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## An Analysis of the Roles of Stakeholders in Industrial Cultural and Creative Product Design

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### **Abstract:**

For the regeneration projects of cultural and creative industry in former industrial sites in Shenyang, design thinking and methods involving various parties' participation in industrial cultural products are developed to stimulate the development of local economy and urban culture. Research methods including questionnaires, interviews, speculative design, participatory design are used to analyse these stakeholders' roles in different stages of industrial culture-related cultural and creative product design. This paper proposes the establishment of stakeholder maps and the way to identify the core stakeholders. Through the conceptual design and practice of Industrial culture products in Shenyang of China, this paper finally concludes that core stakeholders can help the design team to generate new values in creative research and development process.

**Keywords:** *Stakeholder, Industrial culture, Participatory design, Cultural and creative product design.*

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### I. INTRODUCTION

Nowadays in China, more and more industrial cities have experienced industrial upgrading and transformation. It has been a heated topic to endow the former industrial sites with new life. Dr. Wang Xinzhe, Chief Economist of the Ministry of Industry and Information Technology of China, stated in the book *Industrial Culture*: "Industry is the foundation of a powerful country, and culture is the soul of the nation. The development of modern industrialization proves that cultural elements have abasic, long-term, and decisive impact on the process of industrialization. And industrial change has a fundamental. The derivation, accumulation and sublimation of industrial culture in the process of industrialization will also play an increasingly

important role in the development of modernization in future” [1]. It is really difficult for single commercial activities like cultural and creative industrial parks to address the problems arising with sustainable urban regeneration.

This research explores the characteristics of cultural and creative product design in major industrial cities in China and analyses the main themes of industrial culture. The novelty of this research lies in the selection of the core members of the participatory cultural and creative design team through stakeholder-related maps. This research focuses on industrial culture from semantics, interprets cultural and creative design from different perspectives such as semiotics and emotional elements, proposes insights under multiple backgrounds, extracts the external representation and invisible image elements of industrial cities to obtain innovation methods of design, and verifies them in practice through specific product design cases. Finally, it provides innovative ideas for the design and development of derivative cultural and creative products of the industrial cultural creative industry parks and contributes to the enhancement of the city’s image.

## II. CURRENT SITUATION OF CULTURAL AND CREATIVE PRODUCT DESIGN IN SHENYANG

Field research including interviews and questionnaires were carried out in Shenyang to summarize current situations of cultural and creative products. Through interviews with relevant staff and analysis of existing cultural and creative products and souvenir sales, this research team conducted several rounds of analysis on cultural background of the products, consumers’ feedback, design purposes, design style, physical characteristics and functional expansion. At the same time, 100 interviewees with the background of cultural and creative product design were invited to participate in the survey and 94 valid questionnaires were obtained. The analysis of these participants’ language and behaviours helped to understand their preferences and purchase tendency of cultural and creative products (see Fig1).

