

Digital Archive Database for Cultural Product Design

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Abstract. The purpose of this paper is to build a digital archive database for Taiwanese people to learn Taiwanese culture through the internet and e-learning environment. This study will be completed in three steps. Firstly, the paper is to explore the meaning of cultural objects and to extract the cultural features from Taiwanese culture; especially, Taiwan ordinary garment cultures. Then, a protocol of information-exchanging is used to analyze the cultural features, and to combine the images with the text using a standardization of digital images. Finally, a digital archive database is established and a friendly interface is designed for users. Results are presented here providing the users with a digital archive database to learn Taiwan local cultural features.

Keywords: Digital archive, database, cultural design, Taiwan aboriginal culture.

1 Introduction

Taiwan is a multi-culture blend of traditional Chinese with significant East Asian influences including Japanese and such Western influences as American, Spanish and Dutch. Over time, Taiwan gradually developed its own distinct culture, mostly from a variation of Hoklo culture from Southern China. Of course, the Taiwanese aboriginals also have distinct cultures [1], [23]. Designing local features into products appears to be more and more important in the global market, where products are losing their identity because of their similarity in function and form. Cultural features then are considered to be unique characters to embed into a product both for the enhancement of its identity in the global market and for the fulfillment of the individual consumer's experiences [4], [26], [27]. The increasing emphasis on localized cultural development in Taiwan demonstrates an ambition to promote the Taiwanese style in the global economic market [3], [6].

Using local features in design fields as a strategy to create product identity in the global market, the designer has noted the importance of associating products with cultural features in order to enhance the product value. At this point, the field of Industrial Design has played an important role in embedding the cultural elements into products and in increasing the cultural value in the global competitive product market. Therefore, designing a product with local features in order to emphasize its cultural value has become a critical issue in the design process [15], [24], [25].

“Culture” plays an important role in the design field, and “cross-cultural design” will be a key design evaluation point in the future. Designing “culture” into products will be a design trend in the global market. Obviously, we need a better understanding of cross-cultural communications not only for the global market, but also for local design. While cross-cultural issues become important for product design in the global economy, the intersection of design and culture become a key issue making both local design and the global market worthy of further in-depth study. The importance of studying culture is shown repeatedly in several studies in all areas of technology design [5], [15].

The *Linnak*, literally “twin-cup” in the Paiwan language, was chosen as the cultural object for this paper and its appearance, usability, and cultural meaning were studied. The *Linnak* is a special container for drinking wine used in the traditional tribal wedding ceremony and requires two people to manipulate the object smoothly for the drinking task. There are social meanings, ergonomic concerns and the functional achievement associated with this cultural object. Therefore, this study focuses on the analysis of cultural meaning, operational interface, and the scenario in which this object is used. Then, an archive database model was established to provide designers with a valuable reference for designing a successful cultural product. Results presented herein create an interface for examining the way designers communicate across cultures as well as the interwoven experience of design and culture in the design process [15].

2 Culture and Cultural Design Features

Culture has been called “the way of life for an entire society.” [5], [20]. It generally refers to patterns of human activity and the symbolic structures that give such activity significance. Different definitions of “culture” reflect different theoretical bases for understanding, or criteria for evaluating, human activity. Based on linguistic, anthropological, and sociological studies, culture has been described as that which deals with the result of the evolutionary process in human civilization that involves language, customs, religion, arts, thought and behavior. From the design point of view, Lee [8] proposed a culture structure with multi-layers including ‘artifact’, ‘value’, and ‘basic assumptions’ which identified key design attributes including ‘functional’, ‘aesthetic’, and ‘symbolic’. Leong and Clark [20] developed a framework for studying cultural objects distinguished by three special levels: the outer ‘tangible’ level, the mid ‘behavioral’ level, and the inner ‘intangible’ level.

