Abstract—The innovation and development of traditional folk furniture should not be ignored in contemporary society if Chinese furniture moves towards the world. Based on analysis of the folk traditional furniture creative thinking on contemporary value, it proposes three kinds of innovative models CAI-based technology design innovation, furniture materials-based innovation and intermediate technology-based innovation in furniture production.

Keywords—Folk traditional furniture; Innovation; CAI technology; Furniture material; Intermediate technology

In modern times, folk traditional furniture inherent art and cultural values, have become the important material and content of research that sociologists, archaeologists, and furniture designers are eager to focus on[3], particularly in its "creation view".

1. Contemporary value of folk traditional furniture creation

Folk furniture is a kind of spontaneous creative activities designed to meet human own material and spiritual needs, destined to be in material culture as the standard from the beginning. It has affinity with nature and it believes man and nature are harmonious symbiotic relationship with a precondition of no nature damage in using the extent of the nature. Folk traditional furniture is based on the natural substance. The implementation of the technique is also not contrary to natural law as a criterion. In contemporary society, we often use the old folk traditional furniture craft modes of production and farming society economic cultural background to negate the continued existence of reasonable and necessary elements. However, it is undeniable that reflection in folk furniture and its corresponding natural, social harmony and relationships can be used as a reference of a higher stage of society in contemporary furniture design, and gain useful inspiration. The creative idea of harmonious coexist are between human and nature in folk furniture in contemporary furniture design continues to play an active role, which is a undeniable fact that any contemporary furniture designers believe.

1.1 Contemporary value of folk traditional furniture creation concept

Folk traditional furniture emphasizes the creation concept of the isomorphism between things and human, which mainly embodied in the furniture material, production technology, it has two aspects:

The material of folk traditional furniture is generally using local materials or accordance with material properties, making things done with whatever is available, such as multi-use camphor wood, Azusa wood, pine, cedar, bamboo, grass and stone etc. It often relates the local forest resources with geology and native biological resources, production materials used in furniture must not be at cost of destroying the natural

1 Contemporary value of folk traditional furniture
ecology, emphasizing harmony between man and natural resources.

Tenon in folk traditional furniture joint in bonding structure, joint, tenon joint structure and furniture parts joined harmoniously are mainly used, “taking advantage in production”, according to furniture parts and components of the shape, size, position and materials, choose suitable tenon structure, then comes a wide variety of tenon joint structure, such as simple and practical structure of the square tenon, straight and round tenon structure, bonding more closely dovetail tenon structure, collet tenon structure and the structure of cross-shaped buckle Tenon. The overall structure of furniture is reasonable, natural, practical, solid, almost no glue, nails and other fixed material.

1 Innovative model of folk traditional furniture

Furniture, as an important part of social life, it is the primary need for human to improve the living conditions. Furniture is the carrier of work, study, living, communication etc, involved very extensive, therefore, there are more models of innovation for folk traditional furniture.

1.1 Design innovation model of CAI-based technology

The design thinking of folk traditional furniture emphasizes the isomorphism and harmony between human and things. To innovative research folk traditional furniture design, we should adhere to the people-oriented design concept, the "people-oriented" is also today's mainstream design. Start from the user-friendly design, the use and analysis of ergonomics and other aspects, detailedly analyse "people-oriented" design in the folk traditional furniture, which mainly reflected the thinking: human-oriented design, people's feelings considerate, compatible with human scale, and comply with ergonomic principles; respect for craft, decorative elegant.

Researching on folk traditional furniture design innovation, we should actively promote its simple design. The shape, decoration, structure, category and functions in such areas, traditional folk furniture advocates a minimalist design style and coincides with lifeway of post-modern society.

Computer-aided innovation CAI (Computer Aided Innovation) is an effective tool for product design innovation[4]. It can help researchers to effectively apply innovative scientific laws, a comprehensively analyze issues, and consequently, draw on effective techniques and methods from different disciplines to build a design high efficiency of science and innovation. It can be evaluated technically and economically in the conceptual design phase of the program, thereby reducing the product R&D and production costs as well as effective accumulation and management of corporate intellectual assets, in order to achieve the accumulation of knowledge, integration of sharing and management to store knowledge for the core competitiveness of enterprises. At present, computer-aided innovation and technology in Europe and the United States and other countries has been widely used in business in design stage of new products R&D, which has become an indispensable business tool for innovation.

The application of the general process on CAI technology, product innovation can be summarized as Figure 1.