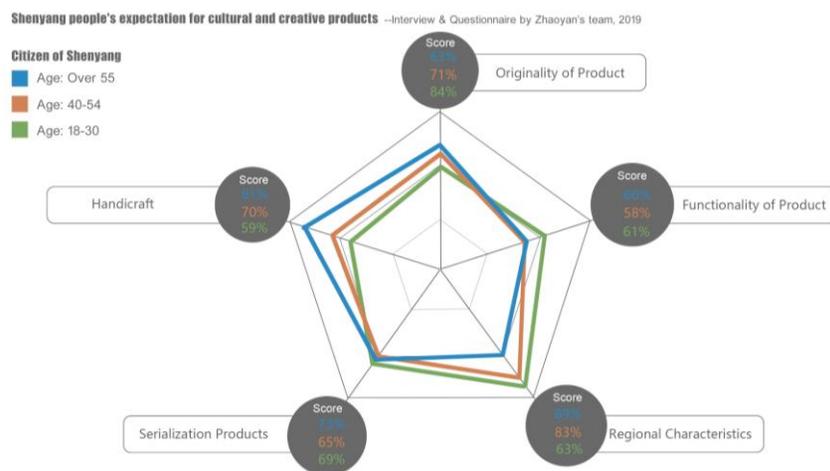


Fig1: Citizens’ expectations for cultural and creative products in Shenyang

Fig2 shows the difference of the market share and sales volume of cultural and creative products between Shenyang and other typical cities in China. Through the analysis of key issues in cultural and creative product design in Shenyang, this research summarizes the current situation of cultural and creative product design in Shenyang as follows. Firstly, there is a widespread phenomenon of homogeneity in cultural and creative products. The story embedded in cultural and creative products and their commemorative nature are of great significance for potential users and customers [2]. However, the homogeneity of tourist souvenirs in the current market has become a serious issue and the lack of tourist image and humanistic emotions also makes it rather difficult for users to choose the products [3]. Secondly, there is a lack of regional characteristics for these cultural and creative products in Shenyang. Even though some cultural and creative product stores are closely related to creative industrial parks, there are few original designs focusing on the theme of cultural and creative parks, and they have not incorporated Shenyang's local culture and style into cultural and creative product design. Many cultural and creative products in Shenyang are available in other parts of China, which reduces the attractiveness and depth of Shenyang's cultural and creative product design to some extent. Thirdly, there is a lack of systematic design. In addition to cultural and creative product design, the decoration styles of cultural and creative product stores and the way of displaying these products have not received sufficient attention. These elements need to be integrated into the whole process of systematic design, or it will cause the disconnection between cultural and creative products and sales environment. As a result of this phenomenon, consumers cannot get themselves into this atmosphere and enjoy the connotations of these cultural and creative products [4].



Fig2: An online survey of cultural and creative industries in typical Chinese cities

The above-mentioned issues in cultural and creative product design in Shenyang set up the basic themes and materials for this research. The focus group of experts were conducted to explore the deficiencies in cultural and creative products in Shenyang, analyze the way of integrating new design forces, pursue the development trend of cultural and creative industry in Shenyang, and propose new solutions for dealing with the problems concerning market, economy and technology.

### III. NEW IDEAS OF INDUSTRIAL CULTURAL DESIGN

As one of the national heavy industry bases built in the early days when the People's Republic of China was founded, Shenyang has many heavy industry factories focusing on equipment manufacturing. The development of Shenyang's industrial culture can be employed as the starting point and innovative elements for developing cultural and creative product design [5]. Among them, Industrial Museum of China was rebuilt from the Shenyang Foundry. More than 1,300 cultural relics show the development of Shenyang's industry and the changes it has brought to the city. Shenyang 1905 Cultural and Creative Park was transformed from the second metalworking workshop of former Shenyang Heavy Industry Group. After the relocation of Shenyang Heavy Industry Group, the industrial sites have been completely kept as a witness for the changes of the factory.

#### 3.1 Use of Industrial Culture Elements

The elements of industrial culture can be directly adopted or integrated with the products to develop new ways to create cultural and creative products. It is mainly aimed at graphic design elements such as patterns and colours. It is one basic way to integrate design elements with functional products [6]. In future urban planning and regeneration, the industrial cultural heritage and original ecological industrial symbols will be preserved to the greatest extent, forming a unique industrial culture phenomenon in Shenyang [7]. Industrial culture endows Shenyang's cultural and creative design with a unique category and vitality, and Shenyang's cultural and creative product design concerning industrial themes will incorporate new creative ideas. Design elements are transformed into carriers through changes, vivid forms, abstract modelling and other ways to form cultural and creative products with new functions.

#### 3.2 Interpretation of Participatory Design

According to participatory research principles adopted by anthropologists Malinowski and Mead, three elements of participatory design are summarized. First, participants should meet the selection criteria. According to different design projects, the design team invited the target users, potential customers and other stakeholders of the project to participate in the survey and group discussion. Second, participants play a role in different design stages [8]. In face-to-face communication, participatory design can provide effective user testing and feedback in the later stage of the design, and the participants can help the design team expand creative ideas and directly affect the direction of the design. Third, collaborative design needs to be carried out efficiently. Although participatory design can inspire the team to exert creative insights, the

design of the final plan requires a professional design team to make final decisions and guarantee the design efficiency.

### 3.3 Structure of the Stakeholder Map

Building stakeholder maps can have the participants' information visualized, and further identify core stakeholders that have positive or negative impacts on the project. The implementation of participatory design needs to involve key stakeholders of Shenyang's cultural and creative products concerning industrial subjects to participate in the design and play an active role in it. This method can help the design team gain different opinions, better understand the needs of different groups related to the design project, increase effective communication with different groups of stakeholders, establish an empathy model, and build a solid foundation for the smooth progress of following research and design.

