



Research on the Influence of Innovative Design Based on the Futures Cone

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Abstract. Innovation is the inexhaustible driving force for social development and the soul of national prosperity. Design is a creative activity with human wisdom. Innovative design helps people stand in the present and face the future, and identify the development opportunities of design. Futurology explores the development prospects of the future society and promotes the society to formulate long-term development strategies. Futures cone are based on futurology predictions, showing us different possibilities for the future. The author explores the influence of innovative design on future development based on the “possible” and “Preposterous” future in “Futures Cone”, and identifies the development opportunities of design.

Keywords: Innovation · Design · Futurology

1 Introduction

What does the future look like? No one can give a specific answer, but people can make predictions research through scientific methods. From this came the futurology which takes the future of things as the object of research and practice. The futures cone is a predictive model for the future developed under futurology.

Design is a creative activity with people as the main body. Innovative design integrates innovative thinking into design practice and forms an integrated innovation mode under the cross of multi-disciplines. This paper discusses the influence of innovative design from the perspective of futurology, in order to emphasize the importance of innovative design and clarify the development opportunities of innovative design to cope with possible changes. The innovation of this study lies in: 1. From the theoretical level, this paper discusses the influence of innovative design on practice and thinking, and puts forward the development vision of innovative design; 2. Combined with the possible forms of future development in the futures cone, this paper studies from the perspective of futurology to provide different perspectives for the impact of innovative design.

2 Innovative Design and Futurology

2.1 Innovation and Design

Innovative design can be divided into two parts, “innovation” and “design”.

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Innovation can be understood as relative innovation and absolute innovation in nature. Relative innovation is based on the existing cognition of innovation, is a kind of iterative update. For example, the iterative update of mobile phones and computer products: From the original Beep Pager, PHS mobile phone to smart phone, it is a mobile phone product iteration. Absolute innovation refers to the creation of new substances, such as the creation of mobile phone products from scratch. The author hold that the development of innovation should be the result of the combined effect of absolute innovation and relative innovation. The object of innovation can be divided into new thinking, new invention and new description. Innovation is not limited to material output, but also includes innovation of thinking and description.

Design In a broad sense, Ezzo Mancini proposes: Design is a culture as well as a practice that focuses on how things should achieve their intended function and meaning [3]. The work that is conceived, planned, and arranged to achieve a certain goal can be said to be design. In a narrow sense, design is gradually separated from handicraft after the Industrial Revolution, aiming to guide innovation, promote commercial success and provide a better quality of life [13]. The definition of design is explored from different perspectives and there are different opinions. In the author's opinion, design is a creative activity with people as the main body in order to meet people's needs and purposes.

Design and innovation are a juxtaposition and cross relationship. Both innovation and design belong to the behavior of creation, and they all solve problems by taking positive actions to achieve value transformation. Design is more about discovering needs and solving problems, while innovation is more about exploring new perspectives and breaking the rules.

2.2 Innovative Design

For the concept of "innovative design", the author summarizes two views. Academician Lu Yongxiang proposed from the perspective of evolution that "innovative design" is a new design based on "traditional design" and "modern design". This is a new interpretation of design based on information network and physical environment in the era of the third industrial revolution and knowledge network. Innovative design presents new characteristics of green and low-carbon, network intelligence, open integration, co-creation and sharing [7]. Academician Pan Yunhe's understanding of "innovative design" is the interdisciplinary integration of scientific and technological innovation, cultural and artistic innovation, user service innovation and industrial model innovation [6].

From the author's point of view, innovative design is a new model of design development that integrates multiple fields in the era of knowledge networks. Innovative design can be understood as applying innovative thinking to design practice, exploring more design possibilities for the future, and guiding the direction of future design development. Innovative design presents the direction of intelligence, green and integration.

2.3 Futurology

Futurology is the science of the future. It is the study of future ideas from the perspective of the present. The discussion of the future has always existed in the social life of human beings. As a subject of systematic exploration and research, futurology has a history of nearly 80 years [5]. In 1902 the English writer Herbert George Wells proposed the idea of establishing a “science of the future” (Liu, 2016). In 1943, German political science professor O. Freichtai coined the term futurology, proposing to take the future as a systematic research object and to study the future in the same way as studying history [4]. Knowing and grasping the future will become as important as knowing the history. The study of futurology can provide long-term planning for the national, political, economic, cultural, scientific and technological fields. The close combination of futurology and science and technology will affect the way people live, work and interact with each other [9].

