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About BIM

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Abstract BIM, the Building Information Modeling, is based on the relevant information data of the construction project, to establish the three-dimensional building model, and simulate the real information of the building through the digital information simulation.

Keywords BIM, development, outstanding characteristics

Introduction

BIM originated in 1975, "The father of BIM" - Professor Charles Eastman of Georgia Tech University has created the BIM concept so far, BIM technology research has gone through three stages: the embryonic stage, the Generative stage and stage of development. BIM concept of the Enlightenment, by the 1973 global oil crisis, the US industry needs to consider the issue of improving industry efficiency, 1975, "the father of BIM" Professor Eastman in his research topic "Building Description System" proposed "a computer -based description of-abuilding ", in order to achieve the visualization and quantitative analysis of construction projects to improve the efficiency of construction projects in the actual project, the use of BIM indeed for the successful completion of the project provides a great convenience. In view of BIM's outstanding performance in the field of engineering, BIM was quickly discovered and carried out by a large number of domestic research and achieved great results at the national level has also developed a related policy, to a certain extent, promote the BIM in China Engineering development.

The reason is that it is to promote the development of BIM depth has eight outstanding characteristics are: visualization, coordination, simulation, optimization, can figure out sex, sex, parameterized and information completeness.

Visualization is the form of "what is seen", for the construction industry, the visualization of the real use of the role in the construction industry is very large, BIM provides a visual idea, so that people will form a line of the former components of a three-dimensional Of the three-dimensional physical graphics show in front of people; the construction industry also has a design renderings, but this renderings is subcontracting to the professional renderings of the production team to read the design of the line produced by the information produced, It is not generated by the information of the component automatically, and lacks the interaction and feedback between the same components. However, the visualization mentioned by BIM is a kind of visualization which can form interaction and feedback between the components. Information model, because the whole process is visualized, so the visualization of the results can not only be used to show the results of the show and the report generation, more importantly, the project design, construction, operation process of communication, discussion, decision Visualized state;

Coordination this aspect is the focus of the construction industry, whether it is the construction unit or the owners and design units, all doing the coordination and coordination of the work. Once the implementation of the project encountered problems, it is necessary to organize the relevant parties to open coordination, to find the cause of the construction problems, and solutions, and then change, do the appropriate remedial measures to solve the problem. Then the coordination of this question really can only be a problem after the coordination?

In the design, often due to the communication between the professional designers are not in place, and the emergence of a variety of professional collision problems; BIM building information model in the building before the construction of the professional collision problem coordination, generate coordination data , Provided. Of course, the coordination effect of BIM is not only to solve the collision problem between the various professional, it can also solve such as: elevator shaft layout and other design arrangements and clearance requirements of the coordination, fire partition and other design arrangements for coordination, underground drainage Coordination of other design arrangements

Mimicry is not just a model of a building that can be modeled, but can also simulate things that can not be manipulated in the real world. In the design phase, BIM can simulate some of the things that need to be simulated on the design, such as energy saving simulation, emergency evacuation simulation, sunshine simulation, thermal conduction simulation, and so on. 4D simulation can be carried out during bidding and construction Project development time), that is, according to the construction of the organization to simulate the actual construction, so as to determine a reasonable construction program to guide the construction. At the same time can also be 5D simulation (based on the 3D model of cost control), in order to achieve cost control; the latter part of the operation phase can simulate the daily emergency treatment of the simulation, such as earthquake personnel escape simulation and fire evacuation simulation.

On the optimization, in fact, the entire design, construction, operation process is a continuous optimization process, of course, optimization and BIM there is no substantive link, but on the basis of BIM can do better optimization, better Do optimization. Optimize the constraints of three things: information, complexity and time. The BIM model provides the actual information of the building, including geometric information, physical information, rule information, and the actual existence of the building after the change of the building. Complexity to a certain extent, the ability of the participants themselves can not grasp all the information, must use a certain degree of science and technology and equipment to help. The complexity of modern buildings is much greater than the competency limits of the participants themselves, and BIM and its various optimization tools provide the possibility of optimizing complex projects.

For making design drawings, BIM is not to everyone out of the more common architectural design institute out of the architectural design drawings, and some pieces of processing drawings. But through the visualization of the building display, coordination, simulation, optimization, can help the owners out of the following drawings: (1) integrated pipeline diagram (after the collision check and design changes, eliminating the corresponding error later), (2) Structure of the hole map (embedded casing diagram), (3) collision check report and recommendations to improve the program

Integration is based on BIM technology can be from design to construction and then run through the entire project life cycle of integrated management. BIM's core technology is a database formed by the computer's three-dimensional model, not only contains the architectural design information, but also can accommodate from the design to the use of the end, even the use of the end of the whole process of information

Parametrics is to establish and analyze new models by simply changing the parameter values in the model by means of parameters rather than numbers. The elements in BIM are in the form of components. The difference between these components is Through the adjustment of the parameters reflected in the parameters of the preservation of the elements as a digital building components of all the information

The completeness of information is that BIM technology can describe 3D geometric information and topological relations of engineering objects and complete engineering information description.

