Analysis on the Application of Architectural Semiotics in Design

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Abstract. In the field of architecture, more and more "symbols" have been introduced into architectural design, enriching the connotation and methods in architectural design, and adding a lot of vitality to architectural design methods. Based on the emergence, development and characteristics of architectural semiotics, this article analyzes the application of architectural semiotics in architectural design in combination with specific practical cases, and discusses the development and significance of semiotics in architectural design.

1. Introduction

Semiotics was first proposed by Swiss linguist Saussure and American philosopher Pierce. Each of them proposed their own basic system of semiotics in the early 20th century. Saussure focuses on the meaning of symbols in social life and its connection with psychology; Peirce focuses on the logical connections and meaning of symbols.

Now the theoretical results of semiotics have penetrated into many other disciplines. The 21st century is a century of semiotics. In social life, symbols are everywhere. Architectural design is closely related to semiotics. Researching and applying semiotic principles to architectural design is an important technique and approach in contemporary architectural design.

2. Overview of Architectural Semiology

2.1. The emergence and development of architectural semiotics

Semiotics was originally introduced into architecture by architects Coenig and De.Fosco, Italian linguists Alco, Scarvini, and Garoni. The main reason is that due to the spread of international style of architectural design in the late 1950s, architects began to use regional or historic design methods to seek breakthroughs. In the 1970s, architectural semiotics became popular in the United States, and it also experienced an emancipation movement in architecture. In the 1980s, the trend of deconstructionism in the field of architecture was a new design idea deduced from the perspective of linguistics. Since then, architectural semiotics has continued to develop and improve.

2.2. Cognition of Architectural Semiology

The so-called architectural semiotics refers to a unique symbol formed by the appearance and materials of the building and the functions of the building itself. Through these symbols, the building conveys the religious beliefs and personal emotions it represents to people.[1] Having the visual...
communication function. In architectural design, we extract, translate and integrate certain elements to form a unique architectural symbol language to convey the thought, culture and connotation expressed by architecture. In the field of architecture, Morris divided semiotics into constructivism, runeology, and aphorism, which have been widely recognized. Constructivism refers to the study of the structure of architectural symbols; Runeology refers to the type of architectural symbols; Aphorism refers to the relationship between architectural symbols and the subject of knowledge. That is the interaction between symbols and people. It regards architecture as a holistic symbol system to analyze the relationship between architecture and people. Its essence is to explore the process of information transmission.[2]

3. Application of architectural semiotics in architectural design

According to Peirce's symbol classification, architectural symbols can be divided into three major categories, which are image symbols of buildings; architectural indicators; and architectural symbols. In architectural design, certain elements are extracted, translated and integrated to form a unique architectural symbol language to convey the thought, culture and connotation expressed by the building.

3.1. Application of image symbols in architectural design

Image symbols of building—referring that have a similar relationship between the form and content of the building, and have the similarity of images. For example, the Sydney Opera House looks like a sailing boat about to sail towards the ocean; it also looks like countless shells. Like the designer said, his design inspiration comes from the peeled orange peel. "Sailboat", "Shell", "Peeled Orange Peel" are similar to the shape of the Sydney Opera House.

The Spanish architect Santiago Calatrava, known as the "poet among architects", also includes elements of image symbols in his design methods that make full use of structure and technology. The new building of the Milwaukee Art Museum designed by him has its figure in many movies. The building is white in color and unique in form, like a giant seagull spreading its wings to the sea (Figure 1). Seeing this building for yourself will surely be shocked by its unique shape. The image of the sea bird is extracted to form a light and dynamic image symbol feature. It is applied to the architectural design concept. Combined with new materials and new technologies, through the integration of the architect, the supposedly behemoth concrete building is light and beautiful. The shape of the overall building is also very suitable for its pioneering art spirit as an art museum and its coastal environment (Figure 2). It can be seen that the idea of applying the image symbol of the building is not just copy. It’s not the restoration of a certain image feature on the building, but the use of new technologies and materials to give new meaning to the building.