3 Possible States of Innovative Design Under the Futures Cone Model

The future category was first proposed by Clem Bezold in 1993, in which the future cone shows us different possibilities of the future (shown in Fig. 1). From the present to the future, the possibilities progress from preposterous, possible, plausible, probable, and preferable. Joseph Voros first began using an early version of the Futures Cone diagram in 2000 when working as a foresight analyst for Swinburne University (shown in Fig. 2). The futurist Stuart Candy also proposed thinking about the futures cone in a speech at the Royal Academy of Arts in 2009 [1] (shown in Fig. 3). From the perspective of design, the author wants to divide the future into two categories, the possible future and the preposterous future to understand [2]. The possible future is logical and natural, and is likely to be achieved through the development of technology. The preposterous future is based on the three degrees of impossibility proposed in “Physics of the Impossible”, and is free to imagine without the constraints of natural laws. In the possible future, innovation design guides design practices that change the physical world; in the preposterous future, innovative design exists as an inspiration for design thinking (shown in Fig. 4).

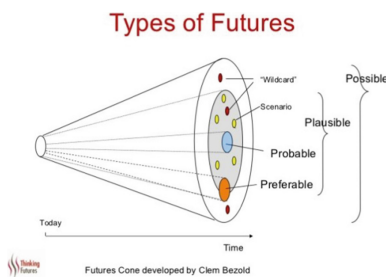


Fig. 1. Futures cone by Clem Bezold

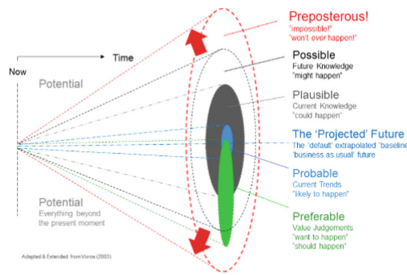


Fig. 2. Futures cone by Joseph Voros

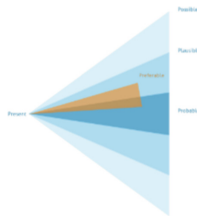


Fig. 3. Futures cone by Stuart Candy

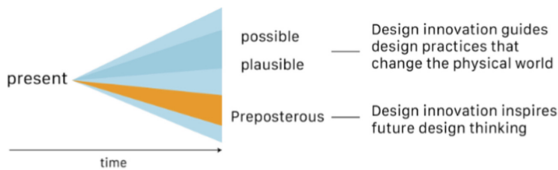


Fig. 4. Future possible states

4 The Impact of Innovative Design on Future Development

4.1 Innovative Design Guides Design Practices that Change the Physical World

When Innovative design faces a possible and desirable future, It is logical and natural, and can be realized with the development of future technology. Innovative design can change the future material world on the basis of relative innovation and absolute innovation. This paper discusses how innovative design can guide the design practice of changing the material world from three aspects: user, technology and system.

(1) Innovative design changes the lifestyle and needs of users. The relationship between designers and users is a binary relationship. In the traditional design concept, We believe that designers should find the direction of design by observing the lifestyle of users based on their needs. However, innovative design should break the traditional design methods. It is easy to understand why people live in the information age. In the era of design 3.0, the intersection of multidisciplinary technology makes human-computer integration an important part of our efforts to change our lives. Artificial intelligence is based on human cognitive state modeling, The establishment of cognitive model is the



Fig. 5. The lamps designed by Artemide

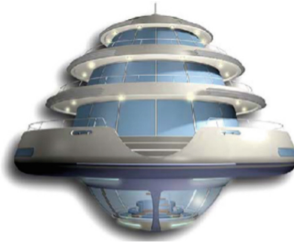


Fig. 6. The “House on the Sea”

core of user state recognition in intelligent system. These technologies will be used in technologies such as driverless cars [10]. The development of innovative design in the future is not only to change the way of life of users, but also to meet the deep-seated needs of users. Just like the lamps designed by Italian lighting company Artemide. (shown in Fig. 5) lamps in the traditional sense meet people’s lighting needs and meet people’s decorative aesthetic needs. The lamps and lanterns produced by Artemide are no longer simply to meet the needs of function and appearance, they convey an inner meaning that subverts the past. By creating an atmosphere, the lamps engage the user. In this way, innovation is carried out according to the inner meaning that users give to design products, and the deep-seated needs of users are met.