Based on previous studies [8], [15], [16], [20], [25], a framework for studying cultural objects is summarized as shown in Figure 1 (Lin, 2005). As shown in Figure 1, culture can be classified into three layers: (1) physical or material culture -- including food, garments, and transportation related objects, (2) social or behavioral culture--including human relationships and social organization, and (3) spiritual or ideal culture -- including art and religion. These three culture layers can be fitted into Leong’s three culture levels given above. While cultural objects can be incorporated into cultural design, three design features are identified as follows: (1) the inner level containing special content such as stories, emotion, and cultural features, (2) the mid

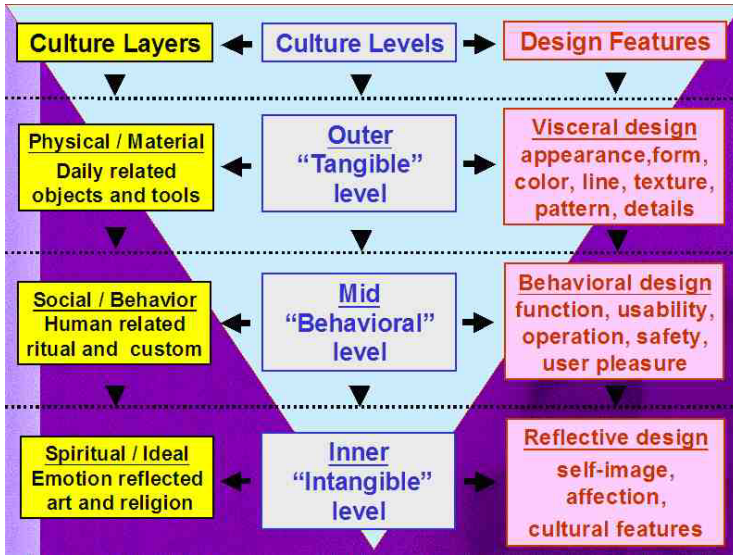


Fig. 1. Three layers and levels of cultural objects and design features

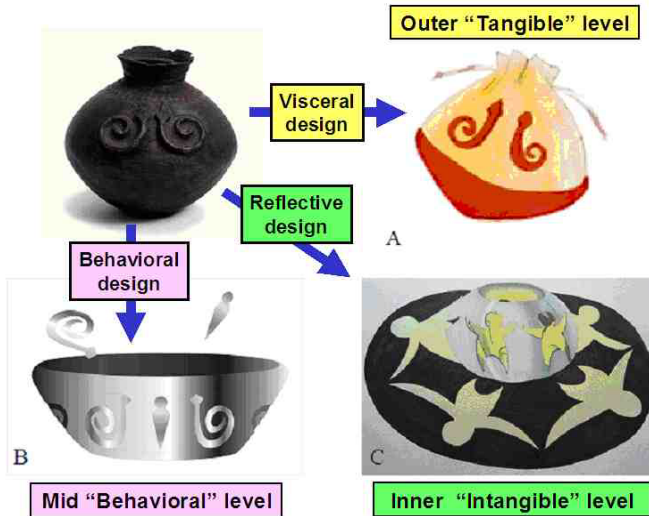


Fig. 2. Three levels of a cultural product and its design features

level containing function, operational concerns, usability, and safety, and (3) the outer level dealing with colors, texture, form, decoration, surface pattern, lines quality, and details [20].

Taking Taiwan aboriginal culture as an example, Figure 2 illustrates the application of the three levels of a "Pottery-pot" from Paiwan Tribe to design a cultural product [15]. The three levels of the cultural object can be mapped into three

levels of design features: visceral design, behavioral design and reflective design, in Norman's book -- 'Emotional Design.' Visceral design concerns the appearance of a cultural object, and transforms its form, textures, and pattern into a new product. The visceral design feature is where appearance matters and first impressions are formed. The behavioral design level is about use, function, performance and usability of a cultural object. The behavioral design feature is the key to a product's usefulness. Reflective design concerns feeling, emotion, and cognition of a cultural object. The reflective design feature is the most vulnerable to variability through culture, experience, education, and individual difference.

