Research on the Application of Scanning Survey in Information Integration System of Construction Stage

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Keywords: Construction Quality Management, Quality Management Information, Information Integration

Abstract: the Frequent Occurrence of Quality Problems in China's Construction Industry is Closely Related to the Current Situation of Extensive Quality Management. At the Same Time, Bim and Other Emerging Technologies as a Means of Information Collaboration in Recent Years Have Attracted Great Attention of the Academic Community. in This Context, How to Improve the Level of Construction Quality Management from the Perspective of Information by Means of Bim and Other Technical Means to Meet the Demand of Intensive Development of Construction Quality Management Has Become a New Research Direction in the Field of Construction Quality Management. Therefore, This Paper Takes the Integration of Quality Management and Information Management as the Starting Point, Analyzes the Construction Quality Management Information Resources and Information Activities, Constructs the Construction Quality Management Quality Chain Model and Selects the Appropriate Chain Nodes, Discusses the Construction Quality Management Information Integration Method Based on Bim, in Order to Guide the Innovation of Construction Quality Management Technology and the Improvement of Management Efficiency. Firstly, the Information Resources and Information Activities in the Process of Construction Quality Management Are Analyzed. on the Basis of Analyzing the Characteristics of Construction Quality Management Information, Based on the Construction Site Documents and Other Information, and with the Help of Grounded Theory, the Construction Quality Management Information is Classified into Three Categories: Top-Down Guidance Information, Bottom-Up Reflection Information and Information Management Data, Forming the Construction Quality Management Information System. Based on the Above Information System Framework, Construction Quality Management Information Activities Are Discussed, and Visual Expression is Carried out to Provide Theoretical Basis for Subsequent Research. Secondly, the Quality Chain Model of Construction Quality Management is Constructed and the Quality Chain Nodes Are Selected. Based on the Theory of Quality Chain and the Analysis Results of Construction Quality Management Information, This Paper Constructs the Quality Chain Model of Construction Quality Management. At the Same Time, Based on the Value Engineering Idea, with the Help of Fuzzy Comprehensive Evaluation and Information Coordination Degree as the Evaluation Means, the Construction Quality Chain Nodes Are Selected from the Construction Quality Management Level and Information Coordination Degree, So as to Achieve the Minimum Technical Input and Obtain the Maximum Function Optimization Effect, and Provide the Focus for the Optimization Research of Construction Quality Management Information Integration Method Based on Bim. Thirdly, the Method of Construction Quality Management Information Integration Based on Bim is Studied. Based on the Analysis of Construction Quality Management Information Resources and Information Activities in the Previous Paper, the Information Management Process of Selected Quality Chain Nodes is Analyzed to Clarify the Information Integration Requirements of Construction Quality Process, and Then the Implementation Path of Construction Quality Management Information Directional Storage, Data Recording, Information Interaction and Other Functions is Discussed, and the Key Code of the Method is Displayed to Optimize Information Management to Improve the Level of Construction Quality Management.

  DOI: 10.25236/iiicec.2019.002

1. Introduction

With the Rapid Growth of the National Economy, the Construction Industry Has Achieved Unprecedented Development. However, Behind the Development, the Quality Problems of Construction Engineering Also Emerge in Endlessly, and More and More Quality Accidents Are Frequently Reported[1]. with the Development of the Internationalization and Complexity of the Construction Industry, the Traditional Quality Management Methods Can Not Meet the Needs of the Construction Quality Management in the New Era. It is Urgent to Improve the Efficiency of the Construction Quality Management with Appropriate Technologies and Methods from a New Perspective to Ensure the Level of the Construction Quality.

2. Research on Construction Quality Management Information of Construction Engineering

2.1 Analysis of Information Characteristics of Construction Quality Management

The quality management of construction project is oriented to all participants of the project. By providing professional services in the field of construction project quality for all parties, the implementation of quality objectives can be guaranteed, so as to make users satisfied[2]. The complexity of construction projects drives the complexity of the organizational structure of construction quality management and the complexity of the implementation process. The construction quality is composed of multiple elements, which are embodied in “people, machines, materials, methods and environment”. These elements are not only accidental but also systematic. At the same time, when the elements work together in a complex quality system, they are not individual elements The emergence of the system[3]. Under the development trend of quality management theory, the management theory which takes “Six Sigma quality concept” as the quality objective has aroused the thinking of system management, continuous improvement and information-based management mode in the field of quality management. From this perspective, it is not difficult to find that the construction stage, as a long and complex process of comprehensive coordination, coordination and mutual restriction of multiple enterprises, departments, types of work and complex materials under different constraints, involves a large range and many subjects. Therefore, before facing the research of construction quality management, it is necessary to clarify the research subjects, that is, from the perspective of this paper, we believe that From the perspective of information technology, it makes a detailed definition of “human, machine, material, law and environment”

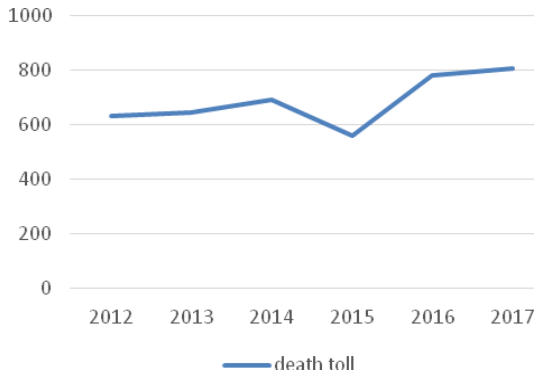

Fig.1 Statistics of Casualties of Construction Quality Accidents in China

2.2 Analysis of the Characteristics of Project Management Information

Information, as an important resource of construction project management, has great use value. Because of the close relationship between information and data, it is often confused by people in the process of management. Data refers to unprocessed facts or descriptions of specific phenomena, while information refers to processed data that is useful to users, which makes information not equivalent to data, but higher-order data[4]. Therefore, a lot of so-called information in the

construction stage is actually only data, which needs to be processed and transformed into useful information. As one of the most important resources of project management, information needs to be used and developed efficiently, that is, information management. As one of the engineering project management activities, information management manages the information resources and activities in the engineering project by means of planning, configuration, utilization and feedback. From the perspective of research stage, the first thing to be determined is the information resources and information activities as research subjects. Based on the understanding of the connotation of engineering project management information, this paper describes the engineering project management information as the general name of drawings, information documents, audio-visual images and other information generated by construction, management, operation and other activities in the whole life cycle of the project. Information classification is the premise of systematic management information, which can be classified from different angles according to the characteristics of engineering projects.

