure in power grid innovation project. The system adopted B/S structure, and imported and exported data through the application of Web Services data interface technology to realize the connection between the system and other systems, so that the basic cost data could be interacted between different systems (Gao et al., 2016). In addition, partial cache for page was conducted through the application of Men Cached coexistence management technology and WORKFLOW technology to simultaneously access the page and improve access speed so as to optimize the system’s access performance. In the development of the system architecture, UML modeling tool and NET framework were used, so that the system had the following functions, the first was the process of construction cost was controlled and managed; the second was the basic cost data was viewed, given supplementary analysis and statistics; the third was the cost data was analyzed and controlled in the basic cost data (Tang, 2016). At the same time, the system could also meet other business needs, which were reflected mainly in the following aspects, the first was information control methods was adopted to achieve project cost management; the second was the format of basic cost data and work process of the project were standardized; the third was target system for the basic cost data were standardized, making it reflect objectively and truthfully the cost control level of power grid innovation project in different areas; the fourth was the system analyzed the basis cost data to improve the cost analysis system; the fifth was the system could realize real-time material information sharing and communication and provide real-time and reliable data information for cost control of the project (Sun et al., 2014).

4.2 Development of system function module

Function modules of the system, mainly including management index module, application module of project index, equipment refinement module and comparison module of settlement calculation, were developed. The figure 1 was schematic diagram of the function module of the construction cost basic data auxiliary analysis system based on the B/S structure.
Figure 1. Schematic diagram of the function module of the construction cost basic data auxiliary analysis system based on B/S structure

The management index module could flexibly maintain the project cost plan according to the business needs and its changes, including the topographic formula, cost summary, the relationship between the project cost and the index module, etc., so as to ensure that the project cost control plan could meet the actual needs and that the adverse impact of emergency on project costs could be eliminated and avoided (Bai et al, 2015). The application module of project index could select different cost analysis templates according to the type of project and calculate the basic cost data of project through the analysis algorithm in the background, having functions of compilation of engineering quantities, application of cost analysis templates, cost summary and engineering information summary. The refinement module could refine the project’s power equipment, facilities and materials and provide specific market prices of equipment, facilities and materials as the reference data for cost control. Meanwhile, the cost data could be summarized to ensure the accuracy of basic cost data (Wang, 2017). The comparison module of settlement calculation could automatically compare and analyze the basic data of the same type of power grid innovation projects, and also set up the difference ratio and issue warning, and fill in the cost settlement data (Tang, 2014).

5. CONCLUSION

In summary, cost basic data auxiliary analysis system based on the B/S structure in power grid innovation project proposed in the paper conducted dynamic assessment of basic cost data according to cost control demand and management characteristics of the project, so that the cost control was informatized and systematized, which was conducive to the improvement of control over the cost of power grid innovation project, thus greatly improving the management level of power grid innovation project, saving the cost of power grid innovation project, and effectively guaranteeing project’s economic benefit.

REFERENCES