BIM, of course, there are some shortcomings, one of the typical representative software BIM Autodesk Revit is the most widely used one of the three-dimensional modeling software, but its computer hardware requirements are too high, so many users stop; Moreover, a BIM concept and National policy binding in a piece, so that many people blindly engaged in this industry, and many even think that BIM is Revit, is a three-dimensional model, this erroneous thinking has now created on the market now cluttered BIM training company or BIM Consulting company; light to understand its advantages and not to pay attention to its shortcomings, then it will cause some cognitive errors, understand the BIM will need a comprehensive understanding of the BIM, the so-called know ourselves, know yourself!

BIM concept imported from foreign countries, its advanced concept in the construction area for the construction project to save 15-25% of the cost, and reduce more than 20% of the duration; this huge benefit directly to promote the foreign government to BIM's strong support; In May 2011, the British Cabinet Office issued a "government construction strategy (Government Construction Strategy)" document, which has the entire chapter on the building information model (BIM), this section clearly requires that by 2016, The government asked for full collaboration with 3D-BIM. And all the documents to information management. BIM led the huge benefits directly contributed to the introduction of the domestic BIM policy; October 24, 2014, the Shanghai municipal government issued "on the city to promote BIM technology application guidance." In the guidance of the Shanghai Municipal Government in the next three years to clarify the objectives and important tasks of BIM technology, but also developed a policy to implement the specific safeguards: BIM technology application to promote the promotion of meetings, clear BIM technology application requirements and supporting costs, improve the relevant Construction project evaluation management approach, the establishment of BIM technical experience exchange platform and mechanism; corresponding to other cities also promulgated the relevant BIM policy; such as the Chengdu Urban and Rural Construction Committee released in November 2016 proposed the city to carry out building information model (BIM) technology Application of the notice: First, from December 1, 2016 onwards, where in the city to obtain a new "planning and design conditions notice" the following items in the design phase should be used BIM technology; Second, the design unit in the project design, Preliminary design and construction design and other stages of the corresponding BIM design technology depth should meet the "Chengdu civil construction information model design technical requirements" (2016 version) of the accuracy requirements; Third, the construction drawings in the design documents before review, the design unit should Asked to fill out the "Chengdu civil construction construction design information model report form" and so on; Whether the foreign or domestic, BIM-related laws and regulations has become one of the government's most important architectural policy, which directly promote the construction industry information, will usher in the construction industry's third revolution; in the near future, BIM software and related plug-ins Will be rampant in the construction sector, and this trend will exist for a long time!

The arrival of the BIM technology era led to the end of the CAD era, but not all replace the CAD, in a certain aspect of CAD still exists in the construction map, and BIM-related software can not replace the role of CAD; use BIM technology can The whole life cycle of the project information management, including four stages that the planning stage, design stage, construction phase, operation phase, each stage can be a comprehensive information management control, so that under construction or existing construction project management More clear and clear;

BIM as a future trend of development will have a few; first, to mobile technology to obtain data. With the popularity of the Internet and mobile smart terminals, people can now access information at any location and at any time. In the field of architectural design, will see a lot of contractors, for their staff are equipped with these mobile devices, in the work site can be designed. Second, the data is exposed. The monitor and sensor can now be placed in any part of the building, monitoring the temperature, air quality, and humidity within the building. Then, plus heating information, ventilation information, water supply information and other control information. After the summary of the information, the designer can have a full understanding of the status quo of the building. Third, the future there is one of the most important concepts - cloud technology, that is, infinite computing. Whether it is energy consumption, or structural analysis, for some information processing and analysis need to use cloud computing powerful computing power. Even, we can render and analyze the process to achieve real-time computing, to help designers as soon as possible in different design and solutions to compare between; Fourth, digital reality capture. This technique, by scanning a laser, can scan bridges, roads, railways, and so on to obtain early data. We also see that there are new algorithms that are now focused on the plane or surface of the laser, and then placed in a modeling environment. 3D movie "Avatar" is in a computer to create a 3D stereo BIM model environment. Therefore, we can use this technology to create a visual effect for customers. It is worth looking forward to the future designers in a 3D space to use this approach to the way to work, visual display of the future of product development; Fifth, collaborative project delivery. BIM is a workflow, and is based on a change in the design of a technology, but also changed the entire project implementation of the construction method, it is a designer, contractor and the cooperation between the owners

of the process, everyone has their own very Valuable ideas and ideas. We should make corresponding changes to these future trends, change ourselves, change buildings, and change lives.
BIM is not just software, but an auxiliary means!

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