Research on Properties and Entity Extension of BIM Model Based on IFC Protocol

Xisheng Li

College of Civil Engineering, Nnajing Forestry University, Nanjing, Jiangsu, 210037, China

xishengli@163.com

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Abstract: This article mainly focuses on the research of BIM model attribute and entity expansion method based on IFC protocol. Because the network renewal in our country is expanding continuously, and the competition pressure of various industries is very great.The reform and innovation of the information age also brings opportunities for the development of our country, but also brings certain challenges. According to the BIM model, this paper will analyze the many problems faced by the current data analysis, and give reasonable solutions to these problems, so as to lay a certain foundation for the future urban development of our country and solve the problems fundamentally.

1. Introduction

Because of the rapid development of BIM in China, it has been applied in all aspects, especially in the construction of urban traffic has played a great role. Because our country belongs to the peak of urbanization construction at present, if there is no reasonable planning of the problems arising from urban development, it will hinder the pace of development and progress of our country. Hence, how to use the BIM rules to plan the development of the city and how to ensure the sustainable, healthy and stable development of urbanization and economy are all worthy of study.

1.1. Use of Bim to Plan Urban Development

First, the main content of using BIM to plan urban development is to integrate BIM technology into the scope and expansion of data analysis. The focus and core of coordination is the content of the city, which also includes the definition of the nature of the city and the rational planning of the city by the state.

2. Specific Problems in Use of BIM Planning for Urban Development

2.1. Bim Can Not Be Shared in Each City

With the development of network technology, BIM sharing in data analysis has spread all over the world, but there are still problems that many cities are difficult to obtain BIM information. Because of technology, systems and cost factors, only governments and large enterprises have the right to collect, store and process large data resource [1]. Thus, the vast majority of BIM processing technologies are available to governments and large enterprises, but the difficulty of making them available to cities across the country BIM, is undoubtedly a major design challenge for data analysis.

2.2. Bim Processing in Data Analysis is Premature

There is a close relationship between BIM processing technology and the development of data analysis. Because of the vast land area, large urban space and complex system in China, it is difficult for the relevant departments and personnel of data analysis to plan and explore cities from different angles, because the data types of each city are large, the number is large, and most of them are located different fields [2]. As a result, different BIM processing methods can play its effect, but many BIM processing methods are not mature, resulting in more difficult data processing, some

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knowledge theory has not yet formed a complete theoretical system, which brings great challenges to the data analysis work.

Figure 1 BIM model attributes

2.3. Low Security Bim in Data Analysis

BIM processing technology in data analysis research for large-value drivers must study and analyze social groups, which involves the will of social groups and individual citizens, but also easy to involve privacy issues, there are high security risks to data ethics and security. in the BIM era, there is a large number of data abuse in data analysis, resulting in a significant decline in BIM security.

3. Consideration on the Construction of Data Analysis in the BIM Age

3.1. Improving the Quality of Bim in the Form of Small Data

To improve the quality of BIM, blind BIM admirers believe that in the BIM context, everything can be quantified, and that advanced scientific and technological means can indeed provide a wide range of continuous data surveys, so BIM is able to achieve "full coverage" data analysis to reduce the occurrence of sample bias, which can completely eliminate the traditional statistical small data research and analysis methods [3]. However, at this time, the BIM technology of science colleges and universities can provide a large number of sample data, but still can not obtain all the complete data.

In the study of spatial behavior of urban residents based on social media data and urban relevance, Social media is seen as a source of information, with large usage and large sample coverage. Based on data analysis for 2013, Sina Weibo, the most frequently used social media software, has about 70 million active users, That's about 10 percent of China's Internet population, So it is clear that the network coverage is still very limited. Although all Internet user data can be used as a source of data, But there are about 600 million Internet users in China, 46% of the total population in mainland China, Still can't get a lot of sample coverage, did not reach the "full sample" analysis. BIM can provide a wealth of data analysis, But in the early days, Data sources can't reach the "full sample" level, Data analysis still faces a lot of information about "traps ", Without paying attention to the quality of the data, It could lead to a big anomaly.

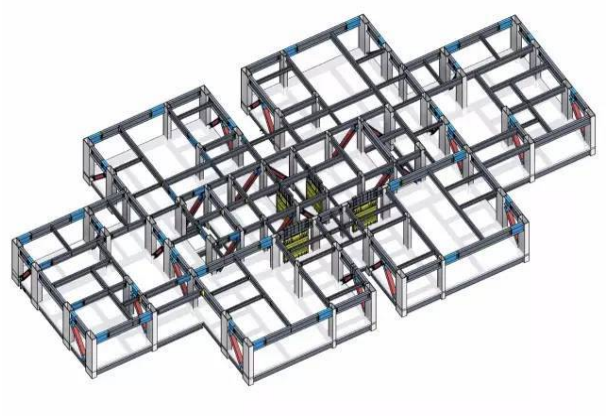

Figure 2 BIM model attributes

3.2. Use Expertise to Drive Bim Analytical Processing

owing to expert-driven BIM analysis, blind BIM fans believe that BIM analysis samples are better, that aI algorithms are very effective in analyzing non-human biases and computing systems, and that BIM analysis can find more relevant than traditional analytical methods, that causal links are not needed to explain the causes of this phenomenon, and that more accurate results can be produced without rigorous analysis. However, relying on correlation analysis has no professional knowledge to explain, when the situation changes, it is difficult to adjust the prediction model accordingly, it is easy to make mistakes.