This research project put an emphasis on regional characteristics; therefore, relevant stakeholders could participate in the whole design process to avoid some risks. For instance, this helped to reduce the probability that design didn't meet the demand of potential customers to buy certain products. According to the types of stakeholders involved in the design, this design group summarized the opinions of people who had relevant interests towards this project and put them into different groups after several rounds of discussion. These groups of stakeholders included the target audience and those who benefited from the project (developers of creative industrial parks, practitioners in these cultural and creative parks, self-employed businessmen, online promotion and marketing platforms, relevant commercial units), decision-making organizations (local governments), those who might be adversely affected (surrounding area residents), and those who might participate in the design (university teachers and students, experts and scholars).

### 3.4 Selection of Core Design Members

This design team continued to refine the stakeholder map and evaluated the design goals and the "viscosity" of the participants. User viscosity is usually calculated according to the DAU/MAU formula. DAU refers to the number of daily active users, and MAU is the number of monthly active users. The closer the ratio is to 1, the higher the user activity is. When the ratio is lower than 0.2, the transmission and interaction of the application will become weak [9]. Then the participants are divided into three categories according to the degree of participants' relevance: core figures, key figures, and reference objects. It is much easier to help the design team attract and include more core members. The criteria for user selection can be summarized as follows. First, they include users who have logical thinking and can clearly express the wishes of the group they represent. Second, there are users who intend to become target buyers and users. Third, there are also managers of cultural and creative parks and developers of the projects. Fourth, those people who get involved in the sales and promotion of new cultural and creative products are also included. Based on the evaluation of the participants' contributions in the project, the stakeholders who will play crucial roles in the design are selected and arranged to form the core team (Fig3).

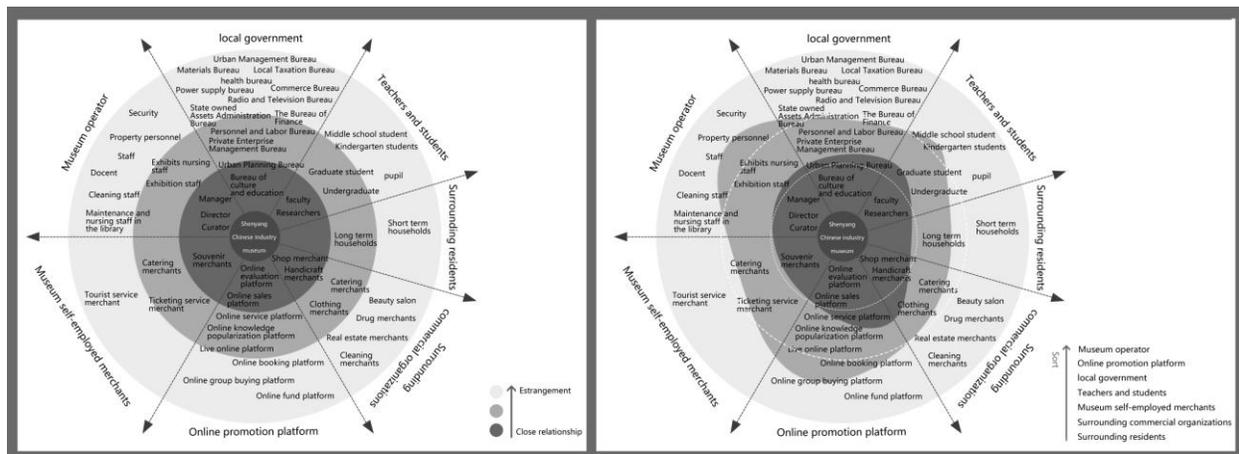


Fig3: Stakeholder maps of industrial culture products in Shenyang

## IV. STRATEGIES AND PRACTICES OF INDUSTRIAL CULTURAL AND CREATIVE PRODUCT DESIGN IN SHENYANG

Different series of conceptual cultural and creative products designed for Shenyang's industrial culture are based on the three levels proposed in Donald Norman's *Emotional Design*. The first level is visceral design. It is the subconscious level of reaction to certain experiences. Prior to consciousness and thinking, it is the basis for the formation of products. More emphasis is placed on the first impression, physical appearance and tactile impression of the products. The second level is the behavioral design. When it comes to the use of products, experience includes functions, performance and usability. The third level is the reflective design, which is a relatively higher level of feelings, emotions and perceptions. This level indicates the complete integration of thoughts and emotions [10].

