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博士論文

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Institute of Creative Industries Design
Doctoral Dissertation

傳統工藝轉型設計模式之建構
—以客家竹簾工藝為例

Constructing a Model of Transformation Design for
Traditional Crafts – Taking Hakka Bamboo Curtain
Crafts as an Example

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Constructing a Model of the Creative Ideas for
Traditional Crafts Transformation Design—Taking
Hakka Bamboo Curtain Crafts as an Example

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Abstract

This study aims to create a model for reference for transformations of traditional crafts designs. It takes Liudui's traditional bamboo curtain crafts as an example to explore the possibilities of transformation design for traditional crafts. The transformation design of traditional crafts is different from the design of new products, and the basis of the design cannot deviate from the original threads. Accordingly, the main goal of this research is to engage in transforming the design of products, which is based on tradition, and to break away from its framework at the same time.

The design of creative thinking structure lies in Morphological Analysis, Attribute Listing, and SCAMPER. This research was also supplemented by the Delphi method for expert consultation. Through the checklist, the independent viewpoints of each expert were collected, and from their repeated feedback and aggregation, the recommendations were summarized and finally based on this, simulation designs of bamboo curtains and value assessment and analysis of the value levels were carried out to explore various possibilities of transformation design for bamboo crafts.

This study, by taking scholarly discussions and expert opinions and consultations into account, constructs three levels of value in the design of cultural and creative products. The products with different design orientations have different core focuses. Craft design and industrial design products are more focused on the satisfaction of "Practical Level," while creative design products are more focused on "Sensory Level." Cultural products are more focused on "Spiritual Level," but creative and cultural products' design does not focus on a single value level, instead, they attempt to balance the multiple values to meet the diverse needs of consumers. Therefore, a well-designed cultural and creative product not only has the value on the practical level but also has the values on the sensory and spiritual levels. The proportion of the three value levels depends on the difference in product design attributes. They can have different focuses, but should not be neglected. The product that can be balanced among the three is the best creative and cultural product. Therefore, it is expected that this study, through the construction of a model of transformation design for bamboo curtain crafts, is able to establish a model of transformation design for products of crafts for reference, hoping that the traditional crafts can not only be based on tradition but also bring consumers a refreshing feeling and revive the past glory.

Keywords: traditional craft, bamboo curtain craft, transformation design, creative ideation, value assessment, cultural and creative products

摘 要

本研究旨在建構一個傳統工藝轉型設計可資參考的模式，研究以六堆客家傳統竹門簾工藝為例，探尋傳統工藝轉型設計的各種可能性。傳統工藝的轉型設計有別於新創產品的設計，其設計的基礎不能偏離原有的文化脈絡，因此如何奠基於傳統又能跳脫框架進行產品的轉型設計即是本研究的目標。

本研究結合形態分析法、屬性列舉法及 SCAMPER 奔馳法建構一份創意思考檢核架構，並輔以德菲法進行專家諮詢，透過檢核表彙集每位專家的獨立觀點並進行觀點的反覆收斂與回饋，最後彙整出可資參考的建議，研究最後並以此為基礎進行竹簾的模擬設計及價值層次的評估與分析，以探尋竹簾工藝轉型設計的各種可能性。

本研究綜合學者論述及專家的諮詢，建構文創產品設計的三個價值層次。不同設計取向的產品各有不同的核心訴求，工藝設計或工業設計產品偏重於「實務層次」的滿足、創意設計產品偏重於「感官層次」的滿足，文化產品設計則偏重於「精神層次」的滿足，惟文創產品的設計並不僅聚焦於單一價值層次，而應能兼顧多元價值的平衡，滿足消費者的多元需求。因此一個設計精良的文創產品不僅具有「實務層次」的價值，亦兼具「感官層次」及「精神層次」的價值，三個價值層次偏重的比例可視產品屬性各有偏重但不偏廢，能三者平衡兼具者為最佳之文創產品。本研究期能透過竹簾工藝轉型設計模式之建構，建立一套工藝產品轉型設計可資參考的模式，以期傳統工藝能奠基於傳統又能給消費者帶來耳目一新的感受，再現其舊有風華。

關鍵字：傳統工藝、竹簾工藝、轉型設計、創意構想、價值評估、文創產品

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Chapter 1 Introduction

1.1 Research motivation and purpose

1.1.1 Research Motivation

For the purpose of product innovation, the objective of this study is to explore a way of transforming Hakka traditional bamboo curtains in Taiwan into creative cultural products. The first step is to conduct a field study for classifying available bamboo door curtains and for selecting the most representative bamboo curtain samples. The design elements of the bamboo curtain samples were then analyzed in order to find a way of realizing the innovation of the traditional bamboo blinds and transforming them into creative cultural products.

This study takes Hakka traditional bamboo curtains in Taiwan as an example of transforming design for traditional crafts. According to the researcher's long-term observation of Hakka traditional crafts in the past, bamboo curtains used to be an indispensable life art of Hakkas, but have gradually declined with time. However, this does not lie in only a single factor. Therefore, this study, in the direction of product innovation design, aims to explore the possibility of product transforming design and establish a set of models of transforming design for traditional crafts.

Hanging bamboo curtains is a major feature of Hakka traditional residences, mainly used as door curtains, also known as bamboo door curtains (Figure 1.1). In the early years, almost every household hung bamboo curtains at the entrance of the house doors. It was an indispensable life craft in the lives of Hakka people in the past. Even now, bamboo curtains can still be seen in the Hakka traditional courtyards.



Figure 1-1. Hakka bamboo curtain in Liudui

The common bamboo curtains in Taiwan are mostly used as curtains or screens. The Hakka ancestors in Liudui areas especially designed the bamboo curtains for the needs of their unique architectural space. In addition to anti-mosquito, dust-proof, inside and outside separation, and ventilation, it also has the dual characteristics of visibility and privacy (Figure 1-2). Also, they can be rolled up and removed. In addition, the bamboo door curtains also combine the edging, piping technique, and painting art, which are not available in the general bamboo curtains. Different regions have developed different characteristics, making the bamboo curtains not only practical and beautiful, but also unique as life craft supplies in Luidui (Figure 1-3). However, with time, this traditional skill has gradually declined. Due to consumers' pursuit of higher living standard and the rise of environmental protection, many advantages of bamboo have been re-emphasized, and various bamboo craft designs have been recognized internationally. The traditional bamboo crafts gain a new lease of life. The bamboo curtains have both practical and decorative value and have a long history of tradition. It is worth developing into distinctive local products.

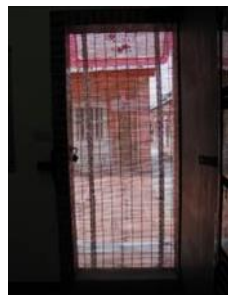


Figure 1-2. Dual characteristics of perspective and privacy



Figure 1-3. Combines the functions of decoration and landscaping

Through the construction of a creative thinking checklist, this research was supplemented by Delphi method for expert consultation. Through the checklist, the independent viewpoints of each expert was collected, and from their repeated feedback and aggregation, the recommendations can be summarized and finally based on this, simulation designs, value assessment and analysis of the products are carried out to explore various possibilities of transformation design for traditional crafts.

1.1.2 Research Purpose

Is there a set of models for the transformation and innovation of traditional crafts? What kind of cultural and creative product design is appropriate? However, until now, only limited related studies have been conducted. Therefore, this study intends to take the transformation of Hakka traditional bamboo curtains as an example and to construct a set of models of creative ideas for reference during product transformation, which will help designers to implement their ideas for product transforming design, and establish a set of value assessment model for cultural and creative product design. Different designs can be created through a value assessment to meet the needs of different customer groups. The purpose of this study is as follows:

1. Establish a creative-thinking checking model: This study intends to integrate Morphological Analysis, Attribute Listing, and SCAMPER to explore the possibility of innovation of Hakka bamboo curtains. The model can systematize the process of creative thinking and help designers to think outside the box and come up with innovation.

2. Establish a model of value assessment: If traditional crafts are to be transformed into cultural and creative products, product performance should be improved, so that products are no longer only practical, but also aesthetic and creative with culture and feelings. The present study intends to establish a set of models of value assessment for cultural and creative product design. Different designs can be created through a value assessment to meet the needs of different customer groups.

3. Establishing a transforming design model for traditional crafts: This study integrates the creative-thinking checking model and the product value assessment level model mentioned above to construct a model of 5 steps for reference for transforming and redesigning traditional crafts. By exploring the feasibility of transforming bamboo curtain products into cultural and creative ones, setting multi-level and spiritual level as the main bases for the reconstruction of cultural and creative products, and promoting value assessment, this study will select the cultural and creative products which can meet the needs of markets. Once this model is established, in the future, it will be applied as a reference to other traditional craft products, which allows designers to transform, upgrade or replace products. As such, those crafts will not disappear with time.

1.2 The Studied Region and Object

1.2.1 Research Region

The purpose of this study is to construct a model of transforming design for traditional crafts, explore the possibilities of transformation design for traditional crafts, and to study the bamboo curtain crafts in the Liudui area of southern Taiwan. "Liudui is the collective name for the six famous Hakka towns and villages in southern Taiwan. It spans the two places: Kaohsiung and Pingtung. In southern Taiwan, the bamboo curtain is a common craft for Hakkas in Liudui. It is a unique life craft product for Hakka people in Liudui.

The creation of this unique craft is related to the construction style of Hakka traditional architecture. Hakka traditional buildings in Luidui are porch-style buildings. The doors are facing a crop square. There are no other external doors that can be used as screens. Accordingly, the Hakka ancestors designed the unique curtains and hung them on the doorway. In terms of practicality, curtains can shield off bugs and dusts and separate the indoors from outdoors. The curtain not only protects the privacy but also enables people to view what happens outside the room. It has the dual functions. When not in use, it can be rolled up, without occupying space, and be removed easily. Meanwhile, it serves as a ventilating device for the old buildings to relieve the summer heat, which helps to solve the problem of early buildings. In terms of artistry, the bamboo curtain combines the edging, piping technology, and painting art that the general bamboo curtains do not have, making bamboo curtains not only practical but also decorative. When a wedding is scheduled, the bamboo curtains are a must-have. It is an extremely practical life craft product in the early days. It plays an important role in daily life and even in the important marriage stage of life (Figure 1-4).



Figure1-4 Traditional Hakka bamboo curtain craft in Liudui

The bamboo curtain samples of this study were obtained by field research and the researcher personally visited Luidui area for on-the-spot investigation and collection. This study recorded the culture of hanging bamboo curtains in Liudui. The samples collected by the field investigation were summarized and classified. Representative samples were selected for follow-up studies.

1.2.2 Research Object

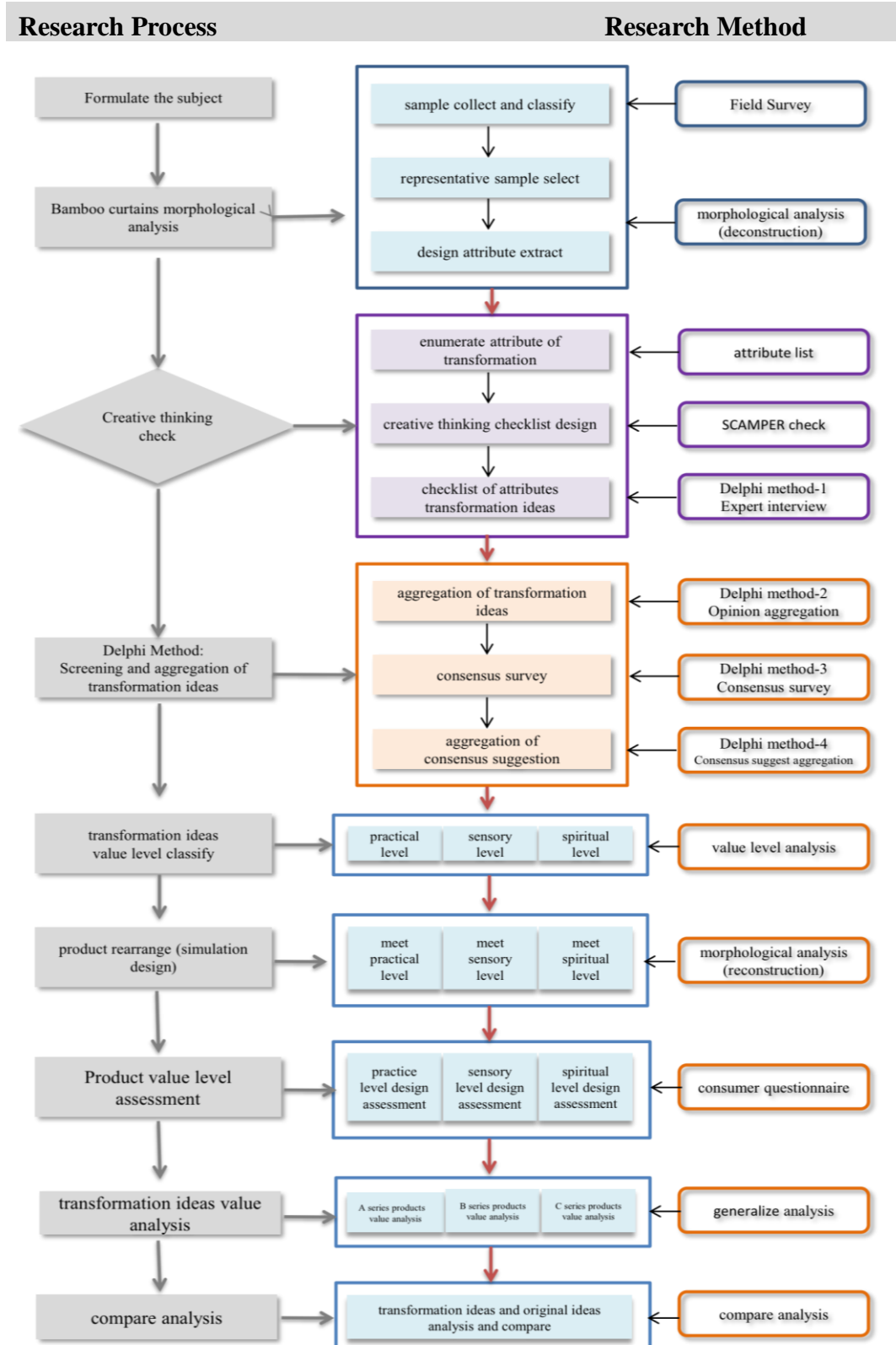
This study takes Hakka traditional bamboo curtains in Taiwan as an example of transforming design for traditional craft and establishes a set of models for transforming traditional crafts. The bamboo curtain is a unique life craft product in the Hakka area of southern Taiwan. It is an indispensable life craft in the life of Hakka people in Taiwan. In the early years, almost every household hung bamboo curtains at the entrance of the house door. It was an indispensable life craft in the lives of Hakka people in the past. Even now, bamboo curtains can be seen in the Hakka traditional courtyards. However, with time, the emergence of substitutes, and the fact that the products themselves are not in line with the current concept of beauty, this traditional skill has gradually declined. Due to consumers' pursuit of higher living standard and the rise of environmental protection, many advantages of bamboo have been re-emphasized, and various bamboo craft designs have been recognized internationally. The traditional bamboo craft gains a new lease of life. The bamboo curtains have both practical and decorative value and have a long history of tradition. It is worth developing into distinctive local products. Through the investigation of this research, we can explore the feasibility of transforming bamboo curtains into cultural and creative products which meet the needs of the cultural industry and the market.

1.3 Research Structure and Flowchart

1.3.1 Research Structure

The research structure is as follows (Table 1-1):

Table 1-1. The research structure



The purpose of this study is to construct a model of transforming design for traditional bamboo curtains and establish a set of models for transforming traditional crafts. The research structure is as follows:

1. The purpose of this study is to construct a model of transforming design for traditional bamboo curtains. First, the field survey was conducted to collect and classify bamboo curtain samples and then representative samples were selected. The morphological analysis was employed to deconstruct the product and recognize its design elements.

2 . Second, the study took every possible transformation of each element into consideration. In order to reduce the limitations of individual subjective thinking, and to make a comprehensive check on the transformable characteristics of traditional bamboo curtains, Attribute listing in combination with SCAMPER was used to draw up a creative thinking checklist. The attributes of the various elements of bamboo curtains were listed one by one, and various transformation ideas were proposed for the seven transformations.

3. This study used the Delphi Method to conduct expert consultations. Through 12 academic, industry, design experts, and scholars' inspection of the transformation concepts, we drew up suggestions for reference by collecting each expert's independent point of view, organizing, and comparing their opinions. Finally, the proposal with higher consensus was used as the reference for transforming bamboo curtains.

4. According to the results of expert consensus screening, products were designed according to different attributes. Finally, the value assessment and analysis of the cultural and creative product design were carried out. The evaluation was divided into three dimensions: practical dimension, sensory dimension and psychological dimension. The three dimensions focused on different directions. The future product design will also promote transforming design and product development according to different levels of demand.

1.3.2 Research Process

This research mainly focuses on Hakka traditional bamboo curtains and explores the possibilities of innovation design of traditional crafts. The study combines Morphological analysis, Attribute listing, SCAMPER, and expert interviews to conduct a creative thinking checklist, and finally evaluates the value of the products in order to meet the expectations of consumers. The research flow of the study is shown below (Table1- 2) :

Table1- 2. Research Process

Research Process		research method
Morphological Analysis --Product Deconstruction	Formulate the subject <ul style="list-style-type: none"> Constructing a reference model for the transformation design of traditional process products. Take the traditional Hakka bamboo curtains of Liudiu as an example. 	
	Sample collect and classify <ul style="list-style-type: none"> carry out field survey to collect samples Sample induction and classification. Select a representative sample for each category as a model for research design. 	field survey
	Design element capture <ul style="list-style-type: none"> Deconstruct the product and draw on the design elements. The bamboo curtain design elements are deconstructed into four elements: bamboo strips, piping, cotton strips and painting. 	morphological analysis - Product deconstruction
Creative thinking check structure establishment	Attribute list <ul style="list-style-type: none"> Combine the attribute listing to enumerate the variables in each element one by one. Bamboo curtain attribute features: such as material / material, shape / style / pattern, color / color, size / length / thickness / width, function / function, method / technology. 	Attribute Listing
	SCAMPER method <ul style="list-style-type: none"> Combine SCAMPER's seven thoughts and explore the possibilities of various variable factors. 	SCAMPER method
	creative thinking checklist design <ul style="list-style-type: none"> Draw up a creative thinking checklist: Combine Morphological analysis, Attribute Listing and SCAMPER method to design a creative thinking checklist structure to systematically conceive. Drafting Checking code and checking items. 	Morphological analysis Attribute listing SCAMPER method
Product value hierarchy assessment form establishment	Theoretical Analysis of Cultural Value Levels <ul style="list-style-type: none"> Inductive scholars' discussion of the cultural value level and corresponds to the level of product design. 	Inductive analysis of literature
	Value hierarchy induction classification <ul style="list-style-type: none"> Cultural value hierarchy classification: (1) use behavior level (2) tangible material level (3) intangible spiritual level 	Inductive analysis
	cultural and creative products attribute feature screening <ul style="list-style-type: none"> In conjunction with the literature expound, the "Modified Delphi Method" is used to conduct expert opinion surveys. With experts gradually enumerate and screen the attributes of different value levels of cultural and creative products and through consensus to screen out the most representative attribute features of each value level as a representative of the attributes of the value assessment. 	Modified Delphi Method (Expert Questionnaire and Consolidation)

	cultural and creative products value hierarchy	<ul style="list-style-type: none"> Divide the value level of cultural and creative products into three levels, each of which lists six main attribute characteristics: <ol style="list-style-type: none"> 1、Practical Level：Practicability、User Pleasure、Functionality、Accessibility、Operability、Convenience。 2、Sensory level：Shape Color、Pattern、Texture Material、Line 3、Spiritual level：Cultural feature、Story behind、Special emotion、Symbolic meaning、Historic significance、Special implication 	induction
	Establish a cultural and creative products value level evaluation form	<ul style="list-style-type: none"> Establish a cultural and creative products value level evaluation form to evaluate the design of the product to see if the product design meets the consumer's expectations. 	value assessment
Creative thinking check	Group of experts	It consists of 12 experts and practitioners in various fields, including three experts in product design field, three scholars in the field of cultural and creative fields, two experts in graphic design field, two non-design background scholars and two experts in bamboo and wood fields.	Delphi method (experts)
	Expert advice -1	The screening of the check items and the proposed transformation concept: the expert consultation with the Delphi method, the respondents to check the check items, and then propose the transformation concept. The first interview's transformation concept uses open-ended consultation, and respondents can propose various possible transformation ideas for the variables of each element.	Delphi method (Expert advice -1)
	Concept screening and consolidation- A	Screen and integrate various transformation ideas, consolidate the ideas and conduct expert consensus surveys.	Delphi method (Opinions - A)
	Consensus survey and screening	The 75% remodeling concept is included in the reference concept for the transformation.	Consensus survey and screening
	Consolidation results feedback consensus survey-a	<ul style="list-style-type: none"> Reconstruction concept consensus survey - Give feedback on the concept of reconciliation to the experts interviewed to adjust the ideas and conduct a consensus survey - Consensus survey to understand the extent to which relevant ideas are accepted by other experts and scholars. - Feedback from different opinions can stimulate new ideas or provide further specific suggestions and practices. 	Consolidation results feedback consensus survey-a

	Consensus screening and consensus review	<ul style="list-style-type: none"> ▪ bamboo curtain design element attribute transformation ideas consensus degree screening - Retain a consensus of more than 75% of the recommendations as a reference for bamboo curtain transformation ideas. - The recommended principle considers the creativity and feasibility of the relevant ideas. - Screening of opinions based on the level of consensus. - Recommendations with a high degree of consensus are included in the reference direction for future product reengineering. 	Consensus screening and consensus review
	Consensus opinion feedback Consensus survey-b	<ul style="list-style-type: none"> ▪ All high degree of consensus opinions and recommendations aggregate - The feedback results are returned to the interviewed experts for a second consensus survey. - Retain the most consistent concept as a reference for bamboo curtain simulation design. - Summarize the feasibility direction of bamboo curtain transformation design. 	Consensus opinion feedback Consensus survey-b
	Consensus perspective Conceptual classification of different design orientations	<ul style="list-style-type: none"> ▪ final aggregated results will be classified according to the hierarchy of values - Practice level design orientation conception - life craft products - Sensory level design orientation conception - creative design products - Spiritual level design orientation conception - cultural and creative design products 	Consensus perspective Conceptual classification of different design orientations

Morphological Analysis Product Reconstruction:Simulation Design and Evaluation	simulation design (product refactoring)	<ul style="list-style-type: none"> Product reconstruction based on questionnaires and assessment results and different core appeals. Then carry out a series of designs according to different needs. Product Reconstruction - Analog Design Series <ul style="list-style-type: none"> Series A - Products with the main level of practice (three models) Series B - Products with sensory level as the main appeal (three models) Series C - Products with a spiritual level as the main appeal (three models) 	simulation design (product refactoring)
	Cultural and creative products value level assessment (consumer questionnaire)	<ul style="list-style-type: none"> The nine design samples of the above three series will be evaluated by consumers in order to understand whether the products meet the expectations of consumers for this type of design oriented products. 	Cultural And Creative products value level assessment (consumer questionnaire)
	Transformation design comparison and analysis	<ul style="list-style-type: none"> Compare products before and after Design and Analysis Related to how products are designed to strike a balance on three levels while highlighting the core values of the design orientation. <ul style="list-style-type: none"> Among the A series products, which one has the highest practical value but at the same time has both aesthetic and cultural characteristics? Among the B series products, which one is the most beautiful and creative, but at the same time it is both practical and even cultural? Among the C series products, what are the cultural characteristics and emotional expressions that are most vivid and at the same time have both practical value and aesthetic appeal? The three series of products will eventually select the best design, and the products with the most cultural characteristics and emotional performance are the best samples of traditional bamboo curtain transformation design. 	Transformation design comparison and analysis
	Conclusion	Traditional process transformation design innovation concept model construction	conclusion

Chapter 2 Literature Review

2.1 Product design methods

There are many methods for product shape design. Different product designs have different design considerations and methods. The product shape design can be divided into two categories:

1. Sensational operation: Collect a wide variety of pictures, images or shapes, and create new product shapes through imagination and association. This is the result of the designer's sensational operation.
2. Rational analysis: Evaluate and analyze the existing products in order to have new combination as the new product shape. This is the result of the designer's rational operation.

Product design methods can be divided into two categories, the shape transformation design method and the shape combination design method. Some are sensational operations, some are rational analysis, and some are the combined results of sensational operation and rational analysis.

2.1.1 Shape transformation design methods

(1) Imitation:

It is a method to imitate what you see in nature for shape creation, such as bionic design. The term Bionic was proposed by JE Stell in 1960. Stell suggested to apply biology to the design and research of engineering. Bionic shape design means the designer directly imitates, transforms, and abstracts the whole image or a certain part of the body of a natural creature for shape design.

(2)Semantics:

The abstract symbols and patterns are interpreted and expressed by words. Ferdinand de Saussure is a Swiss linguist. Saussure (1966) is the first scholar to introduce the concept of linguistics into semiology. He proposed that each sign has two concepts including the signifier and the signified. The signifier indicates the signs that are detectable, audible, and visible at the physical/material layer. On the other hand, the signified indicates the abstract images in one's mind at the spiritual/ideal layer. The signifier of product design is the external visual elements of product shape, and the signified is the aesthetic meaning of product visual design.

At present, in the field of industrial design, semantics is most commonly used among in the theories of semiotics. People use it to present their design. Reinhart Butter (1989), professor of the department of industrial design, Ohio university, proposed the following actions:

1. Establish the goals and characteristics of the product.
2. Establish the expected use and cultural context of the product.
3. List the selected attributes' characteristics.
4. Group and sort the above attributes' characteristics.
5. Look for words that best describe the above characteristics.
6. Evaluate, select and integrate.
7. Technical feasibility.

(3)Image map:

Image map is a tool often used at the beginning of product design for inspiration, mainly to help designers grasp product image and build design consensus through visualization.

The image map is to group and sort the similar pictures of a product according to its image, color, function and show them at axes so as to create a context similar to the target product and stimulate more ideas. In the development process of product shapes, Image Board is used to stimulate more creativity and ideas by designers. The steps can usually be divided into three major procedures: 1. Association 2.Transformation 3.concretization (Lee, SeungHee, 1998)

In the book *Design Dialogue*, Stoops (1983) summed up five strategies for creating new images:

- 1.Extract the details of the image: the focus of the image is extracted as a symbol from the messy imagery.
- 2.Change and transformation: Simplify visual elements such as shapes, lines and colors.
- 3.Happen naturally: Combine unrelated elements to create new ideas.
- 4.Simplify the characteristics of the shape.
- 5.Presented with an abstract element.

(4)Quantification:

The application of quantification method in evaluation and shape design is just like two sides of the same coin. In the evaluation, the quantified object can be the

result defined by qualification, and can also be the result defined by quantification.

1. Shape equalization method: It is a method of quantifying shapes and calculating the average value as a representative shape. The shape equalization method considers aesthetic factors (points, lines, and surfaces) as a quantifiable factor, and a representative shape is calculated from a set of shapes(Chen , 1989).

2. Interpolation is an extended application of the shape equalization method. It adjusts the shape factor by interpolation to create an innovative design that meets the needs of users.

2.1.2 Shape combination design method

(1) Morphological analysis:

Morphological Analysis was proposed in the early 1940s by Professor Zwicky from California Institute of Technology. This analysis deconstructs an original product, analyzes its variability of each element, and finally reconstructs the elements. This method first needs to list all the independent elements of an object with all the variables, makes a Morphological chart, analyzes all the combinations in detail, and comes up with creative ideas for each combination (Zwicky 1966, 1969).The morphological analysis method is implemented as follows:

1. Deconstruct an object into a number of independent elements.
2. For each independent element, consider its variability (variables).
3. Make a morphological chart, setting up a matrix with independent elements as the vertical axis and variables as the horizontal axis.
4. Analyze all the combinations of the elements for creative ideas.
5. Evaluate all possible combinations.

The morphological analysis has two characteristics. One is to think of all the combinations, which include most possible creative ideas. The second is to use Focused Object Technique to review the combinations that are generally not taken into consideration, which may lead to unexpected ideas. The morphological analysis was employed to deconstruct the designs of bamboo curtains and extract related design elements for transformation ideas. Finally, the product reconstruction was carried out according to the transformation ideas.

(2) Structure Variation:

Structural Variation (Tjalve, Eskild, 1979) is mainly applied to expand the possibilities of product structure. Taken primary and secondary functions into consideration, designers need to find appropriate components to meet the requirement of each secondary function. The number of components is controlled in order to change the combinations to produce a variety of different types of the products which have the same qualities. For alternative structures, it is a simple method for designing different shapes for the products with the same function.

(3) Analysis of Interconnected Decision Areas (AIDA):

Analysis of Interconnected Decision Areas (AIDA) is an analytical method in which some relevant decisions must be made for a design problem. Its main purpose is to identify and evaluate all the sub-solutions to the design problem (Morgan, 1971) and to limit the number of solutions according to the relevance of the secondary problem. The steps of AIDA include the following:

1. Identify the viable options of each problem.
2. Indicate which choices conflict with others.
3. Lists all the various combinations of options that can be combined without conflict.
4. Find the combination of options that best meet the indicators.

2.2. Cultural product design model

The design process of general industrial products for mass production is first to have the theme, and then develop the concepts. However, the design procedure of cultural products should begin after the designer's analysis of the culture, and then develop the theme for products. Most importantly, the symbolic meaning represented by the cultural elements must have the same characteristics as the symbolic meaning of the product, so that the meaning of the culture can be appropriately conveyed on the product. Regarding the models of cultural product design, the literature is reviewed in the following:

Guan and Chen (1991) proposed a model of “Refinding elements-Refinding relationships-contrast creation-cultural design.” The core of this model is to create designs through the comparison between the traditional tangible data and abstract concepts, and between the ancient and modern life.

He (1996) addressed that the difference between cultural products and general

products is that cultural products have cultural recognition. Cultural products are developed by reexamining and considering the cultural elements of the objects, and using designs to seek a new and modern form. Cultural products satisfy consumers' spiritual level after use. He and Guo (1997) proposed a design procedure for cultural products. The practices are as follows: (1) Conduct cultural cognition surveys: social and cultural surveys, life style surveys, and product culture surveys. 2. Establish a cultural model: change and adaptation. 3. Set cultural attributes: urban image and rural image. 4) Present cultural representation: shape, color, material, texture, structure, context, and use.

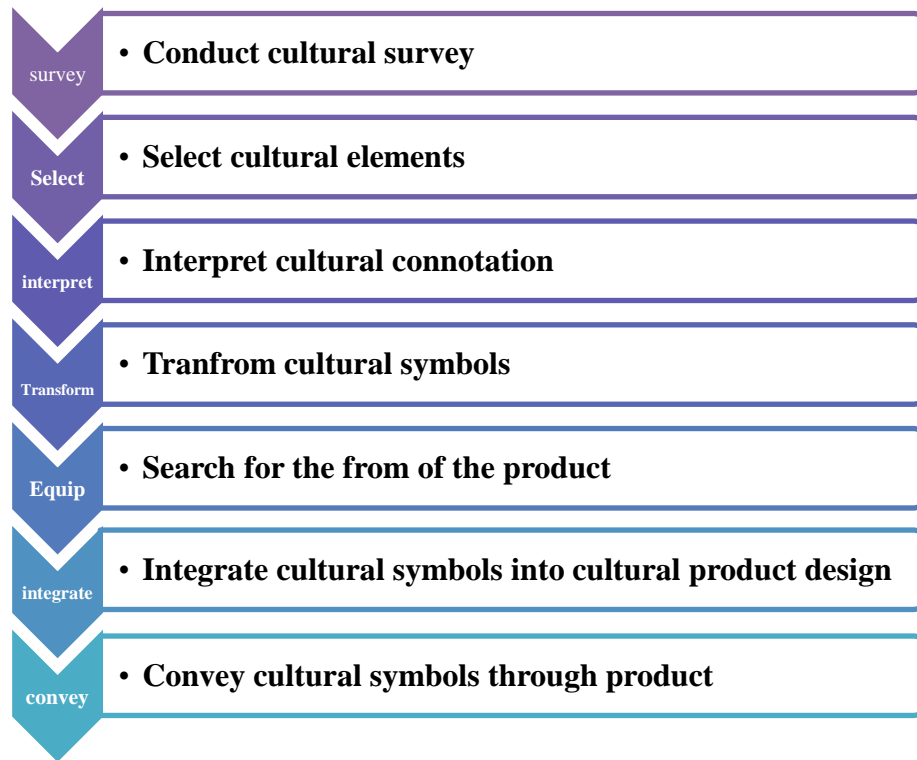
Huang (2003) pointed out that how cultural signs infiltrate into commodities and float out of the appearance of goods basically includes decoration, shape, and meaning transfer of cultural signs. Huang and Li (2004) explored the use of symbols in community cultural goods. Culture is symbolically decoded into commodities. Through “deepening cultural connotation-constituting cultural symbols-combining commodity forms-transferring cultural symbols,” culture is selected, shaped, and translated, equipped, and integrated into cultural goods design.

Xu and Lin (2004) divided the concepts of cultural product design into five when transforming the cultural connotation into design ideas: (1). cultural factor analysis (listing survey); (2.) Cultural level analysis; (3) Design inspiration methods; (4) Corresponding product attributes; and (5) Design evaluation.

Lu and Su (2004) proposed a value-added model for the aboriginal cultural design. As for "subject selection," cultural totem is first taken into consideration, followed by ancestral legends and life behavior; in regard to "commodity condition," product attributes, market segmentation, and product prices are the main consideration; For "design performance" part, color, texture, and material are included.

Based on the above literature review, this study will take the following seven steps for cultural product design: (1) Survey: basic cultural survey; (2) Select: select cultural elements through surveys; (3) Interpret: interpret the connotation of cultural elements by cultural research; (4) Transform: Transform cultural elements into cultural symbols; (5) Equip: Equip the product a suitable form; (6) Integrate: Integrate cultural symbols into cultural goods design; (7) Convey: The consumers accept the cultural symbols conveyed by the cultural goods (Table2-1).

Table2-1. Cultural product design model (developed by this study)



2.3 Creative ideas generating methods

The study of creativity began with the British psychologist Galton's famous "Hereditary Genius" on outstanding figures of creation. The creation process proposed by Wallas in 1926 was regarded as real direct research on creation in modern times (Wallas, 1926, Sadler-Smith, E, 2015). In the industry, creativity research began in the 1930s with the US General Electric Company's Creative Engineering Program. In 1950, Guilford addressed the importance of creativity at the APA Annual Meeting, the research on creativity has sprung up in the academic world.

Since Osborn invented the creative thinking strategy, the brainstorming method, in 1938, there are now hundreds of related strategies were developed. Many strategies have their own similarities and differences, and it is difficult to make a clear classification. Most scholars present the methods by listing. The American psychologist, (J.P. Guilford, 1956, 1967), divides the creative thinking process into two types: Convergent Thinking and Divergent Thinking. Many strategies are both divergent and convergent, so it is difficult to use this trait to make a classification. Chen (2005) used a new way to make classifications for creative thinking strategies, which put similar strategies into series, including brainstorming series, lateral thinking

series, visual thinking series, Attribute listing series, checklist series, and other creative thinking strategies and techniques. Since there are many ways to generate creative ideas, the current study will introduce the important creative thinking methods based on Chen's classifications.

2.3.1 Brainstorming

Brainstorming is a method designed to stimulate creativity and strengthen thinking. It is the most common strategy and technique for creating thinking. Brainstorming was first created in 1938 by Osborn, the founder of the American BBDO (Batten, Bcroton, Durstine and Osborn) advertising company. This method emphasizes collective thinking, focuses on mutual stimulation, and encourages the participants to come out a large number of ideas within a specified time for innovative ideas. Although the brainstorming method is mainly carried out in groups, it can also be used for individual thinking and exploring solutions to problems. The basic two principles of the brainstorming method: 1. Deferment of Judgment; 2. Quantity Breads Quality. The four principles of Brainstorming (BS) are the realization of the above two principles. If those rules are violated, the effects of brainstorming cannot be obtained.

1. Defer judgement
2. Freewheeling is welcomed
3. Go for quantity
4. Hitchhike (improve) on idea (Michael Michalko, 1994)

Brainstorming can be divided into two major stages, ideas generation stage and the ideas evaluation stage, namely, idea Divergence and Convergence. The steps of convergence can be summarized as follows:

1. Inspection and classification
2. Evaluation and filtration
3. Organization and sorting
4. Decision on follow-up

As for evaluation and filtration, there are following methods: Highlighting, A.L.U analysis, KJ Method, and paired comparison method. After many years of evolution and improvement, the brainstorming method has not only derived various improved methods, but its effects have also been verified by many studies. There are numerous methods of creative idea generating developed based on brainstorming method. Therefore, it is the

most common strategy and technique for creating thinking (Chen, 2005).

2.3.2 Lateral Thinking

Vertical thinking and lateral thinking are creative thinking methods for advertising which were advocated by the psychologist Dr Edward De Bono, who invented lateral thinking and developed a formal approach to creative thinking. Horizontal thinking and vertical thinking (logical thinking) are relative concepts, and the differences are as follows:

1. Vertical thinking : Vertical thinking: It is a logical thinking and analysis method. It is a traditional thinking mode. This type of thinking is based on a certain thinking line, in a fixed scope, from top to bottom. Therefore, it is called vertical thinking method for in-depth research, analyzing and researching vertically from the known theory, knowledge and experience. This kind of thinking method is suitable for more in-depth research on a given problem. Emphasis on induction and deduction is a very important way of thinking, but it is very difficult for a person to use only vertical thinking for creativity.

2. Lateral Thinking : also known as divergent thinking. Compared with vertical thinking, lateral thinking is not too much considering the certainty of things, but considering the possibility of multiple choices. It means to get rid of the inherent mode of a certain thing, observe and think from multiple angles and aspects, and capture the idea that happens by chance, so as to produce unexpected "creativity". This type of thinking means getting rid of existing knowledge and old experience constraints when thinking about problems, breaking through routines, and put forward creative insights, ideas, and solutions. The concern is not to improve old ideas, but to propose new ideas; no to pursue correctness blindly, but to pursue richness. Lateral thinking is invented to make up for the shortcomings of vertical thinking to jump out of the existing ways of thinking and to propose different solutions from different angles.

Edward De Bono has published more than 50 books related to creative thinking, including *The Use Of Lateral Thinking*, *Six Thinking Hats* and *Six Action Shoes*, which are popular all over the world.

(1) Six thinking hats

The Six Thinking Hat is a thinking training model, or a model for comprehensive

thinking, developed by British scholar Edward De Bono. It provides a tool for "lateral thinking" and avoids wasting time on disputes. Thinking is like wearing a hat, only one at a time, and you can take off another hat at any time. The six thinking hats is a kind of creative thinking technique in which six kinds of hats represent six different thinking modes. When we are thinking, we also take other factors into consideration at the same time. We try to take care of the facts, and establish the logical relationship among them, but can't ignore emotional factors, which cause obstacles in our thinking for the best judgments or choices. Six thinking hats will teach you to think in the right way. Don't do a lot of things at the same time. We only wear one hat at a time, thinking in one way at a time. Hats come in six colors, each representing a way of thinking, and the thinking modes of the six thinking hats are described below (Edward De Bono,1998) .

1. White hat: White is neutral and like white paper, conveys simple facts. In brainstorming, when you put your white hat on, you want more information.
2. Black hat: Black is judgmental like the black hat a judge puts on when passing the death sentence. In brainstorming, when you put your black hat on, you pick holes in others' ideas.
3. Red hat: Red is fire, warmth and energy and represents intuitive thought. It is the color of a witch's hat. In brainstorming, when you put your red hat on, you tell people how you feel.
4. Yellow hat: Yellow is the color of a straw boater and is summery, positive and optimistic. When you put your yellow hat on, you let others know what you like about their ideas.
5. Green hat: Green, the color of a gardener's hat, represents new life. When you put your green hat on, you are free to express any new ideas no matter how crazy they sound.
6. Blue hat: Blue is the color of cool, detached thinking as if you were looking down from the sky. When you put your blue hat on, you look at ideas logically.

(2) Six Action Shoes

Six Action Shoes is also a lateral thinking strategy. It solves problems in six different modes of action. It is another thinking training model developed by British

scholar Dr Edward De Bono. It directly follows the framework of six thinking hats. Hats suggest thinking, shoes suggest action. The plans that the hats come up with are handed over to the shoes. For different situations, you must put on different shoes, but how to put these shoes on properly? The need for perfect action implies that we must break the action down into six different modes. Each pair is assigned a different color, with each representing a specific mode or action. ° Six action shoes is a practical decision-making framework designed to take the best action in any situation. Each pair of shoes has a special color to meet the requirements of this style of action. The concept of the six action shoes is described below (Edward De Bono,1991) .

1. Navy Shoes: Navy blue is the color of routines. We take navy blue action when we follow the rules.
2. Grey Sneakers: Grey is the color of brainwork, as in "the old grey matter", and is put on when we need to investigate more.
3. Brown Brogues: Brown is the color of earth and represents what is down-to-earth. Brown brogues are put on to take practical action.
4. Orange Gumboots: Orange is the color of warning signs. This is action to avert a crisis.
5. Pink Slippers: Pink is what is comfortable, caring and understanding. We put on pink shoes when it is important to consider and respect human feelings.
6. Purple Riding Boots: Purple is pomp and splendor and represents responsible thinking, what we should do.

The benefits of the six thinking hats and six action shoes: The "Six Thinking Hats and Six Action Shoes" models are very helpful when a group wants to formalise their thinking and decisions about a problem. By allowing different kinds of thinking approach, they allow a group to think in certain ways which, without this permission, would cause disagreement and dissension. As a result, thinking and decision-taking processes are more structured, more open, and more productive.

2.3.3 Visual Thinking

Visual thinking is a kind of thinking technique presented by drawings/diagrams. Common visual thinking methods include mandala thinking method, mind mapping method, Fishbone diagram method, image stimulation method, mental sketch method,

gallery method, imaginative thinking method, Free Association technique and so on (Chen,2005). This study uses mandala thinking method, mind mapping method, and fishbone diagram to explain visual thinking.

(1) Mandala Thinking

Mandala thinking, also known as the nine-grid thinking method, is a thinking strategy that helps divergent thinking. It uses a picture like a nine-grid diagram to write a theme in the center, and then writes the ideas or associations triggered by the theme in the remaining eight circles. Mandala is an integrated system. It starts with a complete segmentation, makes sure which elements to start with, and then integrates and reorganizes them one by one. After several decompositions and combinations to the final stage, a comprehensive image of analogy will appear. This is the structure of the mandala thinking (Chen, 2005).The two basic types are:

1. The ideas of a theme in the center have spread to all sides.
2. It is a step-by-step thinking process, in a clockwise direction, from the center to the final conclusion.

Mandala thinking method has the qualities of visual thinking, including divergent thinking, convergent thinking, balanced thinking, and systematic thinking.

(2) Mind mapping

Invented by a famous British psychologist, Tony Buzan, in the early 1970s, mind mapping is a method for divergent thinking. It can visualize all the ideas/thoughts and their associations with colors, symbols, lines, drawings, and keywords (Lung-An Chen, 2005). Mind mapping has the following advantages:

1. Simple and easy to use.
2. Correlation. Every idea is related.
3. Visualization. It is easy to remember.
4. Branches help us to think from all directions/perspectives.
5. Main points. Those points help us to see the main problems and the connections among them.

(3) Fishbone diagram

Fishbone Diagram was developed by Ishikawa, a Japanese organizational theorist, so the diagram was also named Ishikawa Diagram. The fishbone analysis method is to use a diagram to summarize the characteristic of a problem and the important causes of the characteristic. Because it is shaped like a fish bone, it is also

called a "Fishbone Diagram." The fishbone diagram shows the cause-effect relationship between the design goal and its related factors in a hierarchical structure.

The fish head is the design goal, the backbone shows the various factors to achieve the goal, and the fish bones are the possible content or options of each factor. The key to fish bone analysis is to identify problem categories, find out major problems, and propose solutions. The principle of the fishbone analysis is to start thinking from backbone to small bones. First, find out the most important problems, analyze the factors that cause the problem, and then analyze the factors that lead to the small problem, and finally propose solutions to the smallest problem.

2.3.4 Attribute listing Method

The Attribute listing method is a means to analyze logically the characteristics, and advantages and disadvantages of a specific object, and then propose improvement approaches for each listed item. Common Attribute listing methods include Attribute Listing Technique, hope Listing method, Advantage Listing method, and Disadvantage Listing method. In addition, the SAMM method, function-purpose method, etc., are the extension of the Attribute listing method. The commonly used Attribute listing methods include the Attribute Listing Technique, the Hope listing method, the advantage listing method, and the defect listing method. The SAMM method and Function-Purpose Method (FPM) are the extensive application of Attribute listing methods.

(1)Attribute Listing Technique

Attribute listing is a well-known creative thinking strategy, which was first proposed in 1954 by US Professor Robert (Crawford 1979). This method emphasizes the importance for a user to observe and analyze characteristics or attributes of objects or problems during the process of creation. After that, the user can propose conceptions of improvements or changes by aiming at each of the characteristics. The purpose of this approach is to list a product's changeable characteristics in a more comprehensive way so as to avoid the limitations of thinking. The practical way is to list various attributes of an object that is typically accomplished in a way of listing various types of modifiable attributes and features of a product. Afterwards, the relevant modification will be recombined in order to propose the conception of new products.

(2)Hope listing method

It is through constant wish making "I wish I can," and "how to make it better" and then to propose strategies or approaches to make wishes come true. The steps of hope listing method are first to determine the theme, then list the hopes of the theme, and then consider how to select the hopes for accomplishment.

(3) Defect listing and advantage listing methods

Defect listing method is a way of thinking to improve the status quo. By constantly reviewing the shortcomings and defects, the solution to the problems will be proposed for those shortcomings. The steps of defect listing method are first to determine the theme, then list the disadvantages of the theme, and then consider how to select the disadvantages to make improvement. On the contrary, advantage listing is a method to list all the advantages one by one, and then attempt to solve problems and made improvement. The steps of advantage listing method are first to determine the theme, then list the advantages of the theme, and then consider how to expand the advantages according to the selected advantages.

2.3.5 Check-List Technique

The so-called check-list technique is first to list all the relevant problems about design or the problem that needs to be solved, then check each item on the checklist, have further discussions and examination, and finally come out the solutions to the problems or the innovative ideas for the design. The checklist can help thinkers to make compulsive associations. They will concentrate all their thoughts on the check items in a short period of time. Each item is checked one by one to avoid omissions for more and better ideas. When looking for solutions to a problem, a list is first made and each item is checked one by one to avoid any omissions. This method helps to think up new ideas and make more improvements or innovations. Until now, some scholars have developed a number of checklists, but the most widely used ones are Osborne's check(Osborn,1963)and Eberle's SCAMPER(Eberle,1971).

(1) Osborn Checklist:

There are nine points on the Osborn checklist. The short text or questions are written on a card to make a checklist to propose more improvement ideas or innovative solutions (Osborn, 1963).The nine questions are listed below (Table2-2):

Table 2-2. Osborn's Checklist

Put to Other Uses?	New ways to use as is?
	Other uses if modified?
Adapt?	What else is like this? What other idea does this suggest?
	Does past offer parallel? What could we copy? Whom could we emulate
Modify?	New Twist? Change meaning, color, motion, sound, odor, form, shape? Other changes?
Magnify?	What to add? More time? Greater frequency? Stronger? Higher? Longer? Thicker? Extra value? Plus ingredient? Duplicate? Multiply? Exaggerate?
Minimize?	What to subtract? Smaller? Condensed? Miniature? Lower? Shorter? Lighter? Omit? Streamline? Split up? Understate?
Substitute?	Who else instead? What else instead? Other ingredient? Other material? Other process? Other power? Other approach? Other tone of voice?
Rearrange?	Interchange components? Other pattern? Other layout? Other sequence?
	Transpose cause and effect? Change pace? Change schedule?
Reverse?	Transpose positive and negative? How about opposites?
	Turn it backward? Turn it upside down? Reverse role?
	Change shoes? Turn tables? Turn other cheek?
Combine?	How about a blend, an alloy, an assortment, an ensemble? Combine units?
	Combine purposes? Combine appeals? Combine ideas?

(2) SCAMPER

SCAMPER is an abbreviated name for the thinking of developing creativity and it is one of the important methods of modern innovative thinking. In 1971, US Psychologist Robert F. Eberle referred to Osborn's checklist (Osborn, 1963) and proposed another type of creative thinking checklist method which is later called SCAMPER (Eberle, 1971). It is an approach that allows thinking outside the box and allows the creativity to run quickly and therefore is often used for product improvements. This type of checklist can trigger a designer's creativity and its name is an abbreviation of seven English characters each of which represents one of the seven modification directions which are respectively S-(Substitute), C-(Combine), A-(Adapt), M-(Modify/Magnify), P-(Put to other uses), E-(Eliminate), and R-(Rearrange/Reverse) (Table 2-3). By means of the approaches mentioned above, .

this way the time spent on innovations can be saved and the innovative thinking process can be systemized.

Table 2-3. SCAMPER Checklist

Mnemonic	Meaning	Helper Questions
S	Substitute	<ul style="list-style-type: none"> • What can I substitute? • Who can I substitute? • Who else? • What else? • What other place? • What other time, routine, or process?
C	Combine	<ul style="list-style-type: none"> • Combine what? • Combine ideas? • Combine purposes? • Combine materials? • Can anything be blended or ensemble?
A	Adapt	<ul style="list-style-type: none"> • How is the problem currently solved? • How can it be made more accommodating? • How can it be more compatible? • How can it be more consistent?
M	Modify/Magnify	<ul style="list-style-type: none"> • How can this be altered for the better? • What can I modify? • Modify color? • Modify shape? • Change motion or sound? • Change size, form, or taste?
P	Put to other uses	<ul style="list-style-type: none"> • What else can this be used? • What are those uses? • Who else could use it? • How would they use it?
E	Eliminate	<ul style="list-style-type: none"> • What should I add or take away? • What should I simplify or enrich? • Should it be plain or fancy? • How can I do these? • How will this affect the target?
R	Rearrange/Reverse	<ul style="list-style-type: none"> • What other arrangements might be better? • What would happen if I flipped the order? • Rearranged the sequence, layout, or pattern? • Turned it over or backwards?

2.4 Culture value level

Several scholars proposed different opinions regarding cultural or creative product values. The classification of culture level by Yang (1998), the spatial perspective of culture level by Leong (2003), and the emotional designs level by Norman (2004) are examples of such discussions. The scholars further expounded on the different discussions.

2.4.1 The classification of culture level

In the discussion of the cultural level, Yang (1998) divided the culture into three levels, namely, the natural level, the physical level and the metaphysical level. The natural level is the artifact culture, which is the object and the concrete visible form used by human beings; the physical level is the life culture, which belongs to the system of human interaction; the metaphysical level is the spiritual culture, which is a deep-structured thinking activity, spirit and the language, and refers to the spiritual culture of ideology and conscience which is intangible.