3 Cultural Levels and Design Features

Among Taiwan Aboriginal tribes, each tribe has a unique culture and style, which can be identified simply from its sculptures, textile fabrics, webbing, leather craft, and pottery. Furthermore, the tribe can be identified through the applied functions of architectures, daily life objects, tools, ceremonial equipment, weapons, and decorations. Upon investigation of the equipments and tools of the 12 Taiwan Aboriginal tribes, the Linnak from Paiwan tribe displays a remarkable usefulness as a cultural resource [2], [7], [9], [10], [11], [12]. The unique shape of the Linnak shows its cultural meaning, usability, and beauty. Therefore, the Linnak is used as an example to demonstrate its cultural features in product design application.



The Linnak – twin cup from Paiwan culture



Drinking with the Linnak in a wedding ceremony or social events

Fig. 3. The Linnak—twin cup from Paiwan culture

The Linnak, a twin cup, is a very typical object in Paiwan culture. In the Paiwan language, "Linnak" represents the value of connection to Paiwan traditional culture. The Linnak is carved from one piece of wood and usually has two cups with one handle on each side as shown in Figure 3. Taiwan Aboriginal people often drank rice

wine and considered it to be a holy event. Linnak represents their drinking culture and the meaning of drinking [13], [17], [28], [19], [22]. In ancient times, therefore, they developed a variety of drinking containers and each container has an associated special events and meaning. For example, one cup can be used only in special events by the chief of Paiwan tribe; two-cups or three-cups was normally used in wedding or festival ceremonies to enhancement the close relationship of drinkers and to increase warm feelings as shown in Figure 3.

There are social meanings, ergonomic concerns and the functional achievement associated with this cultural object. To provide an ideal drinking cup at a wedding, both the social and operational interfaces of the “*Linnak*” need to be well-designed. The design features of Linnak has been identified with three levels of cultural features: (1) outer-level focus on the Linnak formation which is associated with material, colors, texture, and pattern; (2) Mid-level focus on the consumer behavior and the scenario in which people will use the Linnak in what kinds of occasion; and (3) inner-level focus on the symbolic meaning of the Linnak [8], [15], [20], [21].

4 Cultural Feature Transformation Model

Based on the previous cultural levels and design feature, a cultural features transformation model was proposed which consists of three main parts as shown in Figure 4, including cultural features, design model, and cultural product. The conceptual model focuses on how to extract cultural features from cultural objects and then transfer these features to the design model to design cultural products. The research method consists of three steps; identification, translation and implementation, to extract cultural features from original cultural objects (identification), transfer them to design information and design elements (translation), and finally design a cultural product (implementation). The research method is described as follows:

(1) Identification phase: The cultural features were identified from original cultural objects including the outer level of colors, texture, and pattern, the mid level of function, usability, and safety, and the inner level of emotion, cultural meaning, and stories. The designer used the scientific method and other methods of inquiry and hence is able to obtain, evaluate, and utilize design information from the cultural objects.

(2) Translation phase: A translation phase has translated the design information to design knowledge within a chosen cultural object and has achieved some depth and experience of practice in these design features. At the same time, the designer is able to relate this design knowledge to design problems in modern society, and has an appreciation for the interaction between culture, technology, and society.

(3) Implementation phase: An implementation phase possesses the design knowledge associated with the cultural features, the meaning of culture, an aesthetic sensibility, and the flexibility to adapt to various designs. At this time, the designer has knowledge of cultural objects and an understanding of the spectrum of culture and value related to the cultural object. The designer combines this knowledge with his strong sense of design to deal with design issues, and to employ all of the cultural features in designing a cultural product.

