Research on Dynamic Prediction of Construction Management Duration Based on Big Data

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Abstract: The change brought by big data to our era is indescribable, it has changed our thinking and thinking, and it has also changed the management mode of commercialization, which has had an impact on the transformation of all industries. In the process of dynamic prediction of construction period, we should also learn to study it more deeply based on the application of big data analysis technology, so as to make the construction period plan more scientifically.

1. Introduction

Every big technological change is based on a new industry, and then ideas sprout, slowly delving into traditional industries. In recent years, big data technology has been continuously developed and mature, Internet application cases have increased dramatically, and various innovative business models have also been recognized by various industries. Thus, even the Chinese construction industry with less application of emerging technologies is bound to use big data technology to speed up the development of the industry [1]. In essence, construction projects need to be applied to big data technology most because the industry is based on a wealth of information and data. From the point of view of engineering project management, if we can use big data technology to integrate all construction resources and technology, so as to put into the construction process to achieve better quality project management, we can effectively ensure the quality of the project. Engineering projects are systematic and dynamic, and need to meet the requirements of the present era, and the emergence of big data technology can guide the new development direction of construction engineering management, so as to effectively improve the efficiency of all aspects of construction engineering management, effectively improve the overall level of construction management, so that the construction industry to high scientific and technological content, low energy consumption, management precision direction.

2. The Relationship between Big Data Technology and Construction Project Management

In its 2014 white paper on big data, the Telecommunications Research Institute of the Ministry of Industry and Information Technology made it clear that big data refers to data with considerable volume, effectiveness and diversity of structures that need to be applied to emerging technologies such as new computer architectures and intelligent algorithms in the processing of big data. In the application of big data, it is emphasized that big data is used as valuable reference information to assist decision-making, so that new key nodes can be found in the data and help optimize the construction process. Should be based on the specific construction process, in different degrees of application of big data, divided into four levels from shallow to deep. Different data processing algorithms should be designed according to the different application scenarios of the actual construction project management, and then the experience accumulated in the construction engineering application process should be learned in the implementation and application process as the wisdom crystallization of the industry, to help managers integrate and manage all work and resources during the project implementation cycle, and to ensure that the project can be completed

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according to the quality and quantity within the specified construction period.

Construction project, but the whole process has a certain process, the construction investor will complete the construction task according to a certain investment budget, the whole process needs to use fixed resources within a fixed time through a series of processes, such as early planning, construction design, actual construction, construction acceptance and so on, so that the construction project can meet the corresponding quality requirements. Most construction projects have some common characteristics, such as large investment, long construction period, many uncertain factors in the construction process, large risks and many participants. The construction project manager needs to apply the management viewpoint and method of the system engineering to plan and make decision for all the work and resources in the construction project cycle, ensure the final project quality is up to standard, and speed up the progress of the construction period as far as possible to increase the investment income.

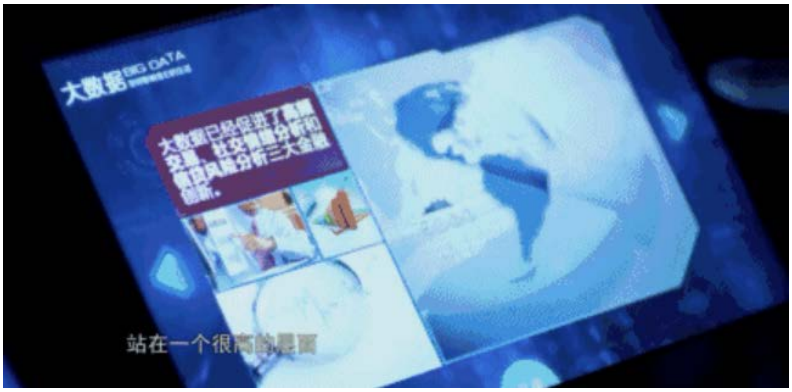

Figure 1 Big data applications

3. Big Data Auxiliary Construction Project Management

3.1. Practical Application of Big Data in Time Schedule Management

Many uncertain factors in the actual construction process will have an impact on the construction schedule, such as insufficient preparatory work, deviation in project design, improper construction management, equipment did not arrive at the construction site according to the prescribed time, etc. It also includes some uncontrolled factors such as weather factors, etc. If we want to grasp the progress of the construction period more scientifically and objectively, we should better analyze and estimate all the factors that may cause the delay in the construction period, which requires data mining in the management of the project and making scientific decision on the time limit based on the results of the data analysis.[2].

The mining of big data is not done by individuals, it needs relevant departments and management mechanisms to ensure its smooth operation, from the beginning of data search, from the construction line real-time transmission to the rear management, and need to be stored in time for later data analysis. The management of the project department will input all kinds of information of the construction site into the information system, and then pass it to the company's backstage database. If there is a need, the project department can also ask the company to call the data in the background database and retransmit it back to the data department. All data transferred from the project department to the company's backstage can be distributed by the company to various functional departments as an important reference information in the management content, at the same time, various analysis models can be formed according to the data, and the data can be deeply mined. Different types of engineering and management data have different characteristics, so it is necessary to sort out different types in order to facilitate search. For unstructured data mining, retrieval techniques can be used to achieve classification management. For example, the MOLDA multi-dimensional data analysis theory, which is often used in recent years, is a very suitable management project model for analysis and decision-making.

