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Research on Service Design in the Construction of Digital Media Art Curriculum*

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***Abstract*—This paper studies the innovative thinking of digital media art in the new era and new design. Through the research on the background and trend of service economy development, this paper analyzes the current digital media art specialty teaching practice cases both in China and foreign countries, and analyzes the problems and main solutions of design education in the new situation, which explains that design innovation based on service design thinking requires corresponding education management innovation and curriculum construction innovation. Emphasizing the training and curriculum of digital media art professionals should keep pace with the times and adapt to the height and depth of design thinking in the new economic situation.**

Keywords—digital media art; curriculum construction; service design; innovation

I. INTRODUCTION

As a teacher and an ordinary design worker, with the accumulation of work experience and constant experience, it can be gradually realized that pure application design teaching can not meet the new social problems raised by students in the face of complex social phenomena and changing social environment. Therefore, it is necessary to upgrade from micro-application teaching to macro-thinking cognitive teaching and research, and it has become the best choice for service design research. This paper combines the characteristics of service design and development, and demonstrates the design features of the arrival of the information society. Combined with the teaching practice of the popular professional with digital characteristics, this paper demonstrates the teaching design principles and possible teaching design methods of service design. While emphasizing the importance of service design thinking and talent cultivation, considering this special stage in the international context and the high degree of development of China's social economy and service economy, the internationalized thinking dimension can better meet the training requirements of future talents.

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II. THE CHARACTERISTICS OF TIMES OF SERVICE DESIGN

A. Pre-industrial Society Transforms to the Information Society

In 1973, Professor Daniel Bell divided the development of society into three stages in his book "The Coming of Post-Industrial Society": the pre-industrial society, the industrial society, and the post-industrial society. In the former industrial society and industrial society, the emphasis is on "the struggle between man and the environment" and "using energy resources to transform the natural environment into a technological environment". The post-industrial society turned to "the struggle between people" under the information-based "intellectual technology" activity. The new model of production, distribution and consumption of information based on knowledge innovation is the primary attribute of the new era.

The main economic performance is that the economic structure transforms from commodity production to service-oriented economy and the demand of national consumption for a better life upgrades from the possession of goods to the pursuit of healthy and sustainable good living services. This standard of good life includes the sustainable natural environment of green mountains and rivers, as well as the convenience and humanity brought by the "ecological chain" and "value chain" services of product brand development, which expresses the values transformation from "people-oriented" to the "ecological-based"

As the focus of design transforms from "objects" to "affairs", from products to services, from industrial design thinking to service design thinking, that is, integrated system design consisting of services, products, environmental brands, etc., can obtain stronger competitiveness in the market. Throughout the history of design development, from the function orientation of modernism and the symbolism and aesthetic orientation of postmodernism, to the social orientation of contemporary, the development trend of design, from the narrow point of view, transforms from product design, interaction design, system design to service design, and from a broad perspective, it transforms from industrial design, experience design to integrated design.

At present, the knowledge economy in China, represented by 5G communication technology and artificial

intelligence, is in rapid development and has become a national development strategy. At the same time, there are social realities problems in the parallel of traditional processing trade and information technology development. On the one hand, it makes people to be proud of China's brilliant achievements in the process of modernization, and on the other hand, it also makes people worried about the negative problems that exist in the development. How to face the challenges of the new era and the trend of the future development of Chinese society has become a heated discussion among academic, industrial and even political circles.

B. The Emphasis Transforms from Functions to Services

Industrial society's corresponding product production is mass production, relying on good product manufacturing standards and machine assembly lines to meet the basic needs of most consumers. The product not only has uniform specifications and quality, but also brings uniform usage habits to the user, and even changes the users' initial usage habits of some certain product, forcing them to reach the pre-set and unified standard usage habits. This kind of unified habits cannot meet the current personalized usage requirements. In order to solve this problem, the combination of modern information technology and products provides unlimited possibilities for individual needs. This service is based on the consumer's custom content requirements and a brand new interactive experience to derive a new relationship between people and products and new design content. From the design of objects to the related design of the relationship between objects, people, society and other elements as the carrier and tool, the value of knowledge and information behind it will become an important resource and wealth for people. In real life, the physical function of the hard disk as storage has not changed, but the text information stored therein has become a virtual currency. Therefore, from the possession of goods to the possession of services, from the priority of goods to the priority of services, participation and sharing, and integration and commonality have become the trend of service economic development.