3.3. Value of Bim Processing Technology Measured By Dialectical Thinking

Blind BIM fans believe that relying on AI algorithms and new computer science can become a powerful force in large-scale data analysis, and its ability is beyond the ability of human and traditional science to fully explore its potential value. BIM analysis that relies on artificial intelligence has had a rich impact in many practical applications, such as Amazon and Taobao. However ," information favors trends and ignores masterpieces ". even in the BIM era, major event decisions about urban development are similar. over a considerable period of time, BIM applications can not simulate these complex human social decision-making processes and can not fully predict the future of urban development. blind data worship may have [4] destructive consequences for cities.Data analysts need to construct a new data analysis support system, which should not only reflect the characteristics of human decision-making behavior, but also reflect the law of data analysis.

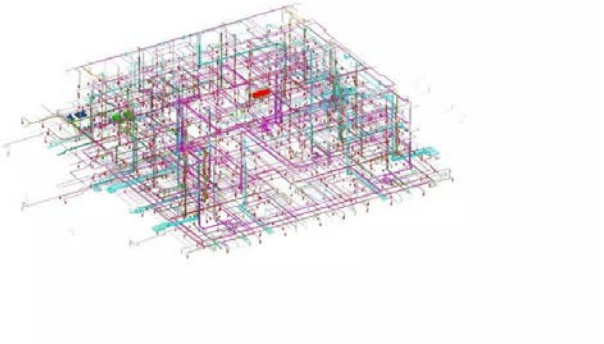

Figure 3 BIM model attributes

4. Positive Impact of BIM Integration Into Data Analysis

Nowadays, every city in our country has entered a large-scale application stage of BIM. Facts have proved that the planning of most cities in our country has implemented network information

management. According to the use effect, BIM management is indeed much more efficient than manual management. greatly strengthen the development speed of data analysis work, and the influence of BIM technology on the traditional data analysis mode is very great, and the combination of the two has laid the foundation for the urban network information market. Relevant departments can integrate BIM technology with data analysis to form urban BIM processing, and can then develop relevant urban network software and implement timely and effective urban network management, so as to promote the development of urban network BIM processing mode.

5. Software Design

The testing and monitoring system is designed as a testing and monitoring unit, which should be part of the integrated detection and control of power system, and its system performance requirements are not high. It also operates independently in power plants, substations and other locations for temperature detection, monitoring, display, overheating judgment and fault alarm.Then the final result of the detection is transmitted to the lower computer in the middle adjustment through the instrument serial interface.Because the software design of MCU system is relatively simple and fast.so it has been used as an important part of on-line detection of high voltage switch contacts and bus temperature. we have designed a program with rich information to receive temperature information sent by single chip microcomputer and display, store, analyze and print data. Through the network computer, we can send more serious overheating information to the mobile phone of the main person in charge, or call the service phone, etc., to ensure that the accident is eliminated in advance. By using the charging current value corresponding to the temperature detection point provided by the power system DCS, the characteristics of the resistor are analyzed, and the design method of the resistor is put forward. this contact was analyzed to analyze and diagnose low temperature faults in electrical equipment.The design of this software can provide effective help for power monitoring system.

6. Conclusion

Data analysis application needs have both advantages and disadvantages in BIM, the combination of traditional data and BIM can better meet the needs of design business. application barriers such as BIM sources and large data processing and analysis techniques must be addressed in the near future. The application of large data in data analysis requires the design innovation of professionals and expertise. Since entering the 21st century, the sustainable development of our country has become the only way of modern development. For data analysis to always carry out the idea of people-oriented sustainable development, the current progress of urbanization in China is gradually improving, so the requirements for data analysis is also gradually rising, gradually appeared the contradiction between supply and demand of planning is increasing, this problem is the first task to be solved urgently by the relevant departments. In the process of coordinated development, we should respect the relevant concepts of sustainable development, then carry out scientific and effective planning according to the specific actual situation, and fully ensure that the overall planning, but also ensure the scientific and sustainable analysis of its data, so as to conform to the natural law of urban construction.To sum up, this detection device successfully solves the urgent need of temperature measurement in high voltage environment of power system, and reaches the ideal standard. Field operation (applied to 10 kV switchgear) shows that the temperature detection range of high precision system, good anti-interference ability and high reliability, combined with DCS current information power system. The function of temperature fault diagnosis is complete, I believe it can be widely popularized and used.Through the analysis of this article, we know what is the BIM model attribute and entity extension based on IFC protocol.

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References

[1] Yuan, Zhimei., Zhou, Lanting., Xu, Changhua. Safety Risk Identification and Application of Pump Station Based on BIM. Journal of Drainage and Irrigation Machinery Engineering, vol. 38, no. 2, pp. 157-162, 2020.

[2] Kong, Lingming., Song, Yuanbin., Luo, Zhigang. Study on automatic wiring of railway signal cables facing BIM. Manufacturing Automation, vol. 42, no. 1, pp. 24-29, 2020.

[3] Zhang, Wensheng., Wu, Qiang, Qi, Pingli., et al. BIM and 3 DGIS integration technology and its application in railway bridge construction. China Railway Science, vol. 40, no. 6, pp. 45-51, 2019.

[4] Cheng, Fangyuan., Yao, Guoming., Kui, Yongcai., et al. Research and Application of Digital GIS/BIM Management of Highway Tunnel. Tunnel Construction (English and Chinese), vol. 39, no. 12, pp. 1973-1980, 2019.