It firstly derives from requirements and then conducts a scientific analysis of the problem and find the key to achieving innovation (that is people-oriented design concepts and simple design style in the specific embodiment of innovative products), conducting problem definition, and then obtaining a number of solutions to the problem optimized with software through a variety of scientific and technical principles and its related application example inspirition with the help of CAI technology innovation theory and innovation in knowledge base, finally uses the program of evaluation system to find out innovative design that not only complies with the general trend but also meets the market demand. Then according to the program, we make the detailed design, analysis and manufacturing in the CAD / CAE / CAM software, thus ensuring the furniture industry to produce highly innovative furniture.

2.2 Furniture materials-based innovative model

The use of the material folk traditional furniture is full of abundance, such as pear, red sandalwood, ferrea, chicken wing wood, rosewood and other precious wood, as well as elm, Phoebe, oak wood, fir, cypress, camphor, pine and other common hard miscellaneous wood. Such as traditional folk furniture mahogany in the Northeast region, mainly use rosewood, oak, birch, catalpa, etc. While furniture in Southern of AnHui mainly use wood, fir, ginkgo, Jiangnan alder, sweet Castanopsis, Castanopsis sclerophylla, camphor, glauca, Liquidambar formosana, Quercus acutissima, Ulmus pumila,
materials and other industrial materials applications. Retardant properties can be used as furniture, decoration coefficient of variation, creep resistance and good flame distribution of material defects, low strength properties of the parallel plywood. Laminated Veneer Lumber with a uniform performance of timber is better than ordinary lumber. Besides, ensure enough the strength of bonding sites, so in general, the removed the original wood defects, modern bonding materials then thicken according to certain rules. Because join process refers to the thick veneer (or saw-timber)lengthen, widen and timbers, Laminated veneer lumber (LVL) and so on. Timber, Laminated veneer lumber is thick veneer peeling, which is a structural material after sizing, cis-grain group billet, pressure glued. Veneer lumber is thick veneer peeling, which is a structural material after sizing, cis-grain group billet, pressure glued. Because all the group in venation, it is also known as parallel plywood. Laminated Veneer Lumber with a uniform distribution of material defects, low strength properties of the coefficient of variation, creep resistance and good flame retardant properties can be used as furniture, decoration materials and other industrial materials applications.

The innovative model of wood composite material replacing some or all of solid saw-wood furniture

China's main supply of wood resources has been undergoing a fundamental transformation since 2005, fast-growing forest timber and artificial cultivation of fast-growing forest in the process of thinned forest become a major type of timber supply. Compared with traditional natural wood and precious species of wood, the material characteristic of this kind of wood is generally poor, mainly in the material loose, poor physical and mechanical properties. Research shows that: Using chemical, physical or mechanical means, and many other processing to handle of such timber, can give some of its new features, change some of their shortcoming or meet the needs of a particular purpose, such a material known as WPC (wood-based composite). Wood composites can be highly efficient using wood resources, protecting the ecological environment, promoting sustainable development of society and the achievement of the scientific development of timber industry, the main direction of development. Traditional artificial plates, such as fiberboard (FB), particleboard (PB), plywood (VB), which are commonly used as wood composite material. According to their composite form of laminated composite, wood composites can be classified into hybrid composites and infiltration compounds, etc., such as all kinds of timber, Laminated veneer lumber (LVL) and so on. Timber refers to the thick veneer (or saw-timber) lengthen, widen and then thicken according to certain rules. Because join process removed the original wood defects, modern bonding materials ensure enough the strength of bonding sites, so in general, the performance of timber is better than ordinary lumber. Besides, almost entirely due to timber retaining the natural appearance of wood, which has a good view performance. Laminated veneer lumber is thick veneer peeling, which is a structural material after sizing, cis-grain group billet, pressure glued. Because of all the group in venation, it is also known as parallel plywood. Laminated Veneer Lumber with a uniform distribution of material defects, low strength properties of the coefficient of variation, creep resistance and good flame retardant properties can be used as furniture, decoration materials and other industrial materials applications.

Wood composite materials obtained through a variety of complex ways, have more excellent properties than wood: dimensional stability good; no rot, anti-mildew; moisture resistant, low water absorption; excellent compressive strength, anti-stretch, anti-shear strength; high impact resistance; materials performance and appearance can be planned well; processability is good. Besides, a variety of wood composite material can be used of timber resources efficiently, optimizing the use of timber resources, therefore, for the protection of forest resources, human and environmental harmony and social sustainable development is concerned. It is of great significance that solid wood is replaced by sawn wood composites. These are consistent with the folk tradition furniture of concept idea creation.

