

# *Innovative Application of Bamboo in Modern Product Design*

**Lu Libo**

*Wuxi Taihu University, Wuxi, 214064, China*

**Keywords:** bamboo products; design innovation; modeling concept; design concept; manufacturing technology

**Abstract:** In view of the problems existing in the development of bamboo products in China, several innovative design methods of bamboo products are proposed from the perspective of modern design, including the use of modern styling concepts, modern design concepts, and modern manufacturing techniques. Therefore, under the circumstance of this change of ideas, the ecological value, human value and economic value of bamboo products have been re-excavated. The intrinsic meaning of bamboo is consistent with the ideas of many people, and the bamboo industry has also become the origin of bamboo in China. It provides some references for the design innovation of bamboo products in the future.

## **1. Introduction**

In the traditional economic development model, people's production and life of material products are high consumption and high elimination. For example, the mission of a product is: the original mining - production processing - consumption - scrap, this model leads to a large amount of natural resources consumption and waste. Now with the shortage of resources, all countries in the world are aware of the problems in the traditional economic development model and are pursuing the path of sustainable development. And now the human life situation brought about by the development of industrialization has begun to produce ambivalence. The human lifestyle is very comfortable and convenient under the promotion of science and technology, but many people are eager to return to the original simple life<sup>[1]</sup>.

## **2. Development status of bamboo products**

China's bamboo resources are very rich, and China has a long history of bamboo product processing. We can see more from books or screens, and our ancestors invented bamboo slip books during the Yin Shang period. Nowadays, with the change of people's life concept, bamboo products have come back to people's lives, and the development and sales of bamboo products have developed very rapidly, and formed a bamboo product industry chain. However, there are still many problems in the bamboo products industry.

## 2.1 Fading traditional handicraft

Bamboo products manufactured by traditional handicrafts have not been able to meet the aesthetic requirements of modern people. Even if some bamboo products are very popular, the production efficiency of handicraft manufacturing is relatively large and cannot meet the market demand. Therefore, the market for bamboo products manufactured by traditional handicrafts is sluggish, and traditional handicrafts are also facing a loss.

## 2.2 Insufficient product innovation

With the development of technical means, large-scale mass production of bamboo products can now be carried out, but the style of bamboo products in the market is single and the products lack innovation. Moreover, bamboo products processing enterprises also lack the concept of bamboo products innovation<sup>[2]</sup>.

## 2.3 Missing product brand

Many bamboo product processing enterprises neglect the connotation of bamboo culture itself when developing bamboo products, which lead to the low added value of bamboo products and cannot form well-known brands.

## 3. Innovation method of bamboo product design

### 3.1 Improve the style of bamboo products with modern styling concept

Nowadays, the style of bamboo products can no longer meet the aesthetic concept of modern people. Therefore, based on the preservation of traditional handicrafts, combined with the design concept of modern people, the style of bamboo products is innovative. When designing bamboo products, you can add the current fashion styling techniques, such as adjusting the overall proportion of the product, changing the gap between the bamboo pieces and the details of the bamboo joints to reflect the rhythm and rhythm of modern atmosphere.

Figure 1 shows the ponytail bamboo vase flower room flower decoration and the tea ceremony Zen bamboo flower arrangement designed by the "Nature House". In this product, the designer uses the traditional craftsmanship, but uses modern styling methods in the shape of the product to make the product simple and clear, and visually highly ornamental [3].



Figure 1: Bamboo products designed by Nature House

### 3.2 Enhance the value of bamboo products with modern design concepts

In ancient China, bamboo products were applied to clothing, food, housing, travel, and musical

instruments. However, the development of society and economy was backward. Bamboo products at that time could meet the needs of people's material and spiritual life. For example, you can punch the flute and Xiao on the bamboo and the sound is very pleasant. However, with the progress of society, the human lifestyle has undergone earth-shaking changes, and the diversity of life has changed. The functions of traditional bamboo products can no longer meet the needs of modern people. Therefore, when designing bamboo products, we should study the material needs and spiritual needs of modern people based on the needs of human life, develop bamboo products that meet the functions of modern people, form different types of bamboo products, and improve bamboo products. For example, under the premise of retaining the characteristics of bamboo, the bamboo spirit's spiritual connotation and use function can be fully utilized to develop household items with useful value.