In the future, innovative design will bring people a more convenient life and create products that meet individual needs with low cost, low risk and wide range of innovation. At the same time, it will pay more attention to the emotional needs of users and create more emotional products. For example, in order to alleviate the increasingly stressful living environment, designers designed the concept yacht “House on the Sea” (shown in Fig. 6). It has a maximum diameter of 15 m and is equipped with a kitchen, bathroom and views of the underwater world [12]. The author also think that the line between user and designer may also blur in the future, The user is the designer himself, and everyone can participate in the innovative design. Designers can accurately grasp the design pain points for innovative design.

(2) Innovative design guides the development direction of science and technology. The ability to explore space has always been one of the criteria to test a country’s scientific and technological level [8]. Human exploration of outer space has been going on since ancient times. In ancient China, chang’e flew to the moon as a myth based

on space fantasy. It can be concluded from this case that the diversity of scientific and technological development can be found by thinking with innovative design.

In the future, emerging technologies such as 3D printing, big data, cloud computing, information communication, Internet of Things, artificial intelligence, etc. will be the underlying foundation for building integrated user designs [14]. Through friendly and easy-to-use design tools, the personalization of products and services will be greatly enhanced.

(3) Innovative design guides the innovation of industrial system. As mentioned above, innovative design is based on the background of various fields and is carried out in the face of the knowledge network era. The most important point of its impact on the future is to guide the innovation of the industrial system. In the future, the design will move from isolation to systematization and comprehensiveness, presenting the features of multi-disciplinary intersection. In this respect, innovative design is reflected as creative reorganization resources. Resource reorganization can be divided into two aspects: one is to create new elements, and the other is to create new combinations. Understand these two levels from the different designs of designing vehicles. Designers use new technologies to design a completely new means of transportation, such as amphibious vehicles. This new vehicle is a new element. Another is to use existing resources to creatively reorganize to affect the entire system. For example, UBER is the use of IoT technology to associate ride-hailing with people with the same travel destination. Their company does not have physical products, they just build a platform to influence the entire system through the structure of the knowledge network.

4.2 Design Innovation Inspires Future Design Thinking

When innovative design faces an preposterous future, it also has its own way and function. The author thinks that conceptual design can be used as a material medium. Conceptual design is actually human's design concepts and design ideas for future products and the future world.

The "Wonderful New Factory" designed by David Behnke, is an extremely small facility that has been developed in collaboration with scientists [11]. The design uses integrated manufacturing techniques similar to rapid prototyping but with built-in electronic circuits. In this way, they think about whether the factory of the future can realize mobility without large-scale mechanical production. From this we can see that innovatively designed products do not necessarily have an impact on the material world and do not change the way people live. The meaning of its existence is that it can provide a broader dimension for creative thinking. It expresses the thinking about the future in material form by integrating the concept into the design, and then transforms it into consciousness and transmits it to others. It has two influences, one is that it can trigger people's thinking about the future, find problems, ask questions, and seek multiple possibilities for the future; Second, it can influence the thinking of design and provide new ideas for the future development of art and design.

5 Conclusion

Through the understanding of innovative design and futurology, the influence of innovative design is considered based on the future of different states in the futures cone. To conclude this article, the author proposes visions for the future development of innovative design: (1) In the future, innovative design will no longer only exist to meet the needs of users, but to discover the deeper needs of users, and even create the needs. (2) The general direction of future technology is big data and artificial intelligence, and innovative design will have subversive changes in these fields. Designers will move to designing a self-operating intelligent generative design system, that is, a self-renewing pattern from conception to the establishment of a feasible implementation. (3) Innovative design will guide the innovation of the industrial system. In the future, innovative design will integrate multi-platform collaborative design to form a new system around management, service, education and other content. And it will be embodied in the design with the innovative method of man-machine integration. (4) Innovative design inspires future design thinking, which not only inspires people to think about the future, but also builds new design thinking based on art and culture.

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