III. INFORMATIZATION ENRICHES THE CONNOTATION OF DESIGN

In 1999, Professor Kevin Ashton of the Massachusetts Institute of Technology proposed the term "Internet of Things" (lot), indicating that "the Internet is a network for information exchange and communication extends and expands its client to anything between items..." It can be seen that the development of network technology has laid the foundation for the formation of current network society. In the future, 5G Internet will not only be a link between people and people, but also a link between people and things, things and things, which will be the key to the world of Internet of everything.

Unlike the influence of the dual system education of Bauhaus in Germany, the US Silicon Valley high-tech companies represented by Microsoft, Apple, and Google have had a profound impact on contemporary design. These influences include not only specific design forms, spaces, carriers, and changing Internet cultural symbols, but also the innovative design spirit centered on technology and knowledge innovation, which also affect the world through the Internet. This influence has brought about a huge change in people's lifestyles.

Strategic emerging industries represent the direction of a new round of scientific and technological revolution and industrial transformation. To build a new modern industrial system and promote sustained and healthy economic and social development, in November 2016, the State Council issued the "13th Five-Year Plan for the Development of the State Strategic Emerging Industries". The plan clearly defines that in the next 5 to 10 years, it will be a key period for the new round of global technological revolution and industrial transformation from being ready to group explosion. It is required to further develop and expand strategic emerging industries such as information technology including digital creative industries.

It is precisely because of the rapid development of the information industry that the connotation of design has undergone tremendous change. This change includes not only the spirit of design, but also the design thinking and design content. Therefore, all product design definitions take into account the existence of the network; more scientific and systematic design methods become effective design guidelines; sustainable environmental concepts become a consensus in material research; people-oriented design is not only physiological but also spiritual; the cultural factors of differentiation and individualization are more and more valued; the emphasis on social development and environmental integration has become an inevitable trend of product design and development; ecosystem and sustainable development have become the research aims of design services.

IV. DIGITIZATION OF USERS' BEHAVIOR

A. Datamation of Users' Behavior

The impact of the Internet on people's lives is increasingly close, constantly changing the details of people's lives, and directly serving the details of the public life, which includes all the industries of all aspects in daily life. The formation of the information network society makes it impossible for everyone to be isolated from the network and become an extension of the virtual network world in real life.

When information content construction and intellectual property awareness continue to strengthen, the history of human civilization history that has been passed down for thousands of years has been changed into a simple data and stored. Thanks to the constant progress of technology, individual information and tracking records have become real-world data sources, so it can be seen that everything in human activities is constantly recorded as dynamic data. Together with the data collection of the world, the human gene pool of human activities in the virtual world will be finally formed.

Industrial design products emphasize purchase and consumption behavior, while service design products emphasize users' use and experience feelings. Because the service design needs to consider various interest-related factors in the overall design, it can be seen that product-oriented industrial design products have become data analysis and system design based on the study on people's activities. The use of data results to decision-making design development and the data collection and research is changing the design. Taking smart stores as an example, smart stores based on data collection can not only collect the origin information of agricultural products to achieve traceability tracking, but also improve safety quality control. User behaviors and habits can also be collected to establish a user consumption model to determine shipments and prices, to achieve zero-distance between consumers and agricultural products through the Internet of Things and other technologies, and eventually to achieve the improvement of consumer shopping experience

B. Visualization of the Changes of the Contact

The contact is where the service object and the service provider interact with each other in behavior. This virtual or realistic contact can provide a better user experience for the consumer. Contact research facilitates a deep insight into user behavior and habits, which in turn leads to the derivation and formation of user research value. Contact visualization research is no longer a problem in the field of entrepreneurial research, and is widely used in more and more public data research, such as: sports hot zone figures for studying athletes' range of motion, browsing hot zone figures for studying Internet users' browsing habits, and eye movement research for studying human visual logic, etc. They are all recording individual habits and differences research in the form of images, and finally judge the corresponding tactical strategies, advertising, product design and other issues.

Service design is a business model, but also a thinking model. Service design is not limited to the design of a single point of contact, but a comprehensive, systematic design of the overall experience of the service. Compared with traditional design, service design has a wider knowledge base and a larger user base. It not only solves users' needs through a single product, but also logically and comprehensively considers and perfects each process step to satisfy users' requirements. Both the service design educator and the service designer emphasize the overall awareness of the service design and service strategy. The job of the service designer is to carry out the visualization design of the system and the overall design, interpret users' behavior and requirements through analysis of user contacts and transform them into potential service design products.

V. INSIGHT OF SERVICE DESIGN TEACHING

A. Service Design Development

G.lynn Shosrack, the founder of service design, first published an article on "How to Design a Service" in 1982. By 1991, Dr. Michael Erlhof and Professor Birgit Mager of the Köln International School of Design (KISD) introduced service design to the design community and began to focus on teaching research, and service design began to develop. Today, it can be found through global keyword search such as Google that organizations, institutions or schools related to service design research are mainly concentrated in developed economies and regions such as Europe and the United States.

B. Service Design and Teaching

In 1991, the Köln International School of Design (KISD) was the first to offer service design courses around the world. Today, dozens of schools around the world introduce service design courses and offer service design majors or research directions. Famous institutions include: Royal College of Art, Politecnico di Milano, Carnegie Mellon University, Linköpings Universitet, Aalto University, Tokyo Higher Institute of Industrial Technology, Lucerne, Lucerne University of Applied Sciences and Arts, Köln International School of Design, etc. Some service design courses and professional situations are as the following "Table I":

TABLE I. COURSE FEATURES OF SERVICE DESIGN MAJOR IN SOME FAMOUS COLLEGES AND UNIVERSITIES

Name of institution	Course Name	Course Features
Köln International School of Design	Service Design	The first service design course launched around the world. The college believes that service design treats services as a product of systematized development, and will eventually form into a concrete product. Compared with that concrete products focus on the design of functions and forms, service design is an intangible product, with a focus on the service itself.
Politecnico di Milano	MSC Product Service System	The goal of the course is to develop high-quality designers who can assume the design responsibilities of the product service system in the international context. Its basic educational goal is to provide a wide range of design tools, teach appropriate skills, and creatively manage products, services, events and communication strategies in a holistic manner.
Royal College of Arts	Service Design	The Royal College of Art's Service Design major has established the postgraduate and postdoctoral courses of two years. The unique interdisciplinary environment allows them to become service design experts while accepting design education. By teaching students to use the latest tools and a range of design techniques, and through their research activities, the courses focus on developing new service innovations under the new model, and testing how design can change the experience and value of services.
Savannah College of Art and Design	BFA Service Design	Service designers create services or service systems that enable people to interact with brand and environmental meaning, sustainable consumption, providers and society.

It can be seen by analyzing the above service design courses: The major service-developed countries and economies have established relevant service design courses and majors. The curriculum provision emphasizes trends and characteristics such as international thinking, overall design, and interdisciplinary.

C. Innovation of Consciousness

Service design is an activity performed by the interdisciplinary teams of web designers, interaction designers, user experience designers, product designers, business planners, psychologists, anthropologists, information architects, graphic designers and project managers. Service design history, blueprints, service ecology, insight collection methods, and quantitative systems may be quite new to others in other design disciplines. That is to say, the way to "bring familiar elements into the background of service design" is still very instructive. Therefore, learning service design can help designers build self-conscious and self-inspection practical thinking, and create service-oriented service design products through proactive innovation activities.

1) Iteration of teachers' teaching thinking:

When service design is widely studied across the world as design thinking, the study of service design teaching methods becomes a necessity. This requires the construction of design professional courses to keep pace with the times. Objectively, it needs the planners of the teaching plan to consider the characteristics of the market, change the design of the traditional course content design, and transform or propose new solutions. But what is more important is the human factor. "The foundation of good is teaching, and the teaching is based on the teacher." As a granting party of teaching ideas, the constructions of teachers' knowledge structure need to be in line with the development of the times. The modern educational environment requires teachers to focus on the commonality and comprehensiveness of the discipline in the planning and teaching of the curriculum, focusing on the commonality and comprehensiveness of the discipline, and focusing on the cross-application of various disciplines and the expansion of comprehensive quality.

2) Transition of students' learning thinking:

With the integration of the spread of the Internet, mobile phones and social media and the wave of social innovation, a new generation of service models has emerged. These services not only provide new solutions to the problems facing by the society at present, but also change people's understanding of happiness and their views on the relationship between citizens and the state.

The self-media represented by live video has changed the younger generation's views of employment. Heavy physical and repetitive work can not be a condition to attract them. A relatively relaxed and free liberal profession has become a choice for many people. For example, whether the creators with crazy enthusiasm, or a graduate student of Peking University engaging in online game anchors, it is a self-career planning and choice in terms of performance. The reason behind this is that the overall socio-economic development has influenced this kind of thinking judgment that is different from previous generations. Therefore, classroom teaching has been impacted by the Internet on a realistic level. Here, various possibilities and opportunities which can achieve "Internet + education" will not be discussed. However, it must be accepted that the way in which students acquire knowledge and information has changed dramatically, that is, the way in which knowledge is acquired has shifted from teachers' words and deeds to virtual data environments. Fragment information and fragmented learning information objectively require a kind of learning thinking to intervene and apply in order to establish a systematic and holistic thinking pattern, and service design has such characteristics.

D. Management Innovation and Teaching

In teaching management, it is the necessary task and responsibility to design teaching managers to study and judge the external development factors that affect education and teaching. Teaching development lagging behind market changes has become a social reality, but it is still possible to adjust and optimize teaching development ideas by studying policies like national strategic planning.

In line with the implementation of the "13th Five-Year Plan for the Development of the State Strategic Emerging Industries", in January 2017, the State Council announced the "Guided Catalogue of Key Products and Services for Strategic Emerging Industries" (2016 Edition), including 5 major areas, 8 industries, and nearly 4,000 subdividing products and services. The specific content of digital culture creativity and design service related design services has been clarified, which directly affects the development direction of digital media art teaching design and curriculum content construction. Therefore, it can be clarified of the objective needs of Chinese society for the training of digital media art talents in the national strategy in a future time period.

E. Design Innovation and Curriculum Design

Ezio Manizni, a professor at the Politecnico di Milano in Italy, proposes that "social innovation design is all the activities that professional design can achieve in order to activate, maintain and guide the society towards sustainable development." The ultimate goal of design teaching is to cultivate future designers with innovative spirits. The main subject of innovation in teaching design is the students. The form of innovation is teaching practice, the method of innovation is design thinking, and the process of innovation is teaching practice. Therefore, classroom teaching design is of paramount importance.

According to the composition of the digital creative industry itself, it can be divided into design services and digital cultural content. The integration of the main body of the digital creative industry and the technical foundation will promote the development of the digital creative industry, which covers different professional directions and categories such as film and television, cultural and sports, tourism, human settlements, and creative manufacturing. The specific implementation of the service design method in the classroom teaching activities can make it more convenient to

find the corresponding majors and courses. This kind of curriculum design is not only at the theoretical level, but also provides new ideas for teaching design and curriculum design.

1) Principles of service design curriculum design:

There is a popular saying within IDEO: "As a whole, we are smarter than any individual." And that's the key to unlocking creativity in all organizations. The overall concept of curriculum design is based on the orientation of the school and the ability of students. The single curriculum reform and curriculum construction not only need to study social development trends and hotspots, but also need to consider the reality of the overall development of the school. According to this characteristic, it is necessary to study the balance of students, teachers, schools, government and other stakeholders, and design service design curriculums with service thinking.

2) Methods of service design curriculum design:

The understanding of service design in different industries is different, even in the same industry. It is the most effective method and way to adapt to local conditions, so only some design methods and ideas for discussion can be provided.

First, it is a single service design curriculum design. It mainly includes courses such as "service design", "service design basis" and "service design method" to introduce and explain the history of service design development, typical thinking tools and case analysis, aiming to provide students with access to a new design concept and design thinking tool and help students initially establish service design to solve the overall design problems of decision-making and thinking consciousness.

Second, it is the design of the service design curriculum group. It means to design more than two service design related courses in the curriculum through context association, from thinking to practice, from theoretical methods to decomposition learning. In particular, the learning and practice of thinking tools can be specific to the design implementation stage of the service design theory, not limited to classroom theory teaching. More extensive data collection and social practice analysis such as user research, design research, and corporate interviews can be carried out to deepen the study and understanding of service design and thinking tools.

In addition, it is the interdisciplinary curriculum design. Service design has interdisciplinary industry characteristics and professional attributes. Therefore, in the curriculum design, a wider range of interdisciplinary elective courses can be adopted, and multiple different professional backgrounds can be realized through case training to create cross-professional and interdisciplinary thinking orientation for students in service design learning, which has positive significance for enhancing the team awareness and overall social perspective.

What's more, there are short-term courses such as international workshop. In this way, it means to carry out regular international study tours, or introduce foreign experts and trainees to implement service design short-term training and teaching communication in the way of workshops to enlighten students' cross-border thinking, thus enhancing the international thinking pattern of multi-language communication and interdisciplinary learning of students.

VI. CONCLUSION

The Chinese economy has entered a transition period from "industrial economy" to "service economy". The development of digital creativity in design services and content construction has become the perfect entry point for digital media art professional design teaching. Based on the high point of international development, it will be an efficient way to use service design ideas, methods and tools as teaching methods and means to actively carry out teaching design and teaching content construction, and cultivate service design talents that meet future development needs.

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