Research on Optimization Method of Physical Asset Management in Distribution Network Based on BIM

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Abstract: Under the new situation, the physical asset management of power distribution enterprises should actively adapt to the new situation of reform and development, and continue to innovate and make breakthroughs. Therefore, it is necessary to study and analyze the impact of the reform of the power system on the physical asset management of the distribution network, summarize the current status quo problems of the physical asset management of the distribution network in terms of asset formation, equipment asset linkage, value management, etc., and identify different businesses after the power reform in the scenario, the needs for physical asset management of the distribution network, with the help of advanced all-information digital model technology, promote the optimization and improvement of the physical asset management level of the distribution network, and lay a solid foundation for grid companies to actively adapt to the new situation in the market environment. “Core, market is fundamental” corporate strategy provides effective support.

1. Introduction
The power distribution network is at the end of the grid and has been ignored for a long time due to its relatively small project scale. However, with the gradual acceleration of urbanization and industrialization, the reform of the power system and the reform of the investment and financing system continue to deepen and develop. Constraints on investment behavior are increasingly strengthened, and the distribution network has become an indispensable energy supply guarantee system for urban modernization, and has an extremely important position in the new urbanization construction.

BIM has been continuously applied to some foreign projects in recent years, and its direct economic and social benefits have become increasingly apparent. This technology is a method and technology for managing and optimizing the entire process of the design and construction of a project under construction through the integration and extraction of engineering project geometric attributes, physical characteristics, material properties, and other data. Its biggest feature is through a virtual information platform, in the actual engineering decision-making stage, a model is used to perform pre-simulation research on the building's performance, cost, constructability, and operating...
2. BIM-based distribution network physical asset management

2.1 Overall management plan

Grid projects are the media for the real-time information generation and carrying of physical assets. The whole-process management of physical assets focuses on the management of the entire project information. Infrastructure and technological transformation projects will involve changes in the shape and value of physical assets. The project management process and requirements are similar; while overhaul projects involve the collection of physical asset operation and maintenance costs. The project management process is relatively brief compared to infrastructure and technological transformation. Based on the model of the entire process of infrastructure project construction, technical transformation and overhaul projects can be implemented by reference. That is, engineering information models are formed in the initial setting, construction drawing budget, engineering construction, and project transfer stages, and the budget, budget, settlement and equipment acceptance are issued. Inventory (including new and dismantled list) information, and supports automatic completion of final accounts. Based on actual project information, equipment assets are generated or accurately integrated.

Therefore, with the help of the BIM model, from the design stage, according to the design plan, the project material inventory and estimated costs are issued; at the project implementation stage, according to the actual progress of the project, the actual resource consumption is reflected, the actual project cost is reflected, and the asset value is accurately collected.

2.2 Research on the whole-process collaborative management mechanism based on BIM

(1) Project approval stage

The project approval phase includes feasibility study, preliminary design, construction drawing design, etc. The preliminary design of the project is carried out after the project is approved, and based on the previous feasibility estimation, the project budget document is produced. Relying on the extensive application and unique advantages of BIM in the design field, carry out preliminary project design in BIM, construct engineering information models, calculate engineering quantities according to different valuation methods, associate various types of engineering budget quotas, material information prices, etc., and automatically generate engineering budget estimates. data. Adjust the
existing budget preparation template, and use the project assets as the guide to prepare the budget estimates, and separate the details of equipment, materials, construction costs, and installation costs into each asset. Establish BIM and ERP related channels, support budget data import into ERP, and associated project WBS codes.

During the design phase of the construction drawing, based on the engineering information model constructed in the preliminary design phase of BIM, the detailed design information of the construction drawing is further improved, and the engineering information model is adjusted to form the engineering information model in the design phase of the construction drawing. Quota database, material information price, etc., automatically generate project budget data.

(2) Project construction stage

During the project construction phase, the engineering information model is adjusted according to the actual construction situation to form the actual engineering information model. At the same time, the actual picking and service confirmation expenses incurred in the ERP, comparing the amount of people, materials, and machines that ultimately occurred in the BIM with the amount of the materials and services confirmed in the ERP to ensure consistency between the two parties.

(3) Project acceptance stage

Method 1: In the project acceptance stage, the engineering inspection equipment inventory is derived from the actual engineering information model. The transportation inspection department organizes the construction, finance, material, control, and information and communication departments to conduct physical inventory on site and improve the inventory based on the equipment inventory. The transportation inspection department created the equipment ledger in the equipment professional management system based on the completed acceptance checklist, added the device number to the inventory, and imported the final "Acceptance Checklist" into the ERP system to generate the "equipment transfer capital inventory". This assists the on-site acceptance check and promotes the electronic acceptance of equipment acceptance.

Method 2: During the project acceptance stage, the 3D engineering model is derived from the actual engineering information model to the mobile client, and the construction inspection, finance, material, control, and information and communication departments are organized by the transportation inspection department to carry out physical inventory on site based on the 3D engineering model. And refine the model. The interface with the professional equipment management system is triggered by the engineering information model, and the equipment ledger is generated by linkage, and the equipment number is returned to the engineering information model.

(4) Pre-funding phase of the project

According to the requirements of accounting standards, when the construction project under construction reaches the expected usable status, fixed assets should be confirmed monthly, that is, borrowed: fixed assets, loans: construction in progress, this is pre-capitalization. According to the progress of the project, the project management department will temporarily estimate the amount of advance funds based on the volume and price information of completed projects in BIM, and realize the automatic collection and allocation of costs. Establish a correlation channel between BIM and ERP, and support the transmission of estimated information on asset value in BIM to ERP for financial posting.

(5) Project settlement stage

According to the actual project quantity in the model, and in accordance with the contract's valuation method (based on actual valuation, fixed unit price, one-stop price, etc.), it supports the import of the actual value of verification in BIM and automatically generates engineering settlement data. It can be compared with the actual construction and installation cost of the project in the ERP system, and the actual value should be the same.

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