Building Integrated Design Practice under the Concept of Sustainable Development

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Abstract: With the continuous development of social economy, people are more demanding for architecture. Some advanced design concepts are gradually applied to the design of buildings. Under the concept of sustainable development, building integration design has also been widely used to promote the rapid development of architectural design. Integrated design concepts and sustainable development concepts play an important role to meet people's requirements. This article will explore the concept of sustainable development under the concept of integrated architectural design and practice analysis, propose appropriate measures.

1. Introduction
In the current era of rapid urbanization, the building construction speed is very fast, and the construction technology of the building is constantly improving and perfecting. Building energy consumption is one of the important energy consumption in our country. Paying attention to the development of building energy-saving technology is also an important issue we are facing currently. The development of energy-saving technology in buildings will also become a trend of future development with broad development prospects. Under the concept of sustainable development, the integrated design of buildings can effectively promote the rapid development of current architectural design. At present, with the rapid development of science and technology, digital technology has been widely applied to various industries. The development in the field of architecture has also been greatly affected. Many advanced technology and design concepts have been applied to architecture design and construction. People are beginning to tend to use integrated design approach, in terms of form it gradually tends to green design, performance and function of buildings to provide a good living environment for human beings.

2. Related Concepts of the Integration of Architectural Design
The concept of integrated architectural design was originally evolved from a small demonstration project in Canada where architects with different professional backgrounds are involved in the design of the project, using existing building technologies and taking all aspects of the technical requirements, the concept of integrated architectural design into account [1]. This concept of integrated construction is widely used in architectural design, and it is continuously improved and perfected in practice. The concept of sustainable development needs to take into account a future trend of development, strict design in the form of building, function, etc., can get the maximum economic benefits through less investment, to achieve the sustainable development of architectural design, architectural design in the process, the concept of sustainable development needs to be run through the entire design process and be able to make full use of all effective resources to obtain the maximum economic benefit under the premise of sustainable development. [2]

The integrated design of a building requires close coordination between different professional
designers and follows a green design concept in terms of form, function and cost of the building needs to achieve a sustainable design approach. In the design of building projects for solar heating and cooling in the International Energy Agency, an integrated design approach is applied, and the integrated design simultaneously and synchronously designs the building with the relevant technical system to form a continuously repeating process [3]. The integrated building design method belongs to a brand new design method. This design concept runs through the whole process of building design and is a comprehensive database containing building information. The building information model is an important part of the integrated design standard. The Building Information Model (BIM), abbreviated as BIM, combines various geometric information and related functional requirements to bring together all the information in one construction project to form a comprehensive information management system. BIM is a design software for integrated design, to meet the different design requirements in the integrated design process.

3. Sustainable Development Under the Concept of Integrated Architectural Design

3.1 Adhere to the Modular Design Concept of Production
In the current rapid economic development background, the requirements for the building is also rising, the quality of the building and aesthetic have a great degree of improvement, the traditional building model also has great drawbacks, and with the energy resources the increasing use of energy saving and environmental awareness began to be applied in architectural design, in promoting the development trend of low-carbon environmental protection, how to improve the quality and utilization of buildings has also become a new topic [4]. One of the integrated house building system in the building structure, doors and windows and equipment to achieve a systematic combination of installation, to achieve a standardized and modular mode of production.

3.2 Focus on Resource Recycling Design Concept
From the perspective of traditional architecture, in the process of large-scale demolition, a large amount of construction waste and wastes are generated, which causes great environmental pollution to the cities and many construction metals can not be reused. Therefore, in the new architectural design under the concept of recycling of building materials will also be the focus of architectural design, we must focus on the recycling of building materials, including light steel integrated house will be the future of housing construction, a direction of development, building materials recycling is also building an important principle of integrated development [5].

3.3 Focus on Saving Design
In an environment of sustainable development of buildings, we should save the design concept throughout the architectural design, we should focus on resource conservation. To protect resources, we must adhere to a new mode of production and management and an intensive mode of production based on low consumption of resources. It is also an embodiment of the development of integrated buildings, which can effectively design the building space, improve the utilization efficiency of buildings and make efficient use of construction resources, forming a high efficiency, low energy consumption building development model.

4. Application of Integrated Design Concept in Architectural Design

4.1 Application Principle
Integrated architectural design is a process of repeated design, and integrated architectural design and other related technical design is achieved at the same time, integrated architectural design is a complex information throughout the architectural design process, from the beginning of the building drawing design until the final building operation and maintenance will be applied to. The building information model is the embodiment of the concept of integrated building design, which can be reflected in the
attribute information and functions. At the same time, the construction information, the construction schedule and the project maintenance and management all cover the related data, and can build the building model. Engineering scientific management, the current building information model in the building design process has been widely used, has been largely promoted.

