

**A Design Guideline for Applying Taiwanese Opera Costume Aesthetics  
to Modern Chair Design**

by

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A thesis submitted to the Graduate Faculty of  
Auburn University  
in partial fulfillment of the  
requirements for the Degree of  
Master of Industrial Design

Auburn, Alabama

May 14, 2010

Keywords: Taiwanese opera, costume aesthetics, culture,  
design guideline, design elements

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## Abstract

The Western society is using an increasing amount of oriental elements to design products, especially furniture. One example of this influence is famous Denmark designer Hans J. Wagner's, whose concept the "Y-Chair" designed in 1949 comes from the "round chair 圈椅" of the *Ming* dynasty. Today, the oriental design guideline is rarely published, leading eager Western designers with little knowledge on how to apply these designs to their products. As an Industrial Design thesis, this research was conducted to study the furniture design from the perspective of Asian culture with a focus on the ability of Taiwanese traditional art to transmit thousand year old oriental aesthetics to a modern culture. From the heritage of Taiwanese culture, Taiwanese Opera's costume design was chosen as a cultural reference for this study. The emphasis of this research was to create guidelines for each role's costume style and apply the guidelines to the furniture design. A design process frame was developed and given the name "The Design Framework of Cultural Element Integrated Chair Design (DFCEICD)". By applying the design process frame and guidelines established in this research, designers can incorporate these elements into

their furniture design. The expectation is that these design guidelines will help designers build the Taiwanese Opera or Asian style furniture, and thus continue the cultural heritage of the Taiwanese Opera. This research acts as the foundation for future research on Taiwanese design culture and will assist others in designing Taiwanese cultural products.

## Acknowledgments

This work would not have been possible without the support and encouragement of my adviser and friend, Tin Man Lau, under whose supervision I chose this topic and began the thesis. I would also like to thank Richard Britnell, Shea Tillman, and Shuwen Tzeng for all of their support and inspiration. I am indebted to my friends Vita Su, JR James, and Mark Walters for helping me get through the difficult times, and for all the emotional support, camaraderie, entertainment, and caring they provided. I wish to thank all my sisters and brothers at Lake View Baptist Church for their spiritual guidance and companionship. Lastly, and most importantly, I wish to thank my parents Xue-Li Huang and Huang-Xiang Chen. To them I dedicate this thesis.



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## CHAPTER ONE: INTRODUCTION

### 1.1 Problem Statement

An issue of *Business Week* magazine featured an article entitled “Asian Design comes of Age” that attested to the rise in Asian influence among general product design (Balfour, 2007). One example of this influence is famous Denmark designer Hans J. Wagner’s, whose concept the “Y-Chair” designed in 1949 comes from the “round chair 圈椅” of the *Ming* dynasty. Although many western designers use Oriental style design elements, not many Oriental design guidelines have been studied.

### 1.2 Need for Study

In Western culture, people apply a lot of Asian patterns and Chinese characters in the form of tattoo art, such as pattern of Eastern dragons, Asian clouds, and figures of Japanese samurai, etc. The use of these patterns is not limited to tattoo art, but Asian design elements are also found in fashion design including: cloth, jeans, bags, accessory, etc. Asian images in furniture design have drawn huge attention, not only in Europe but also in the USA. The famous magazine, *Jurgita.com*, mentioned that furniture trends for 2008-2009 would see, “Ethnic (and ethnic looking) decorations step into spotlight again. If you want to be stylish you probably will not resist Asian furniture” (2008). Also, the *HGTV* newsletter editor Anne Krueger discussed the

“Nine Hot Trends for Today’s Kitchens” and highlighted that Asian fusion is one of the major trends. Moreover, Asian influence is still going strong in the kitchen just like Zen comforts are still popular in urban settings to help consumers unwind during daily business.

The arts, fashion, and product design trends of the 21st century exhibit a substantial amount of traditional Asian elements being used among Western designers. *The Making Tea Interior Design Company* described how to design oriental style furