Analysis of the Development of Lacquerware in Chengdu and the Demand for Cultural and Creative Product Design

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Abstract: Chengdu lacquerware, as a traditional Sichuan handicraft, is one of the national intangible cultural heritages with great regional characteristics, and it carries the wisdom of the Sichuan people, and it is our unshirkable responsibility to pass on and develop these traditional folk handicraft skills. With the rise of the economy, the consumer philosophy and needs of users have changed, no longer just to meet the functionality of the product, but to pursue the individuality of the product. Under the economic development trend, User participatory design is the inclusion of the user in the design, in which all participants have equal status and power.

1 INTRODUCTION

The Historical Development and Aesthetic Characteristics of Chengdu Lacquerware China is the "Land of Lacquerware" (Duan, 2022). Dating back to the ancient Shu period, more than 3,000 years ago, the art of lacquer was already well developed in Chengdu during the Warring States period, when it was used all over China. During the Western Han period, the lacquer art of Chengdu was supplemented by the invention of the needle scratching and gold filling method, and the pile lacquer method of using thick substances to fill in the patterns. In particular, the top of the vessel inlaid with metal flowers and leaves, to agate or glazed beads for the button, the mouth of the vessel body inlaid with gold and silver buckles and hoops and other techniques very popular. The lacquerware produced in Chengdu, Pixian and the northern part of Guanghan County in Sichuan has formed its own style and is self-contained. This paper summarises the development of lacquerware in Chengdu and the design needs of creative products in Chengdu, from the development of lacquerware in Chengdu to the participatory design of actual users (Niu, 2022).

2 OVERVIEW AND DEVELOPMENT OF LACQUERWARE IN CHENGDU

2.1 Overview of Chengdu Lacquerware

Chengdu lacquerware, also known as "halogen lacquer", was included in the first batch of the national intangible cultural heritage list in 2006 (Yang, 2022). Chengdu lacquerware is made from wood, porcelain, linen and paper, and is repeatedly painted with natural lacquer and lacquer, then polished and varnished to create a glorious craft. In addition to the carving and colouring process, in recent times Chengdu lacquerware has developed a variety of techniques, such as concealing, concealing, depicting and carving, making it a richer and more diverse product range. Nowadays, there are more than 100 kinds of lacquerware products, including scholar's houses, jars, plates, tea sets, screens and boxes, which are sold locally and even at home and abroad (Huang, 2022).

2.2 The History of Chengdu Lacquerware

Sichuan is rich in raw lacquer and cinnabar, providing a wealth of raw materials for the production of lacquerware in Chengdu (Liu, 2022). The lacquer art

of Chengdu was one of the earliest lacquer crafts in China and reached a high level of sophistication during the ancient Shu civilisation. The earliest lacquerware found in Chengdu to date is a lacquer cup with the words "Ba Shu Tu" unearthed from a Warring States tomb in Xindu. In his "Shudu Fu", Yang Xiong, a literary scholar of the Western Han Dynasty, praised Chengdu lacquerware for its "carvings and buttons, a hundred tricks and a thousand works". During the Three Kingdoms period (Du, 2022), the lacquer ware excavated from Zhu Ran's tomb, a chessboard with children on sticks, also came from Chengdu; during the Han and Tang dynasties, Chengdu lacquer ware was known as the 'treasure of Shu'. In recent years, most of the lacquer artefacts excavated from Han tombs in Changsha Mawangdui, Jiangling in Hubei and Pingba in Qingzhen, Guizhou, are clearly marked with the words 'Shu County' and 'Chengchengcao'.

3 DEMAND ANALYSIS OF CHENGDU LACQUERWARE CULTURAL AND CREATIVE PRODUCT DESIGN FOR USER PARTICIPATION

3.1 Definition of User Participatory Design

The concept of Participatory Design, PD, is a modern approach to design that is user-centred, includes the user in the design process, respects the user's background, abilities and ideas, and ensures design equality while meeting the diverse needs of the user. Compared to traditional design methods (the differences are shown in Table 1), this approach is more flexible and open, allowing the user to participate in the design process to the greatest extent possible, so that the user has the best possible interactive experience. Participatory design is now being used in a number of research areas.

With the rapid development of social and economic standards, users' needs for products are not only functional and practical, but more spiritual in nature (Chen, 2021). The aim of this study is to open up the design and production rights to users, allowing lacquer enthusiasts, designers and the general public to give full play to their own strengths and characteristics, and to participate in the design and production of lacquer products with the assistance of relevant personnel. This will enhance the user's participation and experience, thus better promoting and passing on traditional culture.

3.2 Forms of User Involvement in Design

User participatory design can be used at all stages of the design process, and its role varies. Before the design process begins, it helps the user to choose the direction of the design and there is no set form or standard for user participatory design, as there are different levels, needs and types of participant (Liu, Kou, 2021). In the process of user participatory design, users should choose the appropriate form according to their actual needs. A comparative analysis of the three forms is shown in Table 2.

