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Connotations Outlooks and Methods of Service Design in the Context of Innovation

Xuefei HUANG
School of Art and Design, Wuhan University of Technology, Wuhan, 430070, China

Abstract: The study try to discover the relationship between product design and service design based on the analyzing of the connotation of service design in the context of innovation, and. It put forward the main four outlooks in service design, including outlooks of user, product, interacting, and ecology. It analysis the main methods of service design by design process. It explains the design process through a product service system that solve the problem of caring for stray animals, including the contact points between different types of user groups, and the construction of products and services in the system. The study forms a research frame of service design, which is an evolution form of product design, and deduces a conclusion that the boundaries of products and services are becoming more and more blurred in the context of innovation, and what people need will not be the possession of material products, but the satisfaction of experience of service.

Keywords: Connotation; Outlook; Method; Service Design; Innovation context

1. Introduction

The boundaries of products and services become more and more blurred, while the current society is entering the post industrial era. We are currently experiencing the shifts from object design to behavior design, from physical logic to behavioral logic, from single product to systematic service, and from function to user experience. Service design is a cross-research field of design, art, psychology, sociology, management, human factors engineering, manufacturing technology, information technology, and system science.

Service design research gradually developed from Europe and United States in the late 1980s, and now it has a certain theoretical basis and research results. Its characteristics are mainly reflected in the following three aspects.

1.1. Discusses about the concepts definitions trends, etc.

A relatively clear concept of service design was born in 1980s. Lynn (G. Lynn Shostack, 1984) published an article "Designing Service That Deliver" in the Harvard Business Review, which combined service and design. Bill Hollins and Gillian Hollins also talked about the concept of service design in its book Total Design in 1991.

1.2. Development of service design education and industrial applications

Stefan Moritz of Cologne International Design Institute (KISD) wrote "Service Design Practical access to an evolving field", which comprehensively discussed the meaning, background, process, methods, tools and case of service design. In addition, some well-known design consulting companies such as IDEO, Live/Work, Engine, etc, have introduced the concept of service design, and developed their own research on the actual case.

1.3. Promotion of service design by design organizations

For example, in 2015, the International Association of Industrial Design Council (ICSID) officially changed its name to World Design Organization (WDO) at the 29th annual meeting, and released the new definition of industrial design. WDO said that service design is a new development of the traditional industrial design in the post industrial era. The focus of modern design has changed from the material (product) to the process of design, which takes the service as an important part of the design.

2. Connotation of Service Design in the Context of Innovation

Industrial design is a kind of science which studies human things. The core of design is innovation, and both tangible and intangible products belong to the category of the subject. Although the concept of "service" is now being widely accepted, managers of various industries have been aware that the quality of service directly affects the user experience. But how to dig up the users' needs how products (services) provided easy to use and be efficient, sticky, and gradually become the new directions for enterprise development. How to design the "ser-

vice" is becoming a new subject for designers and companies.

At present, there are many misunderstandings on service design. Following are two kind of typical viewpoints. One view is based from the industry category of service, which is defined in accordance with the industry division. It is the design for customers in service industry. The definition of the simple division makes the object of the service design still be in the fuzzy state, which count against to the involvement of design knowledge. Another view is to understand the service design from the opposite perspective of product and service, which believe that the product is tangible, the service is invisible, and "the service" should be classified as the intangible product. It is a kind of ideas to differentiate the product and service. But in fact, the service cannot be invisible, and it exists in a certain forms and processes. As to going to the restaurant, customers not only enjoy the food provided by the restaurant, but also enjoy the dining environment and complete service process.

Figure 1. Connotation Change of Service Design

First of all, service design needs to satisfy two elements in the context of innovation. One is the service system, and the other one is the design innovation. Service can be created under the precondition that both of the providers and the users participate in the process. Service is the business process that the supplier acts on the physical body, property or information of the customers. Service reflects the interaction between the service provider and the user. The value of the design innovation is to create new styles or content and make people's lives more comfortable, and make products and service more humane.

The boundaries of current products and services increasingly blurred. Future products cover services, and services also are accompanied by the experience of physical products. What people need will not be the possession of products but more importantly the satisfaction of behavior experience. Therefore, service design should be defined as the design of the interactive process between service providers and customers, and the related products, experience, design process and information organization should belong to the category of service design.

3. Outlooks of Service Design

The object of design activities has changed in the network society and knowledge economy society. Traditional design activities which are based on visual factors are expanding their work area, and factors of psychological, experiential and spiritual value are increasingly emphasized. Therefore, it is the trend in the future that users pay more attention to the intrinsic and non-material value instead of the external and material one. The design innovation ideas of the re-organization of knowledge resources will continue develop in the field of service design.

