On the Combination of Computer Aided Architectural Design and Green Building

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Abstract. The link of traditional architectural design is very complicated. It costs a lot of human and financial resources. The traditional architectural design drawing error is also very big. Engineers can only measure some errors with their own experience. On this basis, experts believe that computer-aided systems can help architectural design. In recent years, the pollution caused by building materials is becoming more and more serious [1]. This situation has attracted the attention of environmental protection departments. Experts put forward the theoretical research of green building. This paper briefly summarizes the characteristics of computer-aided architectural design. This paper describes the application of computer technology in green building. Finally, this paper puts forward the research on the combination of the two.

Keywords: Computer, Aided Design, Green Building

1. Introduction

With the continuous development of advanced new technology, the implementation of industrial technology has improved the social economic level. In this stage, the traditional architectural design technology is an important goal of economic development. However, people slowly found that the traditional architectural design technology of capital operation is very large. It's a waste of manpower. A lot of bean curd residue projects have also emerged. Many people question the level of traditional architectural design. On this basis, experts put forward computer-aided architectural design. People also found the convenience of engineering drawing software. However, the environmental protection of building materials has broken the balance. This situation is very serious.

China draws lessons from foreign architectural theories. Foreign architects think that green building will be an important starting point. Today's ecological environment has been greatly damaged. While meeting the economic level, people are also calling for environmental protection. The concept of green building design also appeared (see Fig 1). Unfortunately, the theory of green building in China is in its infancy. There are many practices in the stage of theoretical research. This paper introduces the characteristics of architectural design. Through computer aided design, this paper introduces its application in green building. Finally, the practical value of the combination of green building and architectural design is put forward. I hope to give you some inspiration.
2. Main features of computer aided architectural design

2.1. Conception process of architectural design
Architectural design belongs to civil engineering industry. Before building a building, the designer needs to think about the whole process. The conception process mainly includes planning and scheme design. The draft mainly refers to the design. Project design includes engineering drawing, cost prediction and risk prediction. In the process of architectural design conception, the designer's thinking needs constant changes. According to the needs of the company, designers need to change the scheme at any time.

2.2. The scheme design of drawings is faster
The engineering drawing of traditional architectural design needs to be completed manually. The designer needs to lie down on the whole drawing to depict the building and its surroundings [2]. Hand drawn engineering drawings are usually dirty. The errors of hand drawn drawings are also very large. If the company needs to change the plan, designers need to waste more time. It is very convenient to describe the drawing of computer aided architectural design. Designers only need to learn how to operate the relevant auxiliary software.

2.3. It can better reflect the visual intuition
The traditional hand-painted drawings of architectural design are two-dimensional graphics. Designers can understand the contents of the drawings. Business managers can't understand. For the managers of enterprises, this is a big disadvantage. Computer aided architectural design can use three-dimensional model software to describe the three-dimensional building model. Enterprise managers can see the overall shape and visual effect of the building through the computer.

2.4. Waste of construction cost can be avoided
Many buildings have had safety accidents. Many construction projects have experienced the problem of waste of funds. It is difficult for traditional architectural design to avoid these problems. Computer aided architectural design can complete the work of cost prediction. After the three-dimensional model is established, the computer simulation software can complete the cost prediction. This way can avoid wasting money ahead of time. It can also break through the psychological barriers of company managers.
3. The main application of computer aided building technology in green building

3.1. Computer based pre design of sketches
A sketch is a preliminary plan. Many designers use sketches to design the pre effect of buildings. They can design the effect of different sketches according to the requirements of customers. Compared with the manual sketch drawing, the computer sketch design is very simple. It can save more time. The error of manual sketch is very big. The error of computer drawing sketch is relatively small.

3.2. Analysis of construction environment
The computer can measure the feasibility of construction environment. Designers will accurately input the environmental parameters around the construction into the computer equipment. Computer can analyze the feasibility of green building design of building environment. Computers can analyze unreasonable details in drawings. Designers can also enter data on building energy consumption. The computer can also calculate the comprehensive result of energy consumption of the whole building environment.

3.3. Application of computer simulation lighting technology
The computer can use CAAD software to simulate the light direction inside the building. The computer can calculate the amount of light entering the building. The computer can calculate the illumination data according to the size and height of the building. This is the famous simulated illumination experiment. The design of residential buildings generally adopts simulated illumination experiment. Designers should ensure that natural light is transmitted throughout the building in the case of green building design.

3.4. 3D virtual animation design
According to the above description, we know that 3D simulation software can provide customers with intuitive visual experience [3]. Through the rational use of 3D software, designers can also design virtual animation. The content of the animation includes the overall appearance of the building and the environmental shape. This part of the animation can be used in the developer's video commentary. The computer can adjust the internal time. It can even simulate the climate around buildings.