In addition to Donald Norman's theory, this research also adopts Maslow's hierarchy of needs and the three levels of human needs defined by Yale University professor Creighton Alderfer, namely, existence needs, relatedness needs and growth needs. Existence needs in this research will include all material and physiological desires provided by the product to users. In this research, relatedness needs refer to the emotional needs between people, society and nature, which can be maintained through the products. Growth needs are satisfied by those products that can help the users to realize their inner desires, self-actualization and internal esteem [11]. According to the above theories, a four-step and three-level progressive thinking model is built for cultural and creative product design concerning industrial subjects in Shenyang, which is further proved by participatory design practices (Fig4).

## Four steps and three levels of Shenyang Industrial Cultural and creative product design

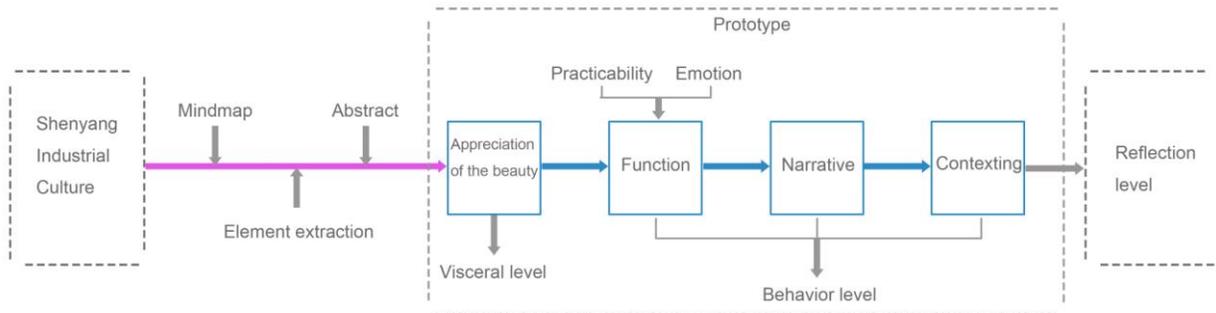


Fig4: Four steps and three levels of Shenyang industrial cultural and creative product design  
4.1 Aesthetic Experience—Cognitive Availability

Cultural and creative products design based on Shenyang’s industrial culture should have specific regional cultural characteristics and unique aesthetic consciousness. These products will become Shenyang’s cultural carriers and derivatives, and will be developed with different design styles to meet the demand of consumers of different age groups. The mind map is used to extract the major elements and symbols of Shenyang’s industrial culture and find the original industrial cultural materials that represent the characteristics of Shenyang for further design practices. Therefore, Shenyang cultural and creative products with distinctive aesthetic characteristics can also publicize and promote intangible cultural connotations, and contribute to the development of regional creative economic industries.

### 4.2 Function Expansion—Functional Availability

The functionality of cultural and creative products can not only provide practical products for our daily life, but also can be regarded as an emotional effect, which contains the unique cultural memory of locality and ethnicity [12]. For example, the British Museum is open free of charge to all visitors. The revenue brought by museum derivatives is much bigger than that from ticket revenue only. The British Museum selects some key cultural relics and celebrity collections with a high degree of cultural identity or exotic customs for systematic development, allowing visitors to increase their desire to collect various kinds of products of different styles. The information about “Rosetta Stone” in the museum’s official website store shows that there are more than 60 derivative products based on its original form. In addition to traditional booklets and replica ornaments, it also includes various products with practical functions such as stationery, jewelry, cups, power banks, USB flash drives, etc. From the perspective of product attributes, there are relevant products based directly on existing things, such as a replica of the Rosetta Stone. There are also some derivative products such as some practical products based on the images of certain collections [13]. Taking this as a reference, this design team made a series of aromatherapy furnaces and lamps that combined the characteristics of Shenyang’s industrial styles, incorporating practical value with physical attractiveness to increase the interaction between users and those souvenirs.

