Evaluation of Interior Design Schemes Based on Artificial Intelligence Processing Technology

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Abstract: This article analyzes the necessity of evaluating interior design schemes. The content of this article includes timely discovering the shortcomings of the plan, improving the comprehensive benefits brought by the plan, and reducing the appearance of construction changes. The composition combines the basic concepts and development of artificial intelligence processing technology, and studies the construction principles of artificial intelligence processing technology in a clear system. The author studied how to evaluate the content of the indicators, the integration of energy-saving function indicators, the calculation of the weights of different indicators, and the objective evaluation of specific application functions in the test plan. The author's purpose is to improve the reliability of the evaluation results of the interior design plan and speed up the progress of the later plan implementation.

1. Introduction
With the rapid social and economic development, people's requirements for the comfort of the living environment are also increasing. When people choose an interior design plan, they need to use a comprehensive evaluation system to obtain reliable evaluation results, so as to improve the reliability of the design plan itself. The integration of artificial intelligence processing technology can improve the accuracy and rationality of evaluation index weight calculation on the one hand, and can participate in complex system calculations. The artificial intelligence processing technology obtains reliable evaluation results in a quantitative analysis method to improve the utilization value of interior design solutions.

2. Necessity of Evaluation of Interior Design Scheme
2.1. Discover the Shortcomings in the Plan in Time
Many application factors need to be considered during the evaluation of interior design schemes. For example: social factors, climate factors, architectural style factors, calculate the influence of many factors to delineate the basic framework of interior design. Subsequently, some details were specifically refined to improve the integrity of the design plan. Based on previous design experience, we can know that the error tolerance rate of many interior design schemes is between 5.3% and 10.5%. The main reason is that some detailed information needs to be obtained through further communication. However, when evaluating the indoor program, we can use some quantitative indicators to point out the deficiencies in the program. In addition, combined with supplementary related materials, the interior design plan can be improved and the reliability and effectiveness of the design plan itself can be improved.
2.2. Improve the Overall Benefits of the Program
The formulation of the interior design plan provides not only a comfortable living environment for the owners, but also an important support for the company to increase economic income. There is a lot of cost in drawing up the interior design plan. For example: data collection cost, personnel expenditure cost, time production cost, etc. The amount of these costs will also affect the comprehensive benefits that the program can bring. Moreover, some quantitative indicators can be used to point out the deficiencies in the plan when evaluating the indoor plan. In addition, comprehensive analysis of the content of various indicators was carried out when the design plan was drafted in the early stage, thereby improving the compliance of the design plan and reducing the number of repairs in the later stage. This not only reduces the overall cost of expenditure, but also improves the overall benefits that the design scheme can bring [1].

2.3. Reduce the Occurrence of Construction Changes
After the interior design plan is drawn up, it will enter the plan implementation stage. During the construction process, there will be some construction changes in the actual application situation. Such as: reflector position, window position, indoor layout distribution, etc. The appearance of construction changes will directly increase some construction costs. Moreover, the appearance of major construction changes will also delay the construction progress of the entire project. Therefore, we need to do a good job in the evaluation of the interior design plan in the early stage, find out the shortcomings in it and correct it in time. At the same time, some design schemes were appropriately refined to improve the orderliness of the later construction process. Otherwise, the probability of occurrence of construction change problems can be reduced by 15% to 30%, thereby improving the comprehensive benefits brought by interior design [2].

3. Overview of Artificial Intelligence Processing Technology Related Content

3.1. Basic Concepts
Artificial intelligence is a branch of computer science, and its essence is to create an intelligent machine similar to human intelligence. The emergence and development of artificial intelligence is first of all a revolution in thinking science. Its appearance and development depend to a certain extent on the scientific revolution of thinking. At the same time, it has also brought profound changes to people's ways of thinking. Artificial intelligence is a scientific discipline, closely related to philosophy. For half a century, artificial intelligence has played an important role in how humans understand themselves and change the world. For a long time, there have been two attitudes towards artificial intelligence research: strong artificial intelligence and weak artificial intelligence. In the analysis of the former, the main tendency is to develop in an all-round way. The former believes that artificial intelligence can reach the active thinking of human beings, and has its own ideas, such as artificial intelligence processing technology, neuron network processing technology, etc. These are all developed technologies derived from this. The latter believes that artificial intelligence is just a kind of auxiliary tool that can imitate human intelligence, but we cannot realize autonomous intelligence, which is also one of the initial development trends of artificial intelligence [3].