![Figure 1. Milwaukee Art Manuscript](photo source: network)

![Figure 2. Milwaukee Art Museum](photo source: network)

3.2. The use of indicators in architectural design

Architectural indicators—referring to a substantial causal relationship between architectural form and content. This mapping relationship is mainly reflected in the one-to-one correspondence between the architectural form and its function, which often exists in the architectural forms that are seen everyday.
For example, in our life, the door means the entrance and exit (Figure 3). For other structures (such as glass windows) built with the same material, the concept of the entrance and exit may not be generated. Each building component has its specific indicative symbol, which represents a specific function. This conventional connection is formed in a long history and is difficult to change, so that it forms a fixed intention.

The Miho Museum of Art is designed by the Chinese architect Ieoh Ming Pei. It is located in Koga, Shiga Prefecture, Japan. Known as the "last master of modernism", Ieoh Ming Pei looks for architectural symbols in traditional Japanese architecture. Based on the mountain and the environment, Pei achieved its unity with the culture of the area. The entrance uses the traditional Japanese building's roof form "hut group" (Figure 4). The roof is soaring and steep. Visitors can recognize it as a reception hall with a strong indication element. In Japanese traditional architecture, the high roof often implies this is an important building. The automatic door entrance in the lobby (Figure 5) is also the most famous attraction of the Miho Art Museum. The iconic suspension bridge can be seen through the door, and the "Yuedong" shape of the door has a strong entrance and exit indication. This is the perception of the "Yuedong" architectural indicators in East Asian garden culture.

3.3. Application of Symbols in Architectural Design
Architectural symbols—refers to any relationship established between architectural form and content, and there is a conventional connection symbol between the two. Symbols are based on conventions. They are generated by people's familiarity with objects. They often have the cultural background, aesthetics, and concepts of the receiver. Therefore, they try to be variable, arbitrary, and changeable.[3]

The Church of Light is one of the most famous buildings in Japan. In the Church of Light, the symbol is also fully reflected. The best symbol is the "cross beam" (Figure 6). The first is that our understanding of the traditional cross is in the front of the wall, highlighting the importance of the cross. In the Church of Light, Ando extracts the symbol of the traditional cross form (Figure 7). By hollowing out the wall surface, when the sun shines into the room, the "light" is formed with the clear concrete wall as the bottom and the wall surface hollow "Cross" is a pattern that sets off a pure and
bright cross through a dark wall. This is the extraction, use and translation of traditional symbols, thus creating a deeper interpretation and understanding of traditional symbols.

![Figure 6. Crossbeam](photo source: network)

![Figure 7. Traditional Cross](photo source: network)

4. Summary
Architectural semiotics is mainly based on the continuous exploration, absorption and renewal of traditional elements to form a new symbolic language, which provides a continuous source of creation for architectural design. Architectural semiotics is a bridge between architects and users, connecting each other and conveying architectural information.

For designers, it enriches the designer's design methods, increases the cultural connotation of the design, and allows the designer to better convey his design ideas and intentions. For users, it can better interpret the building, arouse resonance, and generate a sense of identity and belonging to the building.

If we consider the whole building as a symbol, then this symbol is composed of many smaller symbols. Architectural semiotics is the combination of these small symbolic elements to achieve harmony and unity with each other. The integration of environment, society, nature, country, nation, context, customs, etc., allows the symbolic language to pass between the building and the user, and achieves a strong spiritual and emotional resonance. In today's social life, symbols are everywhere. The introduction of semiotics provides a theoretical basis for architectural creation, allows people to understand architecture more vividly, and brings new vitality to architectural creation.

References
[1] Zhang Wenbo 2012 On architectural semiotics [J]. Business 234
[2] Gong Quyi, Wang Xiqin, Ye Xin, Lu Jun 2018 On the importance of architectural semiotics to architectural design [J]. Building Materials and Decoration 91 92
[3] Liu Xianjue 2008 Modern architecture theory[M]. China Construction Industry Press 87 108
[4] Mojtaba Parsae, Mohammad Parva, Bagher Karimi 2015 Space and place concepts analysis based on semiology approach in residential architecture[J]. HBRC Journal
[5] Hamed Goharipour 2019 Narratives of a lost space: A semiotic analysis of central courtyards in Iranian cinema[J]. Frontiers of Architectural Research