Zheng (2004) then further reorganize the application of cultural integration design and interpret its connotation. Zheng believes that Yang 's cultural levels are different from each other if they are transformed into the levels of the product design. The natural level focuses on the specific external features, and the physical level focuses on the real life experience. The metaphysical level focuses on the hidden feelings of the spiritual mind.

2.4.2 The spatial perspective of culture level

Leong (2003) proposed three levels of spatial perspective of culture which includes the Outer tangible level, the Mid behavioral level and the Inner intangible level. The Outer tangible level refers to the physical/material part-daily related object and tool; Mid behavioral level refers to the social/behavior part-human related ritual and custom, and the Inner intangible level refers to spiritual/ideal part-emotion, reflected art and religion as shown in figure 2-1.

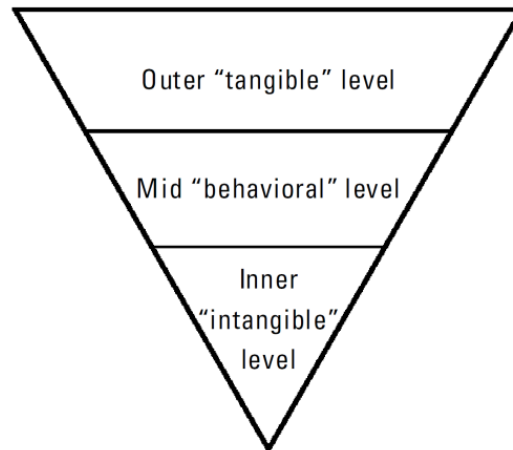


Figure 2-1. The "spatial perspective" of culture /Leong (2003)

With this inverted triangular frame as the foundation, Hsu (2004), Lin (2005, 2007) took a step forward in this, divided into three spatial perspective of culture level corresponding to the three layers of culture, and put forward each cultural layer to design features(figure 2-2). Different layers of product design are different, from the Outer tangible level, the Mid behavioral level to the Inner intangible level, to list his response to the product design.

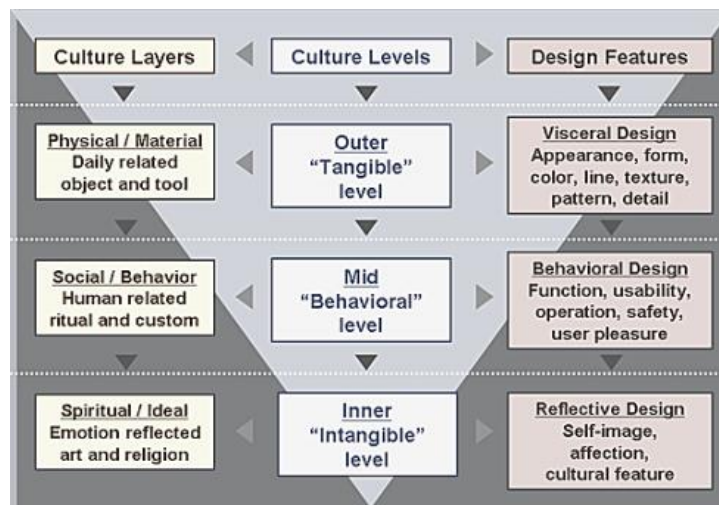


Figure2-2. Three value levels of culture product design./ Hsu (2004)

The Outer tangible level focuses on the visceral design-appearance, form, color, line, texture, pattern and detail, the Mid behavioral level focuses on the behavioral design-function, usability, operation, safety and user pleasure, the Inner intangible level focuses on the reflective design-self-image, affection and cultural feature(Table2-4) This structure makes a clear response to the nature of the cultural characteristics of the product design.

Table2-4. The spatial perspective of culture level

Spatial perspective of culture level	Culture level	Cultural product Attributes
Outer tangible level	Visceral Design	Appearance,form,color,line,texture,pattern,detail
Mid behavioral level	Behavioral Design	Function,usability,operation,safety,user pleasure
Inner tangible level	Reflective Design	Self-image, affection, cultural feature

2.4.3 Emotional designs level

Discussion on the level of product value, Norman (2004) proposed Emotional Designs. He believes that a perfect product design must cover three stages: Visceral level, Behavioral level and Reflective level, but also put forward each level corresponds to the design elements that needed emphasis.

Norman (2004) put forward the three levels to match the level of human needs. The Visceral level affects the consciousness before thinking about the design of the product, including the appearance of the product, touch, perception and feeling. The Behavioral level is related to the use of the product and the consumer's experience of the product, but the experience itself contains a lot of factors, such as function, performance and accessibility. Reflective level is the highest level of emotion, and awareness, it is easy to change with culture, experience, education, and individual differences.

Norman proposed the design factors that corresponds to each level, and analyzed the emotional response of the consumers, on the basis of the layer to achieve a complete consumer experience. The Visceral level on the design factors, mainly to strengthen the product's appearance; the Behavioral level corresponds on the design factors, mainly focuses on the effectiveness of the product process and pleasure; and the Reflective level corresponds on the design factors, mainly to strengthen the user's self-image of the product, a personal satisfaction and memories.

Norman proposed the design factors that corresponds to each level, and analyzed the emotional response of the consumers, on the basis of the layer to achieve a complete consumer experience. The Visceral level on the design factors, mainly to strengthen the product's appearance; the Behavioral level corresponds on the design factors, mainly focuses on the effectiveness of the product process and pleasure; and the Reflective level corresponds on the design factors, mainly to strengthen the user's self-image of the product, a personal satisfaction and memories.

Chapter 3 Research Methods

The purpose of this study is to construct a model of transformation design for traditional crafts, to explore the possibilities of transformation design for traditional crafts, and to study the bamboo curtain crafts in Luidui. This study first combined Morphological Analysis, Attribute Listing, and SCAMPER to construct a creative thinking checking structure. Morphological Analysis deconstructs the design elements of a product, and finally reconstructs the product; Attribute Listing method enumerates all the variable factors in each element, which can avoid the limitation of thinking. SCAMPER is intended to have systematic thinking, which helps to stimulate designers to think outside the box and to develop new ideas. This method is most commonly applied to upgrades of traditional products. Through the construction of a creative thinking checklist, this research was supplemented by Delphi method for expert consultation. Through the checklist, the independent viewpoints of each expert were collected, and from their repeated feedback and aggregation, the recommendations can be summarized and finally based on this, simulation designs, value assessment and analysis of the products are carried out to explore various possibilities of transformation design for traditional crafts. Through the above research methods, the current study established a creative thinking checklist and the value assessment model for bamboo curtains. The research methods and research designs are described below.

3.1 Research Methods

The purpose of this study is to construct a model of transformation design for traditional crafts, to explore the possibilities of transformation design for traditional crafts, and to study the bamboo curtain crafts in Luidui. The research conducted a field survey to collect the samples, and Morphological Analysis was used to deconstruct and reconstruct the products. The deconstructed elements were checked by Attribute Listing and SCAMPER to construct a creative thinking checklist. Through Delphi method, expert consultation was conducted. Then, the researcher integrated all the ideas/responses from the expert advice and a consensus survey for product reconstruction, and finally through the value assessment evaluated the designs in order to explore whether the product design can meet consumer expectations.

3.1.1 Field Survey

This study took Hakka traditional bamboo curtains in Taiwan as an example of transformation design for traditional crafts. The research area was in Luidui of southern Taiwan. "Luidui" is not an administrative area. Luidui is a collective name for the six famous Hakka towns and villages in southern Taiwan spanning Kaohsiung and Pingtung. "Bamboo curtain" is a unique life craft product in the Hakka area of southern Taiwan. The creation of this unique craft is related to the construction style of the Hakka traditional architecture. In the early years, almost every household hung bamboo curtains at the entrance of the house doors. Even now, bamboo curtains can be seen in the Hakka traditional courtyards (see Appendix I). The bamboo curtain samples in this study were taken from 96 Hakka villages in Luidui. The bamboo curtain samples were obtained one by one by field surveys. Photos were taken and then classified. Representative samples were selected as a basis for follow-up studies (Appendix II).

3.1.2 Morphological Analysis

Morphological Analysis was proposed in the early 1940s by Professor Zwicky from California Institute of Technology. This analysis deconstructs an original product, analyzes its variability of each element, and finally reconstructs the elements. This method first needs to list all the independent elements of an object with all the variables, makes a Morphological chart, analyzes all the combinations in detail, and comes up with creative ideas for each combination (Zwicky 1966, 1969). The morphological analysis method is implemented as follows:

1. Deconstruct an object into a number of independent elements.
2. For each independent element, consider its variability (variables).
3. Make a morphological chart, setting up a matrix with independent elements as the vertical axis and variables as the horizontal axis.
4. Analyze all the combinations of the elements for creative ideas.
5. Evaluate all possible combinations.

The morphological analysis has two characteristics. One is to think of all the combinations, which include most possible creative ideas. The second is to use Focused Object Technique to review the combinations that are generally not taken into consideration, which may lead to unexpected ideas. The morphological analysis was employed to deconstruct the designs of bamboo curtains and extract related design elements for transformation ideas. Finally, the product reconstruction was carried out

according to the transformation ideas.

3.1.3 Attribute Listing

Attribute listing is a well-known creative thinking strategy, which was first proposed in 1954 by US Professor Robert Crawford (1979). This method emphasizes the importance for a user to observe and analyze characteristics or attributes of objects or problems during the process of creation. After that, the user can propose conceptions of improvements or changes by aiming at each of the characteristics. The purpose of this approach is to list a product's changeable characteristics in a more comprehensive way so as to avoid the limitations of thinking. The practical way is to list various attributes of an object that is typically accomplished in a way of listing various types of modifiable attributes and features of a product. According to its noun attributes, verb attributes, and adjective attributes followed by proposing the concepts of modification. Afterwards, the relevant modification will be recombined in order to propose the conception of new products. As of now, the attribute listing approach has been extensively used in various types of fields including creativity enlightening (Studer et al., 2016), creative designs (Kim et al., 2005), styling or product design like the air conditioner design (Wu and Wang, 2011), styling analysis of medical treatment products (Shen et al., 2015), design of medical treatment equipment (Melgozaa et al., 2012), etc.

This method is especially suitable to construct creative ideas for upgrading traditional products, so it can be applied to creative thinking in product transformation design. When transforming the designs of traditional craft products, this method can be employed for the creative thinking of craft-related attributes. However, the attributes in different products may be different. The interpretation of attributes may vary from person to person, so designers just need to follow the spirit of Attribute Listing and list the attributes that are suitable for the research topic, and then stimulate different thinking through various creative thinking methods. The following is a list of the relevant attributes for craft products (Table3-1).

The application of Attribute Listing in this study is to list the attributes of the bamboo curtain design, and combine SCAMPER method to transform the design elements.

Table 3-1. List of attributes of process products

Attributes classification	Attributes and features	Attribute Listing
Noun attributes	a- Material	List the materials or textures that make up the product.
	b- Pattern	List the shape or style of the product
Adjective attributes	c- Color	List the color of the product
	d- Dimension/scale	List the dimension, size, proportion, shape of the product
Verb attributes	e- Function	List the various functions of the product
	f- Method / Technology	List the production methods of each component of the product

3.1.4 SCAMPER creative thinking checklist

SCAMPER is an abbreviated name for the thinking of developing creativity and it is one of the important methods of modern innovative thinking. In 1971, US Psychologist Robert F. Eberle referred to Osborn's checklist (Osborn, 1963) and proposed another type of creative thinking checklist method which is later called SCAMPER (Eberle, 1971). It is an approach that allows thinking outside the box and allows the creativity to run quickly and therefore is often used for product improvements. This type of checklist can trigger a designer's creativity and its name is an abbreviation of seven English characters each of which represents one of the seven modification directions which are respectively S-(Substitute), C-(Combine), A-(Adapt), M-(Modify/Magnify), P-(Put to other uses), E-(Eliminate), and R-(Rearrange/Reverse) (Figure 3-1).



Figure 3-1 : SCAMPER

By means of the approaches mentioned above, this way the time spent on innovations can be saved and the innovative thinking process can be systemized (Table 3-2). However, it should be noted that the application of SCAMPER is only to provide a direction for checking. Sometimes, different modification directions are prone to problems or confusion. Therefore, some similar modification checking items can be combined to avoid interviewees' confusion and difficulties.

Table 3-2: SCAMPER Creative thinking checklist

Mnemonic	Meaning	Helper Questions
S	Substitute	<ul style="list-style-type: none"> • What can I substitute? • Who can I substitute? • Who else? • What else? • What other place? • What other time, routine, or process?
C	Combine	<ul style="list-style-type: none"> • Combine what? • Combine ideas? • Combine purposes? • Combine materials? • Can anything be blended or ensemble?
A	Adapt	<ul style="list-style-type: none"> • How is the problem currently solved? • How can it be made more accommodating? • How can it be more compatible? • How can it be more consistent?
M	Modify/Magnify	<ul style="list-style-type: none"> • How can this be altered for the better? • What can I modify? • Modify color? • Modify shape? • Change motion or sound? • Change size, form, or taste?
P	Put to other uses	<ul style="list-style-type: none"> • What else can this be used? • What are those uses? • Who else could use it? • How would they use it?
E	Eliminate	<ul style="list-style-type: none"> • What should I add or take away? • What should I simplify or enrich? • Should it be plain or fancy? • How can I do these? • How will this affect the target?
R	Rearrange/Reverse	<ul style="list-style-type: none"> • What other arrangements might be better? • What would happen if I flipped the order? • Rearranged the sequence, layout, or pattern? • Turned it over or backwards?

The SCAMPER approach is often used for the improvement on existing products. During the development and innovative thinking process in various design

fields, the SCAMPER approach is often utilized on turbomachinery industrial designs (Childs and Tsai, 2010), design of creative cuisines (Kudrowitz et al., 2014), character designs (Yuenetal.,2015), development of universal products (Liu, 2012), design of lighting fixtures (Shohdy Ahmed, 2016), paper cutting with creative patterns (ÇEĞİNDİR and ÖZ, 2016), etc. With the fast development in economy, the SCAMPER approach is further used extensively in many other fields such as the solutions to service design problems (Moreno et al.,2014), engineering concept generalization (Shanna et al.,2012), innovative designededucation method (Seo and Kim, 2014), design heuristics (Yilmaz et al., 2011), and the application of creative thinking education (Chen, 2010), etc.

Though the attribute listing approach and the SCAMPER approach are often used for product improvements, there are few studies which applied these approaches to the modification of traditional craft products. This study aims to combine both the attribute listing and SCAMPER checklist approaches in order to carry out imaginative design thinking on traditional bamboo curtains. The eventual attempt is to overcome the limitation of traditional design thinking.

3.1.5 Delphi Method 、 Modified Delphi Method

Delphi Method is a forecasting method that converges on the independent viewpoint of experts, through expert consultation, independent predictions, statistical regression, and analysis of results to gradually obtain the prediction. The reason that this study used Delphi method is to consult experts' opinions extensively for independent creative ideas. Interpretation, analysis, and induction from the opinions of experts are implemented until the consensus of the opinions is reached. Delphi method was first created in the 1940s by Helmer and Gordon. In 1948, the Rand Corporation in America tried to avoid group members' blind obedience to a majority or authority during a collective discussion, and for the first time, used this method for qualitative predictions, which were later widely adopted (Boberg & Morris-Khoo, 1992). The original application of Delphi method was for military predictions. After the 1960s, it was gradually applied to other fields (Dunn, 1988). In addition to the industrial, commercial, educational, academic, and medical organizations, this method was used as assessment and forecasting methods, such as population prediction, education prediction, operational and demand forecasts, and health care prediction. It is also used for evaluation, decision making, management communication, and planning.

"Delphi Method" is a method of group decision making, anonymous experts collective decision-making, the problem needed to be addressed separately sent to the hands of the various experts consulted, then recovered summary of the collective opinions, and then analyze the results, along with new responses to the questionnaire as a correction to the previous reference of the experts' opinion. Experts then revised their original opinions based on the collected opinions and sum them up so that the distinction between the opinions of the experts is minimized and a consensus on the issues is reached (Hartman, 1981) (Delbecq, Van de Ven, Gustafson, 1975). The features of this study method are to invite experts in relevant fields to systematically collect opinions in an anonymous and written manner about a topic (Patton, 1986) [13], and use the feedbacks from each round to construct questions of the next round in order to achieve expert knowledge sharing (Awad & Ghaziri, 2006), which is a way to converge the experts' independent views and to achieve a final consensus.

The features of this study method are to invite experts in relevant fields to systematically collect opinions in an anonymous and written manner about a topic (Patton, 1986), and use the feedbacks from each round to construct questions of the next round in order to achieve expert knowledge sharing (Awad & Ghaziri, 2006), which is a way to converge the experts' independent views and to achieve a final consensus.

Since the Delphi Method is more time consuming and not easy to control when applied, experts' opinion is also prone to conflicts, therefore Murry & Hammons (1995) put forward "a Modified Delphi Method". "A Modified Delphi Method" is substantially the same with the traditional statistical Delphi Method. The biggest difference is that the part of the open-ended questionnaire, typical for Delphi Method, is deleted, and the literature collection or the structured questionnaire developed and planned by researchers is adopted in the first round of the questionnaire, which not only can avoid the shortcomings of time-consumption but also enable expert opinions to focus on the research topics. Lanford (1972) pointed out that the more obvious aggregation of expert opinions usually occurs between the first and second rounds in the research by the modified Delphi method, so the modified Delphi research requires at least two rounds of feedback. In the present study, for different contents, the researcher adopted different methods for an expert survey. Some contents used the "Delphi Method," while some used the "Modified Delphi Method." In order to save time and enhance the understanding of the interviewed experts about research topics, and enable experts

to focus more on the research, the Modified Delphi Method is adopted to survey the experts' opinions. The creative thinking checking of this study was conducted by the Delphi method for expert consultation, and the establishment of the value level assessment checklist was carried out by the Modified Delphi Method.

The research invited twelve experts in different areas of the questionnaire, which contains three scholars in the field of product design, two in graphic design, three in cultural and creative fields and three from non-academic background of the design and two experts in the field of bamboo and wood. Through the consultation with each expert, the researcher converged the independent viewpoint of the experts, and finally obtained the consensus of transformation designs for bamboo curtains.

3.1.6 Questionnaire survey

The questionnaire survey is also called the opinion inquiry survey. The questions designed in the questionnaire can be used to explore the opinions and feelings of the interviewees to help researchers understand, explain, or predict certain phenomena. This study employed the Likert Scale to design the questionnaire. The questionnaire survey of this research is to explore the value levels of cultural and creative product designs. The sampling method, participants, and questionnaire design are as follows:

(1) Sampling methods and participants: This study used purposive sampling. The samples are general consumers who have a certain knowledge of the characteristics of cultural and creative products.

(2) Questionnaire design: The questionnaire is divided into three parts. The first part is the personal information of the respondents, the second part is the product samples, and the third part is the question items of the product value assessment and the Likert scale survey.

(3) Design of questionnaire: This study designed the value assessment questionnaire of cultural and creative products based on the different value levels of cultural and creative products. The design of questions was based on the related literature and expert surveys by Delphi method. This study designed assessment question items based on the attributes of different value levels. The assessment questions of each value level were established, and then the Likert Scale (1932) was used to design the questionnaire based on the value level assessment checklist.

3.2 Research Design

3.2.1 Creative thinking checklist for bamboo curtain design

The design of creative thinking checklist lies in Morphological Analysis, Attribute listing and SCAMPER. Morphological Analysis was applied to deconstruct and reconstruct the design elements of bamboo curtains. Attribute Listing enumerated all the variable factors in each element for transforming ideas. SCAMPER was used for product improvement and development. This method provided the designer a direction of thinking, and systematizes thinking process, which helped to stimulate the designer to think outside the box and to develop new ideas.






(1) Morphological analysis of bamboo curtains

Morphological analysis was proposed by Zwicky in the early 1940s. This method deconstructs the original product, analyzes the variability of each element, and finally reconstructs the elements (Zwicky 1966, 1969). The purpose of this study is to construct a model of transformation design for traditional crafts, to explore the possibilities of transformation design for traditional crafts, and to study the bamboo curtain crafts in Luidui.

The morphological analysis of bamboo curtains requires a representative sample of bamboo curtains. However, the bamboo curtains in different places have different characteristics. In order to understand the characteristics of bamboo curtains in various places and obtain representative samples, the researcher visited 96 Hakka villages in Luidui of the southern Taiwan and conducted field investigations, collecting the samples of bamboo curtains and learning about the use of Hakka bamboo curtains now. Through field investigations, it is found that bamboo curtains can be seen on Hakka traditional buildings everywhere. It shows bamboo curtains are closely related to the Hakka culture in the past.

a. Representative sample selection

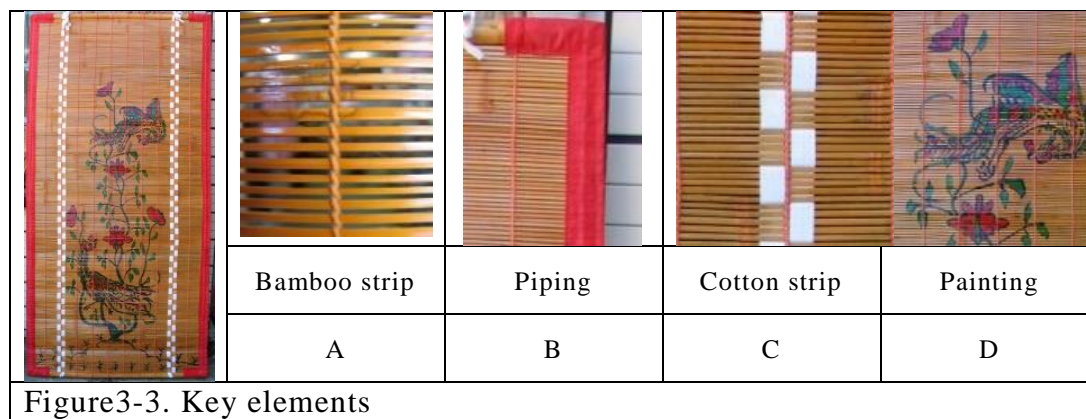
In this study, 75 bamboo curtain samples were obtained through field investigation (Figure X). Because the piping color of bamboo curtain has obvious regional differences, this study used the piping color as the basis of bamboo curtain classification, which can be divided into five categories: red, black, white, blue, and floral pattern cloth. Piping in different colors has its regional distribution, with red and black piping at the most, common in Luidui, blue and floral pattern cloth in Meinong, Kaohsiung, with minimal use of white piping, limited to Gaoshu, Kaohsiung. The characteristics of bamboo curtain piping is closely related to the customs and culture of the local places. In this study, a representative sample was selected from each type of bamboo curtain, and five representative samples were selected as the basis for the follow-up study (Figure. 3-2).

			
Red piping			
			
Black piping		White piping	Blue piping
Figure 3-2. Sample collection and categorization			

Through the field investigation of bamboo curtains and the comparison of their characteristics, it can be found that although the traditional bamboo curtains have their fixed styles, they still present regional characteristics. Their differences are presented in the color of bamboo curtains, the number of cotton strips, and the themes of painting, etc.

b. Extracting Design Elements

In this study, representative samples of the bamboo curtains were used as basic samples for product deconstruction. The study deconstructed the products by Morphological Analysis and extracted its design elements. Through the advice of experts, four elements were presented on the bamboo curtains, including bamboo strip, piping, cotton strip, and painting. Those elements are represented by the elements A, B, C, and D (Figure3-3).



These four design elements are the elements that can be reconstructed and transformed when the bamboo curtains are innovated. This study examined the creative ideas through the creative thinking checklist, and employed the modified Delphi method to consult experts' opinions for the bamboo curtain renovation. And then the reconstruction of those design elements was carried out and analyzed.

(2) Attribute Listing of Bamboo Curtains

Attribute Listing is a well-known creative thinking strategy, especially suitable for the upgrading and substitution of traditional products. Its purpose is to avoid the limitations of thinking, and to comprehensively list and review the transformable characteristics of products one by one. With the application of the attribute listing concept, changeable characteristics of a bamboo strip were listed in this study based on the noun attributes, verb attributes, and adjective attributes. Since the attributes listed for different products are not exactly the same, a person's interpretation of an attribute might possibly be different from the others.

The goal of this research is to transform traditional crafts. It is necessary to avoid the deviation from its traditional culture. Therefore, this study used the four design

elements of bamboo curtains as the basis for the transformation in attributes. After deconstruction, the bamboo curtains are respectively decomposed into four elements: (A) bamboo strip, (B) piping, (C) cotton strip, and (D) painting. These four elements are the main key elements for transforming bamboo curtain design. Each attribute of each element is listed for transformation. However, the attributes of different elements are slightly different, so the same attribute can be extended to two or four properties of the same nature. From the aspect of noun attributes, we listed (a) Material and (b) Pattern; from the aspect of adjective attributes, we listed (c) Color and (d) Dimensions; from the aspect of verb attributes, we listed (e) function and (f) Process/technique of a bamboo strip(Figure.3-4).

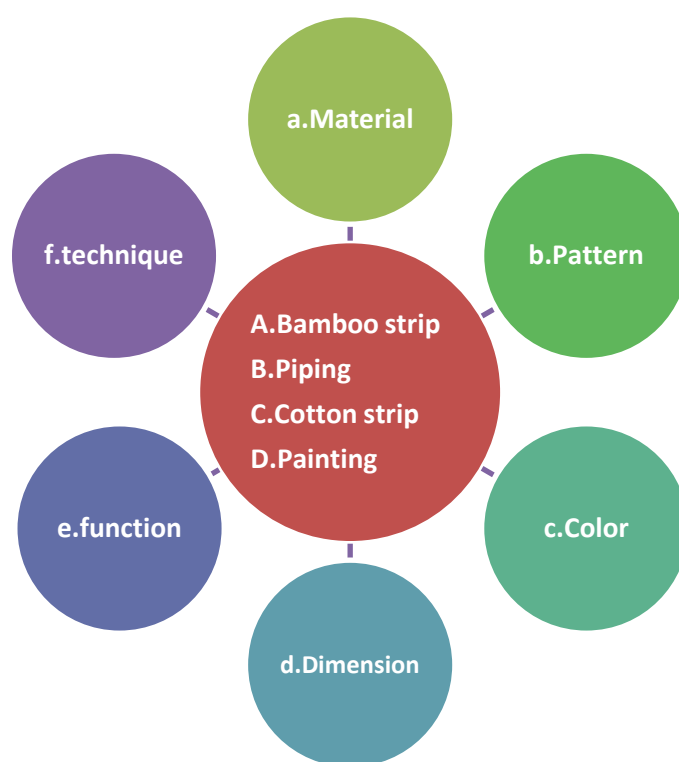


Figure.3-4 : Attribute Listing

Due to the differences of design elements, the list of attributes is slightly changed. The researcher can adjust the attributes in terms of the differences in design elements. To make it more feasible, this study took the six attributes as the main axis, and the similar attribute features were listed in the same attribute. In this study, the bamboo curtains were deconstructed into four design elements, and each element was divided into six attributes for checking (Table 3-3). In order to fully explore the possibility of transforming the attributes of bamboo curtain elements, the research further integrated SCAMPER for producing creative ideas in seven checking directions.






Table 3-3:Attribute Listing of Bamboo Curtains

Attribute	Noun attributes		Adjective attributes		Verb attributes	
Attribute listing	a-Material	b-Pattern	c-Color	d-Dimenions	e-Function	f-Technique
A- bamboo strip	A-a	A-b	A-c	A-d	A-e	A-f
B-Piping	B-a	B-b	B-c	B-d	B-e	B-f
C-Cotton strip	C-a	C-b	C-c	C-d	C-e	C-f
D-Painting	D-a	D-b	D-c	D-d	D-e	D-f

(3) SCAMPER creative thinking checklist

SCAMPER is an abbreviated name for the thinking of developing creativity and it is one of the important methods of modern innovative thinking. In 1971, US Psychologist Robert F. Eberl proposed the creative thinking checklist method which is called SCAMPER (Eberle, 1971). It is an approach that allows thinking outside the box and allows the creativity to run quickly and therefore is often used for product improvements. SCAMPER is an abbreviated name for the thinking of developing creativity and it is one of the important methods of modern innovative thinking. In 1971, US Psychologist Robert F. Eberl proposed the creative thinking checklist method which is called SCAMPER (Eberle, 1971). It is an approach that allows thinking outside the box and allows the creativity to run quickly and therefore is often used for product improvements. Therefore, after listing the relevant attributes of bamboo curtains that can be transformed for traditional associations and brainstorming, the researcher also combined SCAMPER to provide systematic thinking and check the possibility of transforming the characteristics of each element (Table 3-4)

Table 3-4 : Checklist of Attribute Listing and SCAMPER

Product image	all	Partial image				
						
Attribute Listing	Attribute Listing					
	Noun attributes		Adjective attributes		Verb attributes	
	a	b	c	a	b	c
SCAMPER	S					
	C					
	A					
	M					
	P					
	E					
	R					






In this study, after deconstructing the design elements of bamboo curtains, four elements (A) bamboo strip, (B) piping, (C) cotton strip, and (D) painting were used as representative elements for transformation designs of the bamboo curtains. The design of the checklist is to have those six attributes of a bamboo curtain as the horizontal axis and those seven verification directions of SCAMPER as the vertical axis. After that, a matrix was constructed as shown in Table 1. Those six attributes and features of the horizontal axis are respectively a-Material, b-Pattern, c-Color, d-Dimension, e-Function and f-Technique. The seven verification directions of SCAMPER on the vertical axis are respectively S-Substitute, C-Combine, A-Adapt, M-Modify, P-Put to another use, E-Eliminate, R-Rearrange.

Each of the interviewee was asked to propose his/her conceptions of modification against the items in the table. Any inadequate modification direction was directly eliminated and the interviewee was asked to move forward to the next assessment item. The transformation opinions from the first interview were conducted with open-ended consultation. During the consultation, other information and opinions were not provided to the respondents, and the experts shaped their independent thinking and gradually developed new ideas. The current research further screened and summarized every kind of transformation idea, and then conducted expert consensus surveys. The ideas which achieved more than 75% consensus were included for bamboo curtain transformation. At the end of the study, simulation designs and value assessment of the products were implemented to find out whether the design attributes of the products met the expectations of consumers.

3.2.2 Creation of the Creative Thinking Checklists of Four Attributes for Bamboo Curtain Designs and Checking Items

In this study, after deconstructing the design elements of bamboo curtains, four elements (A) bamboo strip, (B) piping, (C) cotton strip, and (D) painting were used as representative elements for transformation designs of the bamboo curtains. The four design elements of bamboo curtains are divided into four checklists, which are the creative thinking checklists of four attributes (Table 3-5): bamboo strip, piping, cotton strip, and painting. According to the design elements and attribute characteristics of each checklist, a list of checking items was constructed for the Delphi expert interviews.

Table 3-5. Checklist of attributes and features for bamboo curtains

Design Element		all	Partial image				
							
		A	B	C	D		
Attribute Listing	Noun attributes		Adjective attributes		Verb attributes		
	a	b	c	d	e	f	
SCAMPER	S	A-a-S	A-b-S	A-c-S	A-d-S	A-e-S	A-f-S
		B-a-S	B-b-S	B-c-S	B-d-S	B-e-S	B-f-S
		C-a-S	C-b-S	C-c-S	C-d-S	C-e-S	C-f-S
		D-a-S	D-b-S	D-c-S	D-d-S	D-e-S	D-f-S
	C	A-a-C	A-b-C	A-c-C	A-d-C	A-e-C	A-f-C
		B-a-C	B-b-C	B-c-C	B-d-C	B-e-C	B-f-C
		C-a-C	C-b-C	C-c-C	C-d-C	C-e-C	C-f-C
		D-a-C	D-b-C	D-c-C	D-d-C	D-e-C	D-f-C
	A	A-a-A	A-b-A	A-c-A	A-d-A	A-e-A	A-f-A
		B-a-A	B-b-A	B-c-A	B-d-A	B-e-A	B-f-A
		C-a-A	C-b-A	C-c-A	C-d-A	C-e-A	C-f-A
		D-a-A	D-b-A	D-c-A	D-d-A	D-e-A	D-f-A
	M	A-a-M	A-b-M	A-c-M	A-d-M	A-e-M	A-f-M
		B-a-M	B-b-M	B-c-M	B-d-M	B-e-M	B-f-M
		C-a-M	C-b-M	C-c-M	C-d-M	C-e-M	C-f-M
		D-a-M	D-b-M	D-c-M	D-d-M	D-e-M	D-f-M
	P	A-a-P	A-b-P	A-c-P	A-d-P	A-e-P	A-f-P
		B-a-P	B-b-P	B-c-P	B-d-P	B-e-P	B-f-P
		C-a-P	C-b-P	C-c-P	C-d-P	C-e-P	C-f-P
		D-a-P	D-b-P	D-c-P	D-d-P	D-e-P	D-f-P
	E	A-a-E	A-b-E	A-c-E	A-d-E	A-e-E	A-f-E
		B-a-E	B-b-E	B-c-E	B-d-E	B-e-E	B-f-E
		C-a-E	C-b-E	C-c-E	C-d-E	C-e-E	C-f-E
		D-a-E	D-b-E	D-c-E	D-d-E	D-e-E	D-f-E
	R	A-a-R	A-b-R	A-c-R	A-d-R	A-e-R	A-f-R
		B-a-R	B-b-R	B-c-R	B-d-R	B-e-R	B-f-R
		C-a-R	C-b-R	C-c-R	C-d-R	C-e-R	C-f-R
		D-a-R	D-b-R	D-c-R	D-d-R	D-e-R	D-f-R

For the convenience of recording the conception directions for the attributes of each element, the items to be investigated are designated by three English characters which serve as the codes. Among these three codes, the first English character represents a bamboo curtain's design element; the second English character represents the curtain's attributes; the third English character represents the thinking direction of SCAMPER. For example, A-a-S means the possibility of having a bamboo strip's (A) Material(a) to be substituted (S); A-b-R means the possibility having a bamboo strip's


(A) Woven pattern (b) to be rearranged (R). The modification conceptions of similar concepts can be integrated together such as A-c-S/M-means the possibility of having a bamboo strip's (A) Color (c) to be substituted (S) or modified (M).

(1) Creative Thinking Checklist for Bamboo Strips and Checking Items

a. Creative Thinking Checklist of Bamboo Strips' Attribute Transformation

The following table shows the creative thinking checklist of bamboo strips' attribute transformation Bamboo strips is one of the four elements of bamboo curtain design, and it is also a core element. In this study, a bamboo strip's six attributes and features were integrated with seven components of the SCAMPER creative thinking for the assessment by the checklist. (Table 3-6) ◦

Table 3-6. Checklist of attributes and features for a bamboo strip (Element A)

Design Element	Element A - bamboo strip						
Attribute	independent variable Control Variables	Noun attributes		Adjective attributes		Verb attributes	
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	A-a-S	A-b-S	A-c-S	A-d-S	A-e-S	A-f-S
	C	A-a-C	A- b-C	A-c-C	A-d-C	A-e-C	A-f-C
	A	A-a-A	A- b-A	A-c-A	A-d-A	A-e-A	A-f-A
	M	A-a-M	A- b-M	A-c-M	A-d-M	A-e-M	A-f-M
	P	A-a-P	A- b-P	A-c-P	A-d-P	A-e-P	A-f-P
	E	A-a-E	A- b-E	A-c-E	A-d-E	A-e-E	A-f-E
	R	A-a-R	A- b-R	A-c-R	A-d-R	A-e-R	A-f-R
explanation	<p>*Ex. A-a-S : Bamboo strip(A)- Material(a)- Substitute(S) →the possibility of having a bamboo strip's material to be substituted.</p> <p>*EX. A-c-S/M-Bamboo strip(A)- Color(c)- Substitute(S) or Modify(M) →the possibility of having a bamboo strip's color to be substituted or modified.</p>						

b. Creation of checking Items for Bamboo Strips' Attribute Transformation

The following table shows the checking Items for bamboo strips' attribute transformation. The current study listed the checking items according to the above table and the six attributes of bamboo strips with SCAMPER. Accordingly, 42 items were assessed separately, and the respondents proposed the ideas of transformation for each item. However, this table is only used as a guiding direction for creative thinking. If the item is similar to one another or not suitable, then the respondents can jump directly to the next checking item (Table 3-7).

Table 3-7. Creation of Checking Items for Bamboo strip's Attribute Transformation

Attribute Attribute listing		SCAMPER	Creation of Checking Items
Noun Attribute	Bamboo strip (A) - material (a)	A-a-S	The possibility that the bamboo strip material is substituted.
		A-a-C	The possibility that the bamboo strip materials are combined with other materials.
		A-a-A	The possibility that the bamboo strip materials are adapted.
		A-a-M	The possibility that the bamboo strip materials are modified.
		A-a-P	The possibility that the bamboo strip materials are put to other uses.
		A-a-E	The possibility that the bamboo strip materials are eliminated.
		A-a-R	The possibility that the bamboo strip materials are rearranged.
	Bamboo strip (A) - weaving pattern (b)	A-b-S	The possibility that the bamboo strip weaving pattern is substituted.
		A-b-C	The possibility that the bamboo strip weaving pattern is combined.
		A-b-A	The possibility that the bamboo strip weaving pattern is adapted.
		A-b-M	The possibility that the bamboo strip weaving pattern is modified.
		A-b-P	The possibility that the bamboo strip weaving pattern is put to other uses.
		A-b-E	The possibility that the bamboo strip weaving pattern is eliminated.
		A-b-R	The possibility that the bamboo strip weaving pattern is rearranged.

Adjective Attributes	Bamboo strip (A) - color (c)	A-c-S	The possibility that the bamboo strip color is substituted.
		A-c-C	The possibility that the bamboo strip color is combined.
		A-c-A	The possibility that the bamboo strip color is adapted.
		A-c-M	The possibility that the bamboo strip color is modified.
		A-c-P	The possibility that the bamboo strip color is put to other uses.
		A-c-E	The possibility that the bamboo strip color is eliminated.
		A-c-R	The possibility that the bamboo strip color is rearranged.
	Bamboo strip (A) - dimensions (d)	A-d-S	The possibility that the bamboo strip dimensions are substituted.
		A-d-C	The possibility that the bamboo strip dimensions are combined.
		A-d-A	The possibility that the bamboo strip dimensions are adapted.
		A-d-M	The possibility that the bamboo strip dimensions are modified.
		A-d-P	The possibility that the bamboo strip dimensions are put to other uses.
		A-d-E	The possibility that the bamboo strip dimensions are eliminated.
		A-d-R	The possibility that the bamboo strip dimensions are rearranged.
Verb Attributes	Bamboo strip (A) -Function(e)	A-e-S	The possibility that the bamboo strip function is substituted.
		A-e-C	The possibility that the bamboo strip function is combined.
		A-e-A	The possibility that the bamboo strip function is adapted.
		A-e-M	The possibility that the bamboo strip function is modified.
		A-e-P	The possibility that the bamboo strip function is put to other uses.
		A-e-E	The possibility that the bamboo strip function is eliminated.
		A-e-R	The possibility that the bamboo strip function is rearranged.
	Bamboo strip (A) - weaving (f)	A-f-S	The possibility that the bamboo strip weaving is substituted.
		A-f-C	The possibility that the bamboo strip weaving is combined.
		A-f-A	The possibility that the bamboo strip weaving is adapted.


	A-f-M	The possibility that the bamboo strip weaving is modified.
	A-f-P	The possibility that the bamboo strip weaving is put to other uses.
	A-f-E	The possibility that the bamboo strip weaving is eliminated.
	A-f-R	The possibility that the bamboo strip weaving is rearranged.

(2) Creative Thinking Checklist for Piping and Checking Items

a. Creative Thinking Checklist of Piping's Attribute Transformation

The following table is the creative thinking checklist of piping's attribute transformation. Piping is one of the four elements designed for bamboo curtains. It has the functions of protecting and decorating bamboo curtains, which is both practical and decorative. In this study, a bamboo strip's six attributes and features were integrated with seven components of the SCAMPER creative thinking for the assessment by the checklist (Table 3-8)

Table 3-8. Checklist of attributes and features for a Piping (Element B)

Attribute	Design Element Element B - Piping						
		Noun attributes		Adjective attributes		Verb attributes	
		a	b	c	d	e	f
		Material	Pattern	Color	Dimensions	Function	Technique
SCAMPER	S	B-a-S	B-b-S	B-c-S	B-d-S	B-e-S	B-f-S
	C	B-a-C	B-b-C	B-c-C	B-d-C	B-e-C	B-f-C
	A	B-a-A	B-b-A	B-c-A	B-d-A	B-e-A	B-f-A
	M	B-a-M	B-b-M	B-c-M	B-d-M	B-e-M	B-f-M
	P	B-a-P	B-b-P	B-c-P	B-d-P	B-e-P	B-f-P
	E	B-a-E	B-b-E	B-c-E	B-d-E	B-e-E	B-f-E
	R	B-a-R	B-b-R	B-c-R	B-d-R	B-e-R	B-f-R

b. Creation of Checking Items for Piping's Attribute Transformation

The following is the checking items for piping's attribute transformation. The researcher listed each item according to the above table. As mentioned above, this table is only used as a guiding direction for creative thinking checking. If the item is similar to one another or not suitable, then the respondents can jump directly to the next checking item (Table 3-9).

Table 3-9. Creation of Checking Items for Piping's Attribute Transformation

Attribute listing	Attribute	SCAMPER	Creation of Checking Items
Noun Attributes	Piping (B) - Materials (a)	B-a-S	The possibility that the piping materials are substituted.
		B-a-C	The possibility that the piping materials are combined with other materials.
		B-a-A	The possibility that the piping materials are adapted.
		B-a-M	The possibility that the piping materials are modified.
		B-a-P	The possibility that the piping materials are put to other uses.
		B-a-E	The possibility that the piping materials are eliminated.
		B-a-R	The possibility that the piping materials are rearranged.
	Piping (B) - Pattern (b)	B-b-S	The possibility that the piping pattern is substituted.
		B-b-C	The possibility that the piping pattern is combined.
		B-b-A	The possibility that the piping pattern is adapted.
		B-b-M	The possibility that the piping pattern is modified.
		B-b-P	The possibility that the piping pattern is put to other uses.
		B-b-E	The possibility that the piping pattern is eliminated.
		B-b-R	The possibility that the piping pattern is rearranged.
Adjective Attributes	Piping (B) - Color (c)	B-c-S	The possibility that the piping color is substituted.
		B-c-C	The possibility that the piping color is combined.
		B-c-A	The possibility that the piping color is adapted.
		B-c-M	The possibility that the piping color is modified.
		B-c-P	The possibility that the piping color is put to other uses.
		B-c-E	The possibility that the piping color is eliminated.
		B-c-R	The possibility that the piping color is rearranged.



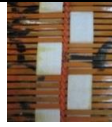
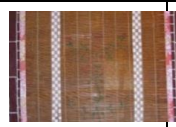

Verb Attributes	Piping (A) - Dimensions (d)	B-d-S	The possibility that the piping dimensions are substituted.
		B-d-C	The possibility that the piping dimensions are combined.
		B-d-A	The possibility that the piping dimensions are adapted.
		B-d-M	The possibility that the piping dimensions are modified.
		B-d-P	The possibility that the piping dimensions are put to other uses.
		B-d-E	The possibility that the piping dimensions are eliminated.
		B-d-R	The possibility that the piping dimensions are rearranged.
	Piping (B) - Function (e)	B-e-S	The possibility that the piping function is substituted.
		B-e-C	The possibility that the piping function is combined.
		B-e-A	The possibility that the piping function is adapted.
		B-e-M	The possibility that the piping function is modified.
		B-e-P	The possibility that the piping function is put to other uses.
		B-e-E	The possibility that the piping function is eliminated.
		B-e-R	The possibility that the piping function is rearranged.
	Piping (B) - Weaving (f)	B-f-S	The possibility that the piping weaving is substituted.
		B-f-C	The possibility that the piping weaving is combined.
		B-f-A	The possibility that the piping weaving is adapted.
		B-f-M	The possibility that the piping weaving is modified.
		B-f-P	The possibility that the piping weaving is put to other uses.
		B-f-E	The possibility that the piping weaving is eliminated.
		B-f-R	The possibility that the piping weaving is rearranged.

(3) Creative Thinking Checklist for Cotton Strips and Checking Items

a. Creative Thinking Checklist of Cotton Strips' Attribute Transformation

The following is the creative thinking checklist of cotton strips' attribute transformation. Cotton strip is one of the four elements designed for bamboo curtains. It has the functions of fixing and decorating. The common string is mainly composed of two and three. In this study, a bamboo strip's six attributes and features were integrated with seven components of the SCAMPER creative thinking for the assessment by the checklist (Table3-10).

Table3-10. Checklist of attributes and features for a Cotton strip (Element C)

Design Element	Element C - Cotton strip						
Attribute	independent variable	Noun attributes		Adjective attributes		Verb attributes	
		a	b	c	d	e	f
	Control Variables	Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	C-a-S	C-b-S	C-c-S	C-d-S	C-e-S	C-f-S
	C	C-a-C	C- b-C	C-c-C	C-d-C	C-e-C	C-f-C
	A	C-a-A	C- b-A	C-c-A	C-d-A	C-e-A	C-f-A
	M	C-a-M	C- b-M	C-c-M	C-d-M	C-e-M	C-f-M
	P	C-a-P	C- b-P	C-c-P	C-d-P	C-e-P	C-f-P
	E	C-a-E	C- b -E	C-c-E	C-d-E	C-e-E	C-f-E
	R	C-a-R	C- b -R	C-c-R	C-d-R	C-e-R	C-f-R

b. Creation of Checking Items for Cotton Strips' Attribute Transformation

The following is the creative thinking checklist of cotton strips' attribute transformation. Cotton strips is one of the four elements designed for bamboo curtains. It has the functions of fixing and decorating. The common string is mainly composed of two and three (Table3-11).

Table 3-11. Creation of Checking Items for Cotton strips' Attribute Transformation

Attribute listing	Attribute	SCAMPER	Creation of Checking Items
Noun Attributes	Cotton strips (C) - Materials (a)	C-a-S	The possibility that the cotton strips materials is substituted.
		C-a-C	The possibility that the cotton strips materials is combined with other materials.
		C-a-A	The possibility that the cotton strips materials is adapted.
		C-a-M	The possibility that the cotton strips materials is modified.
		C-a-P	The possibility that the cotton strips materials is put to other uses.
		C-a-E	The possibility that the cotton strips materials is eliminated.
		C-a-R	The possibility that the cotton strips materials is rearranged.
	Cotton strips (C) - pattern (b)	C-b-S	The possibility that the cotton strips pattern is substituted.
		C-b-C	The possibility that the cotton strips pattern is combined.
		C-b-A	The possibility that the cotton strips pattern is adapted.
		C-b-M	The possibility that the cotton strips pattern is modified.
		C-b-P	The possibility that the cotton strips pattern is put to other uses.
		C-b -E	The possibility that the cotton strips pattern is eliminated.
		C-b -R	The possibility that the cotton strips pattern is rearranged.
Adjective Attributes	Cotton strips (C) - Color (c)	C-c-S	The possibility that the cotton strips color is substituted.
		C-c-C	The possibility that the cotton strips color is combined.
		C-c-A	The possibility that the cotton strips color is adapted.
		C-c-M	The possibility that the cotton strips color is modified.
		C-c-P	The possibility that the cotton strips color is put to other uses.
		C-c-E	The possibility that the cotton strips color is eliminated.
		C-c-R	The possibility that the cotton strips color is







Verb Attributes	Cotton strips (C) - Dimensions (d)		rearranged.
		C-d-S	The possibility that the cotton strips dimensions is substituted.
		C-d-C	The possibility that the cotton strips dimensions is combined.
		C-d-A	The possibility that the cotton strips dimensions is adapted.
		C-d-M	The possibility that the cotton strips dimensions is modified.
		C-d-P	The possibility that the cotton strips dimensions is put to other uses.
		C-d-E	The possibility that the cotton strips dimensions is eliminated.
		C-d-R	The possibility that the cotton strips dimensions is rearranged.
	Cotton strips (C) - Function (e)	C-e-S	The possibility that the cotton strips function is substituted.
		C-e-C	The possibility that the cotton strips function is combined.
		C-e-A	The possibility that the cotton strips function is adapted.
		C-e-M	The possibility that the cotton strips function is modified.
		C-e-P	The possibility that the cotton strips function is put to other uses.
		C-e-E	The possibility that the cotton strips function is eliminated.
		C-e-R	The possibility that the cotton strips function is rearranged.
	Cotton strips (C) - Weaving (f)	C-f-S	The possibility that the cotton strips weaving is substituted.
		C-f-C	The possibility that the cotton strips weaving is combined.
		C-f-A	The possibility that the cotton strips weaving is adapted.
		C-f-M	The possibility that the cotton strips weaving is modified.
		C-f-P	The possibility that the cotton strips weaving is put to other uses.
		C-f-E	The possibility that the cotton strips weaving is eliminated.
		C-f-R	The possibility that the cotton strips weaving is rearranged.

(4) Creative Thinking Checklist for Painting and Checking Items

a. Creative Thinking Checklist of Painting's Attribute Transformation

The following table is the creative thinking checklist of painting's attribute transformation. Painting is one of the four elements of bamboo curtain design, which is the main decorative element of bamboo curtains. In this study, a bamboo strip's six attributes and features were integrated with seven components of the SCAMPER creative thinking for the assessment by the checklist (Table3-12) .

Table 3-12. Checklist of attributes and features for a Painting (Element D)

Design Element	Element D - Painting						
Attribute	independent variable	Noun attributes		Adjective attributes		Verb attributes	
	Control Variables	a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	D-a-S	D-b-S	D-c-S	D-d-S	D-e-S	D-f-S
	C	D-a-C	D- b-C	D-c-C	D-d-C	D-e-C	D-f-C
	A	D-a-A	D- b-A	D-c-A	D-d-A	D-e-A	D-f-A
	M	D-a-M	D- b-M	D-c-M	D-d-M	D-e-M	D-f-M
	P	D-a-P	D- b-P	D-c-P	D-d-P	D-e-P	D-f-P
	E	D-a-E	D- b-E	D-c-E	D-d-E	D-e-E	D-f-E
	R	D-a-R	D- b-R	D-c-R	D-d-R	D-e-R	D-f-R

b. Creation of Checking Items for Painting's Attribute Transformation

The following is the checking items for painting's attribute transformation. The researcher listed each item according to the above table. As mentioned above, this table is only used as a guiding direction for creative thinking checking. If the item is similar to one another or not suitable, then the respondents can jump directly to the next checking item (Table 3-13).