Another aspect of innovative furniture: the use of modern industrial materials

Moreover, due to the benefit from the rapid development of science and technology, we've developed and produced many industrial materials, such as plastic, metal, glass, etc. They are excellent performance, specifications, good product modeling ability, a fine "carrier" for folk tradition of social reproduction in contemporary furniture, it's a way of folk tradition furniture in using innovative material. Modern industrial materials such as plastic, metal, glass, ceramics production do not consume timber resources completely, and under technical safeguards, the production of industrial materials can be achieved both high economic and social benefits, it's no doubt also to actively protect the forest resources and the ecology-environment, which embodies the folk tradition of furniture to emphasize the creation concept harmony between man and environment.

Therefore, we should integrate the shape characteristics of different materials to conduct a reasonable match and the use of folk furniture without losing inherent in the premise of traditional culture and form the folk tradition of furniture in keeping with contemporary technological and cultural context of the modern fashion and sense of freshness.

2.3 Innovative mode of intermediate technology-based furniture production

Folk traditional furniture is handmade, after long-term accumulation and development, folk furniture making process in Ming and Qing dynasties reached a consummate level, leaving many in the production process on the rated exquisite furniture. Folk furniture producing are mainly tailored to customers face to face, a small number of workshops of furniture products exchange in market. Adhere to sell according to strict production quotas, the degree of low-volume, long production cycle, low production capacity, production costs are high. The way of folk tradition furniture production has the following characteristics:

① Market marginalization. The domestic market is small, powerless to open up overseas markets, handicraft development folk furniture is limited.

② Scale miniaturization. More furniture production made mainly face to client, a small number of workshops of furniture products exchange in the the nearest market.
“appropriateness” is the best.

In contemporary society, the furniture industry of the modern means of production should have the following two characteristics: (1) high-efficient production. Emphasize high-efficient production systems, that is, eco-efficient utilization of environmental resources, efficient using of materials and products, functionality and efficient using of the development, production process, high efficiency and so on. (2) The user-friendly production mode emphasizing the production process of the personality of a production and producer's feeling. The performance of its characteristics is that: first, the extensive use of flexible production technology; second, mass customization mode; third, under the conditions of high-tech arts and crafts production concepts.

Therefore, it's not difficult for us to find a great contrast between production of traditional folk furniture "hand-workshop-style" features and a modern large-scale industrial production processes embodied in the "systematic" and "standardized". Hand-workshop-style turned to systematic, standardized of the modern large-scale industrial production experiences a long period of time; it is a complicated project. "Intermediate technology" better meet the community's traditional folk contemporary furniture and modern means of production requirements, "intermediate technology" is a folk tradition of furniture production methods and the basis of innovative technology.

"Intermediate technology" has been described vividly as a technology between the local technologies and advanced technologies from the developed countries by Schumacher, which is also between £ 1 and £ 1000 technology."Intermediate technology" equipment is relatively simple, technical requirements is not relatively high, less investment and quick returns. It is easier to master advanced technology, but also closer to the maintenance on the spot, high much less dependent on raw materials and auxiliary parts and more adaptable to market volatility. "Intermediate technology" can better adapt to a relatively simple production environment. Easier staff training supervision and management, organizational systems are not as stringent as the use of advanced technology. "Intermediate technology" does not exclude the high-tech, it is often taken smaller, simplified form of absorption and transformation of high-tech. For the local market, overlooking the domestic market, smallness and flexibility are the main features of contemporary and forms of "intermediate technology" in the folk traditional furniture production. "Intermediate technology" is not a pattern of things "appropriateness" is the best.

3 Conclusion

With the continuous improvement of social civilization, contemporary "traditional culture" in the furniture design are taken more and more attention. "The nation's is the international". It is an urgent for us to give full range of attention to traditional culture and pursue it. It also necessary for us to charm the essence of traditional culture into modern furniture design to design a more traditional Chinese cultural characteristics of contemporary furniture. At the same time, rapidly rising living standard of people in developed countries is no longer satisfied with the use of machinery standardization and mass manufacturing of furniture products, turns to the pursuit of environmental protection, natural and the original furniture, personalized eco-products, which is the return and innovative opportunity of traditional folk furniture.

We should seize this opportunity to work hard to develop innovative traditional folk furniture from the furniture design, furniture materials to furniture production procedure so as to enlarge and strengthen our country's furniture industry.

REFERENCES