3.2. Development Analysis
The development of artificial intelligence can be divided into five stages. The first stage is to put forward the concept of artificial intelligence, and successively compiled scientific and technological achievements such as machine theorem proofs, test procedures and LISP language. In addition to the failure of natural language translation, the development of artificial intelligence has also fallen into a trough. At the same time, the obvious characteristic of artificial intelligence research at this stage is that it attaches importance to problem solving and ignores the importance of knowledge. The second stage
is from the late 1960s to the 1970s. The emergence of expert systems once again pushed artificial intelligence research to a climax. The well-known expert systems include Dandal Chemical Mass Spectrometry System, MTCIN Disease Diagnosis and Treatment System, Rumor-11 Language Understanding System, etc. The appearance of these expert systems indicates that artificial intelligence has entered the stage of practical application [4].

In the third stage, that is, in the 1980s, the focus was on improving the speed of system inference and numerical calculation so that it could keep running in sync. However, the early stage was not successful, but it also opened up new areas of development. The fourth stage was in the late 1980s, after absorbing the failure experience of the third stage, neural network science was launched. Artificial intelligence processing technology based on this has also been rapidly developed. Since then, the development of artificial intelligence has entered the fifth stage, which is the comprehensive development of artificial intelligence processing technology. The development of artificial intelligence in various countries has achieved very good research results, and the artificial intelligence processing system has been continuously improved [5].

4. Specific Application of Artificial Intelligence Processing Technology in the Evaluation of Interior Design Schemes

4.1. Clarify the Principles of System Construction

When establishing an interior design plan evaluation system, it is necessary to clearly and specifically implement the principles. Use this as a basis to determine the specific operation content and improve the reliability of the analysis results. The following construction principles need to be followed in specific applications. First, the principle of comprehensiveness. Many influencing factors will be involved in the evaluation process of interior design schemes. However, not all influencing factors can be included in the evaluation system. Therefore, we need to carefully screen the evaluation indicators, so as to select the most representative and complete evaluation indicators, so as to improve the effectiveness and comprehensiveness of the evaluation indicators. Second, the principle of rationality. Combining past experience, qualitative indicators and quantitative indicators can be appropriately incorporated in the system construction process, and the ratio between the two is controlled at 3:7. In this way, further adjustments can be made based on the actual situation, thereby improving the scientificity and rationality of the evaluation results. Third, systemic principles. The indicators participating in the evaluation have a certain degree of independence between each other, and there is also a certain degree of correlation between each other. For example, in the floor quality assessment, the sub-indices include the basic performance of the floor material, whether the material is localized, the energy saving of the material, and the market price of the material. These indicators all maintain independence and relevance, and need to be focused on in the evaluation process [6].

4.2. Clarify the Content of Evaluation Indicators

| Evaluation Indicators | Include Sub-items | Score |
|-----------------------|------------------|-------|
| Indoor Environmental Quality | 4 | 15 |
| Wall Material Quality | 4 | 15 |
| Ceiling Material Quality | 4 | 15 |
| Floor Material Quality | 4 | 20 |
| Temperature and Humidity Control Index | 7 | 35 |
| Sum | 23 | 100 |

As shown in Table 1, the evaluation system based on artificial intelligence processing technology can be divided into five major items and 23 small items, and the "100-point system" is used for scoring,
which facilitates the subsequent comprehensive evaluation work. The specific content of each major indicator is as follows. First, indoor environmental quality indicators. In the specific evaluation process, the sub-project evaluation indicators involved include acoustic environment evaluation, light environment evaluation, air quality evaluation, thermal environment quality evaluation, etc. Second, the quality index of wall materials. In the specific evaluation process, the evaluation indicators of the sub-projects involved include the energy-saving design of the wall structure, the energy-saving of the equipment used, the heat recovery, and the utilization of renewable resources. Third, the quality index of the ceiling material. In the specific evaluation process, the evaluation indicators of the sub-projects involved include ceiling water-saving design, ceiling durability design, material environmental protection, and material water-saving measures utilization efficiency. Fourth, the quality index of floor materials. In the specific evaluation process, the evaluation indicators of the sub-items involved include the basic performance of the floor material, whether the material is localized, the energy saving of the material, and the material market price. Fifth, the temperature and humidity control situation. In the specific evaluation process, the evaluation indicators of the sub-projects involved include the operating load of the indoor environment, the compliance of the indoor layout, the method of temperature and humidity control, the convenience of life, the establishment of related facilities, the optimization of materials, and the statistics of material prices. Summarizing the content of these indicators can improve the reliability of the evaluation results [7].

4.3. Integration of Energy-saving Function Indicators
When evaluating interior design schemes in the context of green construction concepts, it is also necessary to incorporate energy-saving function indicators. However, the main auxiliary function provided by artificial intelligence processing technology in this link is to do some index screening, summary processing, etc., in order to improve the effectiveness of the evaluation results. After quantitative and qualitative analysis, the extracted energy-saving indicators include the following parts. First, determine the heat transfer coefficient. The more heat a building conducts per unit time, the worse the energy efficiency of the building. In the specific calculation, you can refer to the formula \( K=1/(a1+a2+k1) \), where \( K \) represents the thermal conductivity coefficient, and \( a1 \) and \( a2 \) represent the actual measured value of the conductor's heat transfer and the calculated value of the thermal conductivity. \( k1 \) represents the conventional coefficient, which can be obtained by consulting the data [8]. Second, the power consumption performance of the system itself. For example: lighting system power consumption, heating and air conditioning system power consumption. This is also one of the important indicators for evaluation. According to the application of artificial intelligence processing technology, reliable data analysis can be obtained.

4.4. Calculate the Weights of Different Indicators
In specific applications, artificial intelligence processing technology can be used to complete the quantitative analysis of various evaluation indicators. Taking the environmental assessment index as an example, after the treatment is completed with the help of manual processing technology, the assessment content shown in Table 2 can be obtained. Take this as an example to calculate the weights of other evaluation indicators to lay the foundation for the smooth progress of subsequent evaluation work [9].

| Subproject Content            | Individual Weight | Proportion of Total Weight |
|------------------------------|-------------------|----------------------------|
| Acoustic Environment Index   | 0.0965            | 0.0476                     |
| Light Environment Index      | 0.0965            | 0.0476                     |
| Ventilation Performance Index| 0.0965            | 0.0476                     |
| PM2.5                        | 0.0965            | 0.0476                     |
| TVOC                         | 0.0965            | 0.0476                     |
4.5. **Objective Evaluation Test Plan**

With the help of artificial intelligence processing technology to carry out the evaluation of the experimental plan, the following application steps should be followed. First, establish the matrix needed in the evaluation process. The matrix contains a number of evaluation indicators, and the corresponding standard deviation, variance, and average value are solved. Substitute the weight data calculated above into it for calculation to obtain the load index of the interior design. Second, the number of indicators involved in the objective evaluation plan. In addition, establish a data model for system evaluation, thereby improving the reliability and validity of the overall evaluation results [10].

5. **Conclusion**

In summary, in the evaluation process of interior design schemes, the integration of artificial intelligence processing technology has high practical value. By applying technology to the evaluation process, not only can the reliability of the content of the interior design plan be improved, but also have a positive effect on speeding up the implementation of the interior design plan.

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