In the service design, the primary task is to describe and study of the context and the users, which concern about the knowledge elements of the material, cultural and social values. Single designer's knowledge structure cannot be competent for the work of knowledge innovation, and the collaborative innovation and integration innovation involving various kinds of knowledge and disciplines will be the main way of service design. In addition, due to the needs of users' participation in the realization of the service value, service design is not a traditional general production design process, but a user-participating design process, which is personalized and highly customized innovation activity. Therefore, the innovation of service design is a systematic design process based on the User scenario analysis.

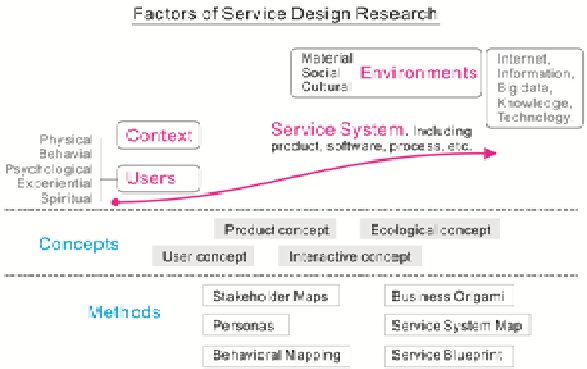

Figure 2. Factors of Service Design Research

3.1. The outlook of user

Since ancient times, the core idea of design is the "human centered" concept, and the goal is to solve the contradictions between man and nature, man and society, man and himself, which is called "Starting from the needs of the human, and reflect the value of the people". So it is necessary to in order to find the design opportunities by confirming the real target users, analyzing their specific habits and ensuring the problems, obstacles and needs in their production and lives. And then we can organize effective resources to design more efficient human products (services). Service design which is truly considered for users can not only make them to enjoy the intimate

service and process, the sticky service products will also make the service providers to obtain commercial success.

3.2. The outlook product

Since the late 20th Century, with the increasing problems of sustainable development in the human society and the nature, people in the design world have begun to rethink the traditional concept which makes the artifacts and the ownership of it as the core. People begin to explore the physical, intangible, and new valuable design and innovation under the framework of sustainable development, and manufacturing companies also make changes to shift the value sources in business. Tangible products and intangible services are provided to users as a complex system. It is a comprehensive product concept, which performs in the following 4 aspects. First of all, it is the key factor to provide the user-friendly services for the success of the enterprise. Secondly, the value of designed products and services will bring to the main profit source of enterprises in the future. Thirdly, the homogenization trend of technology makes the competition of enterprises to focus on the interests of core users and the services they own provide. Finally, the product service system will reflect the soft power of enterprise in the areas of knowledge innovation, organization innovation and the service management.

3.3. The outlook of interacting

Different from traditional product design or industrial design, the key attribute of service design is the interactivity of service. Similarly different from the management and operation of service in the field of marketing, the key to service design is the active design and innovation of the interactive process. Service design focuses on the human characteristics of the location scene and context when the service happens. The interactive concept of service design reflects the innovation which is related to the user's perception. Regarding users, products, information and environment as whole, designers coordinate and customize the users' experience and the way of service. Based the working ways in service design, some research and design practices use the methods of interactive services as the core methodology of work, which shows that the interactive concept is one of the core concepts of services design activities in the new period.

3.4. The outlook of ecology

In the future, competition of enterprise is the competition of the capacities in the integrating of multidimensional resources. Service providers need not only knowledge and manufacturing resources, but also management, marketing, finance, internet and other high-tech resources. Service design need to consider how to complete the integration and innovation of knowledge resources in the ecological industrial system framework, which requires the service designer (or team) need to have the ecological development concept and the multidisciplinary knowledge structure. Meanwhile, the business ecosystem, which is composed of e-commerce, big data, warehousing logistics, financing and consumer finance will provide a wide range of innovative design practice platform and build a higher industry barrier.

4. Methods of Service Design

The service design activity is a multidisciplinary innovation activity. The responsibility of the service designers is not only different from the traditional industrial designers, but also different from the traditional managers. They are more like planners and innovators based on thinking of variety interests and values. The activity of service design is research-based planning and organization, which contains activities of three stages. The first stage is the research based on the users, the affairs and the contexts which relate the two parts. The second stage is to innovate and design new ways, styles and forms for a new solution of service system. The last stage is not only to construct and express the service system, but also to organize and actualize the elements of service.

The main methods of service design are derived from the related disciplines, such as industrial design, interactive design, management, sociology and other fields. In the following, several major methods will be discussed according to the two core stages of design process.

4.1. The main methods in the stage of users, affairs and contexts research

4.1.1. Stakeholder maps

Stakeholders are the key elements in the service design chain, which constitute the main system of service. The various stakeholders in the service design have different importance, and there are different stakeholders in different application scenarios. However, stakeholders are directly or indirectly linked in the entire service process. Stakeholder map put the users, employees, staff, partners and other stakeholders together, and analysis comprehensively with visual language, which extends the relationship between the users and enterprises in the traditional industrial design field and emphasizes the interactive features between the elements of human affairs system.

4.1.2. Personas

Personas method sets the human character categories within the service system framework, and concretes the attributes of the personalities involved, which is obtained by market and user research, such as age, gender, occupation, value orientation, lifestyle, intelligence, emotional characteristics, etc. This method is convenient to study the issues of demand, behavior and interaction in a real situation.

4.1.3. Behavioral mapping

Behavioral mapping method is used to observe the activities of people in some places by means of annotated map, plan, video or timing camera. You can record the behavior of features, movements and activities of the observed, including the age and sex of the observed, being alone or with others together, what they do, and the details at a fixed location, time or environment. There are two types of behavioral mapping. One is the location-centric mapping which is mainly used to observe people's activities in specific locations. Another one is the human-centric mapping which is used to record the activities of the specific group of people in different times and places, especially social behaviors and interactions. Location-centric mapping and human-centric mapping are often used in conjunction.

4.2. The main methods in the stage of service solution design

4.2.1. Business origami

Business origami is a simulation of the service design activities in the current and future systems. This method is to make a paper prototype, which can simulate the interaction and value exchange between characters, components and environments in a multi-channel system. It is a platform for demonstration of the operating mode of a system in which the stakeholders gather in the same workplace, and then simulate or other. It is a platform for the physical demonstration of the operating mode of a system and the simulation of the state of the system in the future, when all of the stakeholders gather in the same workplace. The main purpose of the method is to demonstrate clearly the system and the value exchanges between various symbols.

4.2.2. Service system map

Service system map method is mainly used to express the dynamic relationship between the designed service system and the social and natural system. It describes the value relationships and the interacting modes between the service elements in the system. It helps policymakers to clarify the flow of information, capital, material and other factors in the system, and examines the win-win and coexistence possibilities of the business systems, social systems and ecosystems.

4.2.3. Service blueprint

Service blueprint describes the service flowcharts in form of time axis, in order to analyze the service process according to the time nodes and find the problems in the service process. It makes systematic and graphical studies of the external, internal, tangible and intangible objects in the service system, and considers all aspects, such as users, service providers, supporters, technical systems, and all items directly related to the service.

5. A Design Practice: Homeless Animal Adoption System Design

The design case is a concept design based on the product and service system. Focusing around the "homeless animal adoption system", the designer wishes to use the interesting experience to attract users. This will promote to solve the homeless animals' problem. According to the present adoption method, the designer aims to develop an adoption method which care the stray animals and provide adoption application platform for stray animals. Besides, it tries to create a self-sustaining business model through the Internet model, making more homeless animals can get relief.

5.1. Investigation and analysis on the problem of stray animal in Wuhan City

5.1.1. Fundamental state

About 20% of people in Chinese cities will breed different kinds of pets, but there are plenty of stray animals roaming the streets of the city. As stray cats and dogs become more and more, the city's public health and safety are also challenged. In 2015, Wuhan Municipal Public Security Bureau has dealt with more than 1000 cases of dog injuries. China's current measures and designs to reduce the number of stray animals are still lagging behind, and the number of related service products is minimal. Pet related products or services designed for domestic pets are often seen in supermarkets and shopping malls, but there are few caring designs for stray animals. Therefore, it can produce social value to design in caring for stray animals and solving the problem of them. Through interesting and interactive product and service design, not only the public can harvest the interest, but also the system can effectively reduce the number of stray animals, care for stray animals, and arouse the positive attention in society.

5.1.2. Surveys of the problems

Through the field research of the Jiefang Park in Wuhan city, the survey of public homeless animals and the questionnaire survey of the public, designer finds out these results. Firstly, in order to get food, the range of stray animals' activities coincides with the one of tourists in the park, and it causes the potential harm for the public (Figure 3). Secondly, most of the domestic animal protection institutions have not enough money and capacity, and administrative means is difficult to solve the problem completely. Thirdly, most respondents do not reject them and are willing to help them.

Figure 3. Distribution of stray animals in Jiefang Park, Wuhan City

5.1.3. Discover design opportunities

The result shows that the current adoption mechanism is very limited, and the attitude of most people to stray animals is positive. The opportunity for design is to create a public platform for the public and stray animals, to involve the citizens of the city, to care for the flow of animals and to solve the problem of stray animals.

5.1.4. Analysis of core object

This platform is a system which includes products and services, and there are three main types of users. One is service provider which is responsible for platform operations and maintenance, one is ordinary user which includes the general citizen in city, and the other is the special user which includes the stray animals in public.

5.2. Three interactive states and service contact points

Here are three main interactions between the "Homeless Animal Adoption Service System". One is that between citizens and stray animals, one is between citizens, and the other is between citizens and the service provider. We need to analyze the contact points between the three interactions.

5.2.1. Interaction between citizens and stray animals

The main ways in which people interact with stray animals are feeding and adoption. The former temporarily solves the eating problem of stray animals. We can concentrate stray animals, and provide people with the possibility and convenience of feeding animals by providing good interactive experience. In the park scene, the experience of feeding stray animals, will meet the needs of people's self-value realization, and will bring a strong sense of satisfaction. The latter can solve the problem of the number of stray animals directly through the simple adoption mechanism provided by the platform. The latter will directly solve the problem of the number of stray animals, through a simple adoption mechanism the platform provides.

5.2.2. Interaction between citizens

They may be people who feed pets, people who plan to feed pets, people who plan to adopt animals, or pet-loving people. All four groups of users should be able to get or publish the information they need on this platform, such as the experience of feeding pets, information of lost pets, information of adoption or searching pest. Relevant relief associations and aid agencies can also use the platform to publish service information, recruit volunteers, share the dynamic, access to the stray animal information, and donations of love. In addition, in the park scene, citizens near the terminal can have a rest, feed animals, and communicate with each other. These activities of caring and sharing will bring the sense of pleasure and identity.

5.2.3. Interaction citizens and the service provider

To achieve this interaction, the Business-to-consumer mode of electrical business should be appropriate, and this pattern is one of the ways to maintain app operations. Service providers can take advantage of the user's characteristics, which loves animals, feeds pets, or has a program to feed pets, and obtain income by putting targeted advertising, selling pet related products. They also can get a certain amount of money by providing pets food to feed the stray animals in park.

5.3. Conceptual design of the system

It is the designer's main goal to innovate by considering the affective and interactive factors in service contacts. Affective is the core content of user experience and interaction, which is an important part to make the user feel satisfied in psychology and physiology. It is also an important factor that can maintain users' use of the service products and enhance their stickiness. The key to achieving the goal is to enrich users' experience and feedback through sensory, visual, and auditory affective factors.

5.3.1. Functional positioning of the system

The function of this product service system should include the points below. Firstly, it can feed stray animals automatically, and is a platform for adoption and adoption of stray animals. Secondly, it can provide the function to view the distribution and the statistics of the nearby stray animals. Thirdly, it can search and find out the pets citizens lost by using the service terminal. Fourthly, it can be used as a platform for news release by small animal protection associations or other public groups to share information about stray animals, pets and adoption. Finally, it also can provide online purchase of pet related products.

5.3.2. Interface design of the APP prototype

The APP "TakeMeHome" is the mobile-phone operator in the stray animal adoption system, which brings together all of the functions described above. It is possible for the public to view the location of different service terminals at any time, the location and time of the last occurrence of the animals concerned, and to control the feeding and adoption of the animals concerned (Figure 4).

Figure 4. Interface Design of the APP "TakeMeHome"

5.3.3. Terminal design of the service system

The station "TakeMeHome" is the service terminal device in the stray animal adoption system. It is equipped with a camera, a microphone and a food storage box, which are connected to the cloud. Members of the public can buy pet food by scanning the QR code on it. The station "TakeMeHome" itself can identify nearby animals, take photos of them and send them to the server cloud (Figure 5).

Figure 5. Terminal Design Concept of the Station "TakeMeHome"

6. Summary

In the context of innovation, the boundaries of products and services become more and more blurred. Products will cover services and services will also be accompanied by products in the future. Meanwhile, what people need will not be the possession of material products, but the satisfaction of experience of service. Service design is the product of the times change, which reflects the changes from static to dynamic, changes from product context to service context, changes from single value to multiple values, changes from material design to immaterial design, and changes from narrow humanistic care to broad humanistic care. Service design will play a positive role in the harmonious development and sustainable development of the society.

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