4.2 The Application of Sustainable Development Concept in Architectural Design
In the process of building design, the concept of sustainable development is also a development goal that architecture design needs to follow. Designing in terms of function and safety of the building needs to follow the trend of development in terms of function. Designing at the architectural ecology level can effectively meet the needs of construction occupants and is also an idea of following the social sustainable development. Under the concept of sustainable development, we must continue to replace unreasonable construction materials, recycle non-renewable energy, recycle and promote the sustainable development of modern buildings. In addition, the concept of sustainable development, the need to constantly improve the level of technical aspects of the building, do a good job in the design of the assessment, the sustainable development of buildings is from the construction technology point of view, by selecting a reasonable building construction technology, building project construction, but also a manifestation of sustainable development [6].

5. Practice of BIM Technology in Integrated Design Process
Under the concept of sustainable development, BIM technology is applied to the design of building integrated design. This technology can optimize the construction scheme and the maintenance of later buildings, and can also achieve the sustainable development of architectural design. BIM technology is to quantify the design ideas of different professionals through the quantification of the data stored in the computer information to effectively meet the integration needs of the building design process, BIM technology has become widely used in the construction of a design method.

5.1 The Design Phase of the Building Program
In the early stage of the design of the building program, the use of BIM technology to create a three-dimensional model, the model contains the building information, the software can be used to establish information model, building designers in the design process, to consider the contents of the building program, from Intercepting the drawings in the 3D building model for analysis and comparing the differences between the different schemes enables the timely adjustment of the designed schemes to comprehensively consider the form and type of the building and the design positions of the windows and doors, take the minimum energy consumption, we should focus on different aspects of architectural design different programs, choose the best solution. Among them, the information model established by using BIM technology has a lot of building information data resources, including building geometry types, materials and related components, and building performance software for simulation analysis. For example, IES software has been used extensively in building simulation analysis, an integrated building performance analysis software that simulates building energy consumption, ventilation, and daylighting, and uses information from the model. The simulation analysis of resources will make the design process more accurate and predict the construction conditions ahead of time and predict the energy saving effect of the buildings before the construction is over.

5.2 The Operational Phase of the Building
BIM technology to create the building model contains engineering and technical data needed for the construction of the building, the structure of the building design and cost accounting data, etc., can be used in the process of establishing a model to establish a model for a variety of data. (Figure 1 below is a building information model) Architects can calculate and apply information about the length of wall beams and the strength of the material during the design process. The contractor can obtain accurate information during the actual construction of construction materials information, choose the
materials that need to be applied in the construction, and then import the data information into the simulation software for analysis, including the construction safety inspection and building code inspection, such a simulation test or analysis, to enhance the quality of the project to a great extent. In addition, the construction cost budget, you can extract the relevant building components and manufacturers of data for a comprehensive analysis of the cost of the budget, the project can be made to a minimum. There are post-construction maintenance, but also can be based on the model of the relevant data analysis, from which to choose the appropriate maintenance methods, good post-construction maintenance, it will avoid the latter part of the phenomenon of maintenance costs are too high, can effectively maintain the building management. Such an integrated building design process, the application of BIM technology will greatly reduce the error occurred in the information transmission process, but also can fully guarantee the effective completion of the overall design of the building, which will lay a good foundation for the later use and maintenance of the building, and can fully reduce the waste of building materials and save resources.

Figure 1 Building Information Modeling Information Sharing

5.3 Application of BIM Technology in Building Ecological Energy Saving

Integrated architectural design runs through the entire life cycle of the building, plays an important role in the design of the building and the maintenance in the later stage. It needs to establish the information model and keep the design optimization of the scheme, from which it can find the optimal program. In the current era of rapid social and economic development, the building has been widely applied to ecological and energy-saving technologies. For the design and construction of buildings, it is necessary to continuously explore new building energy-saving technologies and make use of some clean energy such as solar energy for building-related design jobs. The application of integrated design methods need to be more knowledge of multiple disciplines organically linked to different professional designers to design ideas and methods together to achieve synchronous communication and communication in the entire building system design process, the cooperation between the division and the engineer can ensure that the design scheme achieves the optimum result. For example, the use of BIM design software can provide a common platform for different stages of the design phase of the building, and designers of different disciplines can communicate and communicate directly. In the early stages of design, designers can communicate their design intentions with their owners and improve the efficiency of their work. As a technical means and tool in integrated design, BIM can establish an intuitive information integration body and realize the sustainable development of architectural model design.
5.4 Late Construction Maintenance Work
After the completion of the construction design, it is the maintenance simulation analysis of the post-construction application, focusing on the building energy evaluation as the main simulation analysis. Through the use of relevant data and information in BIM technology, a certain model is established. Components to give a certain amount of information, the use of this design platform to improve the relevant information, from the most basic component energy consumption assessment to assess the entire building design energy consumption, focusing on various factors into account, throughout the entire building design life cycle, taking into account the design of the surrounding environment, fully assess the energy consumption.

6. Conclusion:
To sum up, in today's sustainable social environment, higher requirements are placed on the design of buildings. As an important part of the sustainable development of society, the design of buildings should fully embody the principles of energy saving, environmental protection and sustainable development concept, from the overall layout of the building, the choice of materials and building maintenance and other aspects of continuous improvement. The BIM technology used in this method can evaluate the design of a building by building a building information model.

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