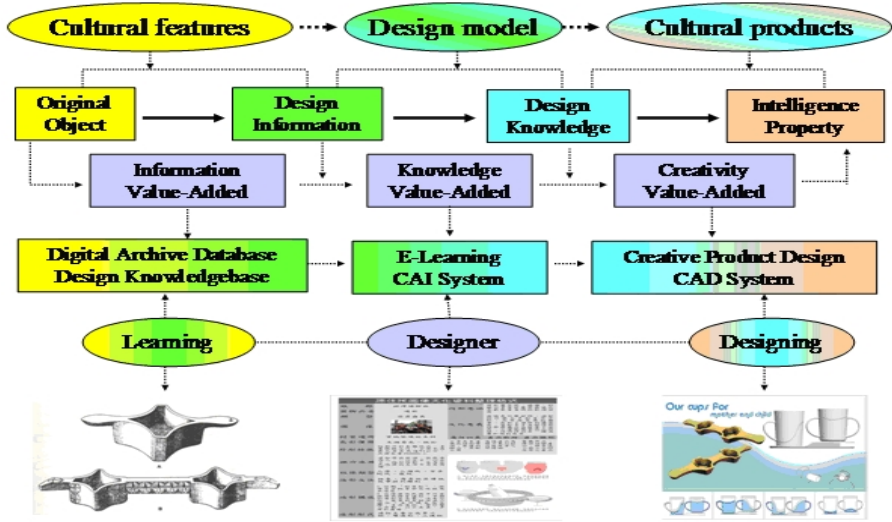


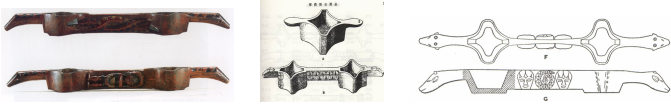
Fig. 4. The cultural product design model consists of three main parts

5 Applications of Digital Archive Database

The application of cultural features is a powerful and meaningful approach to product design. Consumers nowadays require a design which is not only functional and ergonomic, but which also stimulates emotional pleasure. The results of studying the Linnak shown in Table 1 demonstrate that cultural features are a valuable element to embed into a product to emphasize its value or meaning.

Table 1 shows an example of cultural features and design attributes of the Linnak from the Paiwan tribe. Based on the cultural feature transformation mentioned above, table 1 illustrates three levels of Linnak information in Paiwan culture: physical appearance, interactive behaviors, and spiritual meaning. As mentioned above, material culture has illustrated a strong impact in design application in terms of visual image stimulation and symbolization of the objects. This study first focused on data collection from the Paiwan in the aspects of physical, material, customs, ceremonies, and spirituality among the objects. The collected data as shown in Table 1 was then matched to the different items based on tribe, name of object, type, image, material, color, appearance, usability, pattern, form grammar, form structure, form style, inner content, and original resource. These items covered three levels of cultural characteristics and basic information such as imagery icon, tribe, and name. We propose that this information will serve as a reference for designers during the product design phase (Cheng, 2005; Hsu, 2004; Chen, 1961; Liu, 1982).

Table 1. Cultural features of Linnak Container from the Paiwan tribe

Object	Linnak or twin cup
Type	Drinking container
Tribe	Paiwan, Rukai
Picture	
Material	Wood
Color	Natural wood color or painting with colors
Pattern	Figure, human-head, long-hooded pit viper pattern, Deer pattern
Principle of formation	<ol style="list-style-type: none"> 1. Embossment on handles with a variety of patterns. 2. Total length from 43cm to 91cm, pitch from 29cm to 42cm, and cup capacity from 300c.c. to 600c.c. 3. Single cup with a rectangular column shape and handle on both sides. 4. The Linnak contains two rectangular column cups, a beam bridge in between and a handle on both sides.
Classification	Twin-cup, Single-cup and Tri-cup.
Operation	Two drinkers are required to hold the handles with left and right hand on each when drinking alcohol.
Using Scenario	<ol style="list-style-type: none"> 1. Single cup is created only for the chief to drink liquid in the Paiwan tribe. Sometimes it was used to contain rice alcohol and to reward a hunting hero for demonstrating valor. 2. The twin -cup was created for use in wedding ceremonies where the bride and groom were required to drink alcohol together. 3. The Tri-cup was created for the groom and bride and chief (a witness), who stands between groom and bride to drink alcohol together which represents the greatest honor and wish for the couple.
Cultural content	<ol style="list-style-type: none"> 1. The long- hooded pit viper or ancient figure pattern on the cup enhances the value of cup. 2. The twin-cup was mostly used in ritual or festival ceremonies to demonstrate a warm and harmonious spirit. 3. To drink with the twin cup represented the commitment in love between a male and female in tradition culture. 4. Drinking together represents eternal friendship.