Table 1: Differences between traditional and user-involved design methods.

Design features	Traditional design methods	Participatory design methods
User power	Choice	Right to choose, create, design
Inclusivity	None	Inclusivity (no goal)
Main output	Product	Experience
Value Objective	Low production costs	Creative needs
Key claims Fast,	mass production Open,	independent creation
Technical advantages Low cost	,Short production cycle, high efficiency High output	,originality and diversity
Difficulties in shaping and decoration	Determined by the designer	Determined by the user's design ability

Table 2: Forms of user involvement in design.

Format	Features	Strengths	Difficulties
One to One	Only 1 user can communicate directly with the designer	Higher operability and user motivation Better and more efficient	User thinking is limited
Group style	6-8, in small groups	Design more in line with demand	Users vary from one user to another
Online Open	Everyone	More convenient	Conduct Interaction

3.3 User involvement in the Design Process

User involvement design starts from user analysis, by analysing the user's physiology, behaviour and psychology to establish the user'sneeds, such as interaction needs, self-fulfilment needs, usage needs and cultural needs.

Then, we analyse the data of user needs, design and develop product shapes and decorative elements to meet the needs of users, and allow users to fully develop their creativity through user participation in design.

Through user participation in the design process, users can give full play to their own creativity and finally complete the design and production of the product. The user participation design process is illustrated.

Step 1: User analysis.
Step 2: Requirements acquisition.
Step 3: User needs analysis.
Step 4: Design element development and user involvement.
Step 5: Design realisation.

3.4 r Demand Acquisition for Chengdu Lacquerware Cultural and Creative Products

Today, the number of different types of cultural and creative product designs is increasing, and the demand for cultural experiences is growing, with both users and designers expecting the product to enhance the spiritual experience through cultural implantation. By accurately tapping into information about user needs, translating them into specific elements of product design, and presenting external factors such as the shape, ornamentation and colour of the product in the design of Chengdu lacquerware cultural and creative products, the transformation between user needs and the characteristic elements of the product is further completed. User needs are categorised in order to better understand the needs of the target users. The first step in acquiring user needs for Chengdu lacquerware cultural and creative products is to identify the target user group and clarify who the product is designed for. In determining the target users, this can be done by analysing the background information of the user's identity and through questionnaires to locate them (Liu, 2021). The user portrait is a way of standardising the target user group through questionnaires and user interviews to better capture the target users and their real needs, to ensure that the product development process does not deviate from the user needs, and to use the Kano model user needs taxonomy to analyse the target user's needs preferences and measure the user's satisfaction with a certain attribute of the product (Huang, 2021). The Kano model was used to analyse the preferences of the target users and to measure their satisfaction with a particular attribute of the product. This helped the designers to accurately position the style, function and shape of the Chengdu lacquerware product design.

4 EXTRACTING AND RECONSTRUCTING ELEMENTS OF CHENGDU LACQUERWARE PRODUCT DESIGN FOR USER PARTICIPATION

As one of the pearls of intangible cultural heritage, Chengdu lacquerware is of great artistic value in terms of its production techniques and aesthetic characteristics. This chapter first analyses the characteristics of the appearance, decorative elements and compositional forms of Chengdu lacquerware, analyses the data collected on ancient and existing products of Chengdu lacquerware, combines the regional cultural characteristics of Chengdu lacquerware and other factors, and constructs an analysis chart of Chengdu lacquerware cultural and creative product design. Based on user needs and

Table 3: Analysis of the stylistic features of Chengdu lacquerware.

Type of object	Name of object	Stylistic features	Use/function
Catering	Lacquer cups	One- and two-eared cups	Holding wine
	Lacquer bottle	Cylindrical	Holding wine
	Lacquered plate	Round	Serving food
	Lacquer Goblet	Cylindrical	To hold wine or water
	Lacquered tripod	The base is threeleggedrounded,	Serving food
	Lacquered box	various shapes,	Containing objects
	lacquer pot	Deep belly,	Serving food
	Lacquer pot	Square, round or flat jug	For wine or water
Grooming	Lacquered trousseau	single, square,round,oval, crescent	cessories and and food
	Lacquered wash	Round with widemouth	Washlet
	Lacquered table	paneled legs	Place settings
	Lacquered case	grated legs	Place settings
Etiquette	Lacquer gui	wide mouth and rounded belly	Food/giftware
	Lacquer bells	francium Two types of lacquer	ritual vessels
	lacquered tripod	with a rounded base and a flat or rounded foot	Ritual vessel
	lacquered horse	carved from a single piece of wood	Burial Object

Table 4: Characterisation of the decorative elements of Chengdu lacquerware.