## 4.3 Design Narrative—Perception Availability

Shenyang industrial cultural product design tries to increase the surprise experience and emotional communication that design can bring to users from the perspective of user experience. Most of the cultural and creative industrial parks in Shenyang are transformed from derelict factories, which aim to maximize the preservation of the historical features and equipment of former industrial areas. The cultural and creative products designed for Shenyang’s industrial culture integrate design narrative and emotional elements, and its design orientation is “emotion and regeneration”. The assembled parts of cultural and creative products are made from former industrial equipment parts, which preserve the cultural history of the old industrial city and create new value. At the same time, considering the recycling and reuse of resources, this design team tries to make customers who buy cultural and creative products feel the historical values and glory of this industrial city, and the confidence of this city to gain new vitality in the new era.

This research project has involved a large number of participants. In the process of cultural and creative product design, stakeholders’ valuable opinions and ideas have been obtained to help designers generate new creative ideas in different fields. After several rounds of brainstorming, this research team determined the key information and creative highlights of the design. Figure 5 shows the Children’s toys based on Shenyang’s industrial culture. Machinery and robots are the inspiration for this design and the design concept is to adopt a modular structure. Through the free combination of various components, users can create unexpected and interesting cartoon shapes, which is absolutely an attractive point for children and teenagers. At the same time, the metal parts that make up the dolls are used parts from the factories in Tiexi District. Some parts of the toys are composed of the machine parts, while sometimes designers make some changes of these parts and turn them into the components of the toys.



Fig5:Children’s toys based on Shenyang’s industrial culture

## 4.4 Contextualization—Context Availability

It is rather difficult for a single product to reflect the general atmosphere of Shenyang’s industrial culture. Therefore, this design team fully considered the relationship between products and the environment in its overall design and planning process to enhance

users' shopping and cultural experience. Another series of designs shown in Fig6 better promote Shenyang's industrial culture. The design team uses original illustrations to show the style of the cultural and creative parks in former industrial sites in Shenyang. Tourist maps, umbrellas, mineral water and other promotion media are used to promote and publicize a number of Shenyang cultural and creative parks, e.g. the Industrial Museum of China and further promote Shenyang's industrial culture.



Fig6: Propaganda product design of Shenyang industrial culture

A series of conceptual cultural and creative products designed for Shenyang's industrial culture were completed by a participatory team. Participants of this project include: product designers, service designers, craft manufacturers and their engineers, researchers of Shenyang's culture, staff from the Culture and Education Bureau, and leaders of cultural and creative product design projects in the museums.

## V. REFLECTIONS ON INDUSTRIAL CULTURE DESIGN

### 5.1 Cultural Connotation Influencing Users' Cognition

When the implicit cultural element is considered as the transformation target, it is usually necessary to analyze the connotations of the cultural elements, form a concrete concept, and then perform the extraction and transformation work. Due to the differences in individual cognition, different designers have different understandings of implicit cultural elements. The understanding of the connotations is different, so there are great uncertain factors of connotation extraction, and the pros and cons of the extraction results are also very different [14]. However, the connotation extraction method is widely used since they can help to create excellent works that have unique humanistic features and conform to the intrinsic value expressed by cultural and creative products [15].

### 5.2 Positive Value of Resources and the Environment

From the perspective of environment-friendly design and resource recycling, the series of conceptual cultural and creative products based on Shenyang's industrial culture are fully discussed. The setting of narrative lines is useful in establishing a harmonious emotional relationship between the old machines and the new souvenir [16]. When users purchase the designed product, their behaviors also express their deep consideration as well as their preferences. The design purpose that takes environmental factors in consideration also provides space for more dimensional values.

## VI. CONCLUSION

This article took cultural and creative products as the research object, and adopted methods such as cluster analysis and comparative analysis to carry out design practice, focusing on original narration based on cultural elements. User participatory design was conducted as the research carrier. This research also analyzed the role and value of participatory design thinking in the design process, exploring the way to establish a core stakeholder model system and forming a four-step and three-level cultural and creative design thinking method. From the perspectives of designers and stakeholders, the article analyzed the personnel structure, design creativity, design process and methods in the participatory design process, established a design innovation model and formed an optimization mechanism. Finally, the key information in the design process was integrated and this research proved to improve the efficiency of design information exchange between the design team and users, and form a participatory design research system by applying the optimized views into the design process.

## ACKNOWLEDGEMENTS

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