According to Table 1, a digital archive database was built to help to understand both the hard and soft contents of the cultural object. A process of building a digital archive database included six steps (figure 5): select the cultural object, deal with the image, collect the information, transfer to the design knowledge, format the related information, and build the database. In addition, a friendly interface was provided to designer for accessing the database easily as shown in Figure 6, 7, 8. Some cultural products design are shown in Figure 9 and 10 on the basis of the digital archive database.

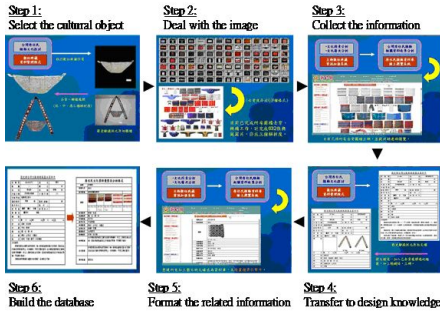
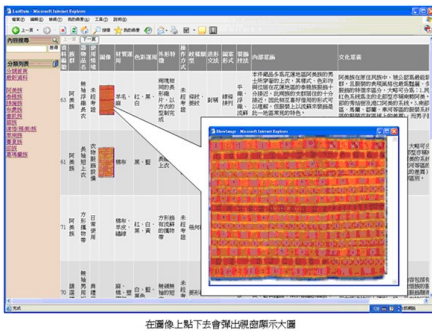


Fig. 5. Process of building the database



Fig. 6. Interface of the database



在圖像上點下去會彈出視窗顯示大圖

Fig. 7. Interface for referring the pattern

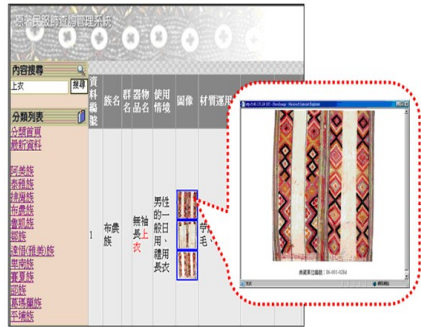


Fig. 8. The detail of the pattern

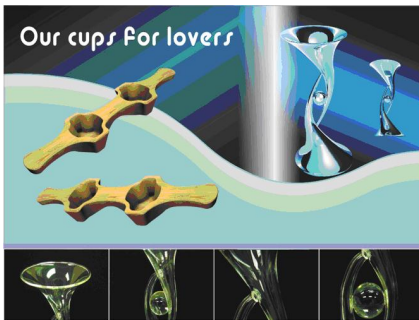


Fig. 9. Our cups for lovers



Fig. 10. Our cups for mother and child

6 Conclusion and Suggestion

It is noted that the beauty of Taiwan Aboriginal culture and art demonstrates a great potential for enhancing the design value of modern consumer products. With beautiful and primitive visual art and crafts, Taiwan aboriginal culture should have great

potential to enhance the design value, and to be recognized in the global market. Evidence shows that the perspective of Taiwan local culture in design will undoubtedly become crucial cultural elements in future design applications. Therefore, a cultural feature transformation model was proposed for transforming Taiwan aboriginal culture features into modern product design.

In this study, the Linnak demonstrates the value of Aboriginal culture in design. Based on the cultural feature transformation model, the Linnak has been identified with three levels of cultural interfaces and used as an example to demonstrate how to build a digital archive database. The Linnak is a typical cultural object which can be transformed into a contemporary design for the current consumer market. The idea of sharing in the design of the Linnak is valuable for enhancing usage in our daily life. However, the contemporary consumer market may need a new form of the Linnak suitable for a modern environment. In other words, a transformation of the Linnak is necessary for the modern market.

For future study, we suggest field investigations and interviews with Taiwanese Aboriginal people in addition to literature review in order to accurately understand Aboriginal culture and art so as to avoid incorrect interpretation of the culture when transforming cultural features into modern product design. In addition, a detailed design process needs to be developed in order to provide designers with the specified procedures for designing cultural products in the future.

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