3. Information Integration Theory

Integration means that all elements of a system work harmoniously and organically to achieve the purpose of overall optimization[5]. Based on this connotation, the concept of information integration is defined, that is, under the premise of ensuring the consistency of coding standards of all users and subsystems in the system, the information sharing of the whole system is realized, and then the application interaction and orderly work of relevant users through information channels are realized. Information integration in engineering projects includes horizontal integration, vertical integration and end-to-end integration. Horizontal integration refers to the integration of various computer systems and project participants in different stages of work, which involves different areas of work and the exchange of resources and information between the parties. In other words, horizontal integration is a kind of resource integration realized by the value chain and information network among the participants[6]. With the development of construction industry and the innovation of information technology, engineering projects gradually pursue the seamless connection and organic coordination of information flow, capital flow and logistics in the process of project promotion, so as to realize the information sharing and business coordination among different participants in the fields of quality, progress, cost, etc. Vertical integration refers to the integration of all levels of the project in order to achieve end-to-end solutions. In other words, vertical integration is to solve the information fault of each stage, each working link and each process step in the project, and realize the seamless link of all links. This is the basis for the realization of Engineering informatization, and its purpose is to establish a highly integrated system Unification. Its main task is to collect, process and transmit the information related to the work content of each stage, realize the real-time exchange of information, improve the expression of information, and make the integrated system. End to end integration refers to the end-to-end digital integration in all stages of the project life cycle[7]. Each task will be supported by corresponding digital terminal equipment. The useful digital information generated in these terminals will be integrated through the end-to-end data transmission mode, which requires a very important technical concept, that is, end-to-end real-time transparency, that is, connecting with each digital terminal through database, and designing key technologies Data interface, to achieve the integration of big data, to ensure the sharing and real-time application of project life cycle information.

3.1 Research on Optimization of Construction Quality Management Based on Integrated Method

Above, through the work of construction data recording, information feedback and problem application, updating information content to guide the construction quality management, quality acceptance work in each stage and analysis of various construction data sorting process, as well as the discussion of information flow, combining with BIM Technology to discuss how to carry out information integration and how to meet the corresponding functional requirements based on information integration[8]. Therefore, based on the research of information integration method, this

section discusses how to express in the selected construction quality management quality chain node process, and analyzes the improvement of information integration method based on BIM for the existing management mode, in which the information storage of construction quality management is reflected in other processes as in the previous section.

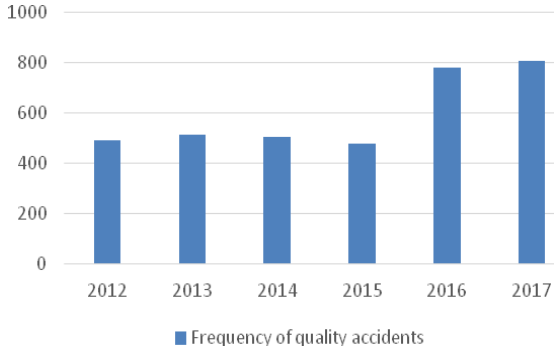

Fig.2 Frequency of Quality Accidents of Construction Projects in China

3.2 Construction Data Recording, Information Feedback, Problem Application, Etc

The key of quality control in the resurvey plan is to record the resurvey information of pile position and the inspection information of resurvey results. The normalization and rationality of the data information determine the overall quality level of construction[9]. In the traditional construction data records, the management personnel need to take into account the data recording, data inspection and verification, non-conforming data screening, information reporting and other work at the same time, “Miller According to the rule, “human brain can process 5-9 information at most at the same time. The increase of information groups will increase the probability of errors, and reducing the occurrence of errors is one of the main tasks of construction quality management. Therefore, this paper brings information data generation and information interaction into the process. In this process, the comprehensiveness and standardization of information are mainly related to the safety, systematization and scientific rationality of BIM information hub for information management. Managers only need to record and release information, and the system will automatically judge whether the quality information meets the specifications In order to reduce the risk of construction quality management non-compliance caused by unreasonable and unsystematic information and speed up the overall construction quality management efficiency, the non-compliance information can be screened out and the relevant documents can be released at the same time of finding non-compliance information. For the construction data record, information feedback and problem application, the key lies in four links: data search and transfer, document filling, document approval and document storage. The main core is how to deal with the information content and information behavior of construction quality record information and construction quality application information in the “bottom-up reflection” information.

4. Conclusion

In this paper, quality management in the construction phase is taken as the research object. From the perspective of quality management information, the information system and information flow of quality management in the construction phase are studied. Based on the construction quality chain model, the construction quality chain nodes are optimized. Through grasping the coupling of quality flow and information flow in the process of construction quality management, the paper discusses the method based on BIM and information integration Optimize the method to improve the construction quality management level.

Acknowledgement

This research has been financed by Shanghai education committee government support funds in

2017 “Construction engineering 3D measurement training field “(Z-30001-17-07).

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