4. The combination of computer aided architectural design and green building

4.1. Expression methods of architectural drawing design
Computer aided system can build the model of high quality building. Generally speaking, the drawings of architectural design are displayed by simple two-dimensional drawings. However, the drawing expression of green building design is different. The materials used in green buildings are environmentally friendly. The shape characteristics of green buildings are also special. Therefore, the design graphics of green building should adopt three-dimensional model display (see Table 1).

4.2. Analysis based on 3D model parameters
In order to meet the design concept of green building, the computer should make a reasonable three-dimensional model. According to the detailed analysis of three-dimensional drawings, the computer will simulate the sunshine data and the data of light transmission. Computers also analyze the range of noise. Energy consumption design of buildings is also commonly used. In addition, ventilation, indoor lighting and the use of building materials should be predicted.

4.3. Decomposition of green building design process
In every stage of architectural design, the designer should constantly modify the scheme. By establishing the hierarchical relationship of different stages, designers can transform the design process into an organic whole. The design process should include design specification, conceptual
5. Design, preliminary scheme design and construction scheme design. The process of green building design is complex. Therefore, each step may have different problems.

Table 1. The combination of auxiliary architectural design and green building design links and main application software types.

| Design link               | Software assistance        | Feature                      |
|---------------------------|----------------------------|------------------------------|
| Sketch                    | CAD                        | Easy to do it                |
| Environmental parameters  | Simulation software        | The calculation is convenient|
| Conceptual design         | Aided design               | It's complicated             |
| Performance simulation    | Simulation software        | Real-time measurement        |

4.4. Performance simulation of green building
Generally speaking, the performance simulation of green building is divided into two parts. They include application simulation system and building simulation system [4]. These systems can effectively measure the energy consumption of buildings. They can optimize the energy consumption of buildings. According to the above description, we know the calculation method of some parameters. It should be noted that the calculation of parameters needs to be carried out at all times. According to the dynamic measurement data, we can analyze the average value of the data.

5. Advantages of computer aided architectural design

5.1. It can deal with graphic problems more easily
There are many problems in hand drawn graphics. It's difficult to adjust the color balance of a graph. Hand drawn textures are also difficult to guarantee accuracy. The color, scale and main texture of the graphics can be adjusted by computer-aided software. Fortunately, this adjustment is very simple. Designers don't need to do repetitive work again. Computer aided architectural design can reduce the workload of designers.

5.2. Fast computing speed
A lot of calculation skills are explained in the construction engineering task book. The deviation of manual calculation process is very large. It needs constant checking. The calculation process of some huge construction projects is very difficult. Enterprises need to spend more human resources to complete the calculation process. Computer aided technology provides people with faster computing speed. The accuracy of computer calculation is also very high. All computational problems can be solved effectively.

5.3. Personalized design elements
Personalized design of buildings is quite common. In the process of traditional architectural design, hand-painted personalized drawings are very rare. Personalized architectural design is a complex work. He takes the requirements of customers as the main target. Computer aided architectural design has the function of personalized design. It can provide designers with various personalized solutions. The charm of personalized design elements is more strong.

5.4. Highlight the coordination between human and environment
Green building needs to emphasize the humanized service. The tenet of green building is human oriented [5]. In addition, green building emphasizes the coordination between human and environment. Green building design drawings should include environmental factors. The integration of building shape and environment shape can reflect the harmony between human and nature. The computer simulation system can also be used to predict various adverse environmental problems.
6. Practical value of the combination of computer aided architectural design and green building

6.1. It can save more construction funds
In fact, the capital utilization of green buildings is much lower than that of traditional buildings. The amount of capital used in traditional architectural design is a lot. Computer aided architectural design can save some construction funds. In order to meet the needs of green buildings, many building materials need to be more environmentally friendly. Therefore, green building design can save more money. This is an important means to maintain China's economic growth.

6.2. It can protect the environment
China often emphasizes the importance of environmental protection. Environmental protection departments often put forward relevant policies for environmental protection. Traditional architectural design is difficult to ensure that the environment is not infringed. Some unscrupulous developers are desperate to develop uncompleted buildings. They destroy the natural environment. The green building design with computer emphasizes the harmony between man and nature. Therefore, it can effectively protect the environment from being infringed.

6.3. It can save more building materials
In fact, the utilization rate of natural resources in China is very low. Many foreign scholars have commented that China is the country with the worst utilization of resources [6]. This is true. We must correct this thinking. Traditional architectural design wastes a lot of materials. Green building design always tries to use less building materials to complete construction projects. This is also the main reason why we should emphasize the use of green buildings.

7. Conclusion
There is no doubt that computer-aided architectural design is an innovative design method. Green building is a way to protect the environment that we should emphasize. The combination of the two can effectively alleviate the waste of resources. They can protect the ecological environment of our country. This is also the main direction of China's advanced construction industry.

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