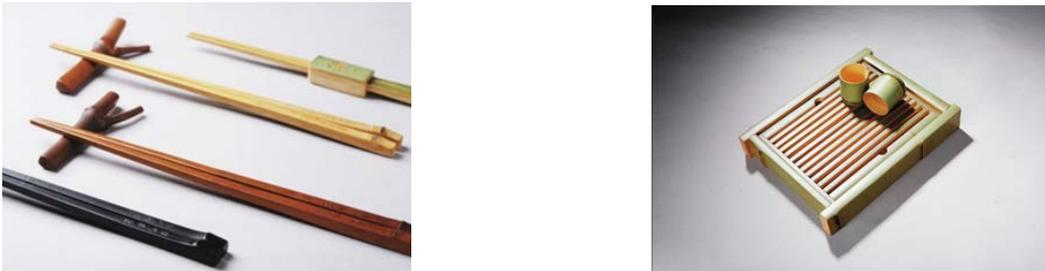


Figure 2: Bamboo products designed by Bamboo Art

As shown in Figure 2, the two bamboo products designed for “Bamboo Art” are chopsticks and teacups made of bamboo. The design of the chopsticks is very clever. It makes full use of the bamboo's raised parts of the bamboo, and retains the colour and texture of the bamboo itself. It looks very beautiful and can be used as a craft ornament for people to enjoy. The practicality also reflects the Chinese food culture. The other one is a tea cup made of bamboo. It looks very intuitive and simple, and the tray of the cup is made of bamboo<sup>[4]</sup>.

### 3.3 Apply modern manufacturing techniques to bamboo products

#### 3.3.1 The use of modern manufacturing technology

The traditional bamboo products adopt traditional hand-made technology, the production efficiency is relatively low, and the traditional manual processing techniques are relatively backward, and the bamboo structure cannot be made a big breakthrough. If modern production technology is applied in the production process of bamboo products, the bamboo can be quickly cut and processed, and the rapid prototyping of the product can effectively improve the production efficiency of the product and realize the mass production of the product.

Moreover, the pressing and splicing techniques in modern processing technology can be applied to create the shape and shape of products that are difficult to manufacture by traditional manual processes, which provides a technical basis for the development of new bamboo product styles, such as the application of pressing technology as shown in figure 3. As shown in the figure 3, this bamboo product is a shape in which a large bamboo piece is pressed, and the texture inside the bamboo material is preserved, and a very beautiful craft ornament<sup>[5]</sup>.



Figure 3: Bamboo products produced by pressing technology

### 3.3.2 Application of surface treatment technology

The aesthetic design of many modern products uses a rich surface treatment process. Surface treatment processes include spraying, laser engraving, thermal transfer, wire drawing, sand blasting, water transfer, etc.



Figure 4 Laptop with bamboo surface and computer keyboard with bamboo case

Figure 4 shows a notebook computer produced by ASUS. These processes are applied to the surface treatment of the product to give the product a wonderful visual effect. For example, the release of Xiaomi mobile phone 5, the frame of this millet phone has experienced 193 processing steps, a steel plate from the beginning of forging melting, 8 times control machine precision machining, to micro-scale sandblasting process, vacuum coating colouring and Nano The level of anti-fingerprint coating and other processes, and finally the current visual effects, I have to say that the metal frame of the Xiaomi phone 5 is really beautiful. Although these surface pre-treatment processes are mainly applied to the surface treatment of metal products, this technology can also be applied to the processing of bamboo products, so that bamboo products can also display good visual effects.

### 3.3.3 Application of connection technology



Figure 5: The glasses with bamboo

If the product is designed with a single material, the visual effect of the product will be greatly

reduced, causing visual fatigue. If the different materials can be connected to each other to form a visual difference, the visual appreciation of the product can be effectively improved. Nowadays, China's splicing technology is very perfect, and bamboo materials can be connected with modern metal, plastic, ceramic, glass and other materials to highlight the texture of different materials. Figure 5 shows the glasses with a bamboo frame. It can be seen from the figure that the effective splicing of the bamboo material and the glass material, the surface treatment of the bamboo material, and the natural texture of the bamboo material itself can effectively highlight the unique charm of the bamboo material.

#### 4. Conclusion

This paper mainly analyzes the current status of bamboo products and the innovative methods of bamboo products. It is pointed out that bamboo products should be designed with modern aesthetic concepts in mind. On the basis of retaining traditional techniques during processing, modern processing techniques and surface treatment techniques can be used to make bamboo products in the new era not only meet the needs of people's lives, but also have Very good visual effect. This article provides some references for the innovative design of bamboo products.

#### References

- [1] Azariadis P, Papagiannis P, Koutkalaki Z. *Integrating modern virtual engineering tools in footwear design and development [J]. IOP Conference Series Materials Science and Engineering*, 2018, 459:012072.
- [2] Shyshkina M. *The Problems of Personnel Training for STEM Education in the Modern Innovative Learning and Research Environment [J]*. 2018.
- [3] Tan J R. *Special Issue on Innovative Design of Complex Products [J]. Chinese Journal of Mechanical Engineering*, 2018, 31(1):36.
- [4] Gebrekidan S, Tiki L, Mulatu Y. *Indigenous knowledge on highland bamboo (Yushania alpina) management and utilization practices in Kokosa Woreda, South East Ethiopia [J]. Scientific Research and Essays*, 2018, 13(11):1-.
- [5] Jie L, Ming X, Xiong J. *Research on applications of bamboo material in modern design-based on hunan bamboo culture[C]// International Conference on Advanced Materials for Science & Engineering*. 2017.