

Analysis and Psychological Thinking on Visual Forms of interface of Exhibition Halls-----Taking the Exhibition Halls of World Expo as an Example

Jiefang Jin¹ & Qizhao Wang²

¹School of Art Design, Shanghai University of Engineering Science

²Faculty of Art and Design, Shanghai Business School

KEYWORD: Visual forms of interface; Exhibition halls ; Analysis and psychological thinking

ABSTRACT: The interface of exhibition halls is the external appearance of the inner space and structure. Exhibition halls especially those at World Expo represent the trend of the times and epitomize the creativity of exhibition forms. Therefore, an analysis on the methods and traits of designing the interface of exhibition halls can pave the way for future design and relevant teaching.

The graceful silhouette of the 2010 Shanghai World Expo has not faded while the lithe figure of the exhibition halls of the 2015 Milano Expo have immensely attracted the eyes from all over the world. Throughout the history of World Expo halls design, the architecture design language has changed from single use for exhibition and rest to possess open, dynamic, diverse, and complicated traits. Pioneer designers keep searching for novel architectural language and forms based on various scientific and technological fields including complicated science, digital fabrication, topology theory, and emergence theory. In this way, pioneer designers create complex, luxurious, and fantastic exhibition halls. Therefore, the exhibition halls of each World Expo are grounds for testing new thoughts and technology and epitomes of new architectural forms behind which a change of architectural creativity and psychological thought is indicated.

CONCEPT OF EXHIBITION HALL INTERFACE

The interface of exhibition halls is the external appearance of the inner space and structure. The interface is not an independent factor. Instead, it is limited by the internal form of an exhibition hall. Some important external space application means of an exhibition hall like yards and streets is inevitably limited by the external space. The external forms originate from the combined forms of internal functional space and reflect the artistic creativity of designers.

To a large extent, the individualized features of the external image of exhibition halls naturally reflect the internal functional space. These features should be further enhanced with implicit artistic approaches. The external forms of exhibition halls can exaggerate these features. Some special images can also rouse the audience's analysis, memory and association. As an exhibition hall has complex functions, a single modern exhibition hall may be about 30 meters high. Together with functional space for meeting, office, and catering, etc., the external image of exhibition halls may be immense. Besides, there are various architectural styles. For example, the main exhibition halls on the central four floors of National Art Museum of China, which is composed with 17 exhibition halls and office spaces of various sizes, adopt the traditional Chinese attic-styled roofs matched with light yellow ceramic veneer and ornamental designs of exterior walls, looking dignified and magnificent. Some memorial exhibition halls have simple functions but are required to be artistically appealing. The external forms of this kind of exhibition halls do not reflect the functions but be given on the basis of certain artistic intention of designers. This kind of exhibition halls are supposed to evoke noble and solemn feelings in people. The characteristics of World Expo halls are not directly related to their functions, so the demands on spatial combinations and functions are relatively simple while the demands on the aesthetic value and features are high. Therefore, spatial and form combinations are mainly for appreciation, and exhibition halls become exhibits themselves due to their original interface. Some exhibition halls express certain artistic meanings in abstract geometric shapes, and some have certain symbolic meanings.

ANALYSIS ON VISUAL FORMS OF EXHIBITION HALL INTERFACE

The interface of World Expo halls use many ground-breaking and creative languages due to the experimental features of interface and multiple and optional architectural techniques.

Visual features of interface Forms

----Virtual forms

Using virtual forms is a feature of the interfaces of modern World Expo halls. With the development of high technology, various light and transparent synthetic materials emerge and become the main interfaces of enclosed exhibition halls rather than the necessary lighting materials. Transparent exhibition halls virtualize their dimensions and show inside-out space hierarchy and present a sense of openness. A interface with virtual forms is like a huge exhibit screen projecting the space hierarchy of the interior hall. Through this screen, the visiting activities, various exhibits and props are demonstrated and delivered to the external space. In this way, the interface not only demonstrates its unique formal languages but also interacts with the internal space. interfaces with solid forms cannot achieve this effect.

The design theme of the Austrian Hall of 2015 Milano Expo is “Feeding the Earth”. The idea of the designers is to provide plant seeds for tourists to sow in person. The interface is of a grid structure set up with wood frames. The internal structure is also completely exposed with each grid planted with vegetable, fruit, and herb seeds. The structure of the interface is based on a modular system, which can be flexibly deconstructed and reused. As a result, the tourists can eat the food they have personally grown. The growing of these plants to organic food contribute to the premium environment and planting techniques of Austria. Besides, the food can be delivered in a short time as Austria is a small country, which ensures the sales and freshness of the food. Not all countries can achieve this by using natural production bases.