Decorative element categories/themes		Characteristics of decorative elements
Plant motifs	Leaf veins, curly grasses, etc.	Embellishment
Animal prints	Fish, butterfly, sheep, etc.	Exaggerated shapes
Natural landscape motifs	Clouds, water ripples,etc.	Variety of shapes
Geometric patterns	Dots, straight lines, etc.	Richly layered
Inscriptions	"Shu County", "Shi Fu", etc.	Words or symbols conveying information about an artifact

perceptual imagery, the elements of the Chengdu lacquerware creative product design are identified. Using shape grammar, the elements of the Chengdu lacquerware product were extracted and deformed to produce a preliminary design solution.

4.1 Characterisation of Chengdu Lacquerware

4.1.1 Analysis of Exterior Styling Features

There is a wide range of lacquerware in Chengdu, mainly in the form of everyday objects and ceremonial objects, and the specific features are shown in Table 3.

4.1.2 Characterisation of The Decorative Elements

The decorative elements not only enhance the overall artistic effect of lacquerware, but are also an important element of the art of lacquerware (5) Participation in the production experience.

decoration. The specific characteristics of the decorative elements on Chengdu lacquerware are shown in Table 4.

4.1.3 Analysis of The Characteristics of The Composition Form

The formal characteristics of the composition of Chengdu lacquer ware are categorised by the type of object to which they belong, as shown in Table 5.

4.2 User Involvement in The Design Process

The design of the Chengdu lacquerware product for user participation is divided into five parts:
    (1) Identifying design elements.
    (2) Reconstruction of design elements.
    (3) Generate design solutions.
    (4) Design solution evaluation.
    (5) Participation in the production experience.

Table 5: Characterisation of the composition of lacquerware forms in Chengdu.

| Type	Name of the object	Composition
Catering	Lacquer cups	Smooth one piece
	Lacquer bottle	Smooth, concave and convex pattern in one piece
	Lacquered plate	Smooth one piece
	Lacquer Goblet	Smooth one piece
	Lacquered tripod	Smooth, concave and convex pattern in one piece
	Lacquered box	Smooth one piece
	lacquer pot	Smooth one piece
	Lacquer pot	Smooth, concave and convex pattern in one piece
	Lacquer cups	Smooth one piece
	Lacquer bottle	Smooth one piece
Grooming	Lacquered trousseau	Smooth one piece
	Lacquered wash	Smooth one piece
	Lacquered table	Smooth and dimpled in one piece
	Lacquered case	Smooth and dimpled in one piece
Etiquette	Lacquer gui	Smooth, concave and convex pattern in one piece
	Lacquer bells	Smooth, concave and convex pattern in one piece
	lacquered tripod	Smooth, concave and convex pattern in one piece
	lacquered horse	Smooth, concave and convex pattern in one piece
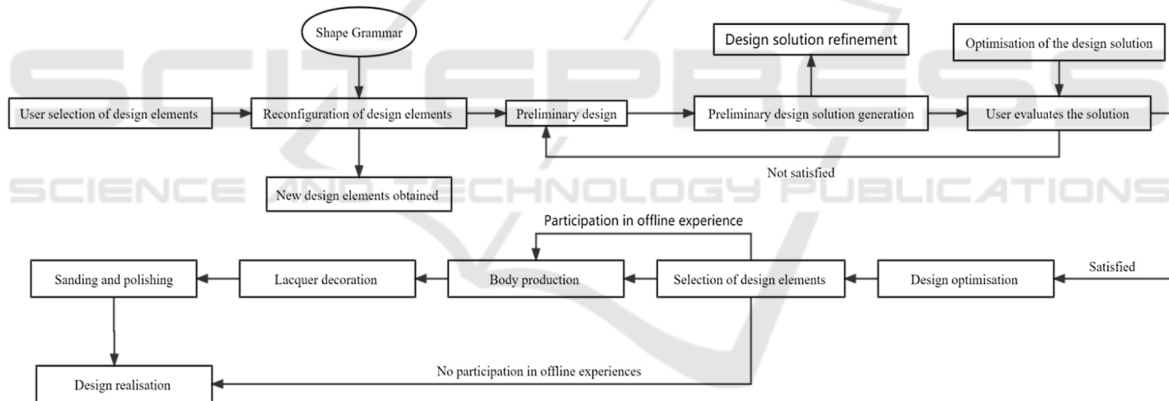
Figure 1: User involvement in the design process.

5 SUMMARY AND OUTLOOK

This study adopted a mapping approach to extract design elements from ancient and existing samples of Chengdu lacquerware products and reconstructed them. The workload was relatively high. Therefore, it is important to consider how to extract design elements from a large number of samples, develop more shapes and patterns, and improve design efficiency. This study used questionnaires and user interviews in the process of obtaining the actual needs of users. Due to the number of questions involved in the questionnaires, some of the respondents may find it tedious and ultimately the data obtained may not be accurate enough. In this regard, there is a need to further enhance the participatory experience of the respondents in the future research process. Finally, as this study is based on user participation in the design of Chengdu lacquerware products, the study is still a bit unconventional in terms of the form, materials and techniques of the products themselves, and needs to be further strengthened and deepened in future research.

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