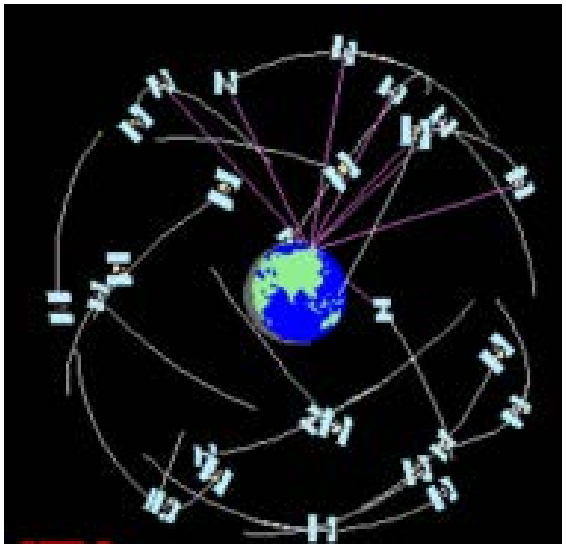

Figure 2 Dynamic forecasting

3.2. Application of Big Data in Project Bidding

Bidding is also an important link in the implementation of construction projects. Big data can realize the deep analysis of project bidding transaction data, and then excavate the potential association relationship in the trading market by detecting the association relationship. The application of the electronic bidding platform can monitor and track the whole bidding process of the project in real time, early warning and timely intervention for the possible behavior of stringing and encircling the bid, and can also rely on the experience of this period to establish preventive and regulatory measures.

4. Recommendations for Implementation of Big Data-Assisted Construction Project Management

4.1. Requirements for Engineering Managers

At present, it has entered the era of industry 4.0. Because the level and ability of engineering managers involve the merits and demerits of the whole project, it is necessary to put forward higher requirements for engineering managers. It is hoped that relevant managers can keep up with the trend of the times and focus on information technology related to big data, such as Internet technology, Internet of things technology and cloud computing technology. Engineering managers can not just mechanized the use of big data technology, should fully understand the connotation of big data, big data not only lies in the huge amount of data and the complexity of information, but also symbolizes a brand-new concept, should learn to analyze the correlation between data and more implied information conveyed by data. In particular, the leaders in engineering project management should break through the traditional management mode, increase the application of big data technology, and formulate various detailed construction plans based on the concept of big data development.

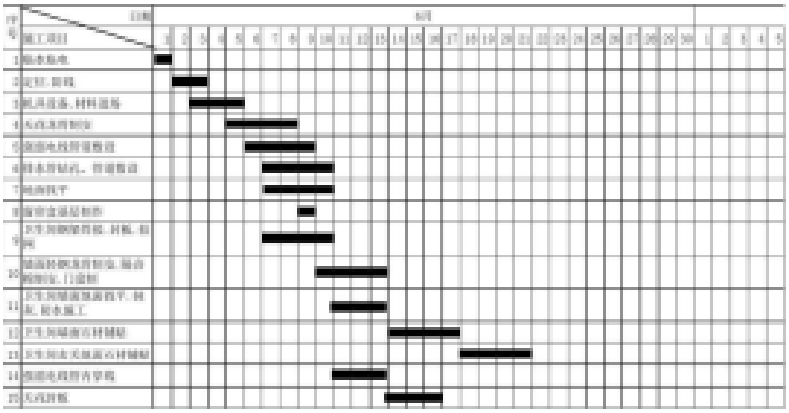

Figure 3 Construction management

4.2. Focus on Talent Development Programmes

In order to better apply big data analysis technology in construction, we should pay more attention to hiring professional talents in data analysis, and big data analysis also involves various fields. The current construction industry generally lacks complex talents who fully understand the connotation of big data technology and actually master the knowledge of project management, but if they rely solely on certain colleges and universities or management institutions to train such complex talents, the efficiency is extremely low, and the training results may also exist in situations that do not meet the actual needs.[3]. Such complex talents require joint cooperation between industry associations and institutions of higher learning to strengthen the training of talents among professional teams in construction engineering project management, giving priority to relevant training for technicians or managers with rich working experience, so that relevant professionals can combine theoretical knowledge with practical experience and truly cultivate complex talents who can meet the development needs of the construction industry. At the same time, the training of relevant talents can further promote the development and application of big data technology in the domestic construction industry.

4.3. Reform of Corporate Culture and Decision-Making Mechanisms

In the enterprise development culture, also needs the timely integration big data management idea. In the past, the decision-making of enterprises was based on the intention of the leadership or the instruction of experts, while in the era of big data, scientific enterprise decision-making can be made based on the results of big data analysis, or the results of data analysis can be used as an important reference in decision-making. Therefore, enterprises can also gradually strengthen the reform of corporate culture and decision-making mechanism in the future development process.

5. Concluding Remarks

All walks of life should be aware that the era of big data is coming, and the demand for huge data in the construction industry is very strong. Compared with other industries, it is more necessary to make project plans and decisions based on scientific data analysis. In line with the current trend of big data development, big data auxiliary construction project management will be everywhere in the future. The development trend of the whole construction industry needs to be analyzed by big data, so as to strengthen the understanding of the future development plan of the whole city and further explore the actual needs of the construction users. In the concrete construction scene of each construction project, it is necessary to use big data analysis technology all the time, such as the adjustment of construction period, the purchase of construction materials, the optimization of construction cost and so on. Only by applying big data analysis technology to the construction industry as soon as possible can we realize the rapid development of the construction industry.

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