----Curved forms

Using curved forms is another feature of the interfaces of modern World Expo halls. Streamlined roofs and vertical interfaces are the elements frequently used by designers. The single function of World Expo halls and new technologies, materials, and structures make curved forms possible. These curved forms look cheerful, technically aesthetic, striking and fashionable. According to the scheme of 2015 Milano Expo halls designed by the United Arab Emirates, the two sides of the entrance path are vertical forms with a height of about 12 meters. This kind of horizontal and wavy vertical forms are adopted throughout the paths in the whole exhibition hall. These forms create a sense of visiting ridges and sand dune for tourists. Hard materials look lively in curved forms, meaning boundless extension in the future. There are “self-sunshade” streets inside the exhibition hall forming a traditional desert city. This scheme adopts the design of the Masdar City of Abu Dhabi. In the center of the exhibition hall, there is a big auditorium designed for the tourists to have a preliminary perception of the history of Abu Dhabi as soon as they enter into the exhibition hall. Then, the tourists can enter into other spaces successively to have a further knowledge about the “desert oasis”. Finally, the tourists can go to the cafeteria cafe and restaurant. This circular design cater to the theme of the World Expo: “Feeding the Earth”.

Analysis of Interface Forms

----Reviving regional cultures

The World Expo is an opportunity for every country to present their regional cultures. So reviving the regional cultures is one of the features of creating exhibition hall forms. A nation has a unique and common cultural characteristic and aesthetic awareness as they live in the same region and have a identical political, economical, and linguistic culture. Exhibition halls should simplify and extract typical images in regional cultures by using the methodology of semiotics to sublimate these images to a representative sign and present the sign on the interface. The theme of the Chinese Exhibition Hall of the 2015 Milano Expo is “The Field of Hope and the Fountain of Life” with the core concepts of “Heaven, Earth, Human, Harmony”. Viewed from the front, the interface is a natural skyline. The design scheme integrates the core concepts and the elements of rice and grains in the roofs,

floors and space, making the exhibition hall look like “rippling wheat” on a field full of hope. “The Field of Hope” indicates the vast land of China and the ancient Chinese cultures. The interface forms combine the traditional Chinese architectural structures and forms with modern technology, forming an image with intense Chinese traditional architecture flavor. The roofs are covered with bamboo made materials with symbolic meanings, greatly reducing the cost. These materials radiate golden rays under the Italian brilliant sunshine.

---Symbolic and metaphoric meanings

The World Expo halls are different from ordinary exhibition halls in that they emphasize its demonstration and amusement functions besides their basic functions. The design of exhibition halls should involve symbolic images to indicate a certain implication and rouse the imagination of the audiences. Symbols are projection between psychological structures originating from visual impression and signs and their meanings. Symbols should be understood by the audiences. Symbolic signs rich the theme of exhibition halls. They not only provide beautiful visual images but enhance the cultural connotation and denotation. The concept of the Italy Exhibition Hall of the 2015 Milano World Expo is “Tree of Life”. This concept originates from the rural temperament of Italy which can be felt everywhere in Italy. The indoor space shows the essence of the Italian diver lifestyles with various exhibits. Trees and round roofs are the most important two signs in this exhibition hall. They are the country’s most representative contribution to the world. From the pantheon to Brunelleschi Nervii, the round roofs are the witnesses of the historical development of Italy. The ideal scenery of mountains and beaches are widely recognized. The trees and round roofs are poetically combined into a set of structure network. With the trees transformed into abstract roots and the round roofs looking flimsy, it seems that the trees want to break the shell of the exhibition hall to grow its branches freely outside. This design is a perfect symbol of life.

---Dynamic devices

Using dynamic devices is a feature of World Expo halls. The World Expo halls should not only have the function of demonstrating exhibits but also have the functions of entertainment and appreciation. Installing dynamic devices can enrich the interface forms and increase the functions of exhibition halls. Some devices can instruct audiences to view the scenery, and some devices adjust the ecological environment of the exhibition halls with its function of ecological circulation. The grid structure of the Italy Exhibition Hall of the 2015 World Expo creates a vast space for plants to grow. This hall was divided into several pieces at the beginning of the design. These pieces can be easily adjusted and combined. These pieces with Italian flavor are combined in Milano. Meanwhile, the principle of kaleidoscope is adopted vividly here. The geometrical pieces of the periphery can be rotated constantly, and the internal round roofs have an effect of kaleidoscope. From the perspective of the audiences, this design indicated the changes and development of Italy. The America Exhibition Hall of the 2015 World Expo is a vertical farm with hi-tech green garden walls named “American Food 2.0”. To present the theme of the 2015 World Expo, architects adopt large-scale green machines inside and outside. In this vertical garden, edible vegetables and plants can be grown, and crops can also be planted using the nutrient solution planting system. The architects are also setting up scenery. It seems that they are making new attempts to grow special crops. They also install a rain irrigation system and rotating wall boards to absorb sunshine as much as possible.

CONCLUSION

In an unforgivable environment of global warming and frequent smogs, the 2015 Milano World Expo is finding new ways to improving human life. Their broad vision and creative thinking will lead green architecture design and human life all over the world and turn a new leaf in “Feeding the Earth”.

References

- [1] Peng Yigang. Architecture Space Combination Theory[M]. Beijing: China Construction Engineering Press, 2001

- [2] Liu Yongde. Form Meaning Structure Combination. Tianjin [M]: Tianjin Science and Technology Press, 2002
- [3] Jin Jiefang. Wang Qizhao. Design of Exhibition Hall Space. Shanghai People's Publishing House, 2011.