Table 3-13. Creation of Checking Items for Painting's Attribute Transformation

Attribute Attribute listing		SCAMPER	Creation of Checking Items
Noun attributes	Painting (D) - Materials (a)	D-a-S	The possibility that the painting materials are substituted.
		D-a-C	The possibility that the painting materials are combined with other materials.
		D-a-A	The possibility that the painting materials are adapted.
		D-a-M	The possibility that the painting materials are modified.
		D-a-P	The possibility that the painting materials are put to other uses.
		D-a-E	The possibility that the painting materials are eliminated.
		D-a-R	The possibility that the painting materials are rearranged.
	Painting (D) - Pattern (b)	D-b-S	The possibility that the painting pattern is substituted.
		D-b-C	The possibility that the painting pattern is combined.
		D-b-A	The possibility that the painting pattern is adapted.
		D-b-M	The possibility that the painting pattern is modified.
		D-b-P	The possibility that the painting pattern is put to other uses.
		D-b-E	The possibility that the painting pattern is eliminated.
		D-b-R	The possibility that the painting pattern is rearranged.
Adjective attributes	Painting (D) - Color (c)	D-c-S	The possibility that the painting color is substituted.
		D-c-C	The possibility that the painting color is combined.
		D-c-A	The possibility that the painting color is adapted.
		D-c-M	The possibility that the painting color is modified.
		D-c-P	The possibility that the painting color is put to other uses.
		D-c-E	The possibility that the painting color is eliminated.
		D-c-R	The possibility that the painting color is rearranged.
	Painting (D) - Dimensions (d)	D-d-S	The possibility that the painting dimensions are substituted.
		D-d-C	The possibility that the painting dimensions are combined.
		D-d-A	The possibility that the painting dimensions are adapted.
		D-d-M	The possibility that the painting dimensions are modified.

Verb attributes		D-d-P	The possibility that the painting dimensions are put to other uses.
		D-d-E	The possibility that the painting dimensions are eliminated.
		D-d-R	The possibility that the painting dimensions are rearranged.
	Painting (D) - Function (e)	D-e-S	The possibility that the painting function is substituted.
		D-e-C	The possibility that the painting function is combined.
		D-e-A	The possibility that the painting function is adapted.
		D-e-M	The possibility that the painting function is modified.
		D-e-P	The possibility that the painting function is put to other uses.
		D-e-E	The possibility that the painting function is eliminated.
		D-e-R	The possibility that the painting function is rearranged.
	Painting (D) - Drawing method (f)	D-f-S	The possibility that the painting drawing method is substituted.
		D-f-C	The possibility that the painting drawing method is combined.
		D-f-A	The possibility that the painting drawing method is adapted.
		D-f-M	The possibility that the painting drawing method is modified.
		D-f-P	The possibility that the painting drawing method is put to other uses.
		D-f-E	The possibility that the painting drawing method is eliminated.
		D-f-R	The possibility that the painting drawing method is rearranged.

3.2.3 Establishment of Value Level Assessment Checklist for Cultural and Creative Products

Cultural and creative products are created from innovative designs with cultural features. The designers integrate cultural elements into product designs through creative design approaches, so that the products themselves no longer only focus on their functional and aesthetic values, but also add cultural factors in order to meet the spiritual satisfaction when consumers use the product. Nevertheless, cultural and creative product design is not easy to assess. Hence, it is still essential for designers to explore a better way of assessing cultural and creative designs. A layer of cultural and

creative products design values is built in this study from various aspects with an attempt to provide designers with a reference direction of design assessments. Studying comprehensively, this analysis probes into the relationship between the value layer of culture and the value layer of the creative design, and then through the "Modified Delphi Method" to collect the expert's opinion and further integrates the three value levels of the cultural and creative product design and their characteristics. Finally, based on this, this study designed value level assessment checklist for cultural and creative products as an evaluation of product transformation design.

The study is based on Yang Yu Fu's (1998) cultural level theory, Leong's (2003) cultural spatial level theory and Norman's (2004) emotional design level theory, and integrates relevant extensions. According to the above scholars, the cultural level can be divided into three levels. One focuses on the social behavior layer, such as the function, behavior, and ritual of products. The second highlights on the physical/material layer, such as the visible appearance of the product, etc. The third emphasizes on the spiritual/ideal layer, such as culture, emotion and symbolic meaning. This study combines the discussion of experts and interviews with scholars, presented "Practical level", "Sensory level" and "Spirit level" to summarize the three value levels of cultural and creative product design, and list six representative characteristics of each value level, serving as the direction for the value evaluation of the cultural and creative products.

The core appeal of each design approach is different than others. A product of industrial design highlights the satisfaction at the practical level. On the other hand, a product of creative design emphasizes more on the satisfaction at the sensory level while a product of cultural and creative design highlights the satisfaction at the spiritual level. However, the design of a cultural and creative product is different from that of typical practical products, product decoration or a work of art. The optimal design of a cultural and creative product should not focus on a single level. Instead, it should reach a balanced state between these three levels including the enhancement at the practical and sensory levels in addition to the spiritual level. The efforts on these three levels should be leveraged depending on the design approach without partiality on any level. The best cultural and creative product design can combine multiple values to satisfy the diverse needs of the consumers, so that the consumers' demand for the product is from "need" to "want" and eventually the "desire" to have this product.

(1) Literature summary – Classification of value layers

The levels of cultural value that is proposed by one of the scholars could be similar to or different from one another as shown in Table 1. Recently, more scholars corresponds the value levels to the design level of the product design. Their models can be classified into three categories. The first category focuses on the physical/material aspect such as a product's visible appearance or features. The second category emphasizes on the application aspect including product function, users' behavior and rituals. The third category highlights the spiritual/ideal aspect such as culture, emotion, and symbolic meaning. By summarizing the above discussions, the value levels can be classified into three dimensions, which are respectively the Physical/material layer, Social/behavior layer, and the Spiritual/ideal layer to be described as follows (Table 3-14).

Table 3-14. Value layers of culture

Scholar \ Layers	Physical/Material Layer	Social/Behavior Layer	Spiritual/Ideal Layer
Yang, Yu-Fu (1998)	Natural level	Physical level	Metaphysical level
Leong (2003)	Outer tangible level	Middle behavioral level	Inner tangible level
Norman (2004)	Visceral level	Behavioral level	Reflective level

a. Physical/material layer

This layer refers to the physical aspect of the product that can be seen, and it emphasizes the aesthetic or creativity of the product. Yang Yu Fu's (1998) and Zheng Mei's (2004) Natural level, Leong's (2003) and Hsu's (2004), Lin's (2005) Outer tangible level and Norman's (2004) Visceral level, these theories focus on the physical, visible, visual and material aspects. For example, the attributes that are transformed into product design focus on the visible features of the product, such as color, texture, shape, line, surface decoration, and detail processing. On the tangible material level, Dondis (1973) also proposed ten visual elements of graphic design, namely point, line, surface, shape, direction, hue, color, texture, size, and scale. Bowman (1990) sums up five elements of shape specifically, point, line, shape, hue, and texture. This value layer focuses on the "visible" aspect of the product. Scholars have always discussed the visual components, but they are still very similar to the visual elements listed above.

b.Social/behavior layer

This layer refers to the level of "use" or "user experience" of the product, emphasizing that the design of the product conforms to the consumer's behavior of using the product. The metaphysical level of Yang Yu Fu (1998) and Zheng Yumei (2004), the middle behavioral level of Leong (2003), Hsu (2004), and Lin (2005), and the behavioral level of Norman (2004) focus on the behaviors from the practical and functional aspect of a product. The relevant discussion focuses on the user behavior, ritual customs and other aspects, such as the attribute characteristics of product design, focusing on the practical functions, such as usability, operation, safety, and user pleasure (Hsu, 2004, Lin, 2007).

c.Spiritual/ideal layer

This layer refers to the psychological aspect of the product, and it highlights the capability of triggering a consumers' spiritual perception. The Metaphysical level proposed by Yang Yu Fu (1998) and Zheng Yumei (2004), the Inner tangible level by Leong (2003), Hsu (2004), and Lin (2005), and the Reflective level of Norman (2004) focus on the Inner tangible level. The related discussion focuses on the aspects of feeling, emotion and cognition, such as the attribute characteristics of product design, focusing on the self-image, affection, and cultural feature of the product (Hsu, 2004, Lin, 2007), most of the emphasis is on the inner spiritual satisfaction of the product.

(2) Experts' opinions with the Modified Delphi Method

This study combines the literature to conduct a survey of experts' opinions with the Modified Delphi Method. The experts enumerate and screen the attributes of the value level of cultural and creative products, and finally select the products through consensus. The most representative characteristic features of the value assessment of cultural and creative products are the most significant.

a.Expert questionnaire and aggregation 1: Attributes aggregate

The value level of product design and its corresponding characteristics can be concluded from the comprehensive literature. In order to combine the opinions of twelve experts and scholars, this study invites experts to list the attribute of product value level. The first round of open-ended questionnaire is omitted in a semi-structured way. After inviting the scholars to take reference from the literature, the study makes use of the behavioral, physical, material, and spiritual layers to enumerate the relevant

properties. This is displayed in the table below (Table 3-15).

Table 3-15 The aggregation of the attribute of product value layer

Value layer	Attribute
Physical/material layer	point, line, plane, body, space, density, color, hue, figure, streak, size, scale, quality, material, shape, structure, ornamentation, pattern, texture, detail processing, component composition, combination
Social/behavior layer	Operational, Safety, Functionality, Practicality, Convenience, Structural, User pleasure, Surprise, Accessibility, Interactivity, Functionality, Effectiveness, Durability
Spiritual/ideal layer	Cultural feature, Historic significance, Social significance, Special emotion, Story behind, Symbolic meaning, Special implication, Special custom, Religious significance, Special ritual. Ethical meaning, Economic system, Mythological belief

b. Expert questionnaire and aggregation 2:Attributes screening

The design of cultural and creative products is distinctive from that of general ones, and their characteristics that consumer value is different from those of general products. Hence, based on the results of the combination of the attributes and characteristics of product value levels, twelve experts are invited to further screen the more essential attributes and characteristics of cultural and creative products from social/behavior layer, physical/material layer and spiritual/ideal layer which are shown below (Table 3-16):

Table 3-16. Screening of attributes of cultural and creative products

Value layers	Attributes
Physical/material layer	shape, pattern, color, texture, line, material, detail processing, assembly component, conjoin relationship, dimension.
Social/behavior layer	practicability, user pleasure, functionality, accessibility, interaction, operability, safety, effectiveness, convenience, durability.
Spiritual/ideal layer	cultural feature, story behind, special emotion, symbolic meaning, historic significance, special implication, social significance, special custom, religious significance, special ritual.

c. Expert Questionnaire and aggregation 3: Attributes ranking

After collecting the attributes and characteristics of cultural and creative products, twelve experts are further asked to rank them according to the significance of the attributes and characteristics of cultural and creative product design on a scale of 1 to 10.

1 signifies the highest importance and 10 is the least important in the design of products that are more valued. According to the survey, the integral and ranking of the attributes and characteristics of the value level of cultural and creative products are as follows (Table 3-17):

Table 3-17: Sequencing of attributes of value level of Cultural and Creative Products

(1) The ranking of Physical/material layer										
Attributes	Shape	Color	Pattern	Texture	Material	Line	Assembly component	Detail processing	Conjoin relationship	Dimension
Summation	17	33	38	50	63	70	90	91	100	108
Rank	1	2	3	4	5	6	7	8	9	10

(2) The ranking of Social/behavior layer										
Attributes	Practicability	User Pleasure	Functionality	Accessibility	Operability	Convenience	Interaction	Effectiveness	Safety	Durability
Summation	28	33	39	58	66	75	84	91	92	94
Rank	1	2	3	4	5	6	7	8	9	10

(3) The ranking of Spiritual/ideal layer										
Attributes	Cultural feature	Story behind	Special emotion	Symbolic meaning	Historic significance	Special implication	Social significance	Special custom	Religious significance	Special ritual
Summation	24	30	53	57	62	69	72	85	100	108
Rank	1	2	3	4	5	6	7	8	9	10

d. Expert consensus aggregation: Attributes of cultural and creative products

At the end of the research, experts' views are summarized, screens out the attributes of cultural and creative products, and takes the six attributes with the highest ranking from each value level. The results are collected and fed back to scholars for final confirmation. According to the viewpoint of the experts' final consensus, the representative attribute of cultural and creative products are shown below (Table 3-18).

Table 3-18. The attributes of cultural and creative products

(1) Physical/material layer attribute characteristics consensus :						
Attributes	Shape	Color	Pattern	Texture	Material	Line
Rank	1	2	3	4	5	6

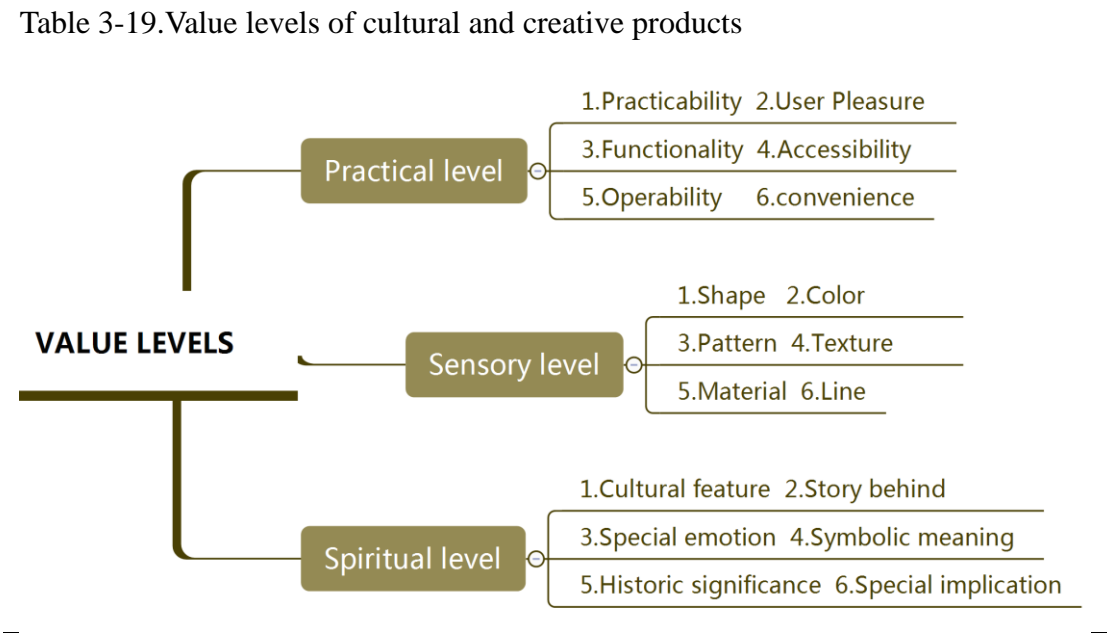
(2) Social/behavior layer attribute special degree of consensus:						
Attributes	Practicability	User Pleasure	Functionality	Accessibility	Operability	Convenience
Rank	1	2	3	4	5	6

(3) Spiritual/ideal layer attribute characteristics consensus:						
Attributes	Cultural feature	Story behind	Special emotion	Symbolic meaning	Historic significance	Special implication
Rank	1	2	3	4	5	6

Through the “Modified Delphi Method” survey, the attributes of the product in the physical/material layer are in terms of shape, color, pattern, texture, material and line, and the attribute features that are more significant at the social/behavioral layer are practicability, user pleasure, functionality, accessibility, operability and convenience. In the spiritual/ideal layer, the more important attributes are cultural feature, story behind, special emotion, symbolic meaning, historic significance and special implication. From the above three value layers and their corresponding attributes, we can see that the attributes of cultural and creative products are different from those of general products. This study is to separate the value layer of cultural and creative products from that of general ones and to further define and classify the value layers of cultural and creative products.

(3) Value levels of cultural and creative products

Based on the above findings, this study intends to summarize a layer of values corresponding to the design of cultural and creative products. The design of cultural and creative products can be divided into three levels according to different attributes, characteristics and design requirements, namely, the "Practical level", "Sensory level" and "Spiritual level" (Table 3-19).



The product design illustrates different design needs, focusing on a single value and multiple values, but the design of cultural and creative products should be able to have multiple values, while focusing on the Spiritual level, Practical level and the Sensory level without partiality.

a. Practical Level

On the social/behavior layer of cultural and creative products, based on the review of relevant studies and experts' viewpoint, emphasizing on cultural and creative products are practicability, user pleasure, functionality, accessibility, operability and convenience. This value level focuses on the practical application or consumer's experience of products. In this study, this level of value is called the "Practical level". The "Practical level" belongs to the engineering level. This level refers to the production of functional sound, security and versatility. Consistent with human factors engineering, user-friendly product, it is a physical product-oriented that ables to meet the needs of people (Yan Huiyun, 2014). In fact, the development of a new product is part of the engineering design that takes part in the effort spent and marketing of products in the market (Michalek, Feinberg, and Papalambros, 2005).

Most of the products with "Practical level" as the main demand are general household goods or industrial design products, which focus on the practical application level. Nevertheless, the design of modern products can take into account different needs. This is especially true for the design of cultural and creative products, which need to have multiple values. If the design of cultural and creative products lacks practical value, it will easily become useless product which is not connected in real life. Therefore, cultural and creative product design should consider the needs of "Practical level" to meet the demands for consumer use and experience aspect.

b. Sensory level

On the physical/material layer of cultural and creative products, based on the review of relevant studies and experts' viewpoint, the attributes and characteristics of cultural and creative products are the product's shape, color, pattern, texture, material and line. This value level focuses on the visual level such as product appearance, which is called "Sensory level". The design of creative products in this value level focuses on whether the visual combination of products is aesthetic or creative.

In the "Sensory level", the different attributes and features shape different aesthetic perceptions and creativity so that a product can generate its unique attractiveness. Blijlevens (2009) pointed out that when a designer is creating a new product, they are concerned about the physical attributes of the product design, such as color, shape, material and size. However, when consumers are choosing a product, they perceive the product's characteristics, appearance, and style as a whole. It can be seen

that consumers' perception of the product is not formed by a single visual element, but by combination of different attributes.

"Sensory level" is the key to attract consumers' attention. Ashby and Johnson (2003) believes that if the product only has the basic conditions of function and safety, it can not fully satisfy consumers, while the aesthetic, association and perceived conditions of the product can improve consumers' taste and personal image, which will affect consumers' purchasing decisions. Hassenzahl (2004) stressed out that the feeling of beauty is the best way to evaluate the overall impression of a product, and the beauty of the product can improve the overall satisfaction of consumers. Blijlevens (2009) pointed out that the appearance of a product can affect consumers' choice. Bahn (2009) also pointed out that the physical aspect of a product is a key factor affecting people's mood and attention. Lin Rongtai (2013) put forward five qualia factors of emotional value. In addition to engineering, attractiveness, beauty, creativity and delicacy are all senses constructed by visual modeling.

Most of the products with "Sensory level" as their main appeal are creative design products. The core value of their design focuses on the aesthetic and creativity of the products. The design of the products through the innovative collocation and combination of visual elements will produce exquisite, novel and creative feelings, and then promote consumers to produce spiritual joy and touching. Thus, the "Sensory level" is the most important value level for attracting consumers' attention in the design of cultural and creative products.

c. Spiritual level

On the Spiritual/ideallayer, combining the literature and expert's viewpoints, the attributes and characteristics of cultural and creative products are cultural feature, story behind, special emotion, symbolic meaning, historic significance and special meaning of the products. This level focus on product value in the intangible spiritual level, this study refers to this as the "Spiritual level". In this value level, the design of creative products focuses on whether the design of products can integrate special cultural features, stories, emotions or unique symbolic meanings, historical importance or meanings enabling consumers to further deepen their recognition of the culture or meet the personal demands at the spiritual level.

Verganti (2013) pointed out that the product should be equipped with two levels of meaning. The first level is the practical level which deals with function and performance. The second level is equally important and it is related to the symbol, recognition, and

emotion. Throsby (2001), an Australian economist, points out that cultural product is different from other products since it creates not only economic values but also unique cultural values. He believes that cultural values must have certain characteristics, such as aesthetic value, spiritual value, social value, historical value, symbolic value, etc. Among these five types of cultural values, only the aesthetic value is at the tangible material level since it presents a product's external aesthetic characteristics. Other cultural values belong to the intangible spiritual level.

The "Spiritual level" is the value of cultural and creative products which are different from general products. Designers bring the spiritual connotation of products through visual elements such as the shapes, patterns, materials or colors, so that the products no longer focus on their functionality and aesthetics. Consumers can meet the diverse needs of the product through aesthetic perception, culture, story, emotion and other factors, and also includes spiritual satisfaction besides practical and aesthetic.

(4) Classification of cultural and creative product values

Maslow (1943) used the pyramid image to present the theory of demand hierarchy. The demand hierarchy theory according to the intensity of demand is physiological needs, safety needs, love and belonging needs, esteem needs and need for self-actualization. According to the theory of human needs, physical/material needs must be met before mental/spiritual needs. Demands are most common at the bottom of the pyramid while the need for self-actualization is at the top.

In this study, the value levels of cultural and creative products are in different levels in a pyramid according to different core needs. From bottom to top are "Practical level", "Sensory level" and "Spiritual level". The bottom to top level deals with the most fundamental needs rather than the importance of the demand. The "Practical level" focuses on product application and experience aspect which is the most common and direct demand in life and is located at the bottom of the pyramid. The "Sensory level" focuses on the visual aspects of the product's appearance and features, and is designed to satisfy the aesthetic and therefore it is at the middle of the pyramid. The "Spiritual level" focuses on the invisible and internal spiritual aspect, emphasizing on the integration of cultural implications, stories and emotions, and at the top of the pyramid as shown in (Figure 3-5).

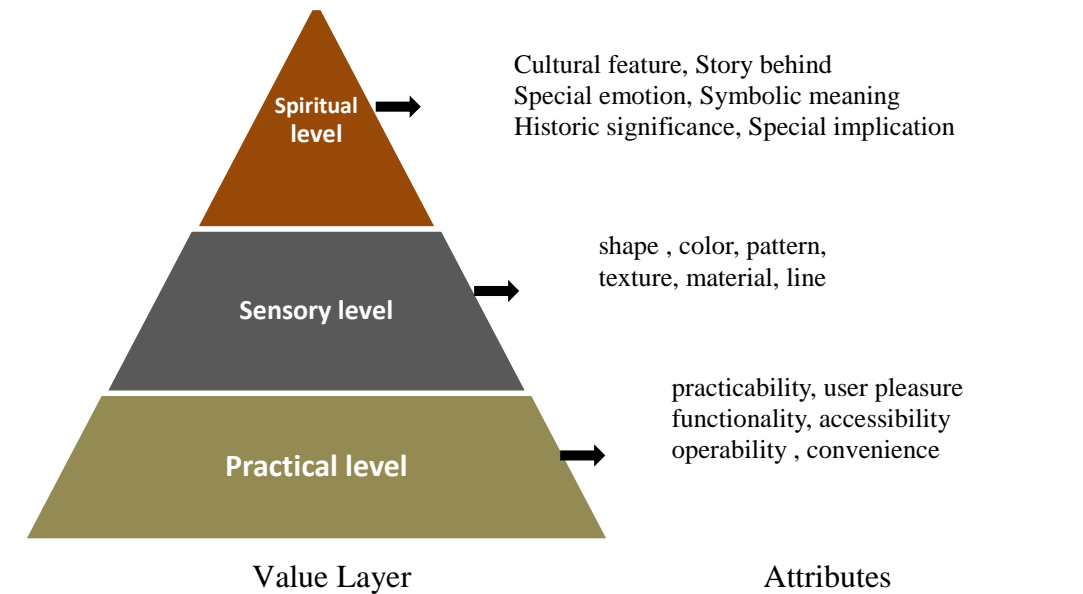


Figure 3-5. Cultural and Creative Product Value Classification

Products with different design orientations have different core demands. Practical level focuses on the level of practical application or consumer's experience of products, such as household goods or industrial design products. Sensory level emphasizes on aesthetic and creativity, such as creative design products. Spiritual level emphasizes on product's cultural features, stories and emotions which are not only the household goods core demand, but also have different values, different from, decorative goods and works of art.

Scott (1997) believes that cultural products meet the function of the mind more than practicality. Lin (2005) points out that since twentieth century, the development of design has progressed from design for function, to design for friendly, design for fun, and design for fancy, to design for feeling. The development is directed from the satisfaction by functions to the feeling by experiencing, whose core value is evolving from functional and physiological needs to aesthetic and psychological needs. It can be seen that the design of modern products is gradually changing from functional value to spiritual value.

Power (2002) believes that cultural industry is a product and service that determines value by aesthetics, symbols, sensations and experiences. Ho (1996) points out that the difference between cultural and creative products and general products lies in the function of a cultural identity. It is visible that the design of a cultural and creative product is different from the general practical product or the cultural and creative product with the aesthetic as the core. Therefore, the design of cultural and creative

products should not focus on a single level of value, but should balance the three levels. In addition to satisfying the basic practical needs of consumers, it can also integrate culture and emotion into product design through creative design techniques, which not only makes the product have unique aesthetic feeling, but also can arouse the satisfaction and touch of consumers to enhance the competitiveness of products in the market (Figure 3-6).

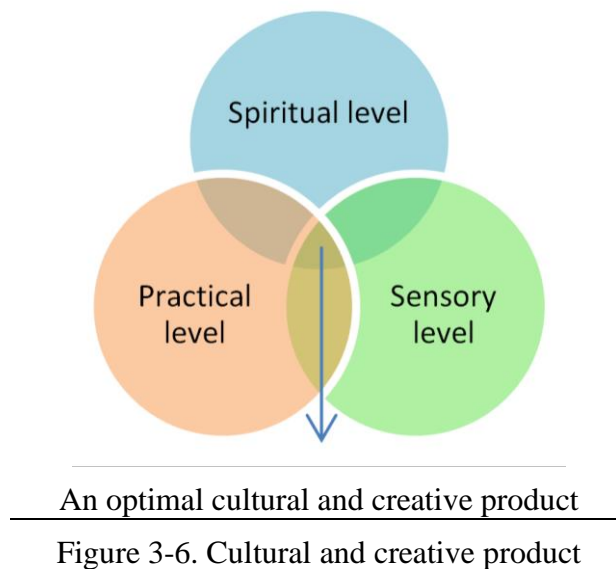


Figure 3-6. Cultural and creative product

(5) Value Level Assessment Checklist

This study has reviewed related literature and the modified Delphi method, and attempted to construct a value level assessment checklist for cultural and creative products. According to different design attributes and needs, the present research divided the value of cultural and creative products into three levels: “Practical level,” “Sensory level” and “Spirit level.” Different product design with different attributes has different core values.

a. Value assessment at Practice level

In terms of the “Practical level,” the attributes of cultural and creative products focus on product application and experience of satisfaction. According to the research results, the attribute characteristics of cultural and creative products at the practical level focus more on the improvement of practicality, pleasure, functionality, user pleasure, and operability. The value assessment items at practical level for cultural and creative product design are as follows (Table 3-20):

Table 3-20. Value assessment at practice level question items

Attribute	Value assessment question items
Practicability	The design of the product has good practicability.
User Pleasure	The design of the product has user pleasure.
Functionality	The design of the product has functionality.
Accessibility	The design of the product has accessibility.
Operability	The design of the product has operability.
Convenience	The design of the product has convenience.
Overall feeling	The design of this product can meet my needs for this product.

b. Value assessment at Sensory level

In terms of “sensory level,” the attributes of cultural and creative products focus on visual combination of products: aesthetic or creative. According to the research results, the attributes of cultural and creative products at the sensory level focus more on the visual aspects of product design, pattern design, color design, texture presentation, lines and material application. The value assessment items at sensory level for cultural and creative product design are as follows (Table 3-21):

Table 3-21. Value assessment at sensory level question items

Attribute	Value assessment question items
Shape	The shape design of the product is attractive.
Pattern	The pattern design of the product is attractive.
Color	The color matching of the product is attractive.
Texture	The texture of the product design is very exquisite.
Line	The line shape of the product is very graceful.
Material	The material application of the product is just right.
Overall Feeling	The overall design of the product has an aesthetic appeal and creativity, which can attract me.

c. Value assessment at Spirit level

In terms of "Spirit level," cultural and creative products emphasize the attribute characteristics of the intangible spirit level. According to the research results, the attributes of cultural and creative products at spirit level emphasize on the cultural characteristics, stories, special emotions, symbolic meanings, historical significance, and special meanings of the products. The study evaluated if these spiritual characteristics are creatively blended into the products through creative design, enabling consumers to further deepen their identity to the culture through the product and thereby achieve spiritual satisfaction. The value assessment items at spirit level for cultural and creative product design are as follows (Table 3-22):

Table 3-22. Value assessment at spiritual level question items

Attribute	Value assessment question items
Cultural feature	The design of the product is rich in cultural feature.
Story behind	The design of the product has a story behind.
Special emotion	The design of the product is rich in special emotion.
Symbolic meaning	The design of the product is rich in symbolic meaning
Historic significance	The design of the product is rich in historic significance.
Special implication	The design of the product is rich in special implication.
Overall feeling	The overall design of the product can meet my spiritual level needs.

It is not easy to evaluate the value of cultural and creative products. This study reviewed the related literature and expert opinions, and divided the value level of cultural and creative products into “practical level,” “sensory level” and “spirit level” according to their different characteristics of cultural and creative products. The core values of product design with different attributes are different. The “practical level” focuses on the actual application or experience of the product; the “sensory level” emphasizes the visual beauty or creativity of the product; the “spirit level” focuses on the cultural characteristics of the product, stories, emotions or symbolic meanings. Product design can focus on different value levels according to different needs of design. However, the design of cultural and creative products has multiple values, so it should not focus on a single value level. Instead, it is necessary to balance the three. In other words, with the focus on the levels of practice and sensory, the designer should also take spirit level into account. The three has different proportions in terms of design needs, but no one should be neglected. The best creative product design should include multiple values and meet the diverse needs of consumers. This is the goal which cultural and creative products should pursue.

d. Value level assessment checklist for cultural and creative products

This study designed a value assessment questionnaire of cultural and creative products based on the above three value levels of cultural and creative products. The design of questions was based on the related literature and expert surveys. This study designed the assessment items based on the attributes of each value level, and the Likert Scale (1932) was used to design the questionnaire. This questionnaire is divided into three levels, namely "practical level," "sensory level" and "spirit level." Each level includes 7 question items, a total of 21 question items. For each item, consumers were asked to select the appropriate degree of importance. The study used the seven-point scale of Likert as the scoring standard. The "7" represents strongly agree, the "1" represents strongly disagree, and the middle score based on the degree of importance is assessed by “6, 5, 4, 3, 2.” The higher the number, the higher the degree of consent the

consumers gave, while the lower the number, the lower degree of consent. The questionnaire section for each level was accompanied by a comment column for written opinions. The questionnaire for this study is mainly used for the evaluation of the values of bamboo curtain product samples in order to understand whether the product designs are consistent with consumer expectations (Table 3-23).

Table 3-23 Value assessment questionnaire of cultural and creative products

	Value assessment question items	7	6	5	4	3	2	1
Practice Level	The design of the product has good practicability.							
	The design of the product has user pleasure.							
	The design of the product has functionality.							
	The design of the product has accessibility.							
	The design of the product has operability.							
	The design of the product has convenience.							
	The design of this product can meet my needs for this product.							
Sensory Level	The shape design of the product is attractive.							
	The pattern design of the product is attractive.							
	The color matching of the product is attractive.							
	The texture of the product design is very exquisite.							
	The line shape of the product is very graceful.							
	The material application of the product is just right.							
	The overall design of the product has an aesthetic appeal, which can attract me.							
Spirit Level	The design of the product is rich in cultural feature.							
	The design of the product has a story behind.							
	The design of the product is rich in special emotion.							
	The design of the product is rich in symbolic meaning							
	The design of the product is rich in historic significance.							
	The design of the product is rich in special implication.							
	The overall design of the product can meet my spiritual level needs.							

The products with different design orientation have different core focus, but the design of cultural and creative products not only focus on a single value level, but also balance the multiple values to meet the diverse needs of consumers. Therefore, a well-designed cultural and creative product not only has the value of practical level, but also has the value of sensory and spirit level. The proportion of the three value levels depends on the difference of product design attributes. They can have different focuses, but should not be neglected. The product which can be balanced among the three is the best creative product, and only the product that can satisfy the diverse needs of consumers can trigger consumers' satisfaction and feelings. The consumers' needs are transformed into "want," and then "desire," which will thereby enhance the competitiveness of the product in the market.

Chapter 4 Creative thinking strategies for bamboo crafts transformation design

For the purpose of product innovation, the objective of this study is to explore a way of transforming Hakka traditional bamboo curtains in Taiwan into creative cultural products. To minimize the limitations that may arise from the author's personal bias, firstly a thorough examination on the characteristic variations of traditional bamboo blinds was conducted. To this end, the attribute listing approach was used to generate a list of the attributes of a bamboo curtain. The SCAMPER approach was employed to screen out and evaluate the seven attributes of a bamboo curtain for transformation so that the feasibility of each attribute's transformation was verified.

4.1 Checklist of attributes and features for a bamboo

In this study, we invited 12 professionals from different fields for in-depth interviews. We asked each of these professionals and scholars to carry out creative thinking verification on the attributes and features of each design element. Those six attributes of each design element for a bamboo curtain need to be verified against the seven creative thinking directions of SCAMPER. Each element needs to be verified against 42 assessment items. Therefore, those four elements of a bamboo curtain need to be verified against 168 conception assessment items. Each interviewee was asked to propose his/her conceptions of modification against the items in the table. Any inadequate modification direction was directly eliminated and the interviewee was asked to move forward to the next assessment item. The first round of interviews on the modification conceptions was carried out by open-ended questions. Each interviewee was asked to propose his/her possible modification conceptions based on a bamboo strip's variable factors. After that, the related conceptions were further integrated and the modification advises of reference values were filtered out for the investigation on the consensus of related opinions.

4.1.1 Checklist of attributes and features for a bamboo strip


The characteristics of bamboo strips can be divided into (a) materials, (b) shape or pattern, (c) color, (d) size or length, thickness, width and width, (e) function, (f) manufacturing technique or production method (Table 4-1).

Table 4-1. Bamboo strips (A) attribute :

Number	a	b	c	d	e	f
Attribute	Material	Pattern	Color	Dimenions	Function	Technique

Bamboo strips are the main design elements of bamboo curtains. This study constructed the checklist of attributes and features for bamboo strips. In this study, a bamboo strip's six attributes and features were integrated with seven components of the SCAMPER creative thinking for the assessment by the checklist. In this study, a bamboo strip's six attributes and features were integrated with seven components of the SCAMPER creative thinking for the assessment by the checklist (Table 4.2).

Table 4.2. Checklist of attributes and features for a bamboo strip (Element A)

Design Element	Element A - bamboo strip						
Attribute	independent variable	Noun attributes		Adjective attributes		Verb attributes	
	Control Variables	a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	A-a-S	A-b-S	A-c-S	A-d-S	A-e-S	A-f-S
		25%	58%	91%	X	X	X
	C	A-a-C	A- b-C	A-c-C	A-d-C	A-e-C	A-f-C
		41%	41%	X	X	41%	X
	A	A-a-A	A- b-A	A-c-A	A-d-A	A-e-A	A-f-A
		16%	58%	83%	66%	41%	83%
	M	A-a-M	A- b-M	A-c-M	A-d-M	A-e-M	A-f-M
		41%	58%	91%	66%	41%	83%
	P	A-a-P	A- b-P	A-c-P	A-d-P	A-e-P	A-f-P
		41%	X	41%	58%	50%	X
	E	A-a-E	A- b-E	A-c-E	A-d-E	A-e-E	A-f-E
		X	X	X	X	X	X
	R	A-a-R	A- b-R	A-c-R	A-d-R	A-e-R	A-f-R
		X	58%	X	X	X	75%

The following table shows the checking results of bamboo strips' attributes for transformation. The respondents proposed the transformation ideas according to the results of expert consensus screening (Table4-3) .

Table4-3. Checklist of attributes and features transformation for a bamboo strip

code	Checking items	screening	Checking items consensus screening
A-a-S	Bamboo strip - material - substitute	3/12	25% of respondents believe that bamboo strips can be substituted by other materials.
A-a-C	Bamboo strip - material - combine	5/12	41% of respondents believe that bamboo strips can be combined with other materials.
A-a-A	Bamboo strip - material - adapt	2/12	16% of respondents believe that the material of bamboo strips can be adjusted.
A-a-M	Bamboo strip - material - modify	5/12	41% of respondents believe that the material of bamboo strips can be modified or ameliorated.
A-a-P	Bamboo strip - material - put to other uses	5/12	41% of respondents believe that the material of bamboo strips can be put to other uses.
A-a-E	Bamboo strip - material - eliminate	X	No idea
A-a-R	Bamboo strip - material - rearrange	X	No idea
A-b-S	Bamboo strip - weaving pattern - substitute	7/12	58% of respondents believe that the weaving style of bamboo strips can be substituted.
A-b-C	Bamboo strip - weaving pattern - combine	5/12	41% of respondents believe that the weaving style of bamboo strips can be combined with other materials.
A-b-A	Bamboo strip - weaving pattern - adapt	7/12	58% of respondents believe that the weaving style of bamboo strips can be adapted.
A-b-M	Bamboo strip - weaving pattern - modify	7/12	58% of respondents believe that the weaving style of bamboo strips can be modified.
A-b-P	Bamboo strip - weaving pattern - put to other uses	X	No idea
A-b-E	Bamboo strip - weaving pattern - eliminate	X	No idea
A-b-R	Bamboo strip - weaving pattern - rearrange	7/12	58% of respondents believe that the weaving style of bamboo strips can be rearranged
A-c-S	Bamboo strip - color - substitute	11/12	91% of respondents believe that the color of bamboo strips can be modified.
A-c-C	Bamboo strip- color - combine	X	No idea
A-c-A	Bamboo strip - color - adapt	10/12	83% of respondents believe that the color of bamboo strips can be adapted.
A-c-M	Bamboo strip- color - modify	11/12	91% of respondents believe that the color of bamboo strips can be modified.
A-c-P	Bamboo strip - color - put to other use	5/12	41% of respondents believe that the color of bamboo strips can be put to other uses.
A-c-E	Bamboo strip - color -	X	No idea

	eliminate		
A-c-R	Bamboo strip – color - rearrange	X	No idea
A-d-S	Bamboo strip - dimensions - substitute	X	No idea
A-d-C	Bamboo strip - dimensions - combine	X	No idea
A-d-A	Bamboo strip - dimensions - adapt	8/12	66% of respondents believe that the dimensions of bamboo strips can be adapted.
A-d-M	Bamboo strip - dimensions - modify	8/12	66% of respondents believe that the dimensions of bamboo strips can be modified.
A-d-P	Bamboo strip - dimensions - put to other uses	4/12	33% of respondents believe that the implication of bamboo strip dimensions can be put to other uses.
A-d-E	Bamboo strip - dimensions - eliminate	X	No idea
A-d-R	Bamboo strip - dimensions - rearrange	X	No idea
A-e-S	Bamboo strip - function - substitute	X	No idea
A-e-C	Bamboo strip - function - combine	5/12	41% of respondents believe that the function of bamboo strips can be combined.
A-e-A	Bamboo strip - function - adapt	5/12	41% of respondents believe that the function of bamboo strips can be modified.
A-e-M	Bamboo strip - function - modify	5/12	41% of respondents believe that the function of bamboo strips can be modified.
A-e-P	Bamboo strip –function - put to other uses	6/12	50% of respondents believe that the function of bamboo strip dimensions can be put to other uses.
A-e-E	Bamboo strip - function - eliminate	X	No idea
A-e-R	Bamboo strip - function - rearrange	X	No idea
A-f-S	Bamboo strip - weaving - substitute	X	No idea
A-f-C	Bamboo strip - weaving - combine	X	No idea
A-f-A	Bamboo strip - weaving - adapt	10/12	83% of respondents believe that the weaving of bamboo strips can be adapted.
A-f-M	Bamboo strip - weaving - modify	10/12	83% of respondents believe that the weaving of bamboo strips can be modified.
A-f-P	Bamboo strip –weaving - put to other uses	X	No idea
A-f-E	Bamboo strip –weaving - eliminate	X	No idea
A-f-R	Bamboo strip - weaving - rearrange	9/12	75% of respondents believe that the weaving of bamboo strips can be rearranged.

4.1.2 checklist of attributes and features for piping


The characteristics of piping can be divided into (a) materials, (b) shape or pattern, (c) color, (d) size or location, (e) function, (f) manufacturing technique or production method (Table 4-4).

Table4-4. Piping(B) attribute :

Number	a	B	c	d	e	f
Attribute	Material	Pattern	Color	Dimenions	Function	Technique

The purpose of piping design is to protect the bamboo curtains, and it is also an important decorative element of the bamboo curtains. Delphi method was used for expert consultation about the transformation ideas of piping's design. The experts conducted independent thinking through the checklist of attributes and features for piping and gradually developed new ideas (Table 4-5)

Table4-5.Checklist of attributes and features for a Piping (Element B)

Design Element	Element B - Piping						
Attribute	independent variable Control Variables	Noun attributes		Adjective attributes		Verb attributes	
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	B-a-S	B-b-S	B-c-S	B-d-S	B-e-S	B-f-S
		75%	66%	100%	X	X	75%
	C	B-a-C	B-b-C	B-c-C	B-d-C	B-e-C	B-f-C
		58%	66%	X	X	X	75%
	A	B-a-A	B-b-A	B-c-A	B-d-A	B-e-A	B-f-A
		X	66%	100%	75%	41%	75%
	M	B-a-M	B-b-M	B-c-M	B-d-M	B-e-M	B-f-M
		75%	66%	100%	75%	41%	75%
	P	B-a-P	B-b-P	B-c-P	B-d-P	B-e-P	B-f-P
		X	X	41%	25%	41%	X
	E	B-a-E	B-b-E	B-c-E	B-d-E	B-e-E	B-f-E
		58%	X	X	X	X	X
	R	B-a-R	B-b-R	B-c-R	B-d-R	B-e-R	B-f-R
		X	X	X	X	X	X

The following table shows the checking results of piping's attributes for transformation. The respondents proposed the transformation ideas according to the results of expert consensus screening (Table 4-6).

Table4-6. Checklist of attributes and features transformation for piping

Code	Checking items	Screening	Checking items consensus screening
B-a-S	Piping - material - substitute	9/12	75% of respondents believe that the materials of piping can be substituted.
B-a-C	Piping - material - combine	7/12	58% of respondents believe that the materials of piping can be combined.
B-a-A	Piping - material- adapt	X	No idea
B-a-M	Piping - material- modify	9/12	75% of respondents believe that the materials of piping can be modified.
B-a-P	Piping - material- put to other uses	X	No idea
B-a-E	Piping - material - eliminate	7/12	58% of respondents believe that the materials of piping can be eliminated.
B-a-R	Piping - material - rearrange	X	No idea
B-b-S	Piping - Pattern - substitute	8/12	66% of respondents believe that the pattern of piping can be substituted.
B-b-C	Piping - Pattern - combine	8/12	66% of respondents believe that the pattern of piping can be combined.
B-b-A	Piping - Pattern - adapt	8/12	66% of respondents believe that the pattern of piping can be adapted.
B-b-M	Piping - Pattern - modify	8/12	66% of respondents believe that the pattern of piping can be modified.
B-b-P	Piping - Pattern - put to other uses	X	No idea
B-b-E	Piping - Pattern - eliminate	X	No idea
B-b-R	Piping - Pattern - rearrange	X	No idea
B-c-S	Piping - color - combine	12/12	100% of respondents believe that the color of piping can be substituted.
B-c-C	Piping - color - combine	X	No idea
B-c-A	Piping - color - adapt	12/12	100% of respondents believe that the color of piping can be adapted.
B-c-M	Piping - color - modify	12/12	100% of respondents believe that the color of piping can be modified.
B-c-P	Piping - color - put to other uses	5/12	41% of respondents believe that the color of piping can be put to other uses.
B-c-E	Piping - color - eliminate	X	No idea
B-c-R	Piping - color - rearrange	X	No idea

B-d-S	Piping - dimensions - substitute	X	No idea
B-d-C	Piping - dimensions - combine	X	No idea
B-d-A	Piping - dimensions - adapt	9/12	75% of respondents believe that the dimensions of piping can be adapted.
B-d-M	Piping - dimensions - modify	9/12	75% of respondents believe that the dimensions of piping can be modified.
B-d-P	Piping - dimensions - put to other uses	3/12	25% of respondents believe that the dimensions of piping can be put to other uses.
B-d-E	Piping - dimensions - eliminate	X	No idea
B-d-R	Piping - dimensions - rearrange	X	No idea
B-e-S	Piping - function - substitute	X	No idea
B-e-C	Piping - function - combine	X	No idea
B-e-A	Piping - function - adapte	5/12	41% of respondents believe that the function of piping can be adapted.
B-e-M	Piping - function - modify	5/12	41% of respondents believe that the function of piping can be modified.
B-e-P	Piping - function - put to other uses	5/12	41% of respondents believe that the function of piping can put to other uses
B-e-E	Piping - function - eliminate	X	No idea
B-e-R	Piping - function - rearrange	X	No idea
B-f-S	Piping - weaving - substitute	9/12	75% of respondents believe that the weaving of piping can be substituted.
B-f-C	Piping - weaving - combine	9/12	75% of respondents believe that the weaving of piping can be combined.
B-f-A	Piping - weaving - adapt	9/12	75% of respondents believe that the weaving of piping can be adapted.
B-f-M	Piping - weaving - modify	9/12	75% of respondents believe that the weaving of piping can be modified.
B-f-P	Piping - weaving - put to other uses	X	No idea
B-f-E	Piping - weaving - eliminate	X	No idea
B-f-R	Piping - weaving - rearrange	X	No idea

4.1.3 Checklist with items of attributes and features for cotton strips

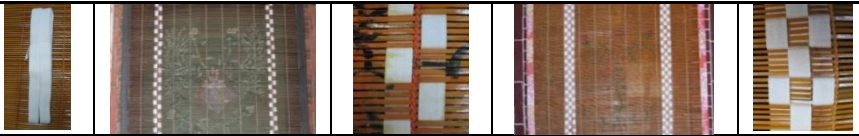
The characteristics of cotton strip can be divided into (a) materials, (b) shape or pattern, (c) color, (d) size or location, and amount, (e) function, (f) manufacturing technique or production method (Table 4-7).

Table4-7. Cotton strips(C) attributes :

Number	a	b	c	d	e	f
Attribute	Material	Pattern	Color	Dimenions	Function	Technique

The main purpose of the cotton strip is to fix bamboo curtains, which is also a decorative element of bamboo curtains. Delphi method was used for expert consultation about the transformation ideas of cotton strips' design. The experts conducted independent thinking through the checklist of attributes and features for cotton strips and gradually developed new ideas (Table 4-8).

Table4-8. Checklist of attributes and features for a Cotton strip (Element C)

Design Element	Element C - Cotton strip						
Attribute	independent variable	Noun attributes		Adjective attributes		Verb attributes	
	Control Variables	a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	C-a-S	C-b-S	C-c-S	C-d-S	C-e-S	C-f-S
		75%	75%	100%	X	X	58%
	C	C-a-C	C-b-C	C-c-C	C-d-C	C-e-C	C-f-C
		58%	58%	X	X	X	58%
	A	C-a-A	C-b-A	C-c-A	C-d-A	C-e-A	C-f-A
		X	75%	100%	75%	X	58%
	M	C-a-M	C-b-M	C-c-M	C-d-M	C-e-M	C-f-M
		X	75%	100%	75%	X	58%
	P	C-a-P	C-b-P	C-c-P	C-d-P	C-e-P	C-f-P
		X	33%	41%	X	33%	X
	E	C-a-E	C-b-E	C-c-E	C-d-E	C-e-E	C-f-E
		75%	X	X	X	X	X
	R	C-a-R	C-b-R	C-c-R	C-d-R	C-e-R	C-f-R
		X	75%	X	X	X	X

The following table shows the checking results of cotton strips' attributes for transformation. The respondents proposed the transformation ideas according to the results of expert consensus screening.

Table4-9. Checklist of attributes and features transformation for cotton strips

Code	Checking items	Screening	Checking items consensus screening
C-a-S	Cotton strips - material - substitute	9/12	75% of respondents believe that the materials of cotton strips can be substituted.
C-a-C	Cotton strips - material - combine	7/12	58% of respondents believe that the materials of cotton strips can be combined.
C-a-A	Cotton strips - material - adapt	X	No idea
C-a-M	Cotton strips - material - modify	X	No idea
C-a-P	Cotton strips - material - put to other uses	X	No idea
C-a-E	Cotton strips - material - eliminate	8/12	75% of respondents believe that the materials of cotton strips can be eliminated.
C-a-R	Cotton strips - material - rearrange	X	No idea
C-b-S	Cotton strips - pattern - substitute	9/12	75% of respondents believe that the pattern of cotton strips can be substituted.
C-b-C	Cotton strips - pattern - combine	7/12	58% of respondents believe that the pattern of cotton strips can be combined.
C-b-A	Cotton strips - pattern - adapt	9/12	75% of respondents believe that the pattern of cotton strips can be adapted.
C-b-M	Cotton strips - pattern - modify	9/12	75% of respondents believe that the pattern of cotton strips can be modified.
C-b-P	Cotton strips - pattern - put to other uses	4/12	33% of respondents believe that the pattern of cotton strips can be put to other uses.
C-b-E	Cotton strips - pattern - eliminate	X	No idea
C-b-R	Cotton strips - pattern - rearrange	9/12	75% of respondents believe that the pattern of cotton strips can be rearranged.
C-c-S	Cotton strips - pattern - substitute	12/12	100% of respondents believe that the color of cotton strips can be substituted.
C-c-C	Cotton strips - Color - combine	X	No idea
C-c-A	Cotton strips - Color - adapt	12/12	100% of respondents believe that the color of cotton strips can be adapted.
C-c-M	Cotton strips - Color - modify	12/12	100% of respondents believe that the color of cotton strips can be modified.
C-c-P	Cotton strips - Color - put to other uses	5/12	41% of respondents believe that the color of cotton strips can be put to other uses.
C-c-E	Cotton strips - Color - eliminate	X	No idea
C-c-R	Cotton strips - Color - rearrange	X	No idea
C-d-S	Cotton strips –	X	No idea

	dimensions/amount - substitute		
C-d-C	Cotton strips - Dimensions - combine	X	No idea
C-d-A	Cotton strips - Dimensions - adapt	9/12	75% of respondents believe that the dimension, place, and amount of cotton strips can be adapted.
C-d-M	Cotton strips - Dimensions - modify	9/12	75% of respondents believe that the dimension, place, and amount of cotton strips can be modified.
C-d-P	Cotton strips - Dimensions - put to other uses	X	No idea
C-d-E	Cotton strips - Dimensions - eliminate	X	No idea
C-d-R	Cotton strips - Dimensions - rearrange	X	No idea
C-e-S	Cotton strips - Function - substitute	X	No idea
C-e-C	Cotton strips - Function - combine	X	No idea
C-e-A	Cotton strips - Function - adapt	X	No idea
C-e-M	Cotton strips - Function - modify	X	No idea
C-e-P	Cotton strips - Function - put to other uses	4/12	33% of respondents believe that the function of cotton strips can be put to other uses.
C-e-E	Cotton strips - Function - eliminate	X	No idea
C-e-R	Cotton strips - Function - rearrange	X	No idea
C-f-S	Cotton strips - Weaving - substitute	7/12	58% of respondents believe that the weaving of cotton strips can be substituted.
C-f-C	Cotton strips - Weaving - combine	7/12	58% of respondents believe that the weaving of cotton strips can be combined.
C-f-A	Cotton strips - Weaving - adapt	7/12	58% of respondents believe that the weaving of cotton strips can be adapted.
C-f-M	Cotton strips - Weaving - modify	7/12	58% of respondents believe that the weaving of cotton strips can be modified.
C-f-P	Cotton strips - Weaving - put to other uses	X	No idea
C-f-E	Cotton strips - Weaving - eliminate	X	No idea
C-f-R	Cotton strips - Weaving - rearrange	X	No idea

4.1.4 Checklist of attributes and features for painting


The characteristics of painting can be divided into (a) materials, (b) shape or pattern, (c) color, (d) size or proportion, (e) function, (f) manufacturing technique or production method (Table 4-10).

Table4-10. Painting (D) attribute :

Number	a	B	c	d	e	f
Attribute	Material	Pattern	Color	Dimenions	Function	Technique

Painting is the main decorative element of bamboo curtains, and the painted patterns or themes are also the medium for the expression of culture or symbolic meanings. Delphi method was used for expert consultation about the transformation ideas of painting's design. The experts conducted independent thinking through the checklist of attributes and features for piping and gradually developed new ideas (Table 4-11).

Table4-11.Checklist of attributes and features for a Painting (Element D)

Design Element	Element A - Painting						
		Noun attributes		Adjective attributes		Verb attributes	
		a	B	c	d	e	f
Attribute	independent variable	Material	Pattern	Color	Dimenions	Function	Technique
	Control Variables						
SCAMPER	S	D-a-S	D-b-S	D-c-S	D-d-S	D-e-S	D-f-S
		41%	100%	100%	X	X	75%
	C	D-a-C	D- b-C	D-c-C	D-d-C	D-e-C	D-f-C
		41%	X	X	X	X	X
	A	D-a-A	D- b-A	D-c-A	D-d-A	D-e-A	D-f-A
		X	75%	100%	91%	X	75%
	M	D-a-M	D- b-M	D-c-M	D-d-M	D-e-M	D-f-M
		X	100%	100%	91%	X	75%
	P	D-a-P	D- b-P	D-c-P	D-d-P	D-e-P	D-f-P
		X	X	41%	X	85%	X
	E	D-a-E	D- b-E	D-c-E	D-d-E	D-e-E	D-f-E
		X	66%	X	X	X	X
	R	D-a-R	D- b-R	D-c-R	D-d-R	D-e-R	D-f-R
		X	75%	X	X	X	X

The following table shows the checking results of painting's attributes for transformation. The respondents proposed the transformation ideas according to the results of expert consensus screening (Table 4-12).

Table4-12. Checklist of attributes and features transformation for painting

Code	Checking items	Screening	Checking items consensus screening
D-a-S	Painting - material - substitute	5/12	41% of respondents believe that the materials of painting can be substituted.
D-a-C	Painting - material - combine	5/12	41% of respondents believe that the materials of painting can be combined.
D-a-A	Painting - material - adapt	X	No idea
D-a-M	Painting - material - modify	X	No idea
D-a-P	Painting - material- put to other uses	X	No idea
D-a-E	Painting - material - eliminate	X	No idea
D-a-R	Painting - material - rearrange	X	No idea
D-b-S	Painting - pattern - substitute	12/12	100% of respondents believe that the pattern of painting can be substituted.
D-b-C	Painting - pattern - combine	X	No idea
D-b-A	Painting - pattern - adapt	9/12	75% of respondents believe that the pattern of painting can be adapted.
D-b-M	Painting - pattern - modify	12/12	100% of respondents believe that the pattern of painting can be modified.
D-b-P	Painting - pattern - put to other uses	X	No idea
D-b-E	Painting - pattern - eliminate	8/12	66% of respondents believe that the pattern of painting can be eliminated.
D-b-R	Painting - pattern - rearrange	9/12	75% of respondents believe that the pattern of painting can be rearranged.
D-c-S	Painting - Color - substitute	12/12	100% of respondents believe that the color of painting can be substituted.
D-c-C	Painting - Color - combine	X	No idea
D-c-A	Painting - Color - adapt	12/12	100% of respondents believe that the color of painting can be adapted.
D-c-M	Painting - Color - modify	12/12	100% of respondents believe that the color of painting can be modified.
D-c-P	Painting - Color - put to other uses	5/12	41% of respondents believe that the color of painting can be put to other uses.
D-c-E	Painting - Color - eliminate	X	No idea

D-c-R	Painting - Color - rearrange	X	No idea
D-d-S	Painting - Dimensions - substitute	X	No idea
D-d-C	Painting - Dimensions - combine	X	No idea
D-d-A	Painting - Dimensions - adapt	11/12	91% of respondents believe that the dimensions of painting can be adapted.
D-d-M	Painting - Dimensions - modify	11/12	91% of respondents believe that the dimensions of painting can be modified.
D-d-P	Painting - Dimensions - put to other uses	X	No idea
D-d-E	Painting - Dimensions - eliminate	X	No idea
D-d-R	Painting - Dimensions - eliminate	X	No idea
D-e-S	Painting - Function - substitute	X	No idea
D-e-C	Painting - Function - combine	X	No idea
D-e-A	Painting - Function - adapt	X	No idea
D-e-M	Painting - Function - modify	X	No idea
D-e-P	Painting - Function - put to other uses	7/12	58% of respondents believe that the function of painting can be put to other uses.
D-e-E	Painting - Function - eliminate	X	No idea
D-e-R	Painting - Function - rearrange	X	No idea
D-f-S	Painting - Drawing method - substitute	9/12	75% of respondents believe that the drawing method of painting can be substituted.
D-f-C	Painting - Drawing method - combine	X	No idea
D-f-A	Painting - Drawing method - adapt	9/12	75% of respondents believe that the drawing method of painting can be adapted.
D-f-M	Painting - Drawing method - modify	9/12	75% of respondents believe that the drawing method of painting can be modified.
D-f-P	Painting - Drawing method - put to other uses	X	No idea
D-f-E	Painting - Drawing method - eliminate	X	No idea
D-f-R	Painting - Drawing method - rearrange	X	No idea

4.2 Investigation on the degree of consensus of attributes and features for for a bamboo

We further summarized the relevant conceptions that are mentioned above and picked those modification conceptions which might serve as a good reference. Generally, we picked one to three modification conceptions with reference values for the investigation on the degree of professional consensus. The purpose of the investigation on the degree of consensus is to understand the professionals' value and recommend each of the relevant conceptions. The principles of recommendations are based on a combination of consideration of creativity and feasibility of a relevant conception. Any recommendation item which has a consensus degree over 70% was included as one of the references for the direction of bamboo curtain modification.

4.2.1 Investigation on the degree of consensus of attributes and features for a bamboo strip

The results of the survey on the consensus of bamboo strips' transformation are shown in the following table .The results show that the experts have summarized and recognized the relevant ideas, which has improved the consensus of the experts on the ideas, and even provided further ideas of transformation. It can be seen that the views of the respondents can stimulate and influence each other (Table 4-13).

Table4-13. The Consensus survey of attributes transformation for the bamboo strip \

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	A-a-S	A-b-S	A-c-S	A-d-S	A-e-S	A-f-S
		25%	83%	91%	X	X	X
	C	A-a-C	A-b-C	A-c-C	A-d-C	A-e-C	A-f-C
		83%	75%	X	X	75%	X
	A	A-a-A	A-b-A	A-c-A	A-d-A	A-e-A	A-f-A
		33%	83%	83%	83%	75%	91%
	M	A-a-M	A-b-M	A-c-M	A-d-M	A-e-M	A-f-M
		75%	83%	91%	83%	75%	91%
	P	A-a-P	A-b-P	A-c-P	A-d-P	A-e-P	A-f-P
		75%	X	66%	75%	66%	X
	E	A-a-E	A b-E	A-c-E	A-d-E	A-e-E	A-f-E
		X	X	X	X	X	X
	R	A-a-R	A-b\ R	A-c-R	A-d-R	A-e-R	A-f-R
		X	83%	X	X	X	75%

The following table shows the results of the consensus opinion survey on the concept of bamboo strips' transformation (Table4-14). The table shows the comparison between the first and second consensus survey. The difference in the second consensus survey shows that only a small number of respondents made suggestions for the open-ended question items. However, when the second survey was conducted, the suggestions were obtained after the feedback has been summarized and recognized. The suggestions were accepted by other respondents, and even produced new ideas.

For example, as for the ideas of A-d-P, (A) Bamboo Strip (d) Size (P) changed the use, the degree of consensus increased from 33% to 75% after providing feedback to respondents. 75% of respondents agree that the size of bamboo strips can be combined with the auspicious meaning of Chinese traditional Feng Shui size. Although this idea of transformation was only proposed by a small number of respondents, it was widely accepted once it was proposed. This idea was regarded as a more creative one, but also can present the dimensions with cultural meanings. For example, the concept of the carpenter's ruler in traditional Chinese feng shui can be integrated so that the dimension itself possesses the auspicious implications.

Table4-14. The Consensus opinion survey of attributes transformation for the Bamboo Strip

Code	Checking items	Screening	Checking items consensus screening
A-a-S	Bamboo strip - material - substitute	25%→25%	25% of respondents assent that bamboo strips can be substituted by different materials.
A-a-C	Bamboo strip - material - combine	41%→83%	83% of respondents assent that bamboo strips can be combined with mixed media to increase the diversity of it.
A-a-A	Bamboo strip - material - adapt	16%→33%	33% of respondents assent that bamboo strips can adapt to the texture of its surface material.
A-a-M/ P	Bamboo strip - material - modify/put to other uses	41%→75%	75% of respondents assented to the original material of the bamboo strip can be modified or put to other uses.
A-b-S/A/ M/R	Bamboo strip - weaving pattern - substitute/ adapt/modify/rearrange	58%→83%	83% of respondents assented to the weaving pattern of the bamboo strips can be substituted, adapted, modified, and rearranged.
A- b-C	Bamboo strip - weaving pattern - combine	41%→75%	75% of respondents assented to the weaving pattern of the bamboo strips can be combined with other materials.
A-c-S/ M	Bamboo strip - color - substitute/modify	91%→91%	91% of respondents agree with the color of the bamboo strips can be substituted and modified.
A-c-A	Bamboo strip - color - adapt	83%→83%	83% of respondents agree with the color of the bamboo strips can be adapted.
A-c-P	Bamboo strip - color - put to other uses	41%→66%	66% of respondents agree with the color of the bamboo strips can be changed.
A-d-A	Bamboo strip – Dimensions - adapt	66%→83%	83% of respondents agree with the dimensions of the bamboo strips can be adapted.

A-d-M	Bamboo strip –Dimensions - modify	66%→83%	83% of respondents agree with the dimensions of the bamboo strips can be modified.
A-d-P	Bamboo strip – Dimensions - put to other uses	33%→75%	75% of the respondents agreed with the implication of the bamboo strip’s dimensions can be changed.
A-e-C/A/M	Bamboo strip - Function - combine/adapt/modify	41%→75%	75% of respondents agree with the function of the bamboo strips can be combined, adapted, and modified.
A-e-P	Bamboo strip - Function - put to other uses	50%→66%	66% of respondents agree with the function of the bamboo strips can be changed.
A-f-A/M	Bamboo strip - Weaving - adapt/modify	83%→91%	91% of respondents agree with the weaving method of bamboo strips can be adapted and modified.
A-f-R	Bamboo strip - Weaving - rearrange	75%→75%	75% of the respondents agreed with the weaving method of bamboo strips can be rearranged.

4.2.2 Investigation on the degree of consensus of attributes and features for piping

The results of the survey on the consensus of piping's transformation are shown in the following table (Table4-15).The results show that after the experts have summarized and recognized their ideas. Experts' strong consensus over ideas has been built up.

Table4-15. The Consensus survey of attributes transformation for Piping

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	B-a-S	B-b-S	B-c-S	B-d-S	B-e-S	B-f-S
		83%	83%	100%	X	X	83%
	C	B-a-C	B-b-C	B-c-C	B-d-C	B-e-C	B-f-C
		83%	83%	X	X	X	83%
	A	B-a-A	B-b-A	B-c-A	B-d-A	B-e-A	B-f-A
		X	83%	100%	91%	58%	83%
	M	B-a-M	B-b-M	B-c-M	B-d-M	B-e-M	B-f-M
		83%	83%	100%	91%	58%	83%
	P	B-a-P	B-b-P	B-c-P	B-d-P	B-e-P	B-f-P
		X	X	66%	58%	58%	X
	E	B-a-E	B-b-E	B-c-E	B-d-E	B-e-E	B-f-E
		58%	X	X	X	X	X
	R	B-a-R	B-b-R	B-c-R	B-d-R	B-e-R	B-f-R
		X	X	X	X	X	X

The following table shows the results of the consensus opinion survey on the

concept of piping's transformation (Table4-16). The table shows the comparison between the first and second consensus survey. The difference in the second consensus survey shows that when the second survey was conducted, the suggestions were obtained after the feedback has been summarized and recognized. The suggestions were accepted by other respondents, and even produced new ideas. For example, as for the idea of B-a-C, (B) piping (a) material (C) combination, the degree of consensus increased from 58% to 83%.83% of respondents agreed with the proposal to combine the materials of piping. For example, the respondents agreed that piping can be combined with calligraphy and roof heads to show different cultural symbols. In addition to its original practical functions, piping can also incorporate special cultural meanings, such as with traditional Chinese calligraphy, so that piping has the beauty of decoration and cultural display; and piping can be combined with Hakka traditional architecture roof heads, which upgrades the function of piping from the practical and decorative functions to a higher level, that is, conveying Chinese cultural images. This transformation idea has been widely accepted once it was proposed. This idea was regarded as a more creative one.

Table4-16. The Consensus opinion survey of attributes transformation for Piping

Code	Checking items	Screening	Checking items consensus screening
B-a-S/M	Piping - material - substitute/modify	75%→83%	83% of respondents agree with the material of the piping can be substituted and modified.
B-a-C	Piping - material- combine	58%→83%	83% of respondents agree with the material of the piping can be combined.
B-b--S/ C/A/M	Piping - Pattern - substitute/ combine/adapt/ modify	66%→83%	83% of respondents agree with the pattern of the piping can be substituted, combined, adapted, and modified.
B-c-S/A /M	Piping - Color - substitute/ adapt/ modify	100%→100%	100% of respondents agree with the color of the piping can be substituted, adapted, and modified.
B-c-P	Piping - Color - put to other uses	41%→66%	66% of respondents agree that the usage of the piping color can be changed.
B-d-A/ M	Piping - Dimensions - adapt/ modify	75%→91%	91% of respondents agree with the dimensions of the piping can be adapted and modified.
B-d-P	Piping - Dimensions - put to other uses	25%→58%	58% of respondents agree with the dimensions of the piping can be put to other uses.
B-e-A/ M/P	Piping - Function - adapt/ modify/ put to other uses	41%→58%	58% of respondents agree with the dimensions of the piping can be adapted, modified, and put to other uses.
B-f- S/C/A/ M	Piping - Weaving - substitute /combine/adapt/ modify	75%→100%	100% of respondents agree with the weaving of the piping can be substituted, combined, adapted, and modified.

4.2.3 Investigation on the degree of consensus of attributes and features for cotton strips

The results of the survey on the consensus of cotton strips' transformation are shown in the following table (Table 4-17). The results show that after the experts have summarized and recognized their ideas. Experts' strong consensus over ideas has been built up.

Table 4-17. The Consensus survey of attributes transformation for cotton strips

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	C-a-S	C-b-S	C-c-S	C-d-S	C-e-S	C-f-S
		83%	83%	100%	X	X	75%
	C	C-a-C	C- b-C	C-c-C	C-d-C	C-e-C	C-f-C
		83%	83%	X	X	X	75%
	A	C-a-A	C- b-A	C-c-A	C-d-A	C-e-A	C-f-A
		X	91%	100%	91%	X	75%
	M	C-a-M	C- b-M	C-c-M	C-d-M	C-e-M	C-f-M
		X	91%	100%	91%	X	75%
	P	C-a-P	C- b-P	C-c-P	C-d-P	C-e-P	C-f-P
		X	75%	66%	X	75%	X
	E	C-a-E	C- b -E	C-c-E	C-d-E	C-e-E	C-f-E
		66%	X	X	X	X	X
	R	C-a-R	C- b -R	C-c-R	C-d-R	C-e-R	C-f-R
		X	91%	X	X	X	X

The following table shows the results of the consensus opinion survey on the concept of cotton strips' transformation (Table 4-18). The table shows the comparison between the first and second consensus survey. Such as C-b-P, (C) cotton strips (b) style (P) use or meaning change, the degree of consensus increased from 33% to 75%. 75% of respondents agreed that the shape of the strips can change the use of cotton strips. The original use of the string is to fix bamboo curtains. In the future, the original function of the cotton strips can be changed. The cotton strips can be woven into a pattern with special cultural meanings or auspicious meanings, so that the product can serve practical and decorative functions, which can further be promoted to a display platform for special culture. This transformation idea has been widely accepted once it was proposed. This idea was regarded as a more creative one.

Table4-18. The Consensus opinion survey of attributes transformation for Cotton Strips

Code	Checking items	Screening	Checking items consensus screening
C-a-S	Cotton strips - material - substitute	75%→83%	83% of respondents agree with the material of the cotton strips can be substituted.
C-a-C	Cotton strips - material - combine	58%→83%	83% of respondents agree with the material of the cotton strips can be combined.
C-a-E	Cotton strips - material - eliminate	66%→66%	66% of respondents agree with the material of the cotton strips can be eliminated.
C-b-S	Cotton strips - Pattern - substitute	75%→83%	83% of respondents agree with the pattern of the cotton strips can be substituted.
C-b-C	Cotton strips - Pattern - combine	58%→83%	83% of respondents agree with the pattern of the cotton strips can be combined.
C-b-A/M/R	Cotton strips - Pattern - adapt/modify/rearrange	75%→91%	91% of respondents agree with the pattern of the cotton strips can be adapted, modified, and rearranged.
C-b-P	Cotton strips - Pattern - put to other uses	33%→75%	75% of respondents agree with the pattern of the cotton strips can be put to other uses.
C-c-S/A/M	Cotton strips - Color - substitute/adapt/modify	100%→100%	100% of respondents agree with the color of the cotton strips can be substituted, adapted, and modified.
C-c-P	Cotton strips - color - put to other uses	41%→66%	66% of respondents agree with the color of the cotton strips can be put to other uses.
C-d-A/M	Cotton strips - Dimensions/Amount - adapt/modify	75%→91%	91% of respondents agree with the dimension, place, and amount of the cotton strips can be adapted and modified.
C-e-P	Cotton strips - Function - put to other uses	33%→75%	75% of respondents agree with the function of the cotton strips can be put to other uses.
C-f-S/C/A/M	Cotton strips - Weaving - substitute/combine/adapt/modify	58%→75%	75% of respondents agree with the weaving of the cotton strips can be substituted, combined, adapted, and modified.

4.2.4 Investigation on the degree of consensus of attributes and features for painting

The results of the survey on the consensus of painting's transformation are shown in the following table (Table 4-19). The results show that after the experts have summarized and recognized their ideas. Experts' strong consensus over ideas has been built up.

Table4-19. The Consensus survey of attributes transformation for Painting

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	D-a-S	D-b-S	D-c-S	D-d-S	D-e-S	D-f-S
		66%	100%	100%	X	X	100%
	C	D-a-C	D- b-C	D-c-C	D-d-C	D-e-C	D-f-C
		66%	X	X	X	X	X
	A	D-a-A	D- b-A	D-c-A	D-d-A	D-e-A	D-f-A
		X	91%	100%	100%	X	100%
	M	D-a-M	D- b-M	D-c-M	D-d-M	D-e-M	D-f-M
		X	100%	100%	100%	X	100%
	P	D-a-P	D- b-P	D-c-P	D-d-P	D-e-P	D-f-P
		X	X	58%	X	75%	X
	E	D-a-E	D- b -E	D-c-E	D-d-E	D-e-E	D-f-E
		X	66%	X	X	X	X
	R	D-a-R	D- b -R	D-c-R	D-d-R	D-e-R	D-f-R
		X	91%	X	X	X	X

The following table shows the results of the consensus opinion survey on the concept of painting's transformation (Table4-20). The table shows the comparison between the first and second consensus survey. The result shows that (DbS/M) painting pattern or theme replacement/modification, (DcS/A/M) the color replacement/adjustment/modification, and (DdA/M) the painting size/proportional adjustment/modification have reached high consensus. Among them, the replacement/adjustment/modification (DfS/A/M) of the painting technique/drawing method, the interviewed experts all adjusted the original viewpoint, and accepted the idea that the painting technique and the drawing method can be replaced, adjusted and modified, such as inkjet printing, ironed pattern technology and wrapping technology.

Table4-20. The Consensus opinion survey of attributes transformation for Painting

Code	Checking items	Consensus	Consensus level of transformation ideas
D-a-S	Painting - material - substitute	41%→66%	66% of respondents agree with the material of painting can be substituted.
D-a-C	Painting - material - combine	41%→66%	66% of respondents agree with the material of painting can be combined.
D-b-S/M	Painting - Pattern - substitute/modify	100%→100%	100% of respondents agree with the pattern of painting can be substituted and modified.
D-b-A/R	Painting - Pattern - adapt/rearrange	75%→91%	91% of respondents agree with the pattern of painting can be adapted and rearranged.
D-b-E	Painting - Pattern - eliminate	66%→66%	66% of respondents agree with the pattern of painting can be eliminated.
D-c-S/A/M	Painting - Color - substitute/adapt/modify	100%→100%	100% of respondents agree with the color of the painting can be substituted, adapted, and modified.
D-c-P	Painting - Color - put to other uses	41%→58%	58% of respondents agree with the color of the painting can be put to other uses.
D-d-A/M	Painting - Dimensions - modify	91%→100%	100% of respondents agree with the dimensions of the painting can be adapted and modified.
D-e-P	Painting - Function - put to other uses	58%→75%	75% of respondents agree with the function of the painting can be put to other uses.
D-f-S/A/M	Painting - Drawing method - substitute/adapt/modify	75%→100%	100% of respondents agree with the drawing method of the painting can be substituted, adapted, and modified.

4.3 Screening and aggregation of transformation ideas for bamboo curtain attributes

After expert consultation, screening, and aggregation, expert consensus survey was conducted. The purpose of the consensus survey was to understand the extent to which the relevant ideas were accepted by other experts and scholars. The ideas which achieved more than 75% consensus were included for bamboo curtain transformation. The current study integrated and classified the relevant ideas after screening (Table 4-21) according to the six attributes of the four design elements of bamboo curtains. Each category retains two to four ideas, and each idea includes one to three specific suggestions. A list of suggested options on the transformation design was constructed, which will be used as a reference for the transformation of each design element. The table lists simplified contents. The detailed design statement of the research survey is placed in the appendix.

Table 4-21. Screening the consensus survey of transformation ideas for bamboo curtain attributes

Elements Attributes	A-Bamboo strip	B-Piping	C-Cotton strip	D-Painting
a-Material	A-a-C A-a-M/P	B-a-S B-a-C	C-a-S C-a-C	
b-Shape/Pattern	A-b-S/A/M/R A-b-C	B-b-S/C/A/M	C-b-S/C/A/M/R C-b-P	D-b-S/M D-b-A/R
c-Color	A-c-S/A/M A-c-A	B-c-S/A/M	C-c-S/A/M	D-c-S/A/M
d-Dimensions	A-d-A/M A-d-P	B-d-A/M	C-d-A/M	D-d-A/M D-e-P
e-Function	A-e-C/A/M		C-e-P	
f-Technique	A-f-A/M A-f-R	B-f-S/C/A/M	C-f-S/C/A/M	D-f-S/A/M

4.3.1 Screening and aggregation of transformation ideas for bamboo strips' attributes

(1) Screening of transformation ideas for bamboo strips' attributes

After screening of transformation ideas for bamboo strips' attributes, the ideas which achieve more than 75% consensus were included for bamboo curtain transformation (Table 4-22).

Table 4-22. Screening the consensus survey of transformation ideas for bamboo curtain attributes

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	A-a-S	A-b-S	A-c-S	A-d-S	A-e-S	A-f-S
			●	●			
	C	A-a-C	A- b-C	A-c-C	A-d-C	A-e-C	A-f-C
		●	●			●	
	A	A-a-A	A- b-A	A-c-A	A-d-A	A-e-A	A-f-A
			●	●	●	●	●
	M	A-a-M	A- b-M	A-c-M	A-d-M	A-e-M	A-f-M
		●	●	●	●	●	●
	P	A-a-P	A- b-P	A-c-P	A-d-P	A-e-P	A-f-P
		●			●		
	E	A-a-E	A- b -E	A-c-E	A-d-E	A-e-E	A-f-E
	R	A-a-R	A- b -R	A-c-R	A-d-R	A-e-R	A-f-R
			●				●

The suggested options with more than 75% of consensus on the transformation ideas for bamboo strips' attributes are listed below (Table 4-23). Among them, the transformation ideas of Substitute/Adapt/Modify (AcS/A/M) of bamboo strip color and Adapt/Modify of bamboo strip production technology/weaving method (AfA/M) has the highest degree of consensus.

Table 4-23. Suggested for more than 75% of consensus on the transformation ideas for bamboo strips attributes

Attribute	Code	Checking items	consensus
Material (a)	A-a-C	Combination of bamboo strip materials	83% (10/12)
	A-a-M/P	Modification of the use of the bamboo strip materials	75% (9/12)
Pattern(b)	A-b-S/A/M/R	Substitution/Adaptation/Modification/Rea rrangement of bamboo strip pattern	83% (10/12)
	A- b-C	Combination of bamboo strip pattern	75% (9/12)
Color(c)	A-c-S/A/M	Substitution/Modification of bamboo strip color	91% (11/12)
	A-c-A	Adaptation of bamboo strip color	83%

			(10/12)
Dimension s(d)	A-d-A	Adaptation of bamboo strip dimensions	83% (10/12)
	A-d-M	Modification of bamboo strip dimensions	83% (10/12)
	A-d-P	The implication of the bamboo strip dimensions put to other use	75% (9/12)
Function(e)	A-e-C/A/M	Combination/Adaptation/Modification of the bamboo strip function	75% (9/12)
Technique(f)	A-f-A/M	Adaptation/Modification of the bamboo strip technique	91% (11/12)
	A-f-R	Rearrangement of bamboo strip technique	75% (9/12)

(2) Aggregation of transformation ideas for bamboo strips' attributes

The current study kept the transformation ideas for the bamboo strips with a consensus of more than 75% and listed the suggested options on transformation according to the six attributes. Each category retains two to four ideas, and each idea includes one to three specific suggestions. A list of suggested options on the transformation design was constructed, which will be used as a reference for the transformation of each design element. The table lists simplified contents. The detailed design statement of the research survey is placed in the appendix (Table4-24).

Table 4-24. Aggregation of transformation ideas for bamboo strip attributes

Attributes		Code of transformation ideas			Transformation ideas	Value level
Material	a	A-a1	add to mixed media	A-a1-1	add to color bead	sensory level
				A-a1-2	add to glass bead	
				A-a1-3	add to metal bead	
		A-a2	wrap in mixed media	A-a2-1	fabric material	
				A-a2-2	leather material	
				A-a2-3	nylon webbing material	
		A-a3	combine with mixed media	A-a3-1	connect transparent acrylic tube	practical level
				A-a3-2	connect color acrylic tube	
		A-a4	additional function	A-a3-1	Add bamboo vinegar to bamboo strips	
				A-a3-2	Add aromatic material to bamboo strips	
Pattern	b	A-b1	Twill weave styles	A-b1/f1-1	thin bamboo strips with twill weave pattern I 、 II 、 III	sensory level
Technique	f	A-f1	Twill weave	A b1/f1-2	wide bamboo strips with twill weave pattern I 、 II 、	

		A-b2 A-f2	Plain weave styles Plain weave		III	
				A-b1/f1-3	wide mixed with thin bamboo strips with twill weave pattern I、II、III	
				A-b2/f2-1	thin bamboo strips with plain weave pattern I、II、III	
				A-b2/f2-2	wide bamboo strips with plain weave pattern I、II、III	
Color	c	A-c1	Carbonized color	A-c1-1	carbonized bamboo strips: light brown	sensory level
				A-c1-2	carbonized bamboo strips: brown	
				A-c1-3	carbonized bamboo strips: dark brown	
		A-c2	Dyed color	A-c2-1	Dyed bamboo strips : achromatic color - white,black,gray	
				A-c2-2	Dyed bamboo strips : warm color	
				A-c2-3	Dyed bamboo strips : cool color	
		A-c3	Gradient/Smudge	A-c3-1	Dyed bamboo strips : achromatic gradient or smudge	
				A-c3-2	Dyed bamboo strips : warm color or smudge	
				A-c3-3	Dyed bamboo strips : cool color or smudge	
		A-c4	Cultural symbol	A-c4-1	Color application from the Hakka culture: Hakka blue	spiritual level
				A-c4-2	Color Application from Taiwan Culture	
				A-c4-3	Color application with auspicious meanings	
Dimensions	d	A-d1	thin bamboo strips	A-d1-1	0.1 cm thin round bamboo strips: bamboo series	sensory level
				A-d1-2	0.2 cm thin flat bamboo strips: bamboo skin series	
		A-d2	wide bamboo strips	A-d2-1	1 cm wide bamboo strips: bamboo series	
				A-d2-2	1 cm wide bamboo strips: bamboo skin series	
		A-d3	wide mixed with	A-d3-1	one wide with one thin	

Implication of function	e		thin bamboo strips	A-d3-2	one wide with two thin	spiritual level		
				A-d3-3	one wide with three thin			
		A-d4	auspicious meaning of the carpenter’s ruler	A-d4-1	welcome fortune/attract money			
				A-d4-2	auspiciousness/ wealth			
				A-d4-3	passing civil exams/prosperousness			
		f	A-e1	Hakka culture image	A-e1-1	the culture emblem of tung blossoms/magnolia	spiritual level	
	A-e1-2				the culture emblem of blue blouse			
	A-e1-3				the culture emblem of paper umbrella / bamboo door curtain			
	A-e1-5				faith in Dragon God			
	A-e1-6				architectural related cultural emblem: -“roof head”/“five elements stone”Chinese Five Elements modeling - Ancestral hall“building couplets” - Words respect pavilions/round-dragon houses/mother mound			
	A-e2			Taiwan culture imagery	A-e21	plants: the emblem of culture such as plum blossom, orchid, bamboo, chrysanthemum, peony, Chinese peony		
					A-e22	animals: the emblem of culture such as Mandarin ducks, Phoenix		
					A-e23	themes with special implication		
	A-e3			auspiciousness imagery	A-e31	blessing implication - such as wish you stay in love forever		
					A-e32	praying implication - such as step by step being promoted		
					A-e33	traditional festivals - such as safe and well all seasons		
	A-f1			Bamboo weaving machine	A-f1-1	twill weave		sensory level
					A-f1-2	plain weave		

4.3.2 Screening and aggregation of transformation ideas for piping

(1) Screening of transformation ideas for piping

After screening of transformation ideas for piping's attributes, the ideas which achieve more than 75% consensus were included for piping transformation (Table4-25).

Table 4-25. Consensus survey on the piping's attributes transformation ideas

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	B-a-S	B-b-S	B-c-S	B-d-S	B-e-S	B-f-S
		●	●	●			●
	C	B-a-C	B-b-C	B-c-C	B-d-C	B-e-C	B-f-C
		●	●				●
	A	B-a-A	B-b-A	B-c-A	B-d-A	B-e-A	B-f-A
			●	●	●		●
	M	B-a-M	B-b-M	B-c-M	B-d-M	B-e-M	B-f-M
		●	●	●	●		●
	P	B-a-P	B-b-P	B-c-P	B-d-P	B-e-P	B-f-P
				●			
	E	B-a-E	B-b-E	B-c-E	B-d-E	B-e-E	B-f-E
	R	B-a-R	B-b-R	B-c-R	B-d-R	B-e-R	B-f-R

The suggested options with more than 75% of consensus on the transformation ideas for piping attributes are listed below (Table4-26). Among them, the transformation ideas of Substitute/Adapt/Modify (B-c-S/A/M) of piping color and Adapt/Modify of piping size (B-d-A/M)) has the highest degree of consensus. The suggested options with more than 75% of the consensus degree are listed as follows:

Table4-26. Suggested for more than 75% of consensus on the transformation ideas for piping attributes

Attribute	Code	Checking items	consensus
Material(a)	B-a-S/M	Substitution/Modification of piping materials	83% (10/12)
	B-a-C	Combination of piping materials	83%(10/12)
Pattern(b)	B-b-S/C/A/M	Substitution/Combination/Adaptation/Modification of piping pattern	83%(10/12)
Color(c)	B-c-S/A/M	Substitution/Adaptation/Modification of piping color	100%(12/12)
Dimensions(d)	B-d-A/M	Adaptation/Modification of piping dimensions	91%(11/12)
Function(f)	B-f-S/C/A/M	Substitution/Combination/Adaptation/Modification of piping technique	83%(12/12)

(2) Aggregation of transformation ideas for piping's attributes

The current study kept the transformation ideas for piping with a consensus of more than 75% and listed the suggested options on transformation according to the six attributes. Each category retains two to four ideas, and each idea includes one to three specific suggestions. A list of suggested options on the transformation design was constructed, which will be used as a reference for the transformation of each design element. The table lists simplified contents. The detailed design statement of the research survey is placed in the appendix (Table4-27).

Table4-27. Aggregation of transformation ideas for piping attributes

Attributes		Code of transformation ideas			Transformation ideas	Value level
Material	a	B-a1	fabric	B-a1-1	tung blossoms floral pattern cloth I 、 II 、 III 、 VI 、 V 、 IV	sensory level
				B-a1-2	floral pattern cloth with multiple designs	
				B-a1-3	floral pattern cloth with geometric patterns	
				B-a1-4	plain color cloth	
		B-a2	leather	B-a2-1	dyed leather	
				B-a2-2	hollow laser cut leather	
				B-a2-3	leather molding or carving	
		B-a3	jacquard sewing the border	B-a3-1	jacquard bound	

		B-a4	Metal	B-a3-2	hollowed laser cut metal sheets	
		B-a5	combine mixed media string weaving	B-a4-1	with beaded embroidery for piping	
				B-a4-2	with tinsel thread	
				B-a4-3	with various beading and weaving piping	
		B-a6	additional function	B-a5-1	apply bamboo charcoal fabric	practical level
Shape		B-b1	nonlinear design	B-b1-1	geometric pattern design	sensory level
				B-b1-2	streamline shape design	
		B-b2	Cultural image design	B-b2-1	Hakka blue blouse collar design I 、 II 、 III	spiritual level
				B-b2-2	Hakka architecture “roof head” with five elements shapes - metal, wood, water, fire and earth	
Pattern	b	B-b3	decorative patterns	B-b3-1	abstract pattern (geometric pattern)	sensory level
				B-b3-2	concrtet pattern (such as decorative pattern)	
		B-b4	Hakka cultural imagery patterns	B-b4-1	symbolic plant : tung blossoms, magnolia	spiritual level
				B-b4-2	emblem costume : blue blouse	
				B-b4-3	living articles : paper umbrella, bamboo door curtains	
				B-b4-4	Faith: Dragon God	
				B-b4-5	Hakka architecture: Roof Head, Words respect pavilions, Round-Dragon Houses, Mother Mound, Five-Element stone	
				B-b4-6	The writing design of the “building couplets” couplet of Hakka architecture	
		B-b5	Taiwan cultural imagery pattern	B-b5-1	Taiwan cultural imagery pattern: peony, Chinese peony	
Color	c	B-c1	with bamboo curtain color	B-c1-1	with bamboo strips’ color	sensory level
				B-c1-2	with piping’s color	
				B-c1-3	with painting’s color	
		B-c2	cultural emblem color	B-c2-1	apply Hakka culture: Hakka blue	spiritual level
				B-c2-2	apply Taiwan Culture	
				B-c2-3	apply auspicious meanings	

Dimensions Position	d	B-d1	adapt width	B-d1-1	adapt the width of the piping	sensory level
			adapt length	B-d1-2	adapt the length of the piping	
		B-d2	adapt position	B-d2-1	above the bamboo curtain	
				B-d2-2	left and right sides of bamboo curtain	
				B-d2-3	below the bamboo curtain	
		B-d3	eliminate piping	B-d3-1	eliminate piping	
Implication of function	e	B-e1	Hakka culture imagery	B-e1-1	tung blossoms/Coco magnolia's culture emblem	spiritual level
				B-e1-2	blue blouse's culture emblem	
				B-e1-3	paper umbrella / bamboo door curtains' culture emblem	
				B-e1-5	the culture of Dragon God belief	
				B-e1-6	architectural related cultural symbols: - "roof head"/"five elements stone" in Chinese Five Elements modeling - Ancestral hall"building couplets" - Words respect pavilions/round-dragon house/mother mound	
		B-e2	Taiwan culture imagery	B-e2-1	plants: the emblem of culture such as plum blossom, orchid, bamboo, chrysanthemum, peony, Chinese peony	
				B-e2-2	animals: the emblem of culture such as Mandarin ducks, Phoenix	
				B-e2-3	themes with special implication	
		B-e3	auspiciousness imagery	B-e3-1	blessing implication - such as wish you stay in love forever	
				B-e3-2	praying implication - such as promote every step	
				B-e3-3	traditional festivals - such as safe and well all seasons	

4.3.3 Screening and aggregation of transformation ideas for cotton strips

(1) Screening of transformation ideas for cotton strips

After screening of transformation ideas for cotton strips' attributes, the ideas which achieve more than 75% consensus were included for cotton strip transformation (Table4-28).

Table 4-28. The Consensus survey of attributes transformation for the Cotton strip

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	C-a-S	C-b-S	C-c-S	C-d-S	C-e-S	C-f-S
		●	●	●			●
	C	C-a-C	C- b-C	C-c-C	C-d-C	C-e-C	C-f-C
		●	●				●
	A	C-a-A	C- b-A	C-c-A	C-d-A	C-e-A	C-f-A
			●	●	●		●
	M	C-a-M	C- b-M	C-c-M	C-d-M	C-e-M	C-f-M
			●	●	●		●
	P	C-a-P	C- b-P	C-c-P	C-d-P	C-e-P	C-f-P
			●			●	
	E	C-a-E	C- b -E	C-c-E	C-d-E	C-e-E	C-f-E
	R	C-a-R	C- b -R	C-c-R	C-d-R	C-e-R	C-f-R
			●				

The suggested options with more than 75% of consensus on the transformation ideas for cotton strip attributes are listed below (Table4-29).Among them, the transformation ideas of Adapt/Modify/Rearrange (C- b-A/M/R) of cotton strips' pattern/weaving patterns and Adapt/Modify of cotton strip size/location/amount (C-d-A/M) has the highest degree of consensus.

Table4-29. Suggested for more than 75% of consensus on the transformation ideas for cotton strips attributes

Attribute	Code	Checking items	consensus
Material (a)	C-a-S	Substitution of cotton strips materials	83% (10/12)
	C-a-C	Combination of cotton strips materials	83% (10/12)
Pattern (b)	C-b-S	Substitution of cotton strips pattern	83% (10/12)
	C- b-C	Combination of cotton strips pattern	83% (10/12)
	C- b-A/M/R	Adaptation/Modification/Rearrangement of cotton strips pattern	91% (11/12)
	C- b-P	Modification of the use of the cotton strips pattern	75% (9/12)
Color (c)	C-c-S/A/M	Substitution/Adaptation/Modification of the cotton strips color	100% (12/12)
Dimensions (d)	C-d-A/M	Adaptation/Modification of the cotton strips dimensions	91% (11/12)
Function(e)	C-e-P	Modification of the cotton strips function	75% (9/12)
Technique (f)	C-f-S/C/A/M	Substitution/Combination/Adaptation/Modification of the cotton strips technique	75% (9/12)

(2) Aggregation of transformation ideas for cotton strips' attributes

The current study kept the transformation ideas for cotton strips with a consensus of more than 75% and listed the suggested options on transformation according to the six attributes. Each category retains two to four ideas, and each idea includes one to three specific suggestions. A list of suggested options on the transformation design was constructed, which will be used as a reference for the transformation of each design element. The table lists simplified contents. The detailed design statement of the research survey is placed in the appendix (Table4-30).

Table 4-30. Aggregation of transformation ideas for cotton strips attributes

Attributes		Code of transformation			Transformation ideas	Value level
Material	a	C-a1	fabric	C-a1-1	white cotton strips	sensory level
				C-a1-2	dyed cotton strips	
		C-a2	nylon webbing	C-a2-1	Colored nylon webbing	
		C-a3	leather	C-a3-1	Dyed leather strip	
		C-a4	jacquard	C-a4-1	plain weave string all kinds of jacquard	
Pattern	b	C-b1	parallel interleaving	C-b1-1	parallel interlace string	sensory level
				C-b2-1	Jacquard string pattern 1	
		C-b2	decorative pattern string	C-b3-2	Jacquard string pattern 2	
				C-b3-3	Jacquard string pattern 3	spiritual level
				C-b2-1	with special cultural symbols	
		C-b3	ideographic pattern string	C-b2-2	with auspiciousness implication pattern	
Color	c	C-c1	match bamboo curtain's color	C-c1-1	with bamboo strip's color	sensory level
				C-c1-2	with piping's color	
				C-c1-3	with painting's color	
		C-c2	colors with cultural symbol	C-c2-1	apply Hakka culture: Hakka blue	spiritual level
				C-c2-2	apply Taiwan Culture	
				C-c2-3	apply auspicious meanings	
Dimension Position	d	C-d1	Adapt width	C-d1-1	0.1 cm cotton strips	sensory level
				C-d1-2	0.5 cm cotton strips	
				C-d2-3	1 cm cotton strips	
		C-d2	Adapt position	C-d2-1	cotton strips place 1	
				C-d2-2	cotton strips place 2	
				C-d2-3	cotton strips place 3	
		C-d3	Adapt amount	C-d3-1	two cotton strips	
				C-d3-2	three cotton strips	
				C-d3-3	multiple changes	
Implication of function	e	C-e1	Hakka culture imagery	C-e1-1	tung blossoms/magnolia's culture emblem	spiritual level
				C-e1-2	blue blouse's culture emblem	
				C-e1-3	paper umbrella / bamboo door curtain's culture emblem	
				C-e1-5	the culture emblem of Dragon God belief	
				C-e1-6	architectural related cultural symbols:	
		C-e2	Taiwan culture imagery	C-e2-1	-“roof head”/“five-elements stone” in Chinese Five Elements modeling	
				C-e2-2	-Ancestral hall“building couplets”	
				C-e2-3	-Words respect pavilions/round-dragon house/mother	

				mound	
		C-e3	auspiciousness meanings	C-e3-1	plants: the emblem of culture such as plum blossom, orchid, bamboo, chrysanthemum, peony, Chinese peony
				C-e3-2	animals: the emblem of culture such as Mandarin ducks, Phoenix
				C-e3-3	themes with special implication

4.3.4 Screening and aggregation of transformation ideas for painting

(1) Screening of transformation ideas for painting

After screening of transformation ideas for painting attributes, the ideas which achieve more than 75% consensus were included for painting transformation (Table4-31).

Table 4-31. The Consensus survey of attributes transformation for the Painting

independent variable Control Variables		Attribute Listing					
		a	b	c	d	e	f
		Material	Pattern	Color	Dimenions	Function	Technique
SCAMPER	S	D-a-S	D-b-S	D-c-S	D-d-S	D-e-S	D-f-S
			●	●			●
	C	D-a-C	D- b-C	D-c-C	D-d-C	D-e-C	D-f-C
	A	D-a-A	D- b-A	D-c-A	D-d-A	D-e-A	D-f-A
			●	●	●		●
	M	D-a-M	D- b-M	D-c-M	D-d-M	D-e-M	D-f-M
			●	●	●		●
	P	D-a-P	D- b-P	D-c-P	D-d-P	D-e-P	D-f-P
						●	
	E	D-a-E	D- b -E	D-c-E	D-d-E	D-e-E	D-f-E
	R	D-a-R	D- b -R	D-c-R	D-d-R	D-e-R	D-f-R
			●				

The suggested options with more than 75% of consensus on the transformation ideas for painting's attributes are listed below (Table4-32).Among them, the transformation ideas of Substitute/Modify (D-b-S/M) or Adapt/Modify (D-b-A/R) of painting pattern or theme, Substitute/Adapt/Modify (D-c-S/A/M) of painting color, Adapt/Modify (D-d-A/M) of size/proportion, or Substitute/Adapt/Modify (D-f-S/A/M) of painting technique/drawing approach has the highest degree of consensus.

Table4-32. Suggested for more than 75% of consensus on the transformation ideas for painting attributes

Attribute	Code	Checking items	Sonsensus
Pattern (b)	D-b-S/M	Substitute/Modify of painting pattern or theme	100%(12/12)
	D-b-A/R	Adapt/Rearrange of painting pattern or theme	91% (11/12)
Color (c)	D-c-S/A/M	Substitute/Adapt/Modify of painting color	100% (12/12)
Dimension (d)	D-d-A/M	Adapt/Modify of painting size/proportion	100% (12/12)
	D-e-P	Transform of painting function	75% (9/12)
Technique (f)	D-f-S/A/M	Substitute/Adapt/Modify of painting technique/drawing approach	100% (12/12)

(2) Aggregation of transformation ideas for painting's attributes

The current study kept the transformation ideas for painting with a consensus of more than 75% and listed the suggested options on transformation according to the six attributes. Each category retains two to four ideas, and each idea includes one to three specific suggestions. A list of suggested options on the transformation design was constructed, which will be used as a reference for the transformation of each design element. The table lists simplified contents. The detailed design statement of the research survey is placed in the appendix (Table4-33).

Table 4-33. Aggregation of transformation ideas for painting attributes

Attributes		Code of transformation ideas			Transformation ideas	Valve level
Pattern Theme Implication	b	D-b1	decorative patterns	D-b1-1	abstract pattern (geometric pattern)	sensory level
				D-b1-2	concrete pattern (such as decorative pattern)	
		D-b2 D-e1	Hakka cultural imagery pattern	D-b2/e1-1	symbolic plant : tung blossoms, magnolia	spiritual level
				D-b2/e1-2	emblem costume : blue blouse	
				D-b2/e1-3	living articles : paper umbrella, bamboo door curtains	
				D-b2/e1-5	Faith: Dragon God	
				D-b2/e1-6	Hakka architecture: roof head, building couplets, Word Respect Pavilions, Round-Dragon House, Mother Mound, five-element stone	

		D-b3 D-e2	Taiwan cultural imagery	D-b3/e2-1	plants: plum, orchid, bamboo, chrysanthemum, peony, Chinese peony	
				D-b3/e2-2	animals: Mandarin Duck and Phoenix are often used in celebrations	
				D-b3/e2-3	themes with special implication	
		D-b4 D-e3	The theme of auspiciousness meanings	D-b4/e3-1	blessing implication - such as wish you stay in love forever	
				D-b4/e3-2	praying implication - such as promote every step	
				D-b4/e3-3	traditional festivals - such as safe and well all seasons	
		D-b5	apply the authorized famous painting	D-b5-1	famous paintings authorized by art museums	
				D-b5-2	famous paintings authorized by Taiwanese artists	
				D-b5-3	authorized local arts	
Color	c	D-c1	match with the bamboo curtain' overall color	D-c1-1	with bamboo strips' color	sensory level
				D-c1-2	with pipings' color	
				D-c1-3	with cotton strips' color	
		D-c2	Cultural symbol	D-c2-1	apply Hakka culture	spiritual level
				D-c2-2	apply Taiwan Culture	
				D-c2-3	apply auspicious meanings	
Size Amount Position	d	D-d1	pattern size	D-d1-1	adapt pattern dimension/proportion	sensory level
		D-d2	pattern amount	D-d2-1	adapt pattern amount	
		D-d3	pattern position	D-d3-1	adapt pattern position and spacing	
Technology Method	f	D-f1	Inkjet printing technology	D-f1-1	inkjet printing painting	sensory level
		D-f2	Ironed decoration technology	D-f2-1	ironed decoration	
		D-f3	Wrapping technology	D-f3-1	wrapping decoration	
		D-f4	Joint technology	D-f4-1	bamboo strips joint with mixed media	

4.4 Aggregation of bamboo curtains' design ideas at value levels

Products with different design orientations have different core product appeals. Practical level focuses on the products practical application, such as daily necessities or industrial design products. Sensory level emphasizes on visual aesthetics and creativity, such as creative design products. Spiritual level emphasizes on product's cultural features, stories and emotions, which show the inner spirits. The core appeal of cultural and creative products lies at this level, which is different from the cores of pure daily necessities, decorative items, and artwork. Good cultural and creative product design not only focuses on a single value level, but also keeps the balance of multiple values. Under the premise of focusing on the spiritual level, the practical and sensory levels can be promoted as well. The degree of emphasis on the three levels can be adjusted in terms of the differences in product types and design appeals. In other words, all levels are equally indispensable.

4.4.1 Practical level

At the social/behavior layer based on the reviewed literature and expert opinions, this study concludes that cultural and creative products focus on the following attributes in order of focus: practicability, user pleasure, functionality, accessibility, operability, and convenience. This value level focuses on the actual application or experience of the product. This study named this value level as the "practical level." ° Most of the craft products with "practical level" as the main product appeal are life craft products, and such products mostly focus on practical application with the satisfaction of functions.

The early Hakka bamboo curtains focused mainly on practical functions. The bamboo curtains only had simple painted decoration and are practical life craft products. Therefore, when the traditional bamboo curtain technology is transformed into cultural and creative products, besides the practical level, the products should upgrade the sensory and the spiritual level. A balance should be achieved among three levels in the design ideas. All levels are equally indispensable in terms of the product attributes. The transformation of the bamboo curtains in this study still holds fast on the traditional culture. Bamboo curtains themselves are practical products. This study is intended to enhance and adjust the functions without deviating from the original characteristics of bamboo curtains. The study obtained expert opinions through Delphi method and retained the ideas with a consensus of 75% for design implementation. The suggestions on the ideas at the practical level are summarized as follows: (Table 4-34) :

Table4-34 Practice level transformation ideas of bamboo curtain

Attributes		Element		Code of transformation ideas		Transformation ideas	
a	Material	A	Bamboo strips	A-a1	Additional function	A-a1-1	Add bamboo vinegar to bamboo strips
						A-a1-2	Add aromatic material to bamboo strips
		B	Piping	B-a6	Bamboo charcoal fabric	B-a6-1	apply bamboo charcoal fabric
		A	Bamboo strips	D-f4	Joint technology	D-f4-1	bamboo strips joint with mixed media
f	Technology Method	A	Bamboo strips	A-f1	Bamboo weaving technology	A-f1-1	twill weave
						A-f1-2	plain weave styles
				A-f2	Carbonization technology	A-f2-1	Bamboo strips are carbonized into different shades
				A-f3	Dyeing technology	A-f3-1	Bamboo strips dyed into diverse colors
		D	painting	D-f1	Inkjet printing technology	D-f1-1	inkjet printing painting
				D-f2	Ironed decoration technology	D-f2-1	ironed decoration
				D-f3	Wrapping technology	D-f3-1	wrapping decoration

The ideas of bamboo curtain transformation mentioned above belong to the design at the practical level, and the main function is to improve the functions of the product. Bamboo curtains are indispensable living crafts for Hakka people's lives in Liudui. However, with changes with the times and the changing needs of life, bamboo curtains have gradually declined. However, with consumers' pursuit of higher living standard and the rise of environmental protection, many advantages of bamboo have been re-emphasized, and various bamboo craft designs have been repeatedly recognized internationally. The traditional bamboo craft gains a new lease of life. Bamboo curtains have both practical and decorative value with a long history of tradition. They are worth developing into distinctive local products. Therefore, in addition to the maintenance and evolution of bamboo curtains' practicality, the transformation design of bamboo curtains needs to further enhance the value of

sensory level and spiritual level, so that bamboo curtains can be transformed from daily necessities into cultural and creative products with local cultural characteristics.

The main principle of transformation in traditional crafts is not to deviate from tradition; thus this research carried out the transformation design of products without departing from traditional cultures in order to preserve the culture and style of traditional crafts. In addition to the transformation design of traditional bamboo curtains, the peripheral products related to bamboo curtains can also be developed into diversified products in the future, such as bamboo window curtains, bamboo screens, bamboo privacy screens, bamboo paintings, bamboo mats and bamboo placemats.

4.4.2 Sensory level

At the physical/material layer, based on the reviewed literature and expert opinions, this study concludes that cultural and creative products focus on the following attributes in order of focus: shape, pattern, color, texture, line, and material application. This value level focuses on visual aspect of the product's appearance. This study named this value level as "the sensory level." The design of cultural and creative products at this value level focuses on whether the visual combination of products is aesthetic or creative. Through the combination of visual elements, the design of the products will create exquisite, novel and creative feelings, which will lead to consumers' joy and touch. This is the value level that best attracts the attention of consumers. This study integrated the results of expert consultations and retained the ideas with a consensus of 75% for design implementation. The suggestions on the ideas at the sensory level are summarized as follows (Table4-35):

Table 4-35 Sensory level transformation ideas of bamboo curtain

Attributes		Element		Code of transformation ideas		Transformation ideas	
a	Material	A	Bamboo strips	A-a1	add to mixed media	A-a1-1	add to color bead
						A-a1-2	add to glass bead
						A-a1-3	add to metal bead
				A-a2	wrap in mixed media	A-a2-1	fabric material
						A-a2-2	leather material
						A-a2-3	nylon webbing
				A-a3	combine with mixed media	A-a3-1	connect transparent acrylic tube
						A-a3-2	connect color acrylic tube

b f	Pattern Technology	B	Piping	B-a1	Fabric	B-a1-1	tung blossoms floral pattern cloth I 、 II 、 III 、 VI 、 V 、 IV
						B-a1-2	floral pattern cloth with diverse designs I 、 II 、 III 、 VI 、 V 、 IV
						B-a1-3	floral pattern cloth with geometric patterns I 、 II 、 III 、 IV 、 V
						B-a1-4	plain color cloth
				B-a2	Leather	B-a2-1	dyed leatherI 、 II 、 III 、 IV 、 V
						B-a2-2	hollow laser cut leather
						B-a2-3	leather molding or carving
				B-a3	Jacquard bound	B-a3-1	jacquard bound
				B-a4	Metal	B-a3-2	hollowed laser cut metal sheets
				B-a5	combine mixed media string weaving	B-a4-1	with beaded embroidery for piping
						B-a4-2	with tinsel thread
						B-a4-3	with various beading and weaving piping
		C	Cotton strips	C-a1	Fabric	C-a1-1	White cotton strips
						C-a1-2	Dyed cotton strips
				C-a2	Nylon webbing	C-a2-1	Colored nylon webbing
				C-a3	Leather	C-a3-1	Dyed leather strip
				C-a4	Jacquard	C-a4-1	Plain weave string all kinds of jacquard
b f	Pattern Technology	A	Bamboo strips	A-b1 A-f1	Twill weave styles	A-b1/f1-1	thin bamboo strips with twill weave patternI 、 II 、 III
						A b1/f1-2	wide bamboo strips with twill weave pattern I 、 II 、 III
						A-b1/f1-3	wide mixed with thin bamboo strips with twill weave pattern I 、 II 、 III
				A-b2 A-f2	Plain weave styles	A-b2/f2-1	thin bamboo strips with plain weave pattern I 、 II 、 III
						A-b2/f2-2	wide bamboo strips with plain weave pattern I 、 II 、 III

						A-b2/f2-3	wide mixed with thin bamboo strips with plain weave pattern I 、 II 、 III
b	Style Pattern	B	Paping	B-b1	nonlinear design	B-b1-1	geometric pattern design
						B-b1-2	streamline shape design
				B-b3	decorative patterns	B-b3-1	abstract pattern (geometric pattern)
						B-b3-2	concrete pattern (such as decorative pattern)
		C	Cotton strips	C-b1	parallel interleaving	C-b1-1	parallel interlace string
				C-b2	decorative pattern string	C-b2-1	Jacquard string pattern 1
						C-b3-2	Jacquard string pattern 2
						C-b3-3	Jacquard string pattern 3
		D	Painting	D-b1	decorative patterns	D-b1-1	abstract pattern (geometric pattern)
						D-b1-2	concrete pattern (such as decorative pattern)
c f	Color Technology	A	Bamboo strips	A-c1 /f2	Carbonized color Carbonization technology	A-c1/f2-1	carbonized bamboo strips: light brown
						A-c1/f2-2	carbonized bamboo strips: brown
						A-c1/f2-3	carbonized bamboo strips: dark brown
				A-c2 /f3	Dyed color Dyeing technology	A-c2/f3-1	Dyed bamboo strips : achromatic color - white,black,gray
						A-c2/f3-2	Dyed bamboo strips : warm color
						A-c2/f3-3	Dyed bamboo strips : cool color
				A-c3 /f3	gradient/smudge Dyeing technology	A-c3/f3-1	Dyed bamboo strips : achromatic gradient or smudge
						A-c3/f3-2	Dyed bamboo strips : warm color or smudge
						A-c3/f3-3	Dyed bamboo strips : cool color or smudge
		B	Piping	B-c1	match with bamboo curtain's	B-c1-1	with the bamboo strips, piping, cotton strips, and painting to match
		C	Cotton strips	C-c1		C-c1-1	

		D	Painting	D-c1	overall color	D-c1-1	the overall color
d	Size Amount Position	A	Bamboo strips	A-d1	thin bamboo strips	A-d1-1	0.1 cm thin round bamboo strips: bamboo backbone series
						A-d1-2	0.2 cm thin flat bamboo strips: bamboo skin series
				A-d2	wide bamboo strips	A-d2-1	1 cm wide bamboo strips: bamboo backbone series
						A-d2-2	1 cm wide bamboo strips: bamboo skin series
				A-d3	wide mixed with thin bamboo strips	A-d3-1	one wide with one thin
						A-d3-2	one wide with two thin
						A-d3-3	one wide with three thin
		B	Piping	B-d1	adapt width	B-d1-1	adapt the width of the piping
					adapt length	B-d1-2	adapt the length of the piping
				B-d2	adapt position	B-d2-1	above the bamboo curtain
						B-d2-2	left and right sides of bamboo curtain
						B-d2-3	below the bamboo curtain
				B-d3	eliminate piping	B-d3-1	eliminate piping
		C	Cotton strips	C-d1	adapt width	C-d1-1	0.1 cm cotton strips
						C-d1-2	0.5 cm cotton strips
						C-d2-3	1 cm cotton strips
				C-d2	adapt position	C-d2-1	cotton strips position 1
						C-d2-2	cotton strips position 2
						C-d2-3	cotton strips position 3
				C-d3	adapt amount	C-d3-1	two cotton strips
						C-d3-2	three cotton strips
						C-d3-3	more than 3 strips
		D	Painting	D-d1	pattern size	D-d1-1	adapt pattern dimension/proportion
				D-d2	pattern amount	D-d2-1	adapt pattern amount
				D-d3	pattern position	D-d3-1	adapt pattern position and spacing

The ideas of bamboo curtain transformation mentioned above belong to the design at the sensory level, mainly focusing on the beauty or creativity of the product design and satisfying consumers' demand for the aesthetic aspect of the product appearance. Taking bamboo curtains as an example, bamboo strips can be combined with mixed media to break through the limitations of single media, showing changes in multiple combinations. Other examples are creative weaving patterns and the changes in the shape, patterns, and color of bamboo curtains, etc. Those can enhance the visual beauty and creativity of bamboo curtains.

4.4.3 Spiritual level

At the spiritual/ideal layer, based on the reviewed literature and expert opinions, this study concludes that cultural and creative products focus on the following attributes in order of focus: cultural characteristics, stories, special emotions, and symbolic, historical, and special meanings of the product. Focusing on the performance of the intangible spirit of the product, this study named this value level as "the spiritual level." The design of cultural and creative products at this value level focuses on whether the design of the product can integrate special cultural characteristics, stories, emotions or unique symbolic meanings, historical meanings into the design of the product through creative design, enabling consumers to further deepen their identity to the culture or achieve spiritual satisfaction through transference.

The spiritual level is the value of cultural and creative products, which are different from general products. Designers express the spiritual connotation of products through visual elements such as shape, pattern, material or color. As such, the products focus on not only their functionality and aesthetics but also the other factors such as culture, story, and emotion. Consumers can meet their diverse needs through the products' functionality and aesthetics. This study integrated the results of expert consultations and retained the ideas with a consensus of 75% for design implementation. The suggestions on the ideas at the spiritual level are summarized as follows (table4-36):

Table 4-36. Spiritual level transformation ideas of bamboo curtain

Attributes		Element		Code of transformation		Transfromation ideas		
b	Shape	B	Piping	B-b2	Cultural image design	B-b2-1	Hakka blue blouse collar design I 、 II 、 III	
						B-b2-2	Hakka architecture “roof head” with five elements shapes - metal, wood, water, fire and earth	
		C	Cotton strips	C-b3	ideographic pattern string	C-b2-1	with special cultural symbols	
						C-b2-2	with auspiciousness implication pattern	
b e	Pattern Implication	A	Cotton strips	A-e1	Hakka cultural imagery patterns	A-e1-1 B-b4/e1-1 C-e1-1 D-b2/e1-1	symbolic plant : tung blossoms pattern I 、 II 、 III 、 IV 、 V coco magnolia pattern I 、 II 、 III 、 IV 、 V	
						B	Piping	B-e1 B-b4
		C	Cotton strips	C-e1		A-e1-3 B-b4/e1-3 C-e1-3 D-b2/e1-3	living articles : paper umbrella, bamboo door curtains	
		D	Painting	D-b2 D-e1		A-e1-4 B-b4/e1-4 C-e1-4 D-b2/e1-4	Faith: Dragon God	
						A-e1-5 B-b4/e1-5 C-e1-5 D-b2/e1-5	architectural: roof head, building couplets, words respect pavilions, round-drangon house, mother mound, five elements stone	
		A	Bamboo strips	A-e2		Taiwan culture imagery	A-e2-1 B-b5/e2-1 C-e2-1 D-b3/e2-1	plants: plum blossom, orchid, bamboo, chrysanthemum, peony, Chinese peony
		B	Piping	B-b5 B-e2			A-e2-2 B- b5/e2-2 C-e2-2 D-b3/e2-2	animals: Mandarin ducks, Phoenix often be used in auspiciouseness
		C	Cotton strips	C-e2			A-e2-3 B b5/e2-3 C-e2-3 D-b3/e2-3	themes with special implication
		D	Painting	D-b3 D-e2				
		A	Bamboo strips	A-e3		auspiciousness meanings	A-e3-1 B-e3-1 C-e3-1 D-b4/e3-1	blessing implication - such as wish you stay in love forever
		B	Piping	B-e3				

						A-e3-2 B-e3-2 C-e3-2 D-b4/e3-2	praying implication - such as promote every step
		C	Cotton strips	C-e3		A-e3-3 B-e3-3 C-e3-3 D-b4/e3-3	traditional festivals - such as safe and well all seasons
		D	Painting	D-e3			
b	Pattern	D	Painting	D-b5	apply the authorized famous painting	D-b5-1	famous paintings authorized by art museums
						D-b5-2	famous paintings authorized by Taiwanese artists
						D-b5-3	authorized local arts
c	Color	A	Bamboo strips	A-c4	colors with cultural symbol	A-c4-1	symbolic color of Hakka culture
		B	Piping	B-c2		B-c2-1	
		C	Cotton strips	C-c2		C-c2-1	
		D	Painting	D-c2		D-c2-1	
		A	Bamboo strips	A-c4		A-c4-2	symbolic color of Taiwan culture
		B	Piping	B-c2		B-c2-2	
		C	Cotton strips	C-c2		C-c2-2	
		D	Painting	D-c2		D-c2-2	
		A	Bamboo strips	A-c4		A-c4-3	symbolic color of auspiciousness
		B	Piping	B-c2		B-c2-3	
		C	Cotton strips	C-c2		C-c2-3	
		D	Painting	D-c2		D-c2-3	
d	Size	A	Bamboo strips	A-d4	auspicious meaning of the carpenter's ruler	A-d4-1	welcome fortune/attract money
						A-d4-2	auspiciousness/ wealth
						A-d4-3	passing civil exams/prosperousness

In addition to strengthening its function in decoration, the transformation design of bamboo curtains transforms cultural elements into designs. With special shapes, patterns or colors, such as the Hakka blue blouse image, traditional architecture image, patterns or colors with cultural images, bamboo curtains are no longer just practical living crafts, but also decorative and cultural art crafts. Moreover, bamboo curtains are upgraded from practical and decorative products to the carriers that can convey cultural images. It has three value levels: practical level, sensory level and spiritual level.

4.4.4. Summary

Based on the above discussion, the transformation ideas of bamboo curtains can be summarized as follows in terms of the attributes:

(1) Material combination:

The combination of mixed media: bamboo strips can be combined with mixed media. Threading, wrapping, or combining with mixed media can add bamboo strips' variation and decoration. Mini colorful beads, crystal beads, metal beads or various kinds of glass beads can integrate different cultural meanings into bamboo strips, which can enrich the diversity of bamboo strips and add cultural meanings (Figure4-1).



Figure4-1. Various color beads that can be combined with bamboo strips

Piping or cotton strips can also break through the limitation of a single medium and can be woven into various patterns to the decoration function. Except for fabric, other materials such as leather, metal, and nylon can be combined with bamboo curtains (Figure 4-2 to 4-4). The replacement or combination of bamboo strips, piping, and cotton strips can increase the diversity of bamboo curtains. Also, the combination of different materials can produce new sparks. Under the traditional basis, a refreshing feeling toward the product can be created. High-quality, special, or stylish materials can also add value and style to bamboo curtains.

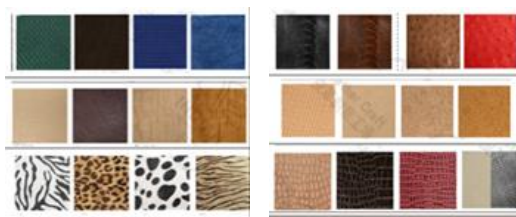


Figure4-2. Dyed leather



Figure4-3. Laser cut leather and cloth



Figure4-4. Nylon webbing

(2) The design of the shape and pattern:

The cultural meanings of bamboo curtains' shape design: product design and pattern design not only enhance value of sensory level; they are also important media for the spiritual level. Apart from the visual beauty from the design of piping and cotton strips, unique cultural symbols or meanings can be presented by incorporating cultural elements into the shape of the product. For example, the design of piping can be combined with the image of the Hakka blue blouses and traditional roof heads with Chinese Five Elements. Also, the design of piping with cultural patterns can be combined with floral pattern cloth with Taiwanese cultural image or tung blossoms with the Hakka cultural symbol. Moreover, the culture of "building couplets" in traditional Hakka architecture can be embedded. This combination of Chinese calligraphy with piping can demonstrate the beauty of decoration and culture.

Manifestation of the culture in bamboo curtains' pattern design: a painting on bamboo curtains is often the visual focus. The design of the patterns is just like the "Kaleidoscope Theory." The same elements which are arranged or adjusted in size, space, and amount can bring a new visual effect. In addition to decorative patterns, the patterns from the cultural symbols can enrich the manifestation of the culture in bamboo curtains, such as the application of Hakka or Taiwanese cultural elements or the meanings of auspiciousness. Taking Hakka cultural symbols as an example, integrating Hakka cultural images into bamboo curtains such as tung blossoms, blue blouses, and paper umbrellas can present Hakka's unique culture. The integration of these cultural themes places multiple values such as practicality, beauty and cultural symbols on bamboo curtains.

The promotion of pattern technology: as for the pattern technology in bamboo curtains, we can employ inkjet printing technology, ironed pattern, and wrapping technology to enrich bamboo curtains' patterns instead of traditional painting. Inkjet printing technology can be applied to print various patterns on bamboo curtains, which display the products' details and diversity. The use of computer inkjet printing technology can transcend the limitations of painting skills and can solve the problems of insufficient painting practitioners, unstable quality, and monotonous themes. In addition, it can print the patterns which customers provide, which meets the need of

customization. The application of ironed pattern technology can produce different brown colors of bamboo strips, bringing out the decorative effects: elegant and simple. The application of wrapping technology can enrich the variation of the bamboo strips by wrapping different materials around some parts of bamboo strips. Moreover, bamboo strips can be combined with mixed media for innovative design. For example, bamboo strips can be fastened or threaded with various colored beads to produce a beaded effect, or bamboo strips can be connected to a transparent or colored acrylic tube to present special images with colors. This innovative approach enhances the overall visual effect of bamboo curtains and adds the overall beauty and creativity to the product.

(3) Performance of color

The upgrade of color application and technology: color is the main visual feature of bamboo curtains, and the change of color often produces a refreshing visual experience. Due to technology reforms, the limitation of traditional colors can be broken. As for bamboo strips' color, darkness and lightness can be adjusted by the "carbonization technology"(Figure 4-5), or the "green color conservation" technology can be applied to keep the green color after the bamboo is dried. In addition, the current "dyeing technology" and "color fixing technology" of bamboos have become mature(Figure 4-6). Through the bamboo dyeing technology, the limitation of the original color of bamboos can be broken, and diverse colors can be revealed. The color of piping and cotton strips can also enhance the overall visual effect of bamboo curtains. The color of paintings can be combined with the color of bamboo curtains for extensive presentation. The designer can do color planning according to the needs, or customize the design in accordance with customers' color preference and the colors of their homes.



Figure 4-5. Color shade of carbonized bamboo strips



Figure 4-6. Dyed bamboo strips

The cultural implication of color: the color of bamboo strips is often the main visual focus of bamboo curtains. The application of colors can be divided into two levels of value. One is the sensory level, which aims to strengthen the decoration. Green color conservation technology, carbonization technology, or dyeing technology can vary the color of bamboo curtains. The second is the spiritual level, which can shape the ideographic function of the color itself. The diversity of bamboo strips' color can enhance visual beauty. The symbolic color in the culture can be utilized for color planning. For example, the Hakka traditional blue blouses make the blue color a cultural symbol of Hakka, and red is also the representative color of auspiciousness. Color is not only a material element, but also an important representation of culture.

(4) Size adjustment and application:

Changes in size of bamboo curtains: According to the experts' opinions, the length, thinness, width and thickness of bamboo strips can be changed in line with different design needs. The size of piping and cotton strips can be adjusted, such as width, amount, position, and space. Besides the left and right sides, the position of piping can be moved to the upper and lower sides with other designs. The limitations can be broken by different amount, space, and position of cotton strips for diversified combination. As for the design of painting, designers can make a list of the design elements, and adjust those elements' size, proportion, amount, position or space to display different visual effects. Apart from the actual demand of product size and variation of visual effects, the concept of the carpenter's ruler in traditional Chinese feng shui can be integrated so that the dimension itself possesses the auspicious

implications, such as welcoming fortune, attracting money, becoming auspicious, becoming wealthy, etc. These figurative implications can enhance the design of bamboo curtains to a higher spiritual level.

(5) Application of bamboo curtain weaving technology

The application of bamboo curtain technology: the improvement of production technology can increase production efficiency and quality, but the improvement of technology has a high threshold, which is related to the development of technology. If producers can apply the modern technology, they can overcome the limitation of traditional production technology. The traditional bamboo curtains are made by hand-cut bamboo and weaving skills. The modern bamboo cutting and weaving machines enable scale production of bamboo curtains. At present, the weaving technique of bamboo strips can be divided into twill weave and plain weave (Figure 4-7). With different thickness and width of the bamboo strips and the weaving techniques, various styles and shading rates can be created. If the production of bamboo curtains can be assisted by modern equipment, the possibility of changes in bamboo curtains can be assisted by modern equipment, the possibility of changes in bamboo curtains can be raised and its production scale can be greatly increased.



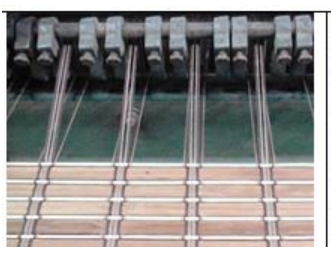
Twill weave machine



Twill weave



Plain weave machine



Plain weave



Figure 4-7. Twill weave and plain weave

Chapter 5 Simulation Design verification and Value Assessment Analysis

5.1 Selected transformation ideas and simulation for bamboo curtains

Through expert consultation, this study aggregated the transformation ideas as mentioned above. The transformation of the attributes of each element can result in new combination changes, which is consistent with the creative thinking theory, the "Kaleidoscope Theory." The number of fragments in the kaleidoscope, no matter in quality or quantity, is the same, but once you turn the kaleidoscope, a new combination of fragments will be made, resulting in ever-changing view and new patterns. The simulation design of this study only lists three series with nine designs, but the same elements can produce countless changes as long as they are combined with one another differently. Different series' product planning can be conducted through transformation ideas for different periods. Because there can be infinite combination changes, this study has selected ideas to carry out the transformation design for bamboo curtains. This study integrated cultural elements into the design to create bamboo curtains' multiple values in practical, sensory, and spiritual levels. The ideas of the simulation design in this study are as follows:

5.1.1 Element A: Selection of bamboo strips' transformation ideas

Bamboo strips are the main core elements of bamboo curtains. Among the ideas of transformation design, this study mainly focuses on the breakthrough of bamboo strips' color, and then the adjustment of bamboo strips' style and size.

(1) Bamboo strips' color:

Color is the main visual feature of bamboo curtains, and the change of color often produces a refreshing visual experience. Due to technology reforms, the limitation of traditional colors can be broken. As for bamboo strips' color, darkness and lightness can be adjusted by the "carbonization technology"(Figure X), or the "green color conservation" technology can be applied to keep the green color after the bamboo is dried. In addition, the current "dyeing technology" and "color fixing technology" of bamboos have become mature. Through the bamboo dyeing technology, the limitation of the original color of bamboos can be broken, and diverse colors can be revealed.

In addition, the cultural meaning of color will also enhance the bamboo strips' spiritual level. The application of colors can be divided into two levels of value. One is the sensory level, which aims to strengthen the decoration. Green color conservation technology, carbonization technology, or dyeing technology can vary the color of bamboo curtains. The second is the spiritual level, which can shape the ideographic function of the color itself. The diversity of bamboo strips' color can enhance visual beauty. The symbolic color in the culture can be utilized for color planning. For example, the Hakka traditional blue blouses make the blue color a cultural symbol of Hakka, and red is also the representative color of auspiciousness. Color is not only a material element, but also an important representation of culture. This study conducted a simulation design, and the color changes of bamboo strips are summarized in the following table (Table5-1).

Table 5-1. Bamboo Strips' Colors

Attributes		Code of Transformation Ideas			Transformation Ideas
Color Techn ology	c f	A-c1/f2	Carbonized colors /carbonization technology (Figure X)	A-c1/f2-1	Carbonized bamboo strips : light brown
				A-c1/f2-2	Carbonized bamboo strips : brown
				A-c1/f2-3	Carbonized bamboo strips : dark brown
		A-c2/f3	Dyed colors / dyeing technology	A-c2/f3-1	Dyed bamboo strips : achromatic color -white, black, gray
				A-c2/f3-2	Dyed bamboo strips : warm colors
				A-c2/f3-3	Dyed bamboo strips : cool colors
		A-c3/f3	Gradient/ smudge/dyeing technology	A-c3/f3-1	Dyed bamboo strips :achromatic gradient or smudge
				A-c3/f3-2	Dyed bamboo strips : warm color gradient or smudge
				A-c3/f3-3	Dyed bamboo strips : cool color gradient or smudge
		A-c4	colors with cultural meanings	A-c4-1	Color application from the Hakka culture: Hakka Blue
				A-c4-2	Color Application from Taiwan Culture
				A-c4-3	Color application with auspicious meanings

The traditional bamboo curtains use the bamboo strips in original color, which present their natural and elegant characteristics. However, the visual effect lacks variation, so it is not easy to attract young consumers. Therefore, this study attempts to break the limitations of bamboo strips. Except for the primary colors of bamboo strips and carbonized colors (Table5-2), bamboo strips will be dyed to make the variation in color (Table5-3).

Table5-2. Carbonized colors of bamboo strips

















					
Original	Light brown-1	Light brown-2	brown-1	brown-2	dark brown

Table5-3. Dyed colors of bamboo strips

									
color-1	color-2	color-3	color-4	color-5	color-6	color-7	color-8	color-9	color10

(2) Kinds of bamboo strips

The traditional bamboo curtains are made by hand-cut bamboo and weaving skills. The modern bamboo cutting and weaving machines enable scale production of bamboo curtains. The improvement of production technology can increase production efficiency and quality, but the improvement of technology has a high threshold, which is related to the development of technology. If producers can apply the modern technology, they can overcome the limitation of traditional production technology. At present, the weaving technique of bamboo strips can be divided into twill weave (Figure5-1) and plain weave (Figure5-2). With different thickness and width of the bamboo strips and the weaving techniques, various styles and shading rates can be created. If the production of bamboo curtains can be assisted by modern equipment, the possibility of changes in bamboo curtains can be raised and its production scale can be greatly increased.



Figure5-1.twill weave

Figure5-2.plain weave

This study conducted a simulation design by employing two weaving methods, twill weave and plain weave, with the bamboo strips in different length, thinness, width and thickness and different cotton strips' patterns for variation. The options are summarized as follows (Table5-4).

Table 5-4. Bamboo strips' weaving styles

Attributes		Code of Transformation Ideas		Transformation Ideas	
Styles	b	A-b1 A-f1	Twill weave styles/ Twill weave	A-b1/f1-1	thin bamboo strips with twill weave I, II, III
				A b1/f1-2	wide bamboo strips with twill weave I, II, III
				A-b1/f1-3	wide mixed with thin bamboo strips with twill weave I, II, III
	f	A-b2 A-f2	Plain weave styles/Plain weave	A-b2/f2-1	thin bamboo strips with weave pattern I, II, III
				A-b2/f2-2	wide bamboo strips with plain weave I, II, III
				A-b2/f2-3	wide mixed with thin bamboo strips with plain weave I, II, III

(3) Bamboo strip size


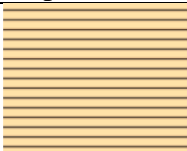
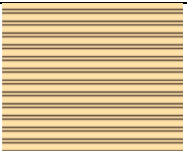
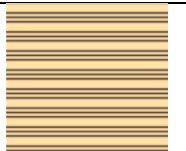




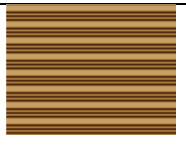
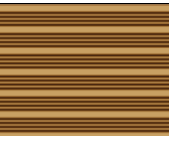





According to the experts' opinions, the length, thinness, width and thickness of bamboo strips can be changed in line with different design needs. Apart from the actual demand of product size and variation of visual effects, the concept of the carpenter's ruler in traditional Chinese Feng Shui can be integrated so that the dimension itself possesses the auspicious implications, such as welcoming fortune, attracting money, becoming auspicious, becoming wealthy, etc. These figurative implications can enhance the design of bamboo curtains to a higher spiritual level. This study conducted a simulation design, and the size changes of bamboo strips are summarized in the following table (Table 5-5).

Table 5-5. Bamboo strip size

Attributes		Code of Transformation Ideas			Transformation Ideas
size	d	A-d1	thin bamboo strips	A-d1-1	0.1cm thin round bamboo strip series
				A-d1-2	0.2cm thin flat bamboo strip series
		A-d2	wide bamboo strips	A-d2-1	1cm wide bamboo strips: bamboo bone series
				A-d2-2	1cm wide bamboo strips: bamboo skin series
		A-d3	wide mixed with thin bamboo strips	A-d3-1	one wide with one thin
				A-d3-2	one wide with two thin
				A-d3-3	one wide with three thin
		A-d4	auspicious meaning of the carpenter's ruler	A-d4-1	welcome fortune /attract money
				A-d4-2	auspiciousness/wealth
				A-d4-3	passing civil exams/prosperousness

The main change of the simulation design is in the color and width of bamboo strips: Thin and wide bamboo strips in different colors. Multiple combinations can be made in the change in the carbonization of the bamboo strips and the thickness of the bamboo strips (Table5-6).

Table5-6. Bamboo strip color tones and thickness

original					
	1-thin	2-wide	3-1 wide 1 thin	4-1 wide 2 thin	5-1 wide 3 thin
brown					
	6- thin	7- wide	8-1 wide 1 thin	9-1 wide 2 thin	10-1 wide 3 thin
dark brown					
	11- thin	12- wide	13-1 wide 1 thin	14-1 wide 2 thin	15-1 wide 3 thin

5.1.2 Element B: Selection of piping's transformation ideas

Piping is mainly used to wrap both sides of a bamboo curtain. Its purpose is to protect the bamboo curtain. In early days, its function is more important than decoration, so dirt-proof black or blue piping is commonly employed, and then the color has been changed to red for a wedding to present joy and decorative effects. The simulation design of this study intends to change the piping position and present it in the form of a bamboo curtain head and incorporate the cultural meanings to express a special cultural image. In the application of the material, it is designed with the Tung blossom cloth in the Hakka culture.

(1) Size and position of piping

The size of piping and cotton strips can be adjusted, such as width, amount, position, and space. Besides the left and right sides, the position of piping can be moved to the upper and lower sides with other designs. The limitations can be broken by different amount, space, and position of cotton strips for diversified combination. The changes are summarized as follows (Table5-7).

Table5-7. Size and position of piping

size position	d	B-d1	width	B-d1-1	adjust the width
			length	B-d1-2	adjust the length
		B-d2	position	B-d2-1	above the bamboo curtain
				B-d2-2	bamboo curtain's left and right sides
				B-d2-3	below the bamboo curtain
		B-d3	removal	B-d3-1	No piping

The traditional piping wraps around the left and right sides of the bamboo curtain. The simulated design in this study removed the piping of the left and right sides and moved it to the bamboo curtain head. The design of the bamboo curtain head is integrated with various cultural elements. This study extracted three main cultural elements in the Hakka culture, namely blue blouses, the roof heads with Chinese Five Elements, and paper umbrellas, and matched them with floral pattern cloth.

(2) Piping material: application of tung blossom cloth















As for the transformation ideas of piping, various materials can be adopted. The change of materials can add not only the variation but also value and style to bamboo curtains with high-quality materials, such as dyed leather. Leathers can be changed by molding, carving or laser cutting to produce the variation of piping. The changes are summarized as follows (Table 5-8).

Table5-8. Piping materials

Attributes		Code of Transformation Ideas			Transformation Ideas
Materials	a	B-a1	fabric	B-a1-1	tung blossom cloth 1-14
				B-a1-2	floral pattern cloth with multiple designs
				B-a1-3	floral pattern cloth with multiple designs with geometric patterns
				B-a1-4	plain color cloth
				B-a1-5	knitted tape bound
		B-a2	leather	B-a2-1	dyed leather
				B-a2-2	hollow laser cut leather
				B-a2-3	leather molding or carving
		B-a3	Jacquard bound	B-a3-1	Jacquard bound
		B-a4	metal	B-a3-2	hollow laser cut metal
		B-a5	mixed media	B-a4-1	with beaded embroidery
				B-a4-2	tinsel thread
				B-a4-3	with various beading and weaving
		B-a6	function	B-a5-1	bamboo charcoal fabric

As for the transformation ideas of the piping materials mentioned above, this study conducted the simulation design with floral pattern cloth. Floral pattern cloth is the shared memory of the early Taiwanese and is inseparable from their daily lives. Therefore, the application of floral pattern cloth can easily draw Taiwanese' attention. Tung blossom cloth presents a Hakka image and is regarded as one of the representative elements of the Hakka culture. Floral pattern cloth has various colors with full saturation. The variation of tung blossom cloth is also rich, and it has a decorative function and presents a cultural image. Therefore, this study used tung blossom cloth as the matching element for the bamboo curtains' design combination. This study selected 14 kinds of tung blossom cloth in the market for the design of bamboo curtains (Table 5-9).

Table5-9. Tung blossom cloth patterns

						
pattern-1	pattern-2	pattern-3	pattern-4	pattern-5	pattern-6	pattern-7
						
pattern-8	pattern-9	pattern-10	pattern-11	pattern-12	pattern-13	pattern-14

(3) Piping shapes/patterns: cultural element integration

The cultural meanings of bamboo curtains' shape design: product design and pattern design not only enhance value of sensory level; they are also important media for the spiritual level. Apart from the visual beauty from the design of piping and cotton strips, unique cultural symbols or meanings can be presented by incorporating cultural elements into the shape of the product. For example, the design of piping can be combined with the image of the Hakka blue blouses and traditional roof heads with Chinese Five Elements. Also, the design of piping with cultural patterns can be combined with floral pattern cloth with Taiwanese cultural image or tung blossoms with the Hakka cultural symbol. Moreover, the culture of "building couplets" in traditional Hakka architecture can be embedded. This combination of Chinese calligraphy with piping can demonstrate the beauty of decoration and culture. The changes of piping shapes and patterns are summarized as follows (Table5-10).

Table5-10. Piping shapes/patterns

Attributes		Code of Transformation Ideas			Transformation Ideas
Shapes	b	B-b1	Nonlinear design	B-b1-1	geometric pattern design
				B-b1-2	streamline shape design
		B-b2	Cultural image design	B-b2-1	Hakka blue blouse collar design : 1-5
				B-b2-2	Hakka architecture "roof head" with five elements shapes - metal, wood, water, fire and earth
Patterns		B-b3	decorative patterns	B-b3-1	abstract patterns (geometric patterns)
				B-b3-2	concrete patterns (such as decorative patterns)
		B-b4	Hakka cultural image patterns	B-b4-1	Tung blossom styles-1-20 Coco Magnolia pattern-1-5
				B-b4-2	Symbolic Costume: Blue blouse: : 1-5
				B-b4-3	Living articles: paper umbrellas, bamboo door curtains
				B-b4-4	Faith: Dragon God
	B-b4-5			Hakka Building: The roof head with five elements 1-5, words respect pavilions, round-dragon Houses, five-star stone	
	B-b4-6			Hakka architecture "roof heads" couplet's writing	
	B-b5	Taiwan cultural image patterns	B-b5-1	Peony, Chinese paeony	

In the cultural expression of piping's shape and pattern design, it can be integrated into the Hakka cultural image, Taiwan cultural image, and auspicious meanings. The application of the cultural images is as follows (Table5-11)

Table5-11. Piping's cultural images

Attributes		Code of Transformation Ideas			Transformation Ideas
Functions Meanings	e	B-e1	Hakka cultural image	B-e1-1	tung blossom/Coco magnolia
				B-e1-2	blue blouses
				B-e1-3	paper umbrellas / bamboo door curtains
				B-e1-5	Faith in Dragon God
		B-e2	Taiwan cultural image	B-e1-6	Architecture related cultural symbols: -"Roof heads" / "Five-star stone" in five-element shapes -ancestral hall's "roof heads" -words respect pavilions/round-dragon houses/Huatai
				B-e2-1	Plants: plum blossom, orchid, bamboo, chrysanthemum, peony, Chinese paeony
				B-e2-2	Animals: mandarin ducks, phoenixs
		B-e3	auspicious meanings	B-e2-3	themes with special meaning
				B-e3-1	Blessings - such as wish you stay in love forever
				B-e3-2	Praying - such as step by step being promoted
				B-e3-3	Traditional Festivals - such as safe for all seasons

As mentioned above, the simulated design of this study removed the piping on the left and right sides and moved to the bamboo curtain head. The Hakka cultural elements are integrated into the design of the bamboo curtain head. The image of blue blouses and roof heads with five elements are employed for design.





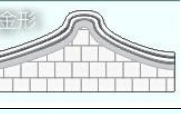





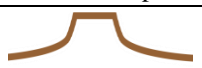
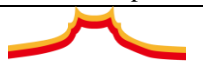
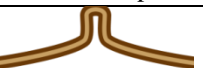
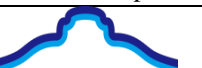
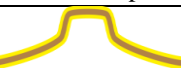
The image of a blue blouse is displayed on a bamboo curtain head. To incorporate the Hakka cultural elements, the image of a blue blouse collar with cloth button symbolizes the Hakka people's diligent and thrifty life style and characteristics. The blue color is used as the main color to present the image of the Hakka culture (Table5-12).

Table5-12. Blue blouse collar styles

				
Blue blouse	Style 1	Style 2	Style 3	Style 4

Roof heads in five elements: in the form of a bamboo curtain head. Incorporating elements of the Hakka culture, the images of the five elements of the roof heads in the Hakka traditional architecture are used. The cultural concept of the Chinese Five Element Generation is the basis of the shape design. According to the Feng Shui book, there are five kinds of corresponding shapes, round "metal" shape, straight "wood" shape, curve "water" shape, sharp "fire" shape, and square "earth" shape. According to the traditional concept of Feng Shui, consumers can achieve the purpose of the five-element generations and the prosperity of future generations by deciding the orientation of houses and the shape of the roof heads. (Zhang, 2007). This study selected the corresponding shapes from the five elements of roof heads as the design elements, and the shape images are shown in the following table (Table 5-13).

Table5-13. The shapes of the five elements of roof heads

				
				
Earth shape	Fire shape	Wood shape	Water shape	Metal shape
				
Square earth	Sharp fire	Long wood	Wavy water	Round metal

(The roof heads with the five elements in the table are shot by the author)

5.1.3 Element C: Selection of cotton strip's transformation ideas

The traditional method is to weave with two or three strips on the left and right sides of a bamboo curtain. The main purpose is to strengthen the fixing of the bamboo curtain, and its practicability is more important than the decorative function. In addition to changing the original weaving style, the design of the cotton strips can also change the amount, position, spacing, and width. The design of the cotton strips can also break through the traditional style and convey special meanings or symbols with cultural meanings, even making cotton strips a main role of visual effects.

(1) Cotton strip's styles :

The traditional cotton strips are woven with one-centimeter 2-3 white cotton strips. The machine-made bamboo curtains can be transformed into different styles, such as decorative style or style with meanings, by the twill weave and plain weave. Different styles can be created with the cotton strips in different size, position, and amount. In this study, the changes for cotton strips are summarized in the following

table (Table 5-14).

Table 5-14. Cotton strip's styles

Attributes		Code of Transformation Ideas		Transformation Ideas
Style	b	C-b1	Plain weave	C-b1-1 Plain weave
		C-b2	decorative style	C-b2-1 jacquard cotton strip 1
				C-b3-2 jacquard cotton strip 2
				C-b3-3 jacquard cotton strip 3
		C-b3	Style with meanings	C-b2-1 with special cultural symbols
				C-b2-2 with auspicious meanings
size position amount	d	C-d1	Adjust width	C-d1-1 0.1cm cotton strips
				C-d1-2 0.5cm cotton strips
				C-d2-3 1 cm cotton strips
		C-d2	Adjust position	C-d2-1 cotton strips position 1
				C-d2-2 cotton strips position 2
				C-d2-3 cotton strips position 3
		C-d3	Change amount	C-d3-1 2 strips
				C-d3-2 3 strips
				C-d3-3 More than 3 strips

The cotton strip's change can be made with the different bamboo strips' weaves to make a variety of combinations. Grand bamboo curtains in Taiwan (Figure.5-3) and the Yixian bamboo in Mainland China (Figure.5-4) show various combination when different bamboo strips, cotton strips, and weaves are used.

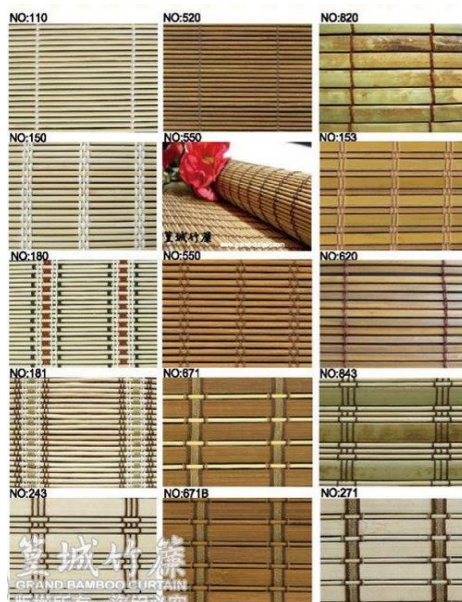


Figure5-3. Grand bamboo curtain in Taiwan
(<https://goods.ruten.com.tw/item/show?11090325369795>)

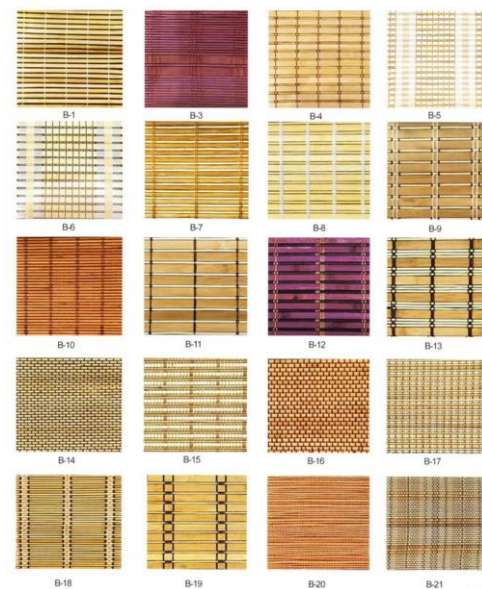


Figure5-4 Yixian bamboo in Mainland China
(The catalogue of Yixian bamboo products,p18).

(2) Colors of cotton strips

The color of paintings can be combined with the color of bamboo curtains for extensive presentation. The color changes of cotton strips are summarized in the following table (Table5-15).

Table5-15. Colors of cotton strips

Attributes		Code of Transformation Ideas			Transformation Ideas
Color	c	C-c1	match with bamboo curtain's color	C-c1-1	with bamboo strip's color
				C-c1-2	with piping's color
				C-c1-3	with painting's color
		C-c2	Cultural Symbol Colors	C-c2-1	Hakka Cultural Colors
				C-c2-2	Taiwan Cultural Colors
				C-c2-3	Auspicious colors

The design of cotton strips in this study adopted a combination strategy. Three styles are combined with colors of bamboo curtains for design (Table5-16).

Table5-16. Cotton strips' styles

pattern 1	pattern 1-1	pattern 1-2	Pattern 1-3	pattern 1-4	pattern 1-5
pattern 2	pattern 2-1	pattern 2-2	pattern 2-3	pattern 2-4	pattern 2-5
pattern 3	pattern 3-1	pattern 3-2	pattern 3-3	pattern 3-4	pattern 3-5

5.1.4 Element D: Selection of painting's transformation ideas

Although the painting of bamboo curtains does not have practical functions, it is often the visual focus. However, themes of traditional paintings are fixed, and they are painted by the bamboo curtain artists. The quality of the painting is unstable and the patterns tend to be simplified with time. Therefore, this study intends to enhance the performance of painting. In addition to the visual aesthetics, the design also

incorporates special cultural meanings, so that bamboo curtains are aesthetic, cultural, and practical.

(1) Painting: cultural element integration

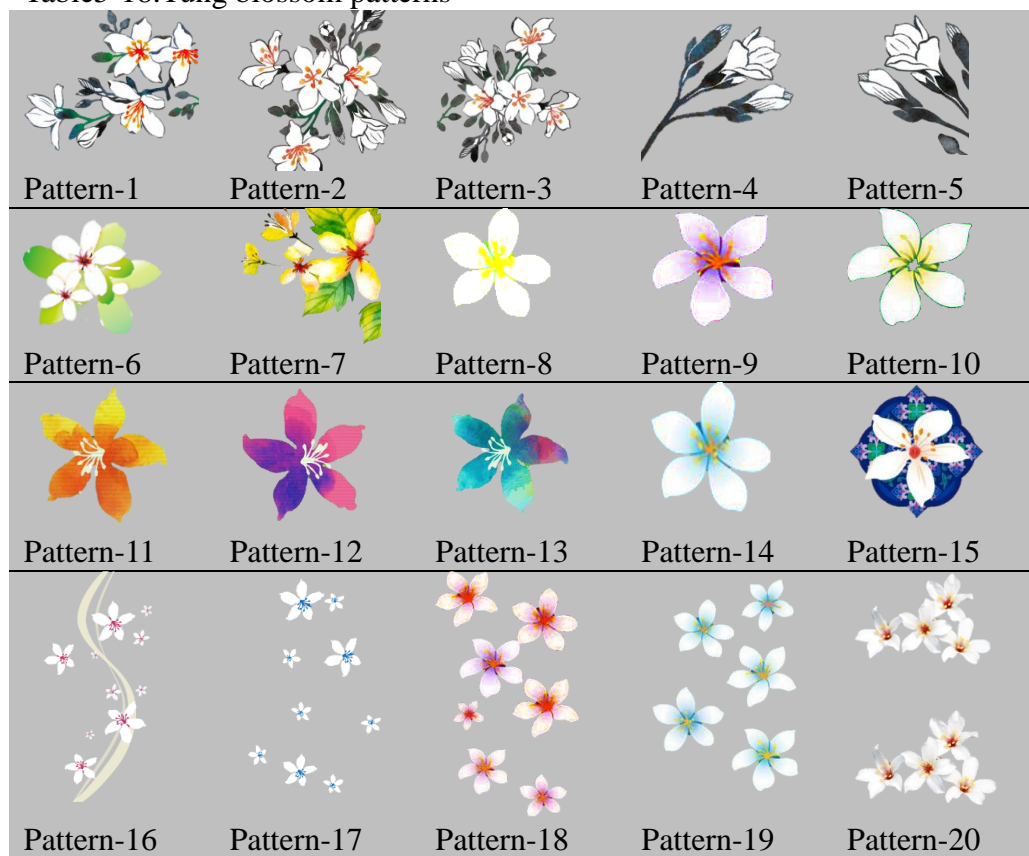
Manifestation of the culture in bamboo curtains' pattern design: a painting on bamboo curtains is often the visual focus. In addition to decorative patterns, the patterns from the cultural symbols can enrich the manifestation of the culture in bamboo curtains, such as the application of Hakka or Taiwanese cultural elements or the meanings of auspiciousness. Taking Hakka cultural symbols as an example, integrating Hakka cultural images into bamboo curtains such as tung blossoms, blue blouses, and paper umbrellas can present Hakka's unique culture. The integration of these cultural themes places multiple values such as practicality, beauty and cultural symbols on bamboo curtains. The changes of painting are summarized as follows (Table5-17).

Table 5-17. Painting patterns / themes

Attributes		Code of Transformation Ideas		Transformation Ideas
Patterns Themes meanings	b 			

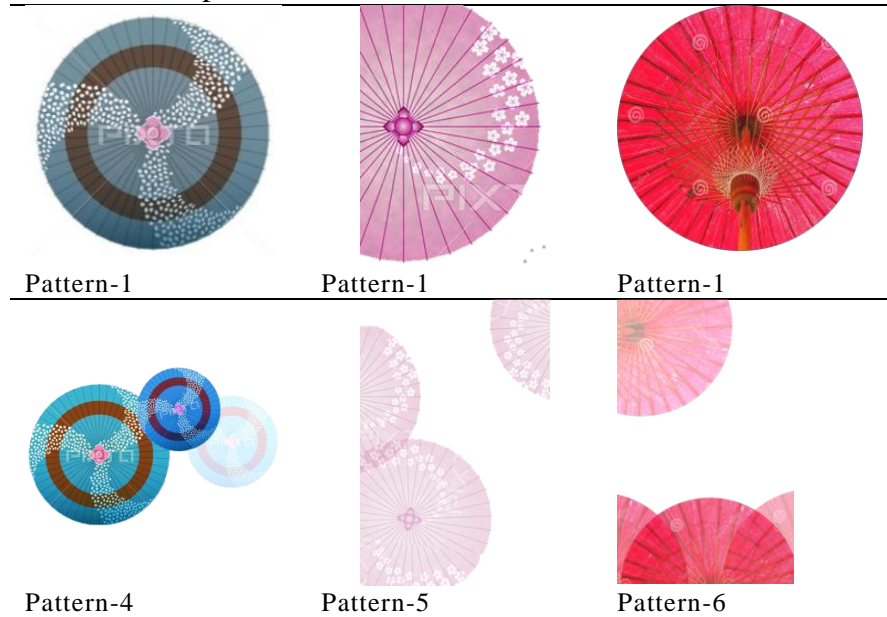
In the transformation ideas of the painting patterns mentioned above, this study conducted the simulation design with tung blossom, paper umbrellas, and unique engraved texts as the main elements of the painting. The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work. This study designed 20 tung blossom patterns for painting combination (Table 5-18). The design of the patterns is just like the "Kaleidoscope Theory." The same elements which are arranged or adjusted in size, space, and amount can bring a new visual effect.

Table5-18.Tung blossom patterns



In addition to tung blossom, this study attempts to integrate paper umbrellas into the design of the painting. A paper umbrella is also a Hakka traditional craft. Paper umbrellas have a variety of metaphors, mainly symbolizing the perfection and fated match, that is, the perfection of all things and happy marriage. This study used the image of paper umbrellas to symbolize the happiness of family members. The study applied paper umbrellas to design three paper umbrella paintings in various colors for design combination (Table 5-19).

Table5-19. Paper umbrella combination



(2) Size of a painting: size / quantity / position

The size of painting refers to the size, quantity, proportion, position and spacing of the painting patterns. The design of the patterns is just like the "Kaleidoscope Theory." The same elements which are arranged or adjusted in size, space, and amount can bring a new visual effect. This creative combination is a process of recreating the original design elements. As for the design of painting, designers just adjust the elements' size, proportion, and position to display different visual effects. The changes of a painting's size are summarized as follows (Table5-20).

Table5-20. Size of a painting: size / quantity / position

Attributes		Code of Transformation Ideas			Transformation Ideas
size amount position	d	D-d1	Pattern size	D-d1-1	Pattern size/proportion adjustment
		D-d2	Pattern amount	D-d2-1	pattern amount adjustment
		D-d3	Pattern position	D-d3-1	pattern position and spacing adjustment

Old elements can be transformed into new creative combinations through reorganization. The simulation design of this study only lists three series with nine designs, but the same elements can produce different changes as long as they are combined with one another differently (Figure5-5). If the design is combined with different colors of bamboo curtains, more combination will be created.



Figure5-5. Design combination of the same elements

(3) Colors of painting

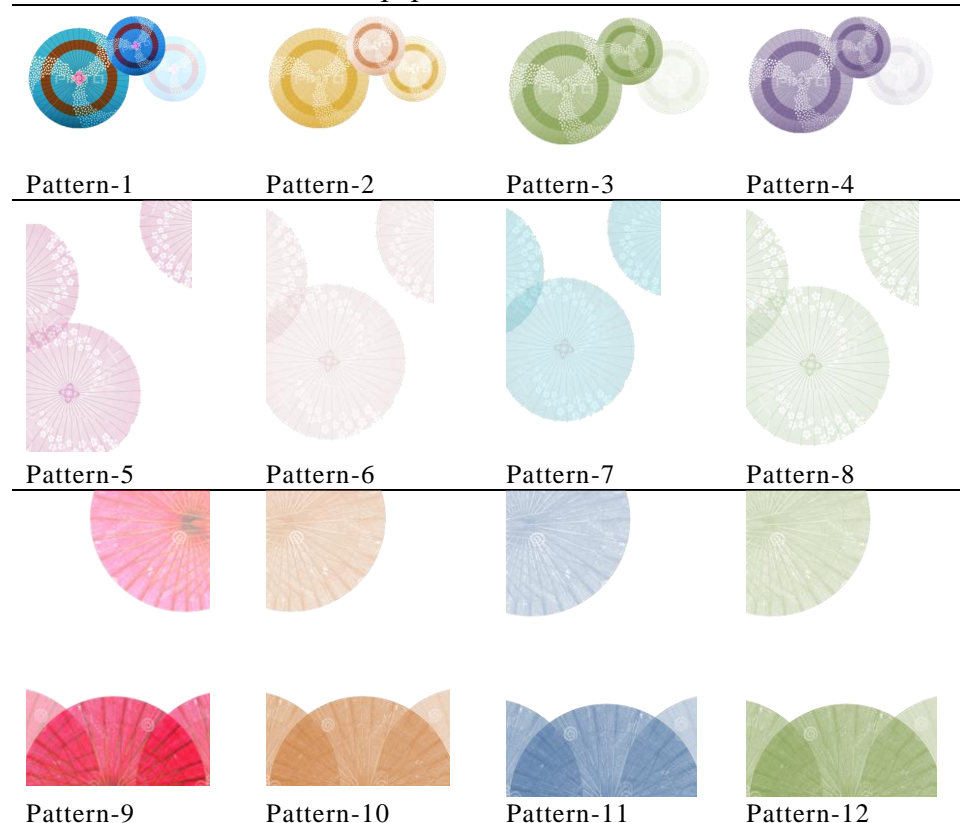
The color of paintings can break through the traditional restrictions and change with the overall design of the bamboo curtain. The color planning can be combined with bamboo strips, piping, and cotton strips. As such, the color itself can not only present cultural meanings but also has the decorative function. This change can promote the painting's sensory and spiritual levels. The changes of a painting's color are summarized as follows (Table5-21).

Table5-21. Colors of painting

Attributes		Code of Transformation Ideas			Transformation Ideas
Color	c	D-c1	match with bamboo curtain's overall color	D-c1-1	Match with bamboo strip's colors
				D-c1-2	Match with piping's colors
				D-c1-3	Match with cotton strip's colors
		D-c2	cultural symbolic colors	D-c2-1	Hakka cultural colors
				D-c2-2	Taiwan cultural colors
				D-c2-3	Auspicious colors

The simulation design of this study selected tung blossom and paper umbrellas as the main theme. The number, size, proportion and position of the patterns in the same theme can be adjusted. Moreover, the change of colors can produce different visual effects (Table5-22).

Table5-22. Combination of paper umbrellas' colors



In addition to the reorganization of the painting elements and the adjustment of their size, quantity and position, the same combination of elements will produce different visual effects if they are combined with the different colors of bamboo strips (Figure5-6). With the advance of the dyeing technique of bamboo strips and inkjet printing technology, it is possible for bamboo curtains to break through the limitations of traditional colors.



Figure5-6 The same painting elements with color changes of bamboo strips

(4) Paint technology

As for the pattern technology in bamboo curtains, we can employ inkjet printing technology, ironed pattern, and wrapping technology to enrich bamboo curtains' patterns instead of traditional painting. Inkjet printing technology can be applied to print various patterns on bamboo curtains, which display the products' details and diversity. The use of computer inkjet printing technology can transcend the limitations of painting skills and can solve the problems of insufficient painting practitioners, unstable quality, and monotonous themes. In addition, it can print the patterns which customers provide, which meets the need of customization. The application of the painting technology in this study is summarized as follows (Table5-23). The simulation design selected inkjet printing technology, which can increase the quality of painting and the possibility of providing various customized patterns.

Table5-23. Paint technology

Attributes		Code of Transformation Ideas			Transformation Ideas
technology	f	D-f1	Inkjet printing technology	D-f1-1	Inkjet printing painting
		D-f2	ironed pattern technology	D-f2-1	ironed pattern
		D-f3	wrapping technology	D-f3-1	wrapping decoration
		D-f4	Joint technolgoey	D-f4-1	Bamboo joint with mixed media

5.2 Simulation design and design changes of Bamboo curtain

In this study, the simulation design of bamboo curtain samples was carried out according to the selected transformation ideas mentioned above. Based on the transformation ideas, this study has carried out simulation design and developed three series and describes their value levels respectively, including A series: blue blouses, B series: traditional architecture, and C series: paper umbrellas. Each series simulated three kinds of samples according to the transformation ideas, and then listed the design changes of the simulation. The same elements can produce different design changes by different combinations. This creative combination is a process of recreating the same design elements. As mentioned in the "Kaleidoscope Theory," as long as you turn the kaleidoscope, a new combination of fragments will be made, resulting in ever-changing view and new patterns. The simulation design of this study only lists three series with nine designs, but the same elements can produce countless changes as long as they are combined with one another differently. The simulation design of this study is for a design demonstration, only listing some elements for simulation design. The three series of simulations and their design changes are described as follows:

5.2.1 The A series: Blue Blouses

This series is designed with the theme of blue blouses, which is a Hakka culture symbol. A blue blouse is a Hakka traditional costume. Its shape and color are full of Hakka images. This series extracts the elements of a blue blouse design such as collar, cloth button, and color, and is named after blue blouses. There are three styles in this series, A1, A2 and A3 (Figure 5-7). The three styles apply blue blouse symbols and floral pattern cloth for simulation designs. Each style has different simulation combinations. Different design changes can be produced with different combination of the same elements.

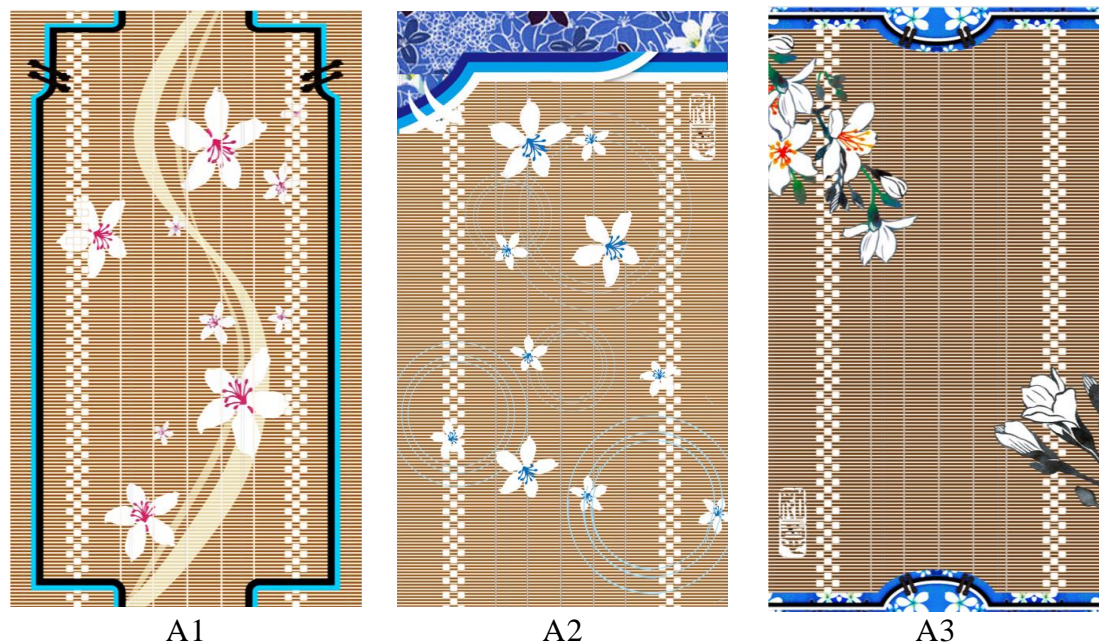


Figure 5-7. A Series:blue blouses


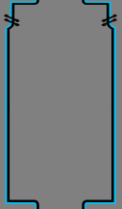


(1) A1 simulation design and its design changes

The A series: blue blouses. The symbol of blue blouses, which represents the Hakka culture, is the main design element. The design elements of the A1 Style and their cultural meanings are listed below, followed by the simulation of the A1 sample and possible design changes.

a. A1 design elements and cultural implications

The design elements of the A1 Style and its cultural implications are illustrated as below (Table5-24):






Table5-24. A1 design elements and cultural implications

Bamboo strip		<ol style="list-style-type: none"> 1. Material: thin round bamboo strips 2. Color: the original color of bamboo strips. 3. Size: auspicious meaning of the carpenter's ruler, 90 cm wide: Welcome Fortune, 192 cm long - Great Fortune. 4. Weave: twill weave
	<p>Cultural implications:</p> <p>-Size: The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune.</p>	
Piping		<ol style="list-style-type: none"> 1. Shape: the Hakka culture elements are incorporated with the collar of the Hakka blue blouses and cloth buttons. 2. Color: The blue collar and dark blue cloth buttons represent the unique cultural symbol of the Hakka.
	<p>Cultural implications:</p> <p>1.Shape: the Hakka blue blouse color with cloth button symbolize the Hakka people's diligent and thrifty life style and characteristics.</p> <p>2. Color: the blue color is used as the main color to present the image of the Hakka culture.</p>	
Cotton strip		<ol style="list-style-type: none"> 1. Style: three white cotton strips for weaving 2. Weaving technology: hand weaving
Painting		<p>Patterns: Tung blossom for design change</p> <p>- Style: Tung blossom painting Style 16</p>
	<p>Cultural implications:</p> <p>- The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work.</p>	

b.A1 simulation design

The simulated design of A1 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table 5-25):

Table5-25. Design element table of A1 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
					Cotton strip	
					Painting	
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip	A-A-a3-1	A-b1/f1-1	A-c1-1	A-d1-1 A-d4-2		A-f1-1
B -Piping	B-a1-5	B-b2-1	B-c2-2	B-d2-1/2/3	B-e1-2	
C -Cotton strip	C-a1-1	C-b1-1	C-c1-3	C-d1/d3-2		
D -Painting	D-f1-1	D-b2/e1-1	D-c2-1	D-d1/d2-1 D-d3-1	D-e1-1	D-f1-1

c. A1 design combination

The A1 Style: blue blouses are combined with the colors of carbonized bamboo strips, the colors of dyed bamboo strips, and the floral pattern cloth piping. Piping can be removed. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-26):

Table 5-26. design change of the A1 Style



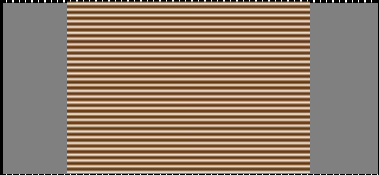





(2) A2 simulation design and its design changes

The A series: blue blouses. The symbol of blue blouses, which represents the Hakka culture, is the main design element. The design elements of the A2 Style and their cultural meanings are listed below, followed by the simulation of the A2 sample and possible design changes.

a. A2 design elements and cultural implications

The design elements of the A2 Style and its cultural implications are illustrated as below (Table5-27):

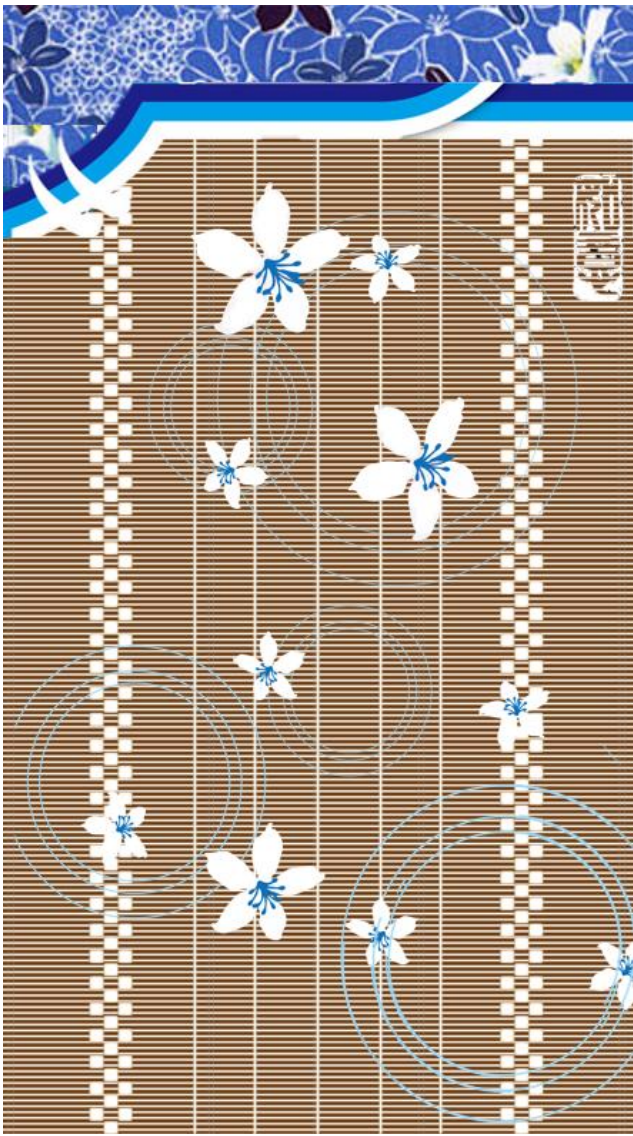




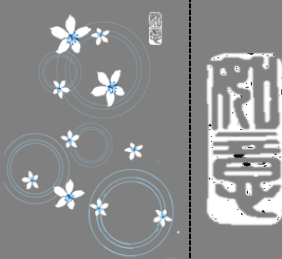
Table 5-27. A2 design elements and cultural implications

Bamboo strip		<ol style="list-style-type: none"> 1. Material: thin round bamboo strip 2. Bamboo strips: carbonized brown color 3. Size: auspicious meaning of the carpenter's ruler, 90 cm wide: Welcome Fortune, 192 cm long - Great Fortune. 4. Weave: twill weave
	Cultural implications: -Size: The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune.	
Piping		<ol style="list-style-type: none"> 1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head. 2. Shape: in the form of a bamboo curtain head incorporating the Hakka culture elements. The blue-blouse collar image (Style 2) with blue floral pattern cloth is employed to present the image of the Hakka blue blouses. 3. Color: blue collar with blue cloth to present the image of the Hakka culture.
		Cultural implications: <ol style="list-style-type: none"> 1. Shape: the Hakka blue blouse collar symbolizes the Hakka people's diligent and thrifty life style and characteristics. 2. Color: the blue color is used as the main color to present the image of the Hakka culture.
Cotton strip		<ol style="list-style-type: none"> 1. Style: three white cotton strips for weaving 2. Weaving technology: hand weaving
	 	<ol style="list-style-type: none"> 1. Patterns:Tung blossom for design change - Style 2: Tung blossom painting Style 17 2. Pattern 2: Circles represent the Hakka Round-Dragon Houses 3. Pattern 3: a seal with the Chinese characters "如意"
Painting	Cultural implications: <ol style="list-style-type: none"> 1. - The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work. 2. Circles placed around tung blossom represent the Hakka Round-Dragon Houses which symbolize perfection and reunion. 3. Add the seal pattern with two Chinese characters "如意" to symbolize "Everything goes as you wish." 	

b.A2 simulation design

The simulated design of A2 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-28):

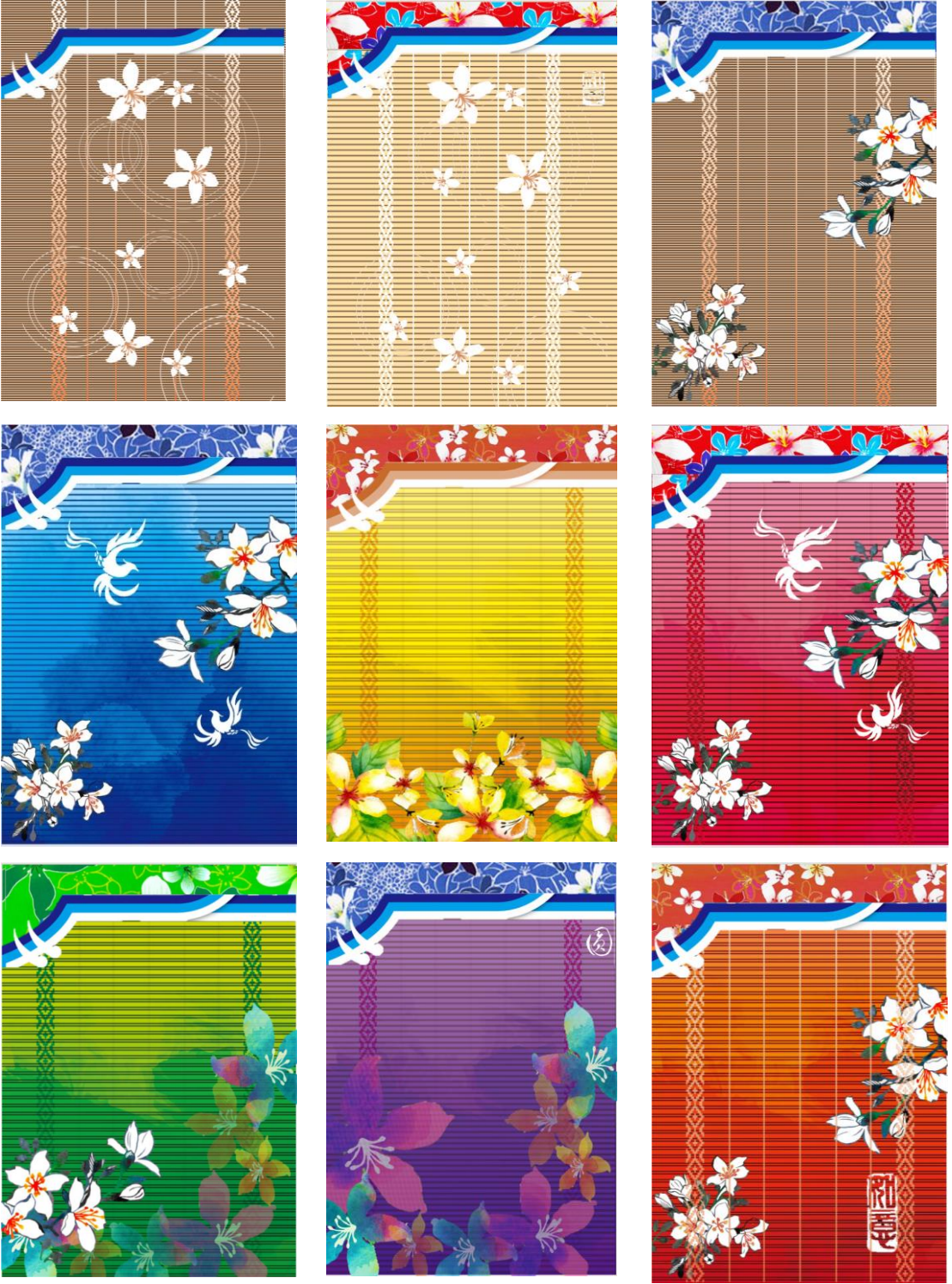
Table5-28. Design element table of A2 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
						
					Cotton strip	
					Painting	
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip	A-A-a3-1	A-b1/f1-1	A-c1-2	A-d1-1		A-f1-1
B -Piping	B-a1-1	B-b2-1	B-c2-2	B-d2-1/2	B-e1-1	
C -Cotton strip	C-a1-1	C-b1-1	C-c1-3	C-d1/d3-2		
D -Painting	D-f1-1	D-b2/e1-1	D-c2-1	D-d1/d2/ D3-1	D-e1-1	D-f1-1

c. A2 design combination

The A1 Style: blue blouses are combined with the colors of carbonized bamboo strips, the colors of dyed bamboo strips, the floral pattern cloth piping, and bamboo painting. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-29):

Table5-29. design change of the B2 Style









(3) A3 simulation design and its design changes

The A series: blue blouses. The symbol of blue blouses, which represents the Hakka culture, is the main design element. The design elements of the A3 Style and their cultural meanings are listed below, followed by the simulation of the A3 sample and possible design changes.

a. A3 design elements and cultural implications

The design elements of the A3 Style and its cultural implications are illustrated as below (Table 5-30):


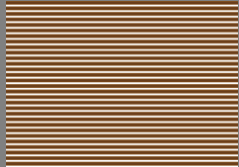




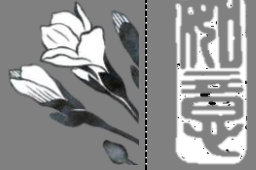
Table 5-30. A3 design elements and cultural implications

Bamboo strip		<ol style="list-style-type: none"> 1. Material: thin round bamboo strips 2. Color: carbonized dark brown color 3. Size: auspicious meaning of the carpenter's ruler, 90 cm wide: Welcome Fortune, 192 cm long - Great Fortune. 4. Weave: twill weave
	<p>Cultural implications:</p> <p>-Size: The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune.</p>	
Piping		<ol style="list-style-type: none"> 1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head. 2. Shape: in the form of a bamboo curtain head incorporating the Hakka culture elements. The blue-blouse collar image with blue floral pattern cloth is employed to present the image of the Hakka blue blouses. 3. Color: blue collar with blue cloth presents the image of the Hakka culture.
		<p>Cultural implications:</p> <ol style="list-style-type: none"> 1. Shape: the Hakka blue blouse collar symbolizes the Hakka people's diligent and thrifty life style and characteristics. 2. Color: the blue color is used as the main color to present the image of the Hakka culture.
Cotton strip		<ol style="list-style-type: none"> 1. Style: three white cotton strips for weaving 2. Weaving technology: hand weaving
Painting		<ol style="list-style-type: none"> 1. Patterns 1: Tung blossom for design change Style 3: Tung blossom painting Style 1& 5
		<ol style="list-style-type: none"> 2. Pattern 2: a seal with the Chinese characters "如意" <p>Cultural implications:</p> <ol style="list-style-type: none"> 1. - The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work. 2. Add the seal with two Chinese characters "如意" to symbolize "Everything goes as you wish."

b.A3 simulation design

The simulated design of A3 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-31):

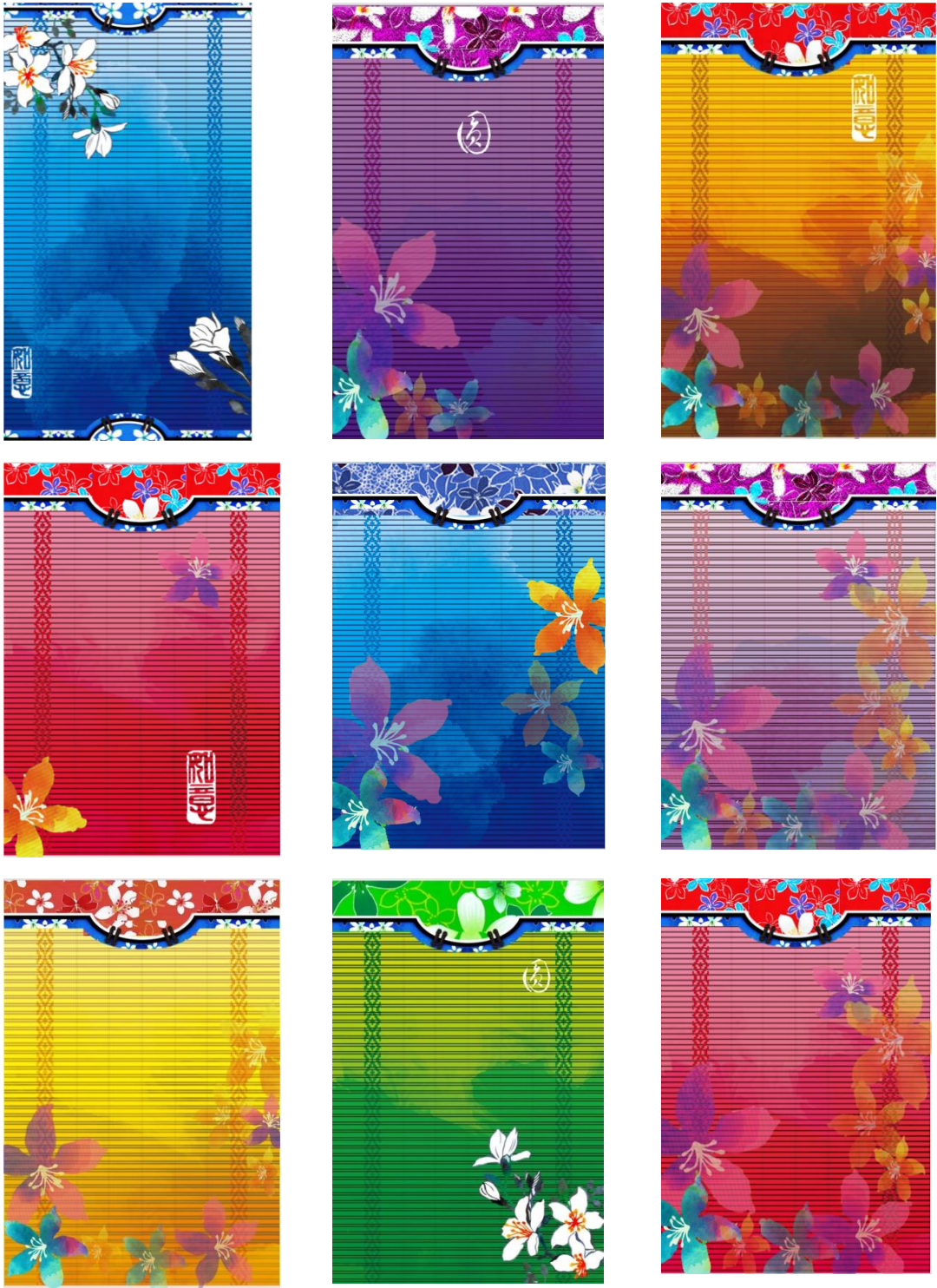
Table 5-31.Design element table of A3 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
						
					Cotton strip	
					Painting	
						
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip	A-A-a3-1	A b1/f1-2	A-c2/f3-3	A-d2-1		A-f1-2
B-Piping	B-a1-1	B-b2-1	B-c2-1	B-d2-1/3	B-e1-1	
C-Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1		
D-Painting	D-f1-1	D-b2/e1-1	D-c2-1	D-d1/d2-1	D-e1-1	D-f1-1

c. A3 design combination

The A3 Series: the blue blouses are combined with the colors of carbonized bamboo strips, piping, cotton strip, and painting. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-32):

Table5-32. design change of the B3 Style



5.2.2 The B series: the traditional architecture

This collection is designed with the theme of the roof heads with Chinese Five Elements in the Hakka traditional architecture. The shape of the roof heads in the traditional architecture can be divided into five: wood, fire, earth, metal, and water. Before the house is built, the shape of the roof heads is determined based on the orientation of the house in order to bring prosperity for future generations (Zhang, 2005). In Fujian style architectures, most of the roof heads are horseback roofs with a single-arc shape according to the five elements "Metal and Wood ...". The culture of roof heads can only be seen in Hakka areas and has special cultural implications. This series extracts the shapes of different roof heads, named traditional architecture series. There are three styles in this series, namely B1, B2 and B3 (Figure5-8). The three styles apply the symbols of roof heads with Chinese Five Elements for simulation designs. The Chinese Five Elements have their corresponding colors. This study applies the corresponding colors on the color design of bamboo curtains. This study extracts the three prominent shapes, earth, fire, and water shapes, for simulation design with their corresponding colors, yellow, red and blue, on bamboo curtains. This study has conducted different simulated combinations for each style. Different design changes can be produced with different combination of the same elements.

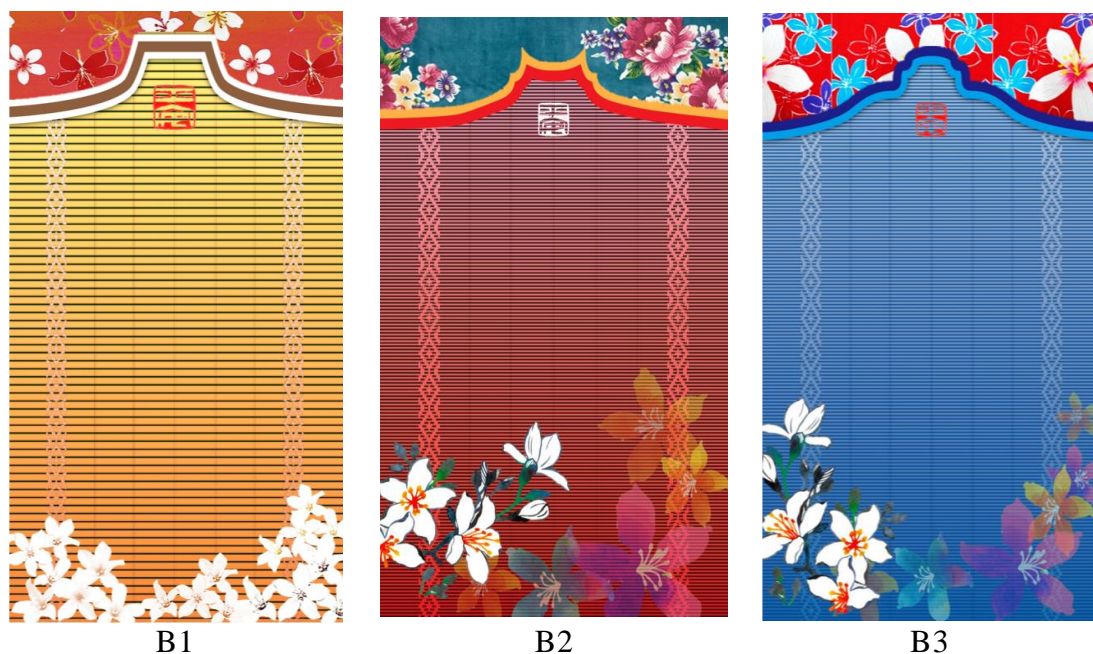


Figure5-8. The B series: the traditional architecture

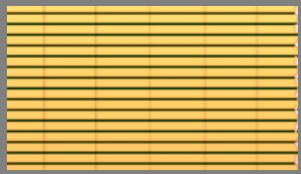
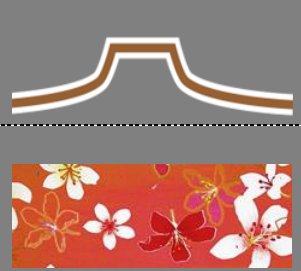


(1) B1 simulation design and its design changes

The B series: the traditional architecture, which represents the Hakka culture, is the main design element. The design elements of the B1 Style and their cultural meanings are listed below, followed by the simulation of the B1 sample and possible design changes.

a. B1 design elements and cultural implications

The design elements of the B1 Style and its cultural implications are illustrated as below (Table5-33):

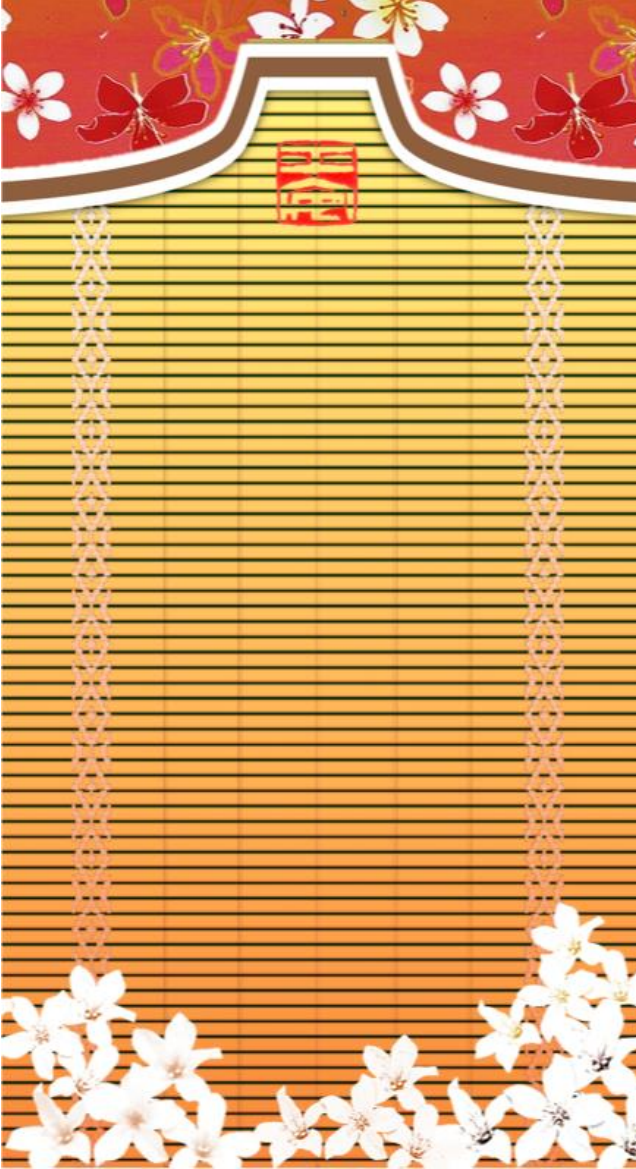
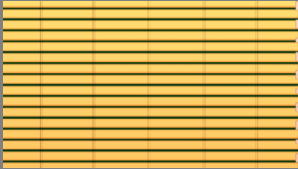


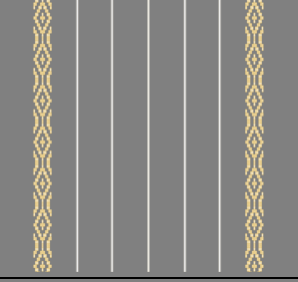


Table5-33. B1 design elements and cultural implications

Bamboo strip		<p>1. Material: wide flat bamboo strip 2. Color: Bamboo strips are dyed and designed with the colors of the Chinese five elements of the roof heads. -B1 bamboo curtain: yellow bamboo strips. Yellow is the symbolic color of the "earth shape" in the Chinese five elements. 3. Weave: plain weave</p> <p>Cultural implications: Color: Bamboo strips are dyed and matched with the yellow color of the "earth shape." Yellow is the main color of bamboo curtains which symbolizes warmth and brightness.</p>
Piping		<p>1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head. 2. Shape: in the form of a bamboo curtain head. Incorporating elements of the Hakka culture, the image of the Chinese five elements of the roof heads in the Hakka traditional architecture are combined with tung blossom cloth. -B1 bamboo curtain head: The yellow square roof head symbolizes the "earth shape" in the five elements, and is designed with the orange tung blossom cloth Style 4.</p> <p>Cultural implications: 1. Shape: Incorporating the elements of Hakka culture, the shape design of the bamboo curtain head is combined with the five elements of the roof heads. The cultural concept of the Chinese Five Element Generation is the basis of the shape design. According to the traditional concept of Feng Shui, consumers can achieve the purpose of the five-element generations and the prosperity of future generations by deciding the orientation of houses and the shape of the roof heads. 2. B1 bamboo curtain head: in the form of "earth-shaped square." The square shape of the roof heads symbolizes the "earth shape" in the five elements. Earth generates metal and metal generates water. This is based on the concept of the Chinese Five Element Generations.</p>
Cotton strip		<p>Style: weave jacquard cotton strip 2. Yellowish orange gradient jacquard cotton strips with yellow bamboo strip color.</p>
painting		<p>1. Patterns 1: Tung blossom for design change- tung blossom Style 20x5. 2. Pattern 2: a seal with the Chinese characters "如意"</p> <p>Cultural implications: 1. - The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work. 2. Add the seal with two Chinese characters "平安" to symbolize "Safe in the house."</p>

b. B1 simulation design

The simulated samples of B1 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-34):

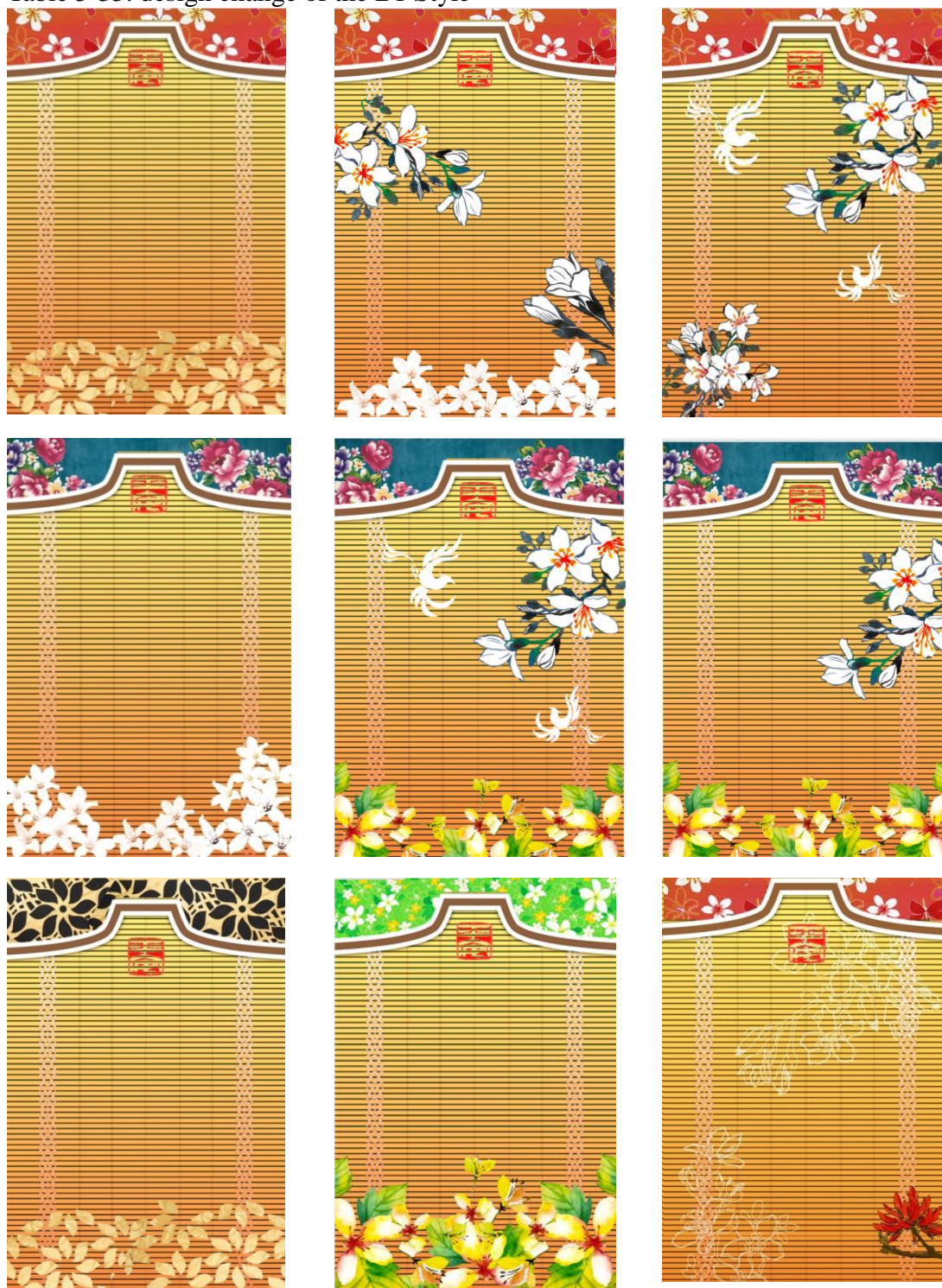
Table5-34. Design element table of B1 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
						
					Cotton strip	
					Painting	
						
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip		A-b1-2	A-c2/f3-2	A-d2-1		A-f1-2
B -Piping	B-a1-1	B-b2-2	B-c2-1	B-d2-1	B-e1-1	
C -Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1	C-a4-1	
D -Painting	D-f1-1	D-b2/e1-1	D-c2-1	D-d3-1	D-e1-1	D-f1-1

c. B1 design combination

The B1 Series: the traditional architecture is combined with the floral pattern cloth piping and painting. The color of the earth shape is yellow. Therefore, the design of the collection is mainly on yellow. The combination of other elements is made under this principle. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-35):

Table 5-35. design change of the B1 Style



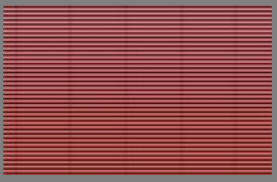


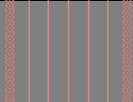


(2) B2 simulation design and its design changes

The B series: the traditional architecture, which represents the Hakka culture, is the main design element. The design elements of the B2 Style and their cultural meanings are listed below, followed by the simulation of the B2 sample and possible design changes.

a. B2 design elements and cultural implications

The design elements of the B2 Style and its cultural implications are illustrated as below (Table5-36):

Table 5-36. B2 design elements and cultural implications

Bamboo strip		<p>1. Material: thin round bamboo strips</p> <p>2. Color: Bamboo strips are dyed and designed with the colors of the Chinese five elements of the roof heads.</p> <p>-B2 bamboo curtain: red bamboo strips. Red is the symbolic color of the "earth shape" in the Chinese five elements.</p> <p>3. Weave: plain weave</p>
	<p>Cultural implications:</p> <p>Color: Bamboo strips are dyed and matched with the red color of the "fire shape." Red is the main color of bamboo curtains which symbolizes passion and vitality.</p>	
Piping		<p>1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head.</p> <p>2. Shape: in the form of a bamboo curtain head. Incorporating elements of the Hakka culture, the image of the Chinese five elements of the roof heads in the Hakka traditional architecture is combined with tung blossom cloth.</p> <p>-B2 bamboo curtain head: The red pointed roof head symbolizes the "fire shape" in the five elements, and is designed with the blue tung blossom cloth Style 12.</p>
		<p>Cultural implications:</p> <p>1. Shape: Incorporating the elements of Hakka culture, the shape design of the bamboo curtain head is combined with the five elements of the roof heads. The cultural concept of the Chinese Five Element Generation is the basis of the shape design. According to the traditional concept of Feng Shui, consumers can achieve the purpose of the five-element generations and the prosperity of future generations by deciding the orientation of houses and the shape of the roof heads.</p> <p>2. B2 bamboo curtain head: in the form of "fire-shaped point." The pointed shape of the roof heads symbolizes the "fire shape" in the five elements. Wood generates fire and fire generates earth. This is based on the concept of the Chinese Five Element Generations.</p>
Cotton strip		<p>Pattern: weave jacquard cotton strip 9. Pink jacquard cotton strips with red bamboo strip.</p>
Painting		<p>1. Patterns 1: Tung blossom for design change tung blossom Style 1 + tung blossom Style 11, 12, 13 as a combination.</p> <p>2. Pattern 2: a seal with the Chinese characters "平安."</p>
		<p>Cultural implications:</p> <p>1. - The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work.</p> <p>2. Add the seal with two Chinese characters "平安" to symbolize "Safe in the house."</p>

b.B2 simulation design

The simulated design of B2 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-37):

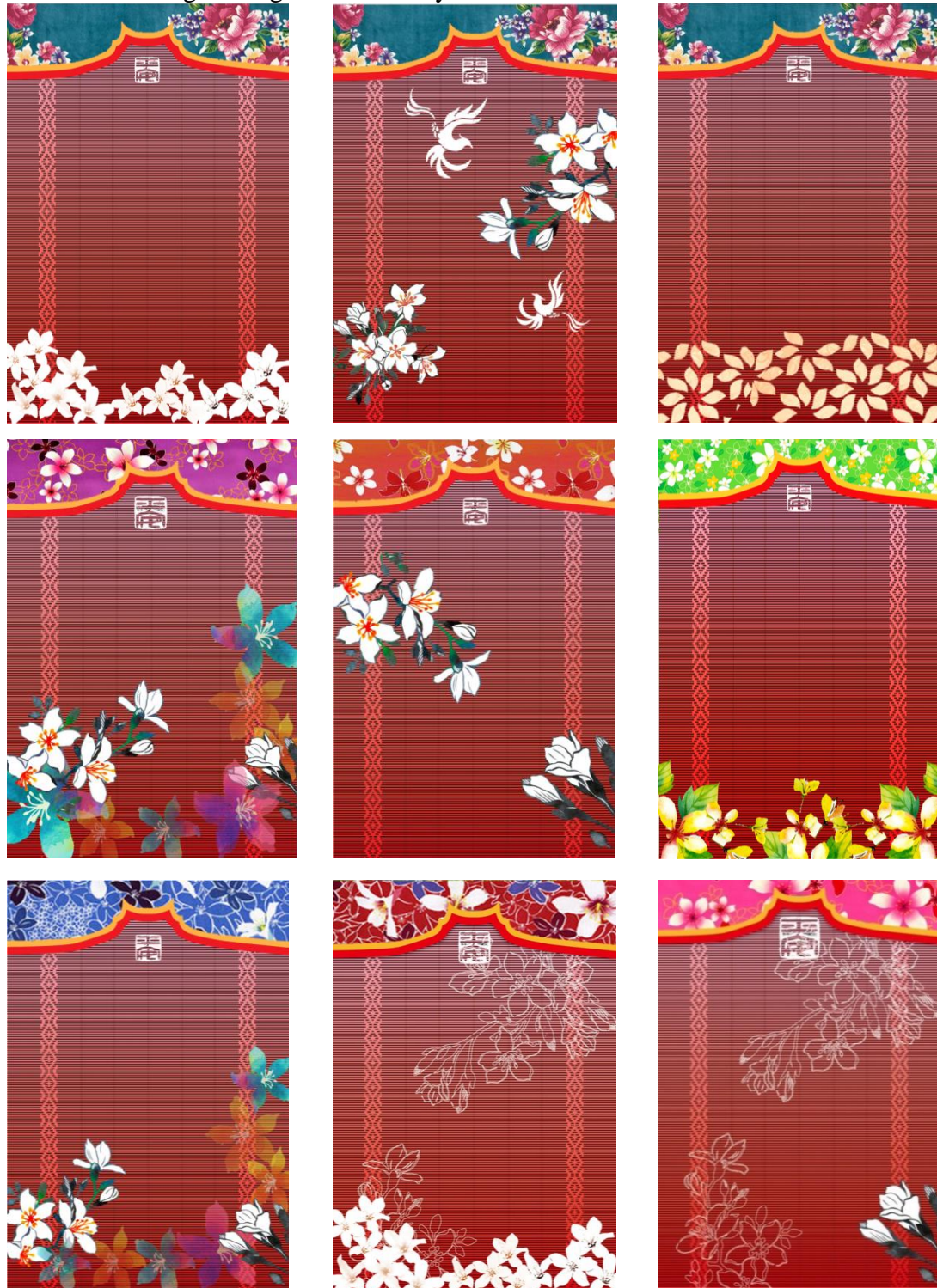
Table5-37. Design element table of B2 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
					Cotton strip	
					Painting	
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip		A-b2/f2-1	A-c2/f3-2	A-d1-1-		A-f1-2
B -Piping	B-a1-1	B-b2-2	B-c2-1	B-d2-1/2	B-e1-1	
C -Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1	C-a4-1	
D -Painting	D-f1-1	D-b2/e1-1	D-c2-1	D-d1/d2-1	D-e1-1	D-f1-1

c. B2 design combination

The B2 Series: the traditional architecture is combined with the floral pattern cloth piping and painting. The color of the fire shape is red. Therefore, the design of the collection is mainly on red. The combination of other elements is made under this principle. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-38):

Table 5-38. design change of the B2 Style



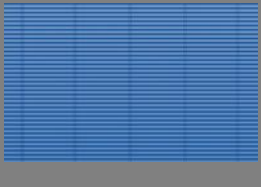
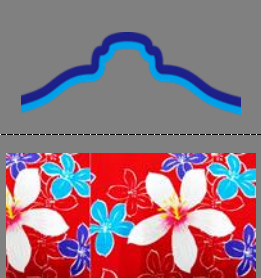


(3) B3 simulation design and its design changes

The B series: the traditional architecture, which represents the Hakka culture, is the main design element. The design elements of the B3 Style and their cultural meanings are listed below, followed by the simulation of the B3 sample and possible design changes.

a.B3 design elements and cultural implications

The design elements of the B3 Style and its cultural implications are illustrated as below (Table5-39):


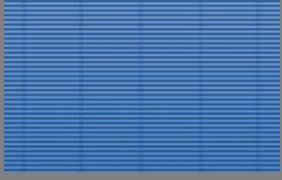


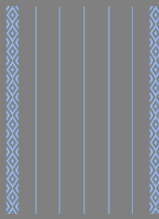


Table5-39. B3 design elements and cultural implications

Bamboo strip			<p>1. Material: thin round bamboo strips</p> <p>2. Color: Bamboo strips are dyed and designed with the colors of the Chinese five elements of the roof heads.</p> <p>-B3 bamboo curtain: blue bamboo strips. Blue is the symbolic color of the "water shape" in the Chinese five elements.</p> <p>3. Weave: plain weave</p>
	<p>Cultural implications:</p> <p>Color: Bamboo strips are dyed and matched with the blue color of the "water shape." Blue is the main color of bamboo curtains which symbolizes sky and ocean.</p>		
Piping			<p>1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head.</p> <p>2. Shape: in the form of a bamboo curtain head. Incorporating elements of the Hakka culture, the image of the Chinese five elements of the roof heads in the Hakka traditional architecture is combined with tung blossom cloth.</p> <p>-B3 bamboo curtain head: the blue wavy-shape roof head symbolizes the "water shape" in the five elements, and is designed with the red tung blossom cloth Style 2.</p>
	<p>Cultural implications:</p> <p>1. Shape: Incorporating the elements of Hakka culture, the shape design of the bamboo curtain head is combined with the five elements of the roof heads. The cultural concept of the Chinese Five Element Generation is the basis of the shape design. According to the traditional concept of Feng Shui, consumers can achieve the purpose of the five-element generations and the prosperity of future generations by deciding the orientation of houses and the shape of the roof heads.</p> <p>2. B3 bamboo curtain head: in the form of "water-shaped wave." The wavy shape of the roof heads symbolizes the "water shape" in the five elements. Metal generates water and water generates wood. This is based on the concept of the Chinese Five Element Generations.</p>		
Cotton strip			<p>Pattern: weave jacquard cotton strip 5. Light blue jacquard cotton strips with blue bamboo strip.</p>
Painting			<p>1. Patterns 1: Tung blossom for design change</p> <p>Painting: a bunch of tung blossom (Style 1) + one tung blossom (Style 11, 12, 13) as a combination.</p> <p>2. Pattern 2: a seal with the Chinese characters "平安."</p>
	<p>Cultural implications:</p> <p>1. - The tung blossom with the new cultural image of the Hakka is used as the painting element, and the life resilience of tung blossom symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work.</p> <p>2. Add the seal with two Chinese characters "平安" to symbolize "Safe in the house."</p>		

b.B3 simulation design

The simulated design of B3 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-40):

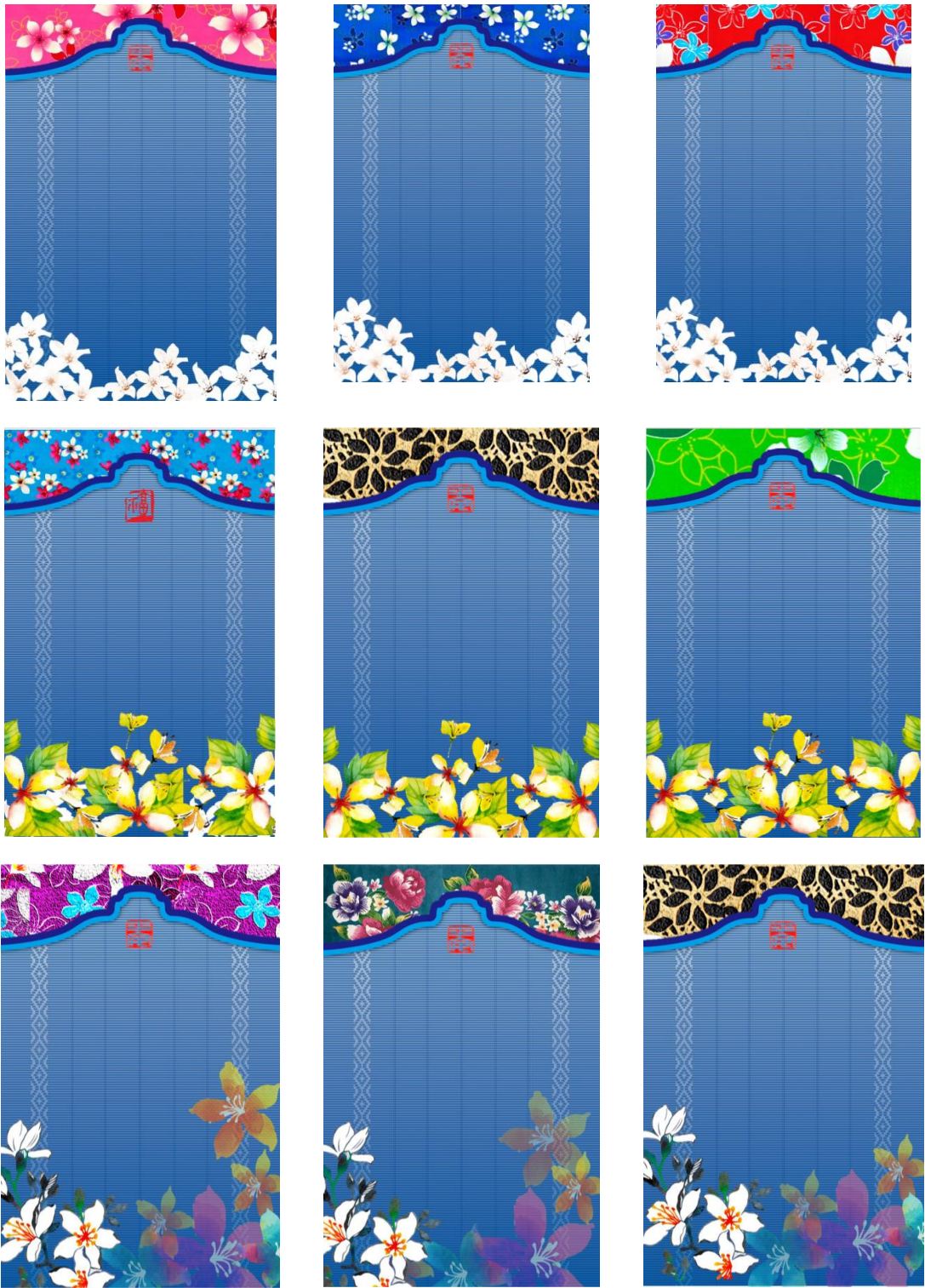
Table5-40. Design element table of B3 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
						
					Cotton strip	
					Painting	
						
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip		A-b2/f2-1	A-c2/f3-3	A-d1-1-		A-f1-2
B -Piping	B-a1-1	B-b2-2	B-c2-1	B-d2-1/2	B-e1-1	
C -Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1		
D -Painting	D-f1-1	D-b2/e1-1	D-c2-1	D-d1/d2-1	D-e1-1	D-f1-1

c.B3 design combination

The B3 Series: the traditional architecture are combined with the floral pattern cloth piping and painting. The color of the water shape is blue. Therefore, the design of the collection is mainly on blue. The combination of other elements is made under this principle, and the design changes are as follows (Table5-41):

Table 5-41.design change of the b3 style



5.2.3 The C series: paper umbrellas

This series employs paper umbrellas in the Hakka culture as the main design. A paper umbrella is also the Hakka traditional craftsmanship. It presents the image of the Hakka. Thus, the theme of this series is paper umbrellas in the Hakka culture. It symbolizes perfection and fated match, that is, the perfection of all things and happy marriage. This series extracts the shape of a paper umbrella and its design to symbolize the successful design, named paper umbrella series. There are three styles in this series, C1, C2 and C3(Figure5-9). The three styles apply paper umbrella symbols and colors for simulation designs. Each style has different simulation combinations. Different design changes can be produced with different combination of the same elements.

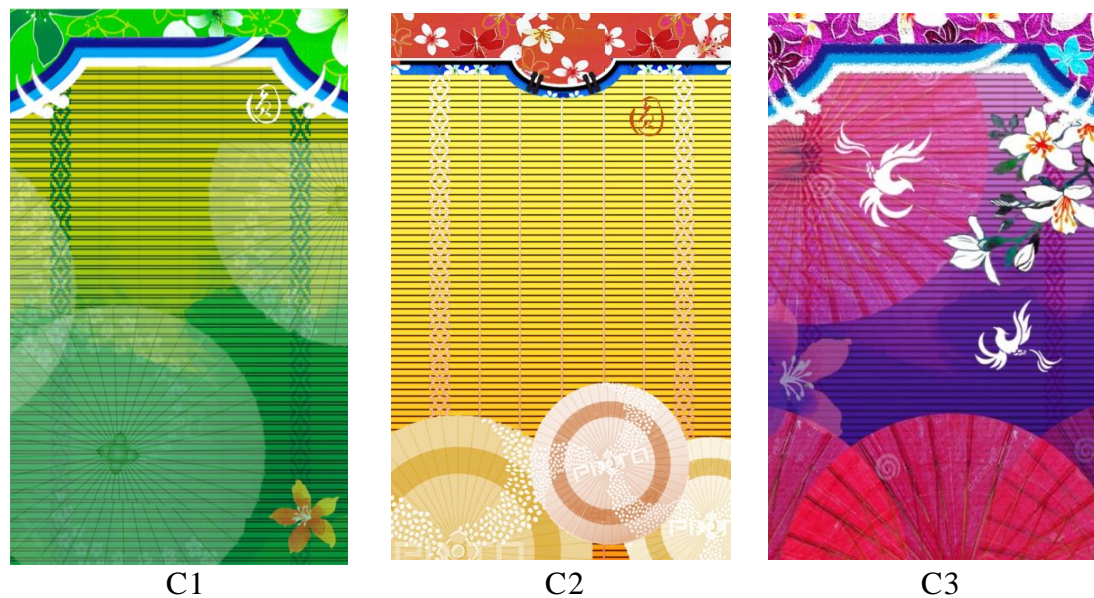


Figure5-9. The C series: paper umbrellas

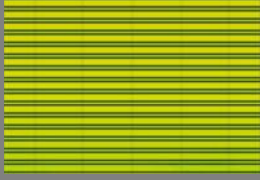
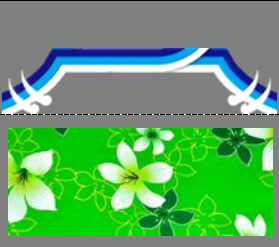

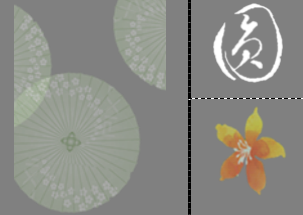
(1) C1 simulation design and design changes

The C series: paper umbrellas, which represent the Hakka culture, is the main design element. The design elements of the C1 Style and their cultural meanings are listed below, followed by the simulation of the C1 sample and possible design changes.

a. C1 design elements and cultural implications

The design elements of the C1 Style and its cultural implications are illustrated as below (Table5-42):

Table5-42. C1 design elements and cultural implications

Bamboo strip		<p>1. Material: wide flat bamboo strips combined with thin round bamboo strips</p> <p>2. Color: Bamboo strip are dyed and designed with the theme colors of bamboo curtains.</p> <p>-C1 Bamboo curtains: Green bamboo strips. The original green color of bamboo is the main color.</p> <p>3. Size: auspicious meaning of the carpenter's ruler.</p> <p>4. Weave: plain weave</p>
	<p>Cultural implications:</p> <p>1. -Size: The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune.</p> <p>2. Color: green color is the main color, symbolizing lush greenery and the earth is full of life</p>	
Piping		<p>1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head.</p> <p>2. Shape: in the form of a bamboo curtain head incorporating the Hakka culture elements. The blue-blouse collar image is combined with tung blossom cloth in each color.</p> <p>-C1 bamboo curtain: a blue blouse collar with lateral symmetry (Style 3) with the green tung blossom (Style 7).</p>
	<p>Cultural implications:</p> <p>1. Shape: the Hakka blue blouse collar symbolizes the Hakka people's diligent and thrifty life style and characteristics.</p>	
Cotton strip		<p>Pattern: weave jacquard cotton strip (Style 11). Green jacquard cotton strips with green bamboo strips.</p>
Painting		<p>1. Pattern 1: three paper umbrellas watermarks to symbolize the family members</p> <p>2. Pattern 2: Add the image of the Chinese character "圓".</p>
	<p>Cultural implications:</p> <p>1. The paper umbrella is also a Hakka traditional craft. Paper umbrellas have a variety of metaphors, mainly symbolizing the perfection and fated match, that is, the perfection of all things and happy marriage.</p> <p>- Three paper umbrella watermarks present a symbol of happy family members.</p> <p>2. Add the Chinese character image of "圓" to symbolize "May everything go perfectly with you."</p>	

b.C1 simulation design

The simulated design of C1 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-43):

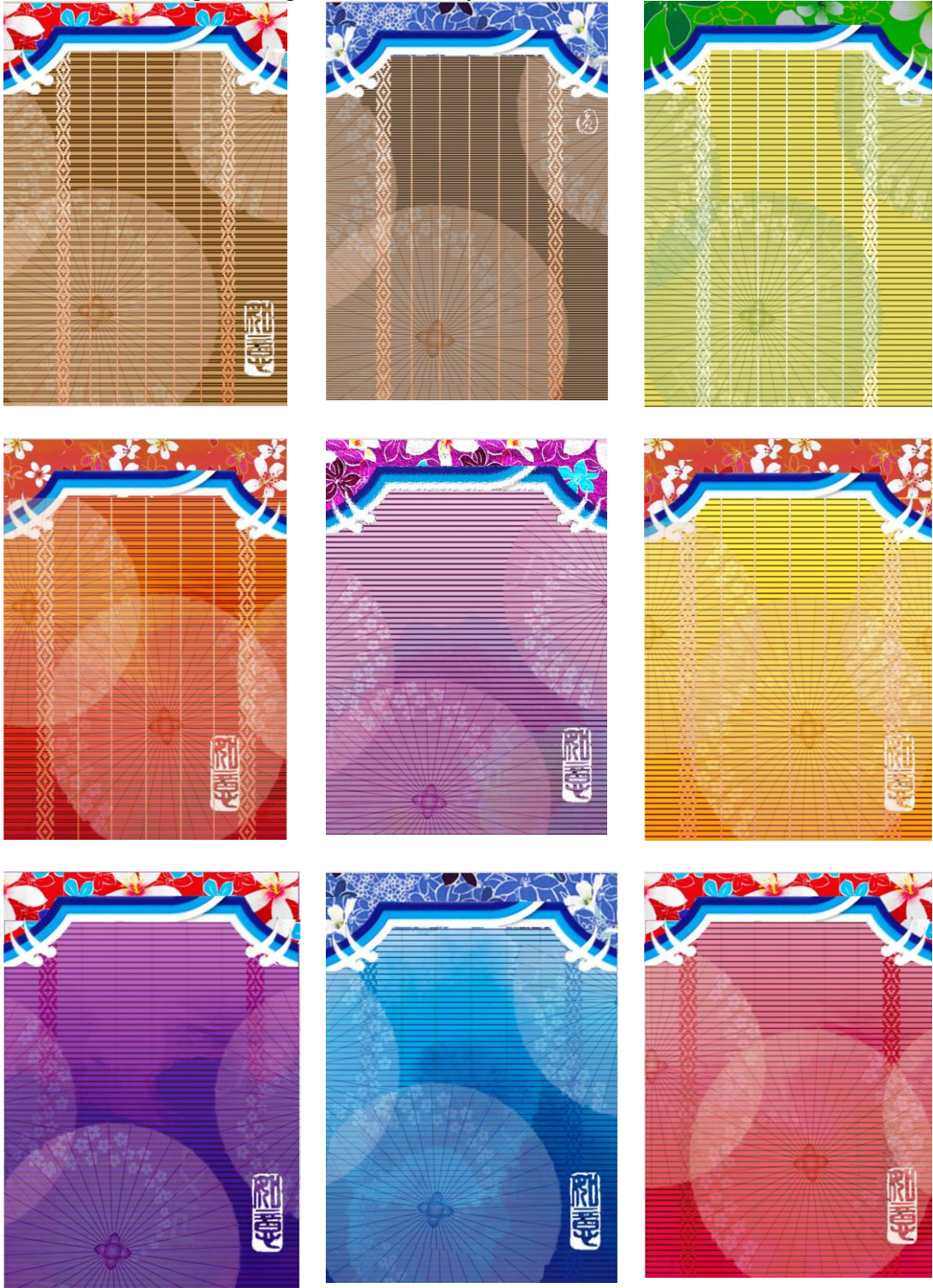
Table5-43.Design element table of C1 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	
					Cotton strip	
					Painting	
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip	A-A-a3-1	A-b2/f2-3	A-c2/f3-3	A-d3-1		A-f1-2
B -Piping	B-a1-1	B-b2-1	B-c2-1	B-d2-1	B-e1-1	
C -Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1		
D -Painting	D-f1-1	D-b2/e1-3	D-c1-1	D-d1-1	D-b2/e1-3	D-f1-1

c. C1 design combination

The C1 Style: paper umbrellas are combined with the colors of carbonized bamboo strips, the colors of dyed bamboo strips, and the floral pattern cloth piping. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-44):

Table 5-44.design change of the C1 Style




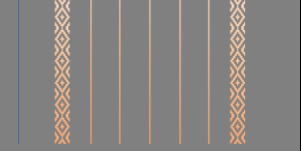




(2) C2 simulation design and its design changes

The C series: paper umbrellas, which represent the Hakka culture, is the main design element. The design elements of the C2 Style and their cultural meanings are listed below, followed by the simulation of the C2 sample and possible design changes.

a.C2 design elements and cultural implications

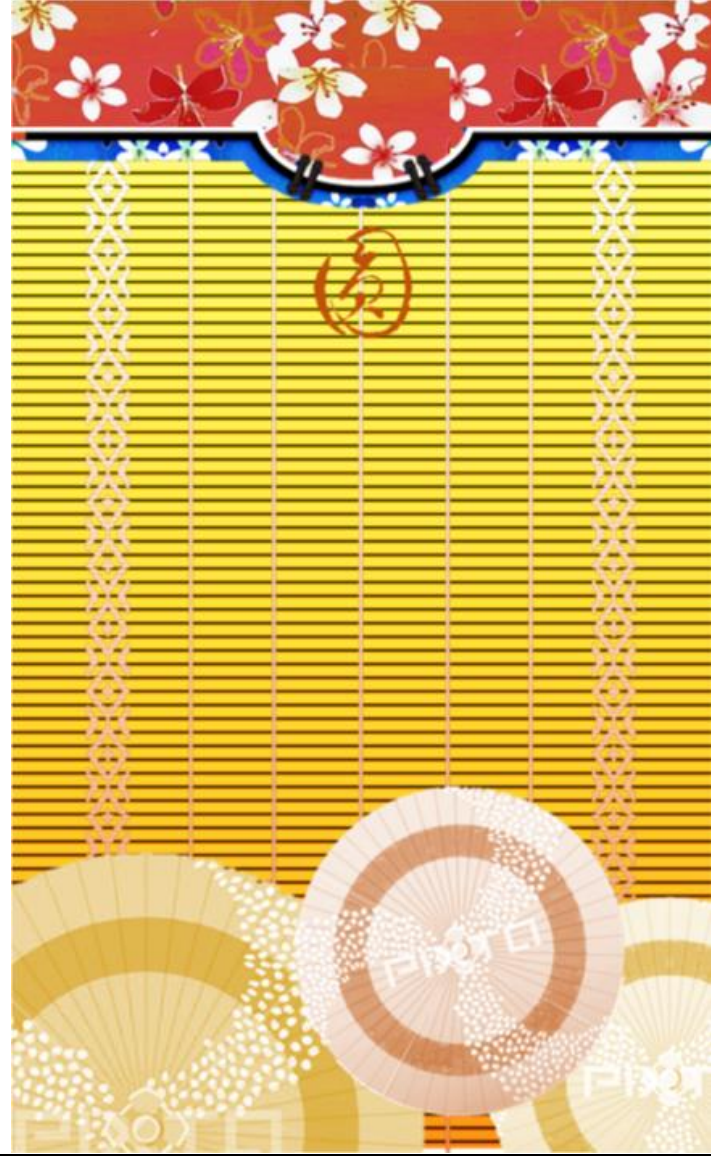


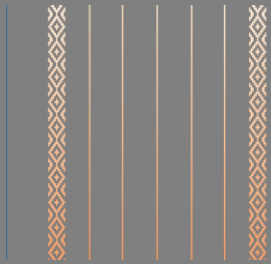

The design elements of the C2 Style and its cultural implications are illustrated as below (Table5-45):

Table5-45. C2 design elements and cultural implications		
Bamboo strip		<ol style="list-style-type: none"> 1.Material: wide and flat bamboo strip 2. Color: Bamboo strip are dyed and designed with the theme colors of bamboo curtains. -C2 bamboo curtain: yellow bamboo strip. The yellow gradient is the main color. 3. Size: auspicious meaning of the carpenter's ruler. 4. Weave: plain weave
	<p>Cultural implications:</p> <ol style="list-style-type: none"> 1. -Size: The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune. 2. Color: yellow color is the main color, symbolizing the sun's warmth, softness, and brightness. 	
Piping		<ol style="list-style-type: none"> 1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head. 2. Shape: in the form of a bamboo curtain head incorporating the Hakka culture elements. The blue-blouse collar image is combined with tung blossom cloth in each color.
		<ol style="list-style-type: none"> - C2 bamboo curtain: It is designed with the blue blouse collar (Style 4) and orange tung blossom cloth (Style 4).
Cultural implications:		
Shape: the Hakka blue blouse collar symbolizes the Hakka people's diligent and thrifty life style and characteristics.		
Cotton strip		<p>Pattern: weave jacquard cotton strip (Style 2). Yellowish orange gradient jacquard cotton strips with bamboo strip color.</p>
Painting		<ol style="list-style-type: none"> 1.Pattern 1: Paper umbrella image. Three overlapping paper umbrellas are placed at the bottom of the paper umbrella, symbolizing family members.
		<ol style="list-style-type: none"> 2. Pattern 2: Add the image of the Chinese character "圓".
Cultural implications:		
<ol style="list-style-type: none"> 1. A paper umbrella is also a Hakka traditional craft. Paper umbrellas have a variety of metaphors, mainly symbolizing the perfection and fated match, that is, the perfection of all things and happy marriage. - The image of three overlapping paper umbrellas symbolizes the happiness of family members. 2. Add the Chinese character image of "圓" to symbolize "May everything go perfectly with you." 		

b.C2 simulation design

The simulated design of C2 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-46):

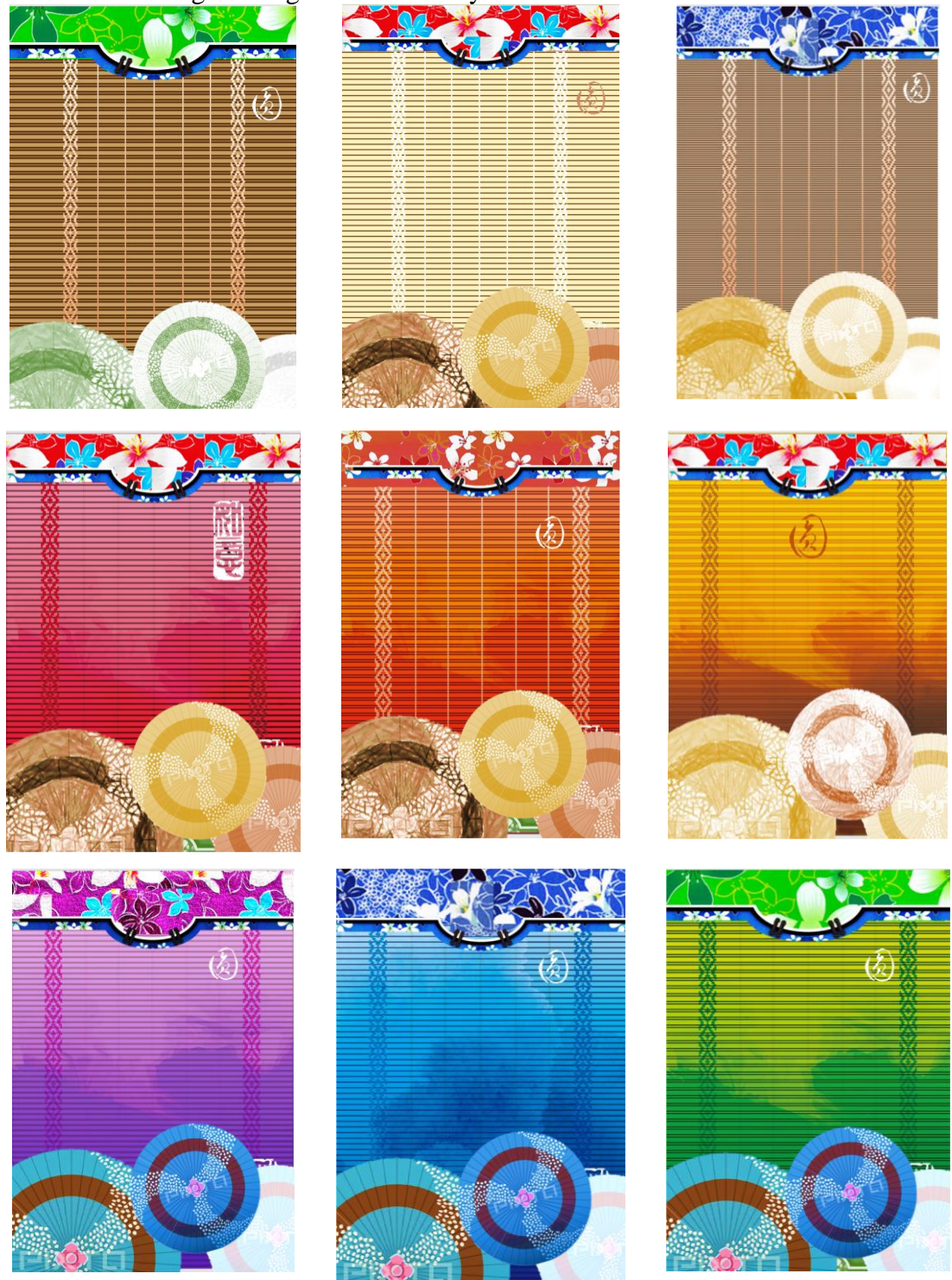
Table5-46.Design element table of C2 and its simulation design

Image				Elements		
				Bamboo strip		
				Piping		
				Cotton strip		
				Painting		
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip	A-A-a3-1	A-b2/f2-2	A-c2/f3-2	A-d2-2		A-f1-2
B -Piping	B-a1-1	B-b2-1	B-c2-1	B-d2-1	B-e1-1	
C -Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1	C-a4-1	
D -Painting	D-f1-1	D-b2/e1-3	D-c1-1	D-d1-1	D-b2/e1-3	D-f1-1

c.C2 design combination

The C2 Style: paper umbrellas are combined with the colors of carbonized bamboo strips, the colors of dyed bamboo strips, the floral pattern cloth piping, and painting of paper umbrellas. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-47):

Table 5-47.design change of the C2 Style






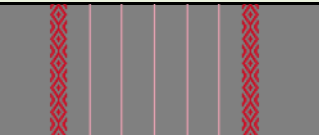
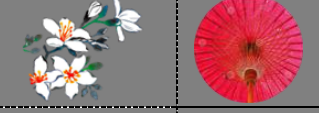

(3) C3 simulation design and design changes

The C series: paper umbrellas, which represent the Hakka culture, is the main design element. The design elements of the C3 Style and their cultural meanings are listed below, followed by the simulation of the C3 sample and possible design changes.

a.C3 design elements and cultural implications

The design elements of the C3 Style and its cultural implications are illustrated as below (Table5-48):




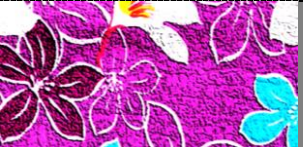
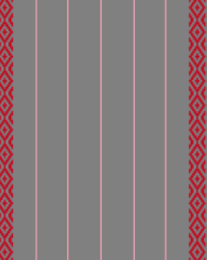




Table5-48. C3 design elements and cultural implications

Bamboo strip		<p>1. Material: wide and flat bamboo strip</p> <p>2. Color: Bamboo strip are dyed and designed with the theme colors of bamboo curtains.</p> <p>-C3 bamboo curtain: purple bamboo strip. The purple gradient is the main color.</p> <p>3. Size: auspicious meaning of the carpenter's ruler.</p> <p>4. Weave: plain weave</p>
		<p>1. -Size: The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune.</p> <p>2. Color: purple bamboo strips with red paper umbrellas. The fuchsia color is the main color as the symbol of passion, attraction, and happiness.</p>
Piping		<p>1. Location: Instead of the left and right sides, piping is presented in the form of bamboo curtain head.</p> <p>2. Shape: in the form of a bamboo curtain head incorporating the Hakka culture elements. The blue-blouse collar image is combined with tung blossom cloth in each color.</p> <p>-C3 bamboo curtain: a blue blouse collar with lateral symmetry (Style 3) with the purple tung blossom (Style 13).</p>
		<p>Cultural implications:</p> <p>Shape: the Hakka blue blouse collar symbolizes the Hakka people's diligent and thrifty life style and characteristics.</p>
Cotton strip		<p>Pattern: weave jacquard cotton strip (Style 9). Red jacquard cotton strips with bamboo strip color.</p>
Painting		<p>Patterns: Tung blossom (Style 1) for design change</p>
		<p>Pattern 2: paper umbrellas.</p> <p>Pattern 3: Two phoenixes face each other.</p>
		<p>Cultural implications:</p> <p>1. A paper umbrella is also a Hakka traditional craft. Paper umbrellas have a variety of metaphors, mainly symbolizing the perfection and fated match, that is, the perfection of all things and happy marriage.</p> <p>The image of paper umbrellas symbolizes the happiness of family members.</p> <p>2. Two phoenixes face each other, symbolizing a happy marriage.</p>

b.C3 simulation design

The simulated design of C3 was conducted using the design elements listed above, and the results of the simulation design are as follows (Table5-49):

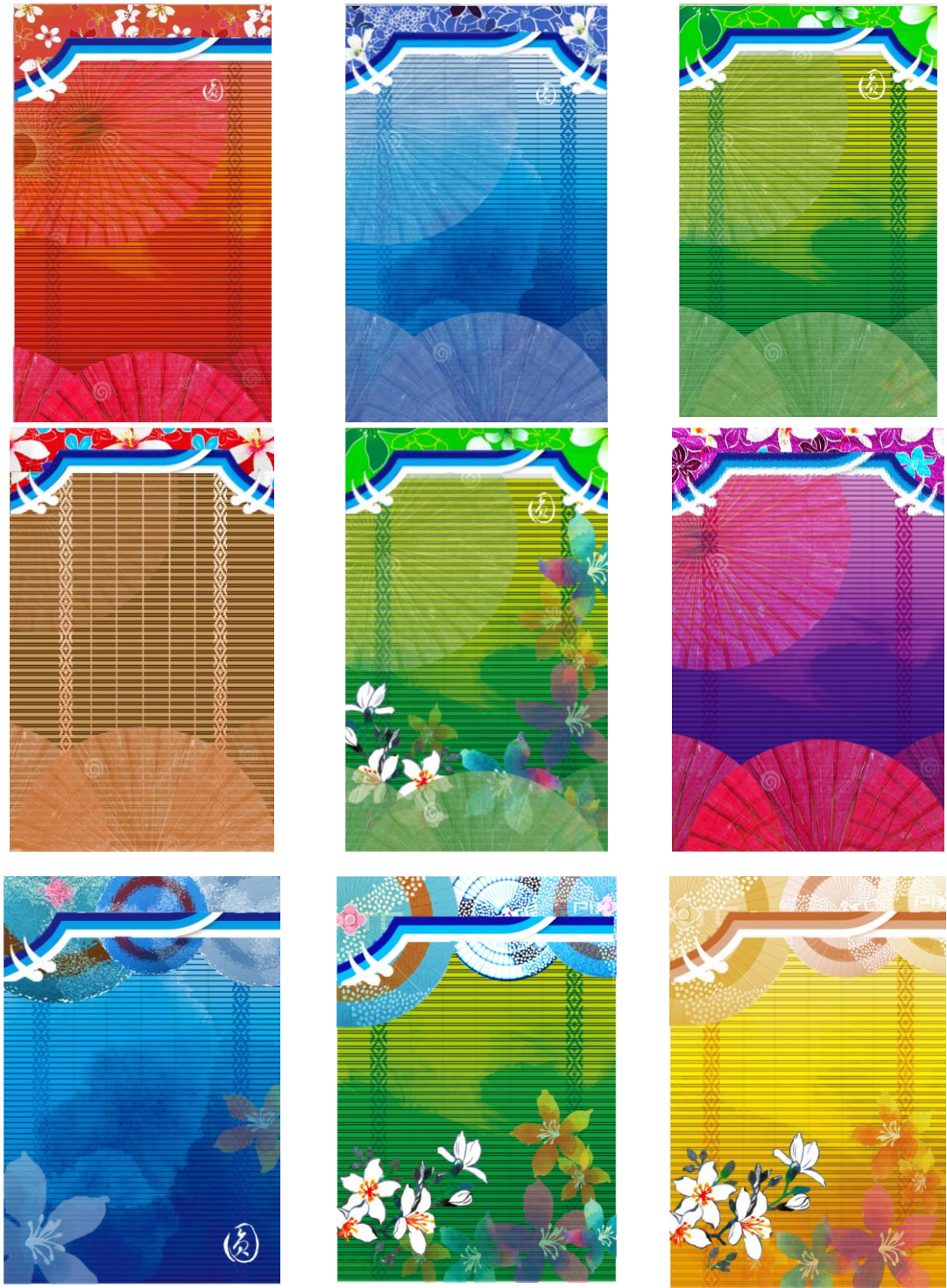
Table 5-49. Design element table of C3 and its simulation design

Image					Elements	
					Bamboo strip	
					Piping	 
					Cotton strip	
					Painting	   
	a-Material	b-Pattern	c-Color	d-Dimensions	e-Function	f-Technique
A -Bamboo strip	A-A-a3-1	A-b2/f2-3	A-c2/f3-2	A-d3-1		A-f1-2
B -Piping	B-a1-1	B-b2-1	B-c2-1	B-d2-1	B-e1-1	
C -Cotton strip	C-a4-1	C-b2-1	C-c1-1	C-d1-1	C-a4-1	
D -Painting	D-f1-1	D-b2/e1-3	D-c1-1	D-d1-1	D-b2/e1-3	D-f1-1

c.C3 design combination

The C3 Style: paper umbrellas are combined with the colors of carbonized bamboo strips, the colors of dyed bamboo strips, and painting of paper umbrellas. The same elements can be presented with different design changes after they are combined differently. The combination is simulated as follows (Table5-50):

Table.5-50. design change of the C3 Style



5.3 Value assessment and analysis of Bamboo Curtains

The transformation design of traditional bamboo curtains is mainly based on the creative thinking checklists and expert consultations to construct transformation ideas for bamboo curtains, and then select the best of them through the expert consensus survey to reconstruct the samples. This study simulated three series by integrating three Hakka cultures. Each series is divided into three styles for combination design. The same elements can produce different changes as long as they are combined with one another differently. The design of cultural and creative products should not only focus on a single value level, but should focus on the promotion of multiple values. Although the practical level, sensory level and spiritual level have its own emphasis, all levels are equally indispensable. Therefore, the current research conducted a questionnaire survey on traditional and innovative bamboo curtains to explore consumers' evaluation of these two series at the practical level, sensory level and spiritual level, and then to understand whether the reconstructed combination design meets the consumers' expectations.

5.3.1 Bamboo curtain samples for value assessment

This study conducted a simulation design and sample combination with different elements after summarizing transformation ideas. This study has carried out simulation design and developed three series, including A series: blue blouses, B series: traditional architecture, and C series: paper umbrellas. Then, a value assessment questionnaire survey is conducted on traditional and innovative bamboo curtain designs. Therefore, there are four samples in this study, namely the traditional bamboo curtain and the three series of innovative bamboo curtains. The four samples are listed as follows:

(1) Traditional bamboo curtain samples

Hanging bamboo curtains is a major feature of Hakka traditional architecture. In the early years, almost every household hangs bamboo curtains at the entrance of the house door. It was an indispensable life crafts in the lives of Hakka people in the past. Even now, bamboo curtains can be seen in the Hakka traditional courtyard buildings. Bamboo curtains are not only practical and beautiful, but also unique living crafts in Liudui (Figure5-10).

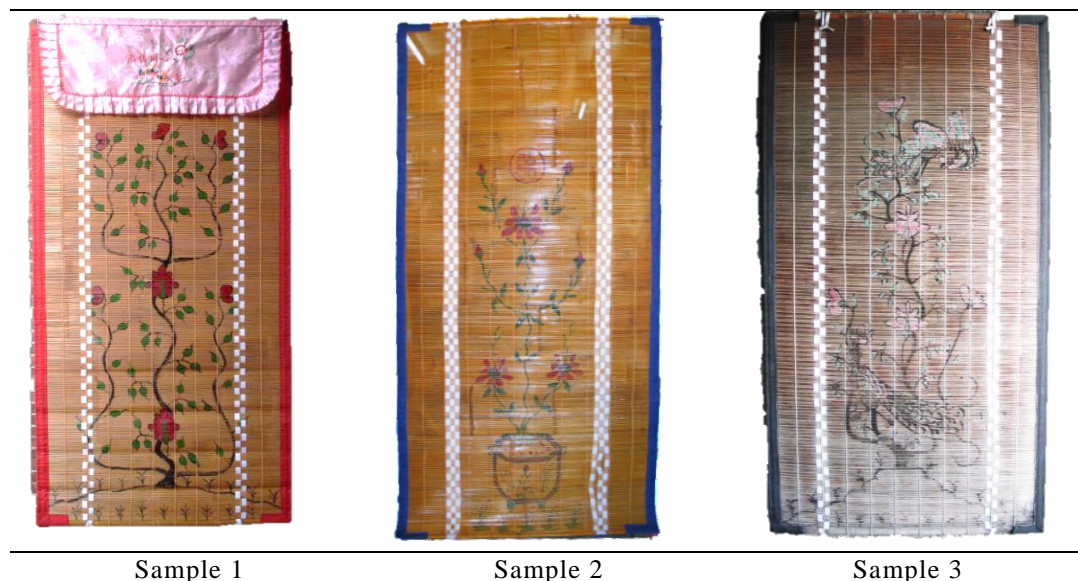


Figure5-10. Traditional bamboo door curtains

A bamboo curtain is a traditional Hakka craftis, which is hung at the entrance of the door. It can shield off bugs and dusts and to separate the indoors from outdoors. The curtain not only protects the privacy but also enables people to view what happens outside the room. When not in use, it can be rolled up and removed. In addition, the bamboo curtains also combine piping, cotton strips, and painting art that are not available in the general bamboo rafts. Different regions have developed different characteristics, making the bamboo curtains not only practical and beautiful, but also unique crafts in Liudui. With time, bamboo curtains have gradually declined. However, with consumers' pursuit of higher living standard and the rise of environmental protection, many advantages of bamboo have been re-emphasized. The traditional bamboo craft gains a new lease of life. Traditional bamboo curtains are handmade. It is time-consuming to cut and weave bamboo, so the output is not high. The average price is about NT 3,500. Now, handmade bamboo curtains are produced only in Neipu and Mino areas.

(2) Innovative bamboo curtain samples

According to this study's survey results, this study has simulated and designed three series of bamboo curtains. Each series is based on different cultures and developed into three styles, nine styles in total. This study used the morphological analysis method to redesign and reconstruct the elements which have been deconstructed. The same elements can produce countless changes as long as they are combined with one another differently. The value assessment questionnaire was used to evaluate traditional bamboo curtains and innovative bamboo curtains. The innovative series are the A series: blue blouses, B series: traditional architecture, and C series: paper umbrellas. These three series of bamboo curtains were evaluated

separately.

The innovative design of the bamboo curtain is functionally extended based on the original characteristics of the bamboo curtain from the traditional curtain function to window curtain, screen and privacy screen. As door curtains or window curtains, it has the functions of ventilation, breathability, transparency and privacy. It can also be used as a screen or privacy screen. When not in use, it can be rolled up and removed. Furthermore, it can be used to separate spaces or decorate the house. The design of the bamboo curtain can be customized according to the different needs of consumers.

A series: Blue Blouses samples

This series is A series: Blue Blouses, which can be divided into three styles C1, C2, and C3 (Figure 5-11). The theme of this series is blue blouses. The blue blouse is Hakka traditional costume. Its shape and color are full of Hakka images. This series takes the image of the blue blouse, which symbolizes the Hakka people's diligent and thrifty life style and characteristics. The new cultural image of Hakka, tung blossom, is integrated into the painting, which symbolizes the spirit of the Hakka people's adaptation of all the circumstances and hard work. The "如意" seal print on the bamboo curtain symbolizes "Everything goes as you wish. The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune. This series not only has practical and decorative functions and conveys cultural meanings. Through the questionnaires, we can further explore whether customers believe that this series of products have the value in practical level, sensory level and spiritual level, and then understand their perspectives toward these three series.

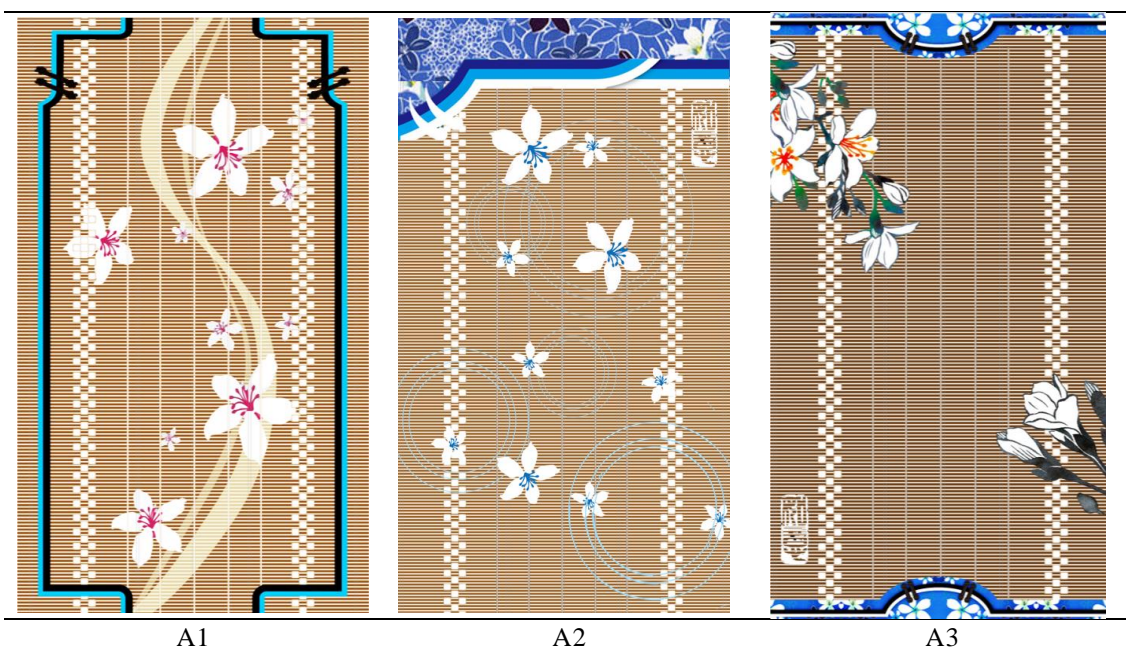


Figure5-11. A series: Blue Blouses

B series: traditional architecture samples

This series is B series: traditional architecture, which can be divided into three styles C1, C2, C3 (Figure5-12). Taking the five elements of Hakka traditional architecture as symbolic shapes, the corresponding shapes and colors of the five elements will be presented on the roof heads. The square, pointed and wavy shapes represent the shapes of the earth, fire and water, and the corresponding colors are yellow, red and blue. According to the traditional concept of Feng Shui, consumers can achieve the purpose of the five-element generations and the prosperity of future generations by deciding the orientation of houses and the shape of the roof heads. Two Chinese characters “安” are printed under the roof heads, which symbolize “Safe in the house.” The size of the bamboo curtain is combined with the auspicious meaning of the carpenter’s ruler, which has the meaning of Welcome Fortune and Great Fortune. This series not only has practical and decorative functions and conveys cultural meanings. Through the questionnaires, we can further explore whether customers believe that this series of products have the value in practical level, sensory level and spiritual level, and then understand their perspectives toward these three series.

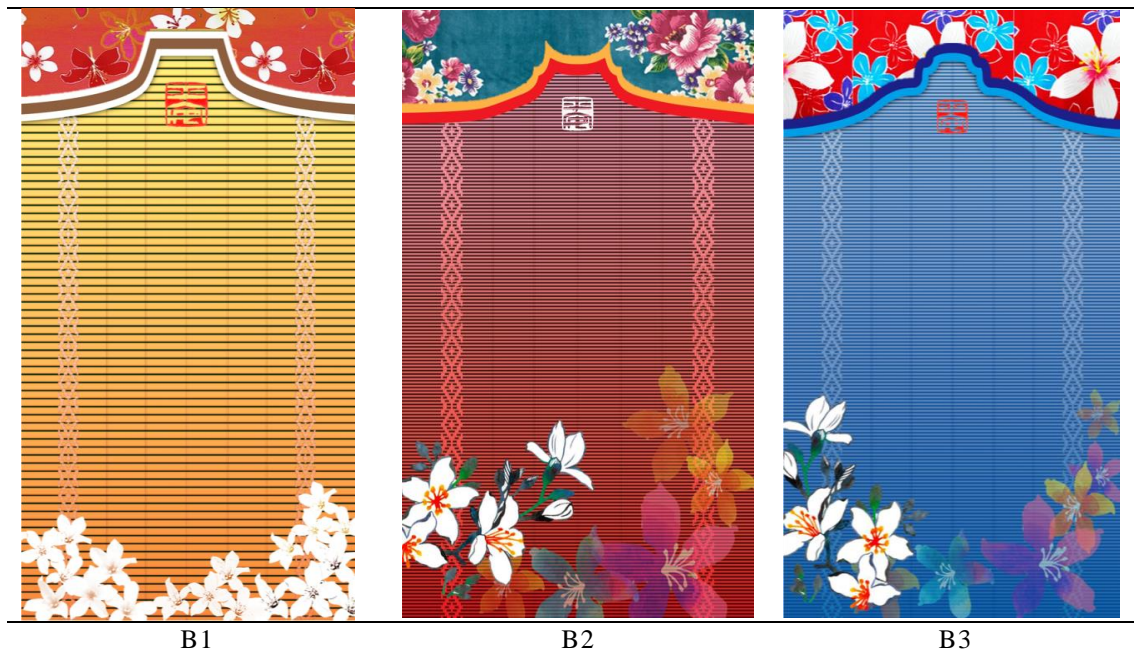


Figure5-12. B series: traditional architecture

C Series: paper umbrellas samples

This series is C Series: paper umbrellas, which can be divided into three styles C1, C2, C3 (Figure5-13). The theme of this series is a Hakka paper umbrella. Its unique meaning symbolizes perfection and fated match, that is, the perfection of all things and happy marriage. The seal with a Chinese character “圓” printed on the top right of the bamboo curtain represents “all things are complete.” Full saturation colors, green, yellow and orange, are employed as the main colors of the bamboo curtains. The colors and themes of the bamboo curtains can be customized according to customers' needs to match or decorate their living space. The size of the bamboo curtain is combined with the auspicious meaning of the carpenter's ruler, which has the meaning of Welcome Fortune and Great Fortune. This series not only has practical and decorative functions and conveys cultural meanings. Through the questionnaires, we can further explore whether customers believe that this series of products have the value in practical level, sensory level and spiritual level, and then further understand their perspectives toward these three series.

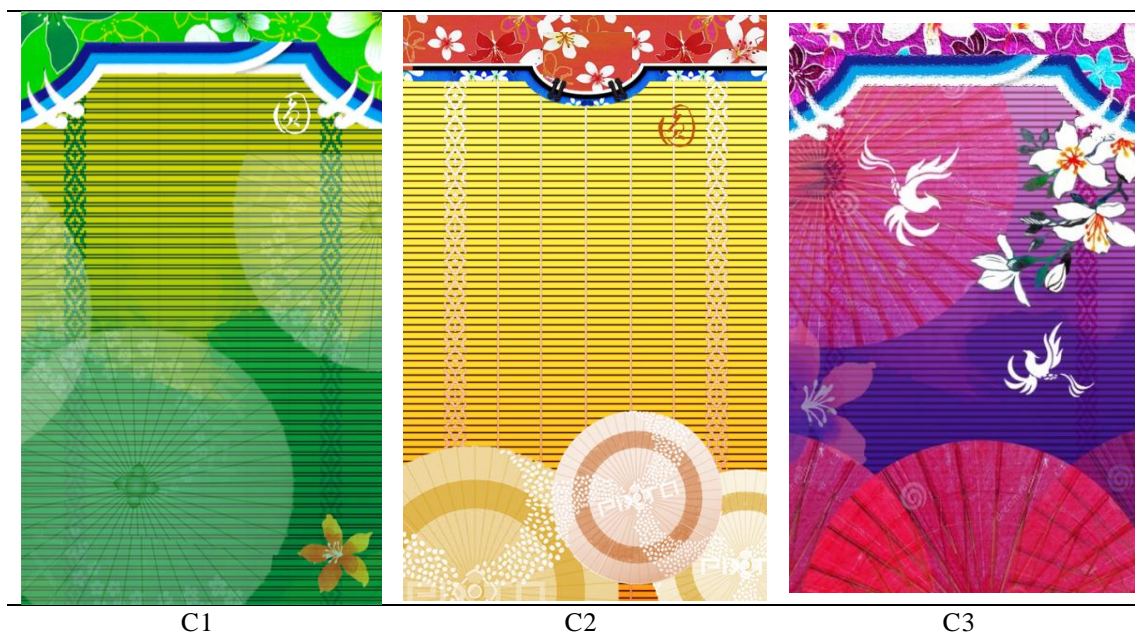


Figure 5-13. C Series: Paper Umbrellas

5.3.2 Value Assessment Questionnaire of Bamboo Curtains

This study has reviewed related literature and the modified Delphi method to construct a value level assessment checklist for cultural and creative products. According to different design attributes and needs, the present research divided the value of cultural and creative products into three levels: “Practical level,” “Sensory level” and “Spirit level.” Different product design with different attributes has different core values. However, the design of cultural and creative products has multiple values, so it should not focus on a single value level. Instead, it is necessary to balance the three. In other words, with the focus on the levels of practice and sensory, the designer should also take spirit level into account. The three has different proportions in terms of design needs, but no one should be neglected. The best creative product design should include multiple values and meet the diverse needs of consumers. This is the goal which cultural and creative products should pursue.

The questionnaire of this study mainly focuses on value assessment of traditional and transformed bamboo curtains. Through this survey, we can understand the difference of value levels before and after the transformation design of bamboo curtains, and then explore whether the transformed bamboo curtain products can meet the expectations of consumers.

(1) The value assessment items at Practical level

According to the research design, In terms of the “Practical level,” the attributes of cultural and creative products focus on product application and experience of satisfaction. According to the research results, the attribute characteristics of cultural and creative products at the practical level focus more on the improvement of practicality, pleasure, functionality, user pleasure, and operability. The value assessment items at practical level are as follows (Table5-51):

Table 5-51. Value assessment at practice level question items

Attribute	Value assessment question items
Practicability	The design of the product has good practicability.
User Pleasure	The design of the product has user pleasure.
Functionality	The design of the product has functionality.
Accessibility	The design of the product has accessibility.
Operability	The design of the product has operability.
Convenience	The design of the product has convenience.
Overall feeling	The design of this product can meet my needs for this product.

(2) The value assessment items at Sensory level

According to the research design, In terms of “sensory level,” the attributes of cultural and creative products focus on visual combination of products: aesthetic or creative. According to the research results, the attributes of cultural and creative products at the sensory level focus more on the visual aspects of product design, pattern design, color design, texture presentation, lines and material application. The value assessment items at sensory level are as follows (Table5-52):

Table 5-52. Value assessment at sensory level question items

Sensory Level	Value assessment question items
Shape	The shape design of the product is attractive.
Pattern	The pattern design of the product is attractive.
Color	The color matching of the product is attractive.
Texture	The texture of the product design is very exquisite.
Line	The line shape of the product is very graceful.
Material	The material application of the product is just right.
Overall Feeling	The overall design of the product has an aesthetic appeal and creativity, which can attract me.

(3) The value assessment items at Spirit level

According to the research design, In terms of "Spirit level," cultural and creative products emphasize the attribute characteristics of the intangible spirit level. According to the research results, the attributes of cultural and creative products at spirit level emphasize on the cultural characteristics, stories, special emotions, symbolic meanings, historical significance, and special meanings of the products. The study evaluated if these spiritual characteristics are creatively blended into the products through creative design, enabling consumers to further deepen their identity to the culture through the product and thereby achieve spiritual satisfaction. The value assessment items at spirit level are as follows (Table5-53):

Table5-53. Value assessment at spiritual level question items

Attribute	Value assessment question items
Cultural feature	The design of the product is rich in cultural feature.
Story behind	The design of the product has a story behind.
Special emotion	The design of the product is rich in special emotion.
Symbolic meaning	The design of the product is rich in symbolic meaning
Historic significance	The design of the product is rich in historic significance.
Special implication	The design of the product is rich in special implication.
Overall feeling	The overall design of the product can meet my spiritual level needs.

This study conducted consumers' value assessment questionnaires on traditional and innovative design for bamboo curtains. As mentioned above, this study divides the value levels of the products into "practical level", "sensory level" and "spiritual level".

There are seven questions for each level, 21 questions in total. The Likert Scale (1932) was used to design the questionnaire. The study used the seven-point scale of Likert as the scoring standard. The "7" represents strongly agree, the "1" represents strongly disagree, and the middle score based on the degree of importance is assessed by "6, 5, 4, 3, 2." The higher the number, the higher the degree of consent the consumers gave, while the lower the number, the lower degree of consent .

5.3.3 Statistics of Value Assessment Questionnaire of Bamboo Curtains

In this study, there were 150 valid questionnaires, including 68 male (45%) and 82 female respondents (55%). The respondents included students and different occupational categories, with 65 students (43%) had the highest proportion. The respondents range in age from 18 to 70; the age group between 21-30 was the highest proportion with 40 respondents (27%). The survey questions in this study are divided into three categories, each of which contains 7 questions, a total of 21 questions. The average and standard deviation of the variables in different value levels of bamboo curtains are summarized below.

(1) Practical Level Statistical Analysis

The Practical Level Statistical Analysis is below (Table 5-54).

Table 5-54. Practical Level Statistical Analysis

Value assessment question items		Bamboo Curtain	Mean	Standard Deviation
1.	The design of the product has good practicability. (Practicability)	Traditional	5.11	1.18
		A series	5.44	1.17
		B series	5.47	1.16
		C series	5.47	1.22
2.	The design of the product has user pleasure. (User Pleasure)	Traditional	4.52	1.03
		A series	5.56	1.08
		B series	5.42	1.26
		C series	5.57	1.16
3.	The design of the product has functionality. (Functionality)	Traditional	5.09	1.06
		A series	5.49	1.11
		B series	5.50	1.20
		C series	5.50	1.20
4.	The design of the product has accessibility. (Accessibility)	Traditional	5.15	1.25
		A series	5.56	1.17
		B series	5.63	1.16
		C series	5.50	1.17
5.	The design of the product has operability. (Operability)	Traditional	5.25	1.21
		A series	5.57	1.16
		B series	5.55	1.19
		C series	5.55	1.14
6.	The design of the product has convenience. (Convenience)	Traditional	4.98	1.29
		A series	5.52	1.16
		B series	5.53	1.11
		C series	5.49	1.21
7.	The design of this product can meet my needs for this product. (Overall feeling)	Traditional	4.29	1.20
		A series	5.35	1.26
		B series	5.38	1.24
		C series	5.40	1.23

(2) Sensory Level Statistical Analysis

The Sensory level statistical analysis is below (Table5-55)

Table 5-55. Sensory Level Statistical Analysis

Value assessment question items	Bambo o Curtain	Mean	Standard Deviation
	Traditional	3.88	1.40
1. The shape design of the product is attractive.(Shape)	A series	5.51	1.20
	B series	5.44	1.25
	C series	5.51	1.17
2. The pattern design of the product is attractive. (Pattern)	Traditional	3.49	1.31
	A series	5.56	1.21
	B series	5.50	1.25
3. The color matching of the product is attractive. (Color)	C series	5.57	1.13
	Traditional	3.69	1.28
	A series	5.55	1.26
4. The texture of the product design is very exquisite. (Texture)	B series	5.48	1.31
	C series	5.68	1.17
	Traditional	3.51	1.18
5. The line shape of the product is very graceful.(Line)	A series	5.52	1.20
	B series	5.54	1.28
	C series	5.61	1.15
6. The material application of the product is just right.(Material)	Traditional	3.60	1.23
	A series	5.59	1.12
	B series	5.51	1.19
7. The overall design of the product has an aesthetic appeal and creativity, which can attract me. (Overall)	C series	5.62	1.10
	Traditional	4.45	1.07
	A series	5.59	1.09
	B series	5.61	1.05
	C series	5.61	1.07
	Traditional	3.69	1.32
	A series	5.49	1.21
	B series	5.45	1.38
	C series	5.61	1.23

(3) Spiritual level Statistical Analysis

The Spiritual level statistical analysis is below (Table5-56)

Table 5-56. Spiritual level Statistical Analysis

Value assessment question items	Bamboo Curtain	Mean	Standard Deviation
1. The design of the product is rich in cultural feature.(Cultural feature)	Traditional	5.17	.89
	A series	5.81	1.01
	B series	5.89	.93
	C series	5.82	.98
2. The design of the product has a story behind.(Story behind)	Traditional	4.75	1.02
	A series	5.70	1.04
	B series	5.72	1.10
	C series	5.73	1.00
3. The design of the product is rich in special emotion.(Special emotion)	Traditional	5.30	.88
	A series	5.77	1.00
	B series	5.81	1.01
	C series	5.79	.95
4. The design of the product is rich in symbolic meaning(Symbolic meaning)	Traditional	5.24	.91
	A series	5.79	1.04
	B series	5.83	.97
	C series	5.72	1.04
5. The design of the product is rich in historic significance.(Historic significance)	Traditional	5.09	1.11
	A series	5.75	1.09
	B series	5.85	1.07
	C series	5.71	1.05
6. The design of the product is rich in special implication.(Special implication)	Traditional	5.25	1.02
	A series	5.71	1.08
	B series	5.85	1.03
	C series	5.79	.99
7. The overall design of the product can meet my spiritual level needs.(Overall)	Traditional	4.18	1.10
	A series	5.46	1.19
	B series	5.58	1.24
	C series	5.53	1.19

5.4 Analysis and comparison of the value levels of bamboo curtains

5.4.1 Analysis of Variances in Practical Levels

The analysis of the variance (ANOVA) of the traditional bamboo curtains and the transformed bamboo curtains in practical level is shown in the following table (Table 5-57). The ANOVA analysis shows that the F value is 11.579 ($p=.000<.005$) has reached a significant level. Further analysis of the Scheffé's posthoc comparisons found that in the practical level, the traditional bamboo curtains are significantly

lower than the A series, B series and C series, which indicates that there is a significant difference between the traditional bamboo curtains and the transformed bamboo curtains in the practical level.

Table 5-57. Analysis of Variances in Practical Levels (ANOVA)

Bamboo Curtain	N	Mean	Standard Deviation	F	P	post hoc test
Traditional	150	4.91	.94	11.579	0.00	Traditional < A 、 B 、 C series
A series	150	5.50	1.06			
B series	150	5.50	1.09			
C series	150	5.50	1.10			
Total	600					

*p<.05

This study further analyzed each question at the practical level. From the analysis results (Table5-58), there is no significant difference in the practicality and operability between the traditional bamboo curtains and the transformed bamboo curtains. However, user pleasure, functionality, accessibility, and convenience are significantly higher than traditional bamboo curtains. It is obvious that the practical level of transformed bamboo curtains can still meet consumers' expectations.

Table5-58. Practice level analysis of variance numbers

Practical Level														
Value Layer	Practicability		User Pleasure		Functionality		Accessibility		Operability		Convenience		The overall	
	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation
Traditional	5.11	1.18	4.52	1.03	5.09	1.06	5.14	1.25	5.24	1.21	4.98	1.29	4.29	1.20
A series	5.44	1.17	5.56	1.08	5.49	1.11	5.56	1.17	5.57	1.16	5.52	1.16	5.34	1.26
B series	5.47	1.16	5.42	1.26	5.50	1.20	5.62	1.16	5.54	1.19	5.52	1.11	5.38	1.24
C series	5.46	1.22	5.56	1.16	5.50	1.20	5.50	1.17	5.54	1.14	5.48	1.21	5.40	1.23
F-test	3.25		28.93		4.69		4.88		2.60		7.47		28.92	
P-value	.022		.000		.003		.002		.051		.000		.000	
post hoc test			Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C				Traditional <A;B;C		Traditional <A;B;C	

A bamboo curtain is a traditional Hakka crafts, which is hung at the entrance of the door. It can shield off bugs and dusts and separate the indoors from outdoors. The curtain not only protects the privacy but also enables people to view what happens outside the room. When not in use, it can be rolled up and removed.

The innovative design of the bamboo curtain is functionally extended based on the original characteristics of the bamboo curtain from the traditional curtain function to window curtain, screen and privacy screen. As a door curtain or window curtain, it has the functions of ventilation, breathability, transparency and privacy. It can also be used as a screen or privacy screen. When not in use, it can be rolled up and removed. Furthermore, it can be used to separate spaces or decorate the house. The design of the bamboo curtain can be customized according to the different needs of consumers.

From the survey of this study, the transformed bamboo curtains, at the practical level, have no significant difference in practicality and operability. In other words, in consumers' perception, the transformed bamboo curtains' practicability and operability are similar with the traditional ones. However, the transformed bamboo curtains have significantly improved in terms of user pleasure, functionality, accessibility and convenience, showing that the transformed design at the practical level can meet the expectations of consumers.

5.4.2 Analysis of Variances in Sensory Levels

This study further analyzes each question at the sensory level. From the analysis results (Table5-59), the transformed bamboo curtains are significantly higher than the traditional bamboo curtains in shape, color, pattern, texture, material, and line. It is obvious that the aesthetic level of the transformation design meets the expectations of consumers.

Table5-59 Analysis of Variances in Sensory Levels (ANOVA)

Bamboo Curtain	N	Mean	Standard Deviation	<i>F</i>	<i>P</i>	post hoc test
Traditional	150	3.76	.83	110.907	.000	Traditional
A series	150	5.54	1.10			< A 、 B 、 Cseries
B series	150	5.50	1.15			
C series	150	5.60	1.06			
Total	600					

*p<.05

This study further analyzes the various questions of the sensory level. From the analysis results (Table 5-60), all levels concerning the bamboo curtain of the transformation design are significantly higher than those of the traditional bamboo curtain in Shape, Color, Pattern, Texture, Material, and Line. The aesthetic level of the transformation design bamboo curtain is in line with consumer expectations.

Table5-60 Sensory level analysis of variance numbers

Sensory Level														
Value Layer	Shape		Color		Pattern		Texture		Material		Line		The overall	
	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation
Traditional	3.88	1.40	3.49	1.31	3.69	1.28	3.50	1.18	3.60	1.23	4.45	1.07	3.69	1.32
A series	5.50	1.20	5.56	1.21	5.55	1.26	5.52	1.20	5.59	1.12	5.58	1.09	5.49	1.21
B series	5.44	1.25	5.50	1.25	5.48	1.31	5.54	1.18	5.50	1.19	5.61	1.05	5.44	1.38
C series	5.50	1.17	5.57	1.13	5.68	1.17	5.60	1.15	5.62	1.10	5.61	1.07	5.61	1.23
F-test	61.06		104.73		84.39		113.74		108.91		43.15		76.05	
P-value	.000		.000		.000		.000		.000		.000		.000	
post hoc test	Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C	

Traditional bamboo curtains mainly focus on the practical level. Although their piping, cotton strips, and painting have different regional characteristics, the styles are fixed and lack of changes. The transformed bamboo curtains make the variation in the bamboo curtain design elements. In addition to the diversified applications, the shape, style, color and painting's theme have broken through the traditional limitations and enhanced the visual beauty and creativity of bamboo curtains. The results show that there is a significant difference between the traditional and the newly designed bamboo curtain on the sensory level, indicating that the sensory level of the transformation design bamboo curtain is more in line with consumer expectations.

5.4.3 Analysis of Variances in Spiritual Levels

The analysis of the variance (ANOVA) of the traditional bamboo curtains and the transformed bamboo curtains in spiritual level is shown in the following table (Table 5-61). The ANOVA analysis shows that the F value is 27.652 ($p=.000<.005$) has reached a significant level. Further analysis of the Scheffé's posthoc comparisons found that in the sensory level, the traditional bamboo curtains are significantly lower than the A series, B series and C series, which indicates that there is a significant difference between the traditional bamboo curtains and the transformed bamboo curtains in the spiritual level.

Table 5-61. Analysis of Variances in Spiritual Levels (ANOVA)

Bamboo Curtain	N	Mean	Standard Deviation	F	P	post hoc test
Traditional	150	5.00	.64	27.652	.000	Traditional < A 、 B 、 Cseries
A series	150	5.71	.97			
B series	150	5.79	.92			
C series	150	5.73	.93			
Total	600					

* $p<.05$

This study further analyzes each question at the spiritual level. From the analysis results (Table5-62), the transformed bamboo curtains are significantly higher than the traditional bamboo curtains in culture feature, story behind, special emotion, symbolic meaning, historic significance, and special implication. It is obvious that the spiritual level of the transformation design meets the expectations of consumers.

Table5-62. Spiritual level analysis of variance numbers

Spiritual level													
Value Layer	Cultural feature		Story behind		Special emotion		Symbolic meaning		Historic significance		Special implication		The overall
	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean	Std. Deviation	mean
Traditional	5.16	.89	4.74	1.02	5.30	.88	5.24	.91	5.08	1.11	5.25	1.02	4.18
A series	5.81	1.01	5.70	1.04	5.76	1.00	5.78	1.04	5.74	1.09	5.71	1.08	5.46
B series	5.88	.93	5.72	1.10	5.80	1.01	5.83	.97	5.85	1.07	5.85	1.03	5.58
C series	5.82	.98	5.72	1.00	5.78	.95	5.72	1.04	5.70	1.05	5.79	.99	5.52
F-test	18.918		32.501		9.652		11.459		15.480		10.484		48.693
P-value	.000		.000		.000		.000		.000		.000		.000
post hoc test	Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C		Traditional <A;B;C

Traditional bamboo curtains focus more on the practical level. As for the spiritual level, only the phoenix and potted flowers with festive cultural imagery can be seen. The transformed bamboo curtains focus on the Hakka culture. Four unique cultural elements of the Hakka are integrated into the design of bamboo curtains, namely the blue blouses on the bamboo curtain head and the shape images of the five elements on the roof heads of the traditional buildings. The traditional paper umbrellas and tung blossoms as the symbols of the Hakka culture are also integrated into the painting. The results show that there is a significant difference between the traditional and the transformed bamboo curtains on the spiritual level, indicating that the spiritual level of the transformed bamboo curtains is more in line with consumer expectations.

In the end of the questionnaire, This research further studies the degree of attraction of design elements, the trend of future application of bamboo curtains, whether the transformation design will increase the purchase intention, and whether the bamboo curtains is worth developing into local cultural and creative goods. The results are summarized as follows:

(1)The most attractive design elements of bamboo curtains:

What are the most attractive design elements of the transformed bamboo curtains?According to the results of the questionnaire (Table5-63), the respondents thought that the design of the painting was the most attractive element, followed by the color of the bamboo strips, the design of the bamboo curtain heads, and the design of the cotton strips. It can be seen that painting is the element that attracts consumers' attention. In the application of bamboo curtain painting technology, we can get rid of the limitations of traditional hand-painting, and use inkjet printing technology to enrich the patterns and maintain the stability and quality of painting. Additionally, the bamboo strips with the original color are simple and elegant, which attract certain groups of consumers. However, the visual effect is lack of change, so it is not easy to attract young customers. From the results of this survey, dyed bamboo strips are popular among consumers. Designers can make a plan for the color of bamboo curtains according to the overall needs in order to attract young consumers.

Table5-63.The most attractive design elements (multiple choices)

Design Elements	Design of painting	Color of bamboo strips	Design of curtain heads	Design of cotton strips
Frequency	112	98	84	62

(2)The most suitable for future use

Which uses of the transformed bamboo curtains are the most suitable for future use? From the results of the questionnaire (Table5-64), the respondents believe that the possible future use of bamboo curtains are window curtains, screens, privacy screens (hanging), bamboo paintings, door curtains, and privacy curtains. Obviously, in the consumers' perception, the use demand for window curtains is the highest, and the demand for door curtains is relatively low. It can be inferred that the transformation design for future bamboo curtains, in addition to the original door curtain function, should try to expand the use of bamboo curtains. How to separate the design of bamboo curtains from the existing bamboo curtains, screens and privacy curtains needs further consideration.

Table5-64.The most suitable for future use (multiple choices)

Bamboo product	Window curtain	Bamboo screens	Privacy screens	Bamboo paintings	Door curtain	Privacy curtain
frequency	75	72	70	68	63	56

(3)The purchase intention of the transformed bamboo curtains

Will the transformed bamboo curtains increase the purchase intention? According to the results of the questionnaire (Table5-65), the transformed bamboo curtains will increase consumers' purchase intention. Only a few respondents indicated the design does not increase their intention or there is no difference. It is obvious that the transformed bamboo curtain can change the purchase intention of consumers.

Table5-65.The purchase intention of the transformed bamboo curtains

Intention	Yes	No	No difference
frequency	102	28	20

(4)The possibility of developing into creative products

Whether the transformed bamboo curtains are worth developing into local cultural and creative products? According to the results of the questionnaire (Table5-66), many respondents believe that the transformed bamboo curtains are worth developing into local cultural and creative products. Only a few respondents held negative opinions. It is obvious that the transformed bamboo curtains have the value of developing into local cultural and creative products.

Table5-66.The possibility of developing into creative products

Intention	Yes	No	No comments
Frequency	129	5	16

Chapter 6 Conclusion and Suggestion

6.1 Conclusion

The purpose of this study is to construct a model of transformation design for traditional crafts. The transformation design of traditional bamboo curtains is mainly based on the creative thinking checklists and expert consultations to construct transformation ideas for bamboo curtains, and then select the best of them through the expert consensus survey to reconstruct the samples.

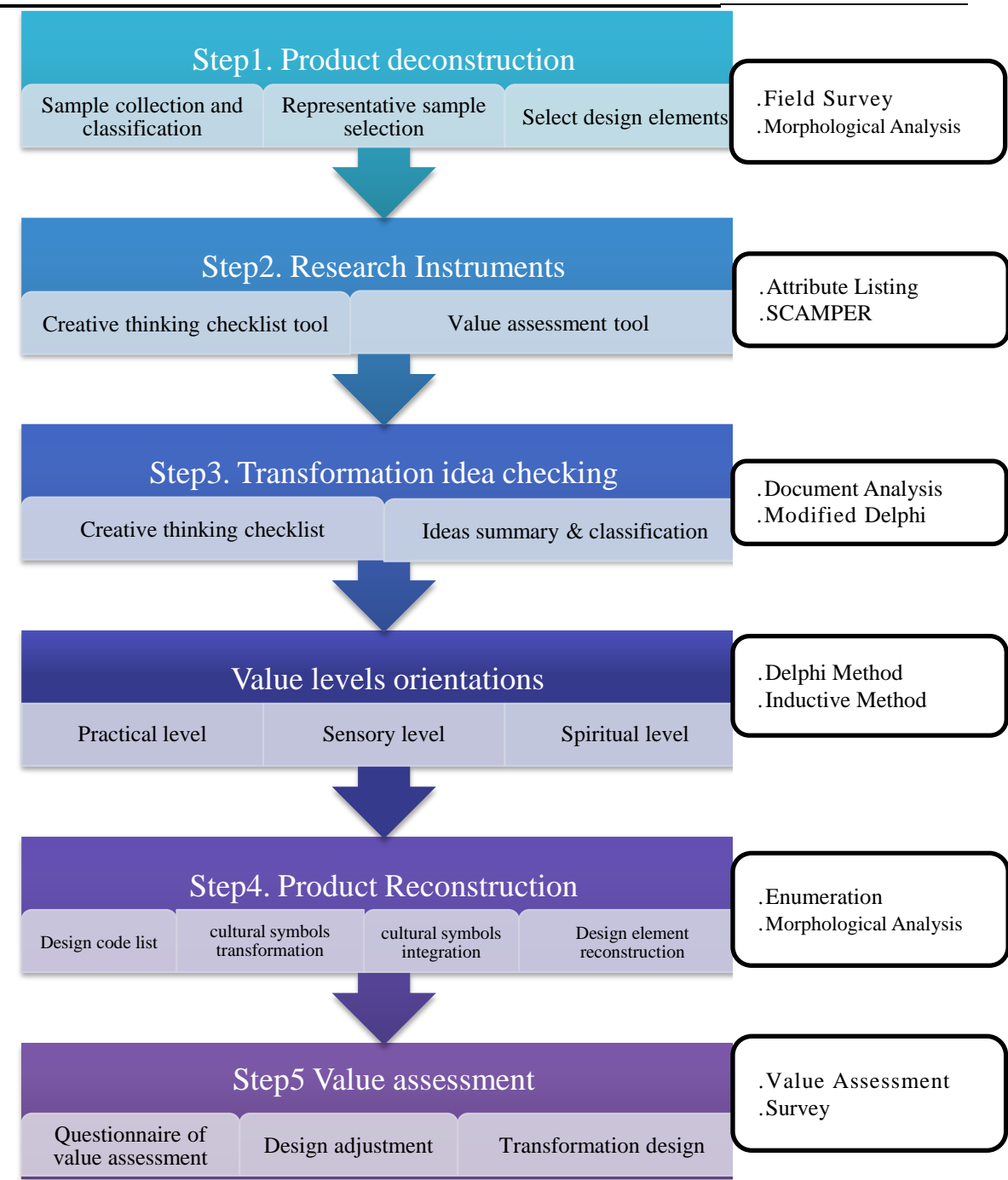
The design of creative thinking structure lies in Morphological Analysis, Attribute Listing and SCAMPER. This research was also supplemented by Delphi method for expert consultation. Through the checklist, the independent viewpoints of each expert was collected, and from their repeated feedback and aggregation, the recommendations were summarized and finally based on this, simulation designs of bamboo curtains and value assessment and analysis of the value levels were carried out to explore various possibilities of transformation design for bamboo crafts.

The application of this model is to deconstruct the product, reconstruct the design elements, and have diversified combination. Different value levels have different design appeals. However, the design of cultural and creative products should not only focus on a single value level, but should focus on the balance of multiple values. Although the practical level, sensory level and spiritual level have its own emphasis, all levels are equally indispensable.

The purpose of this study is to construct a model of transformation design for traditional crafts. This model is applied to the simulation design of three series of bamboo curtains, and then the evaluation of value levels is carried out. The results of ANOVA show that the mean score of the consumers' assessment on transformed bamboo curtains is significantly higher than that of the traditional bamboo curtains, regardless of practical level, sensory level or spiritual level. It is obvious that the application of this design model can effectively improve the value levels of bamboo curtain products. Through the transformation design of the traditional bamboo curtains, this study constructed a model of transformation design for traditional crafts in the following (Table6-1):

Table6-1. A Model of Transformation Design for Traditional Crafts

Research method



Step1. Product deconstruction

1.Sample collection and classification :	Conduct field survey to collect and classify samples
2.Select representative sample :	Select representative sample as this study's example
3.Select design elements :	Deconstruct the product and select its design elements. ◦ Taking the bamboo curtains as an example, the design elements include : bamboo strips, piping, cotton strips, and painting.

Step2.Research Instrument Design

For the end purposes of this study, this study constructs two research instruments:

1.Creative thinking checklist tool :	Combine morphological analysis,Attribute Listing technique and SCAMPER to construct a creative thinking checklist for systematic thinking.
2.Value assessment tool :	Based on the scholars' opinions, a table of value assessment is constructed, including practical level, sensory level and spiritual level.

Step3. Transformation idea checking

1.Creative thinking assesment :	Apply the creative thinking checklist and the Delphi method to collect experts' opinions, and converge the experts' independent views and retain the ideas with high consensus.
2. Ideas summary & classification	<p>The transformation ideas are summarized and classified according to different value levels.</p> <p>Products with different design orientations have different core appeals, depending on their product attributes.</p> <p>Value levels orientations :</p> <p>(1)Practical level orientations :</p> <p>Products with practical level focus on the functions of product, such as daily necessities or industrial design products.</p> <p>(2)Sensory level orientations :</p> <p>Products with sensory level focus on the visual</p>

beauty and creativity of products, such as creative design products.

(3)Spiritual level orientations :

Products with spiritual level focus on products' cultural characteristics, story and emotion, such as cultural products.

Step4. Product Reconstruction - Simulation Design

1.Design code tables : List design codes and decide the design codes.

2.Cultural symbol transformation : Steps to select cultural elements and make transformation :

- (1) Survey: Conduct cultural survey
 - (2) Select: Select cultural elements
 - (3) Interpret: Interpret cultural connotation
 - (4) Transform: Transform cultural symbols
-

3.Cultural symbols integration : Integrate cultural symbols into product designs in an appropriate way

- (1) Fit: Search for appropriate forms for the product
- (2) Integration: Integrate cultural symbols into cultural product design
- (3) Conveyance: Convey cultural meaning through product

4.Design element reconstruction The same elements can produce different combinations as long as they are combined. Just like the "Kaleidoscope Theory", this creative combination is the process of reorganizing the original design elements and recreating them.

Step5 Value level assessment

1.Questionnaire of value assessment : Consumers' value assessment on the products before and after the transformation design are conducted and compared in order to understand whether the reconstructed combination design meets the expectations of consumers.

2. Design adjustment after assessment : According to the results of the questionnaire, the product design that best meets the core appeal is selected. If the results of the questionnaire are not as expected, the product design needs to be adjusted.

3.Product

transformation design :

The products with different design orientation have different core focus.

- (1) Craft Design And Industrial Design Products: are more focused on the satisfaction of "practical level."
 - (2) Creative Design Products: are more focused on the satisfaction of "sensory level."
 - (3) Cultural Products: are more focused on the satisfaction of "spiritual level,"
 - (4) Creative And Cultural Products' design: does not focus on a single value level, instead, they attempt to balance the multiple values to meet the diverse needs of consumers.
-

The design of cultural and creative products should not only focus on a single value level, but should focus on the promotion of multiple values. Although the practical level, sensory level and spiritual level have its own emphasis, all levels are equally indispensable. Therefore, the current research conducted a questionnaire survey on traditional and innovative products to explore consumers' evaluation of these two series at the practical level, sensory level and spiritual level, and then to understand whether the reconstructed combination design meets the consumers' expectations.

The results of this study can be summarized as follows: :

1. Establish a creative-thinking checking model: This study integrates Morphological Analysis, Attribute Listing, and SCAMPER to explore the possibility of innovation of Hakka bamboo curtains. The model can systematize the process of creative thinking and help designers to think outside the box and come up with innovation.

2. Establish a model of value assessment: If traditional crafts are to be transformed into cultural and creative products, product performance should be improved, so that products are no longer only practical, but also aesthetic and creative with culture and feelings. The present study establishes a set of models of value assessment for cultural and creative product design. Different designs can be created through a value assessment to meet the needs of different customer groups.

3. Establish a transformation design model for traditional crafts: This study integrates the creative-thinking checking model and the product value assessment level model, constructs a model of 5 steps for reference for transforming and

redesigning traditional crafts, and thereby explores, one by one, the feasibility of transforming and redesigning bamboo curtain crafts. As for the application of this model, it will first check the areas that could be recreated and of reference value through the creative thinking check mode, and then it will further evaluate the value of the relevant recommendations, in which those that can combine multiple levels with the highlighted spiritual level are the main bases for the reconstruction of products. Through this model, the most suitable design series is selected one by one, the simulation design of the product is carried out, and ultimately, through the value level evaluation form and ANOVA analysis, the products that meet the expectations of consumers are screened out. Once this model is established, in the future, it will be applied as a reference to other traditional craft products, allowing themselves to be transformed, upgraded or replaced, so that different possibilities can be stimulated by the redesigning of traditional crafts.

6.2 Suggestion

Traditional craft products have gained a certain degree of cultural depth and even become a part of ordinary people's lives after years' accumulation of experience. However, the products may not conform to the demand of the times through the vicissitudes of life, perhaps because the old-fashioned styles are not in line with the aesthetics of modern people, or perhaps due to the changes in people's lifestyles or their demands in different functions. So it is necessary to take on a new look and/or enhance the practicality of the product to attract new consumers or to awaken their past user experiences. However, the transformation design of traditional crafts is different from the design of new products. The basis of the design cannot deviate from the original cultural threads. It needs to be based on tradition and can also break away from the framework to transform the traditional craft products. Therefore, the industry or designers need to re-examine and reflect on the cultural elements that the goods have always contained and use creative design techniques to present their cultural elements in a new look. Aside from meeting the practical needs, it can also satisfy the sensory and spiritual needs on these levels.

As mentioned previously, the products with different design orientations have different core focuses. Craft design and industrial design products are more focused on the satisfaction of the "Practical Level," while creative design products are more centered on the contentment of the "Sensory Level," and cultural products zero more

in on the fulfillment of the “Spiritual Level.” However, the design of creative and cultural products does not focus merely on the level of a single value, it, instead, manages to balance the multiple values to meet the diverse needs of consumers. Therefore, a well-designed cultural and creative product not only has the value on the practical level, but also has the values on the sensory and spiritual levels. Truly speaking, the value proportion of the three levels depends on the difference of the product design attributes—despite that they weigh differently in different occasions, any of them should not be neglected. The product that can balance the three is the best creative and cultural one.

Though the design of modern products often possesses multiple values, the sensory-level pursuit is also the universal value of the product design. Therefore, it is challenging to classify and define the value level of the product. What will be the proportion of the three value levels and the degree of emphasis? To establish and define the three of them is the issue that needs to be further specified in future research. In addition, the issue of how cultural elements could be transformed into cultural codes lies on the designer's ability to interpret the culture and transform designs. Seeing the fact that the reorganization of design elements is another kind of re-creation, it is safe to say that different combinations will produce different design results. Hence, in addition to the establishments of design models, human factors also play an important role that cannot be ignored in the transformation design.

This study takes the Hakka traditional bamboo curtain craft as an example, expecting that it can create a model for reference for other transformations of traditional designs through the transformation design of the traditional bamboo curtain crafts. In terms of cultural performance, along with the showcasing of Hakka culture, the incorporation of other different cultural elements, such as indigenous culture, can be taken into account as the basis for the presentation, allowing the bamboo curtain to become a special vehicle for various cultural expressions. Accordingly, the results of the incorporation will not only have practical values, but also will be valuable on the sensory level as well as the spiritual level. Again, the three are emphasized in different occasions, but any of them is not to be overlooked, hoping that consumers' demands of the products will go from "need" to "want" and then onto "desire".

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Appendix

Appendix A, The bamboo curtains hung in Liudui.



佳冬鄉賴家村(左堆)-賴宅祖堂



萬巒鄉五溝水(先鋒堆)-鍾宅祖堂



麟洛鄉新田村(前堆)-徐宅祖堂



旗山鎮客家庄(右堆臨鎮)-簡宅祖堂



旗山鎮廣福里(右堆臨鎮)-古宅祖堂



屏東縣內埔鄉上樹村(後堆)-鍾宅祖堂



高樹鄉高樹村(右堆)-楊宅祖堂



內埔鄉東勢村(後堆)-邱宅祖堂



佳冬鄉六根村(左堆)-李宅祖堂



內埔鄉東勢村(後堆)-邱宅祖堂



佳冬鄉六根村(右堆)-楊宅祖堂

六堆地區傳統建築左右兩側橫屋懸掛之竹門簾



佳冬鄉六根村(右堆)-楊宅全貌-左右兩側橫屋皆懸掛竹門簾



佳冬鄉六根村(右堆)-楊宅前堂右側橫屋



佳冬鄉六根村(右堆)-楊宅前堂左側橫屋



旗山鎮廣福里(右堆臨鎮)-古宅右側橫屋



旗山鎮廣福里(右堆臨鎮)-古宅左側橫屋



屏東縣竹田鄉竹南村(中堆)-吳宅左側橫屋



屏東縣佳冬鄉六根村(右堆)-楊宅前堂左側橫屋



屏東縣佳冬鄉佳冬村(左堆)-蕭宅右側橫屋



屏東縣佳冬鄉佳冬村(左堆)-蕭宅左側橫屋



屏東縣佳冬鄉佳冬村(左堆)-陳宅左側橫屋



屏東縣佳冬鄉佳冬村(左堆)-蕭宅第四堂



佳冬鄉六根村(右堆)-楊宅祖堂右側橫屋



佳冬鄉六根村(右堆)-楊宅祖堂右側橫屋

六堆地區傳統建築左右廊間懸掛之竹門簾



屏東縣內埔鄉內埔村(後堆)-劉宅橫屋及廊間入口處



高雄縣旗山鎮廣福里(右堆臨鎮)-古宅橫屋及廊間入口處



高雄縣美濃鎮(右堆)-林宅右側廊間



屏東縣內埔鄉東勢村(後堆)-邱宅左側廊間

Appendix B, Collected bamboo curtain samples and classification

紅色包邊之竹門簾



內埔鄉東寧村-黃宅



內埔鄉新南村-利宅



內埔鄉東寧村-黃宅



內埔鄉東寧村-黃宅



內埔鄉新南村-鄔宅



萬巒鄉五溝村-劉宅



內埔鄉振豐村



佳冬鄉賴家村-賴宅



內埔鄉富田村-曾宅



內埔鄉富田村-曾宅



佳冬鄉賴家村-賴宅



佳冬鄉賴家村-賴宅



佳冬鄉賴家村-賴宅



佳冬鄉賴家村-賴宅



內埔鄉東寧村-邱宅



內埔鄉東勢村-曾宅



內埔鄉新南村-利宅



內埔鄉振豐村



內埔鄉東勢村-邱宅



內埔鄉東勢村-邱宅



內埔鄉東勢村-邱宅



萬巒鄉五溝村-鍾宅



萬巒鄉五溝村-劉宅



內埔鄉東寧村



內埔鄉東勢村-邱宅



萬巒鄉五溝村-鍾宅



內埔鄉東勢村-邱宅



佳冬鄉佳冬村-陳宅



佳冬鄉六根村-李宅



佳冬鄉六根村-李宅



竹田鄉竹南村吳宅



佳冬鄉佳冬村羅宅



佳冬鄉佳冬村-蕭宅



佳冬鄉佳冬村-蕭宅



佳冬鄉佳冬村-蕭宅



佳冬鄉六根村-楊宅



佳冬鄉六根村-楊宅



佳冬鄉六根村-楊宅



佳冬鄉六根村-楊宅

黑色包邊之竹門簾



內埔鄉利貴發藝師繪



長治鄉潭頭村-邱宅



萬巒鄉五溝水-鍾宅



內埔鄉東勢村-邱宅



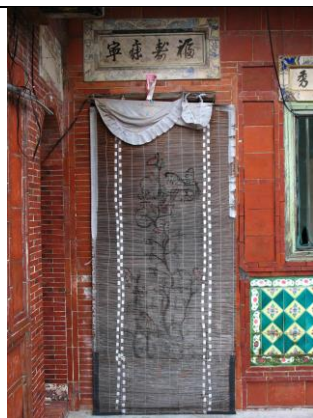
內埔鄉東勢村-邱宅



內埔鄉內埔村-劉宅



內埔鄉上樹村



萬巒鄉五溝村-鍾宅



萬巒鄉五溝村-鍾宅



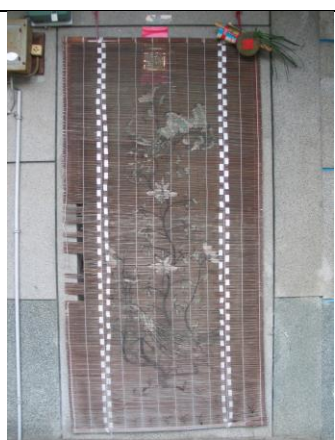
萬巒鄉五溝村-鍾宅



內埔鄉東勢村-邱宅



長治鄉復興村-劉宅



竹田鄉竹南村-宋宅



佳冬鄉六根村-張宅



佳冬鄉賴家村-賴宅



內埔鄉民宅



內埔鄉民宅



內埔鄉民宅

白色包邊之竹門簾



高樹鄉高樹村-楊宅



高樹鄉高樹村-楊宅



高樹鄉高樹村-梁宅



高樹鄉高樹村-梁宅



高樹鄉高樹村-梁宅



高樹鄉高樹村-梁宅

藍色包邊之竹門簾



美濃鎮新興百貨行販售之竹門簾



旗山鎮廣福里-古宅



旗山鎮廣福里-古宅



旗山鎮廣福里-古宅



旗山鎮廣福里-古宅



旗山鎮廣福里-古宅



旗山鎮-客家庄



旗山鎮-客家庄



旗山鎮-客家庄



旗山鎮-客家庄



旗山鎮-客家庄



旗山鎮-客家庄

現代機器製竹簾及彩繪

機器噴製之彩繪



Appendix C, The traditional process for producing bamboo curtains



原竹



剖竹





竹片編號



編織台



依編號削成細竹後綑綁準備曝曬



進行編織



曝曬





彩繪及包邊完成



Appendix D, Questionnaire Design

感謝您參與這次的問卷調查，這是一份關於地方傳統工藝轉型為文化創意產品之創新發展模式的問卷，本研究目的在思考台灣六堆客家傳統竹門簾改造及創新的可能性及作法，期望六堆傳統且特有的竹門簾能以新的風貌延續客家先民的智慧與文化並成為台灣具文化特色的創意產品。在此感謝您提供寶貝的意見及協助。

國立成功大學 創意產業設計研究所 張孟珠 敬上 108.06.04

問卷內容

- 以下問卷分成二大主題，主題一為傳統竹簾；主題二為創新設計的竹簾。
- 創新設計的竹簾分成三個系列，分別是系列 A、系列 B 及系列 C
- 每一系列各設計三款。
- 本問卷目的旨在調查消費者對傳統竹簾及創新設計的竹簾之評價比較，藉此探究各式竹簾的價值層次。


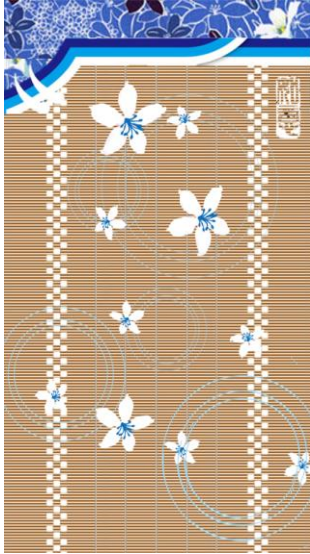

一、The Traditional Bamboo Curtains

傳統竹門簾			
產品圖像	傳統 1	傳統 2	傳統 3
			
說明	<ul style="list-style-type: none"> 竹門簾是客家傳統工藝，主要作為門簾使用，懸掛在房門入口處 除了防蚊、防塵、區隔內外及通風透氣外，亦兼具透視性及隱密性的雙重特性，同時亦具有捲舒及利於拆卸之特性。 竹門簾結合了一般竹簾所沒有的包邊、串線技術及彩繪藝術，不同的地區亦各自發展出不同的特色，使得竹簾不僅實用、美觀，也是六堆地區獨具特色的生活工藝用品。 隨著時代的遞嬗，這項傳統技藝逐漸式微 傳統竹門簾以純手工製作，以手工削竹、剖竹及編竹，十分耗時，因此傳統竹門簾產量不高，平均售價約 3500 左右。 		

價值層次	評估內容	非常同意	很同意	同意	普通	不同意	很不同意	非常不同意
		7	6	5	4	3	2	1
實務層次：使用行為層面	1.該產品的設計該人覺得實用							
	2.該產品的設計令人感到愉悅							
	3.該產品的設計具有良好的功能							
	4.該產品的設計讓人容易使用							
	5.該產品的設計讓人容易操作							
	6.該產品的設計具有良好的便利性							
	7.該產品的設計能滿足我對此類產品的使用需求							
感官層次：有形的物質層面	1..該產品的造形設計具有吸引力							
	2..該產品的圖樣設計具有吸引力							
	3..該產品的色彩搭配具有吸引力							
	4..該產品設計的質感十分精緻							
	5..該產品的線條形態十分優美							
	6..該產品的材料應用恰到好處							
	7.該產品的設計能滿足我對此類產品的使用需求							
精神層次：無形的精神層面	1.該產品的設計蘊含文化特色							
	2.該產品的設計具有故事性							
	3.該產品的設計蘊含特殊情感							
	4.該產品的設計蘊含象徵意義							
	5.該產品的設計蘊含歷史意義							
	6.該產品的設計蘊含特殊意涵							
	7.該產品的整體設計能滿足我精神層面的需求							

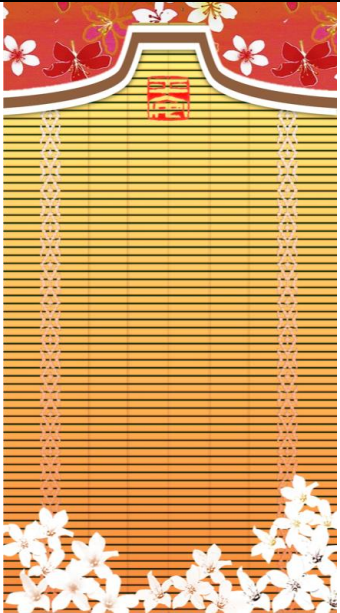


二、innovative Bamboo Curtains

(一) A 系列產品問卷內容

A 系列產品—藍衫如意系列			
產品圖像	A1	A2	A3
			
說明	<p>功能說明：</p> <ul style="list-style-type: none"> • 可作門簾、窗簾、隔屏、隔簾及遮蓋簾使用。 • 作為門簾、窗簾使用具有通風、透氣兼具透視性及隱密性的雙重特性。 • 亦可作為空間隔屏、隔簾或遮蓋簾使用，具有可捲舒及利於拆卸之特性，可彈性區隔空間兼具空間裝飾效果。 <p>設計說明：</p> <ul style="list-style-type: none"> • 本系列為竹簾創新系列一之「藍衫如意」系列。 • 本系列保持竹條原色，以具客家文化象徵的藍衫為主題，藍衫為客家傳統服飾，其造形及色彩深具客家意象，本系列擷取藍衫意象，象徵客家人勤儉樸實的生活型態及族群特性。 • 彩繪則融入客家新文化意象的桐花元素，以油桐花的生命韌性象徵客家人隨遇而安、辛勤生活的精神，竹簾之「如意」印鑑章則象徵「諸事如意」。 • 竹簾尺寸結合文公尺，具有迎福及大吉等意涵。 		

價值層次	評估內容	非常同意	很同意	同意	普通	不同意	很不同意	非常不同意
		7	6	5	4	3	2	1
實務層次：使用行為層面	1.該產品的設計該人覺得實用							
	2.該產品的設計令人感到愉悅							
	3.該產品的設計具有良好的功能							
	4.該產品的設計讓人容易使用							
	5.該產品的設計讓人容易操作							
	6.該產品的設計具有良好的便利性							
	7.該產品的設計能滿足我對此類產品的使用需求							
感官層次：有形的物質層面	1..該產品的造形設計具有吸引力							
	2..該產品的圖樣設計具有吸引力							
	3..該產品的色彩搭配具有吸引力							
	4..該產品設計的質感十分精緻							
	5..該產品的線條形態十分優美							
	6..該產品的材料應用恰到好處							
	7.該產品的整體設計具有美感或創意性能吸引我							
精神層次：無形的精神層面	1.該產品的設計蘊含文化特色							
	2.該產品的設計具有故事性							
	3.該產品的設計蘊含特殊情感							
	4.該產品的設計蘊含象徵意義							
	5.該產品的設計蘊含歷史意義							
	6.該產品的設計蘊含特殊意涵							
	7.該產品的整體設計能滿足我精神層面的需求							

(二) B 系列產品問卷內容

B 系列產品—「五行平安」系列：			
產品圖像	B1	B2	B3
			
說明	<p>功能說明：</p> <ul style="list-style-type: none"> • 可作門簾、窗簾、隔屏、隔簾及遮蓋簾使用。 • 作為門簾、窗簾使用具有通風、透氣兼具透視性及隱密性的雙重特性。 • 亦可作為空間隔屏、隔簾或遮蓋簾使用，具有可捲舒及利於拆卸之特性，可彈性區隔空間兼具空間裝飾效果。 <p>設計說明：</p> <ul style="list-style-type: none"> • 本系列為竹簾創新系列二「五行平安」系列。 • 以客家傳統建築特有文化之棟頭五行作為象徵造形，將客家傳統建築之棟頭意象以五行相對應的造形及顏色加以表現。分別以方形、尖形及波浪形象徵土形、火形及水形，其相對應的顏色分別是黃色、紅色及藍色。依傳統風水觀，如能依房屋座向搭配棟頭的造形則能達到五行相生閤家平安的目的。 • 棟頭蓋下方有「平安」兩個篆字，象徵「在宅平安」。 • 竹簾尺寸結合文公尺吉祥意涵，具有迎福及大吉等意涵，產品兼具實用性、裝飾性及特有文化意涵。 		

價值層次	評估內容	非常同意	很同意	同意	普通	不同意	很不同意	非常不同意
		7	6	5	4	3	2	1
實務層次：使用行為層面	1.該產品的設計該人覺得實用							
	2.該產品的設計令人感到愉悅							
	3.該產品的設計具有良好的功能							
	4.該產品的設計讓人容易使用							
	5.該產品的設計讓人容易操作							
	6.該產品的設計具有良好的便利性							
	7.該產品的設計能滿足我對此類產品的使用需求							
感官層次：有形的物質層面	1..該產品的造形設計具有吸引力							
	2..該產品的圖樣設計具有吸引力							
	3..該產品的色彩搭配具有吸引力							
	4..該產品設計的質感十分精緻							
	5..該產品的線條形態十分優美							
	6..該產品的材料應用恰到好處							
	7.該產品的整體設計具有美感或創意性能吸引我							
精神層次：無形的精神層面	1.該產品的設計蘊含文化特色							
	2.該產品的設計具有故事性							
	3.該產品的設計蘊含特殊情感							
	4.該產品的設計蘊含象徵意義							
	5.該產品的設計蘊含歷史意義							
	6.該產品的設計蘊含特殊意涵							
	7.該產品的整體設計能滿足我精神層面的需求							

(三) C 系列產品問卷內容

C 系列產品—圓緣系列			
產 品 圖 像	C1	C2	C3
			
說 明	<p>功能說明：</p> <ul style="list-style-type: none"> • 可作門簾、窗簾、隔屏、隔簾及遮蓋簾使用。 • 作為門簾、窗簾使用具有通風、透氣兼具透視性及隱密性的雙重特性。 • 亦可作為空間隔屏、隔簾或遮蓋簾使用，具有可捲舒及利於拆卸之特性，可彈性區隔空間兼具空間裝飾效果。 <p>設計說明：</p> <ul style="list-style-type: none"> • 本系列為竹簾創新系列三「紙傘圓緣」系列。 • 本系列以具客家文化象徵的紙傘為主題，取其特有意涵象徵圓滿及美滿，具有萬事圓滿、姻緣美滿的祝福之意。 • 竹簾右上方之「圓」字印鑑章代表「諸事圓滿」。 • 竹簾色彩以高彩度的綠色、黃色及橙色為竹簾主色調，可依需求客製化竹簾色彩及彩繪主題。 • 竹簾尺寸結合文公尺吉祥意涵，具有迎福及大吉等意涵。產品兼具實用性、裝飾性及特有文化意涵。 		

價值層次	評估內容	非常同意	很同意	同意	普通	不同意	很不同意	非常不同意
		7	6	5	4	3	2	1
實務層次：使用行為層面	1.該產品的設計該人覺得實用							
	2.該產品的設計令人感到愉悅							
	3.該產品的設計具有良好的功能							
	4.該產品的設計讓人容易使用							
	5.該產品的設計讓人容易操作							
	6.該產品的設計具有良好的便利性							
	7.該產品的設計能滿足我對此類產品的使用需求							
感官層次：有形的物質層面	1..該產品的造形設計具有吸引力							
	2..該產品的圖樣設計具有吸引力							
	3..該產品的色彩搭配具有吸引力							
	4..該產品設計的質感十分精緻							
	5..該產品的線條形態十分優美							
	6..該產品的材料應用恰到好處							
	7.該產品的整體設計具有美感或創意性能吸引我							
精神層次：無形的精神層面	1.該產品的設計蘊含文化特色							
	2.該產品的設計具有故事性							
	3.該產品的設計蘊含特殊情感							
	4.該產品的設計蘊含象徵意義							
	5.該產品的設計蘊含歷史意義							
	6.該產品的設計蘊含特殊意涵							
	7.該產品的整體設計能滿足我精神層面的需求							

三、 The Comprehensive Questions:

1. 相較於傳統竹門簾，創新設計的竹簾會不會增加您的購買意願

☐會 ☐不會 ☐無差別

2. 創新竹簾的設計最吸引我的部分(可複選)

☐竹條的色彩 ☐竹簾頭(竹簾頂端)的設計 ☐串線的搭配 ☐彩繪的設計

3. 以下哪一系列竹門簾較吸引我(可複選)

☐傳統竹門簾系列

☐A系列-藍衫如意系列

☐B系列 -建築五行平安系列

☐C系列 -紙傘圓緣系列

☐不喜歡竹簾產品

4. 我認為竹簾作為以下哪一種用途最適合未來的使用趨勢(可複選)

☐門簾 ☐窗簾 ☐隔屏(屏風式) ☐隔簾(懸掛式) ☐遮蓋簾 ☐竹掛裝飾畫

5. 您認為客家傳統竹門簾是否有發展為地方特色文創產品的價值

☐有 ☐沒有 ☐沒意見

6. 您認為客家傳統生活用品哪一個最適合發展為特色文創產品(可複選)

☐紙傘 ☐藍衫 ☐竹門簾

四、 The Basic Information:

1、性 別：☐男 ☐女

2、年 齡：☐20 歲以下 ☐21-30 ☐31-40 ☐41-50 ☐51-60 ☐61 歲以上

3、學 歷：☐國中(含以下) ☐高中(職) ☐大學(大專) ☐研究所(含)以上

4、職 業：☐農林漁牧 ☐科技產業 ☐商 ☐服務業 ☐自由業 ☐軍公教

☐傳播業 ☐設計專業 ☐醫護 ☐工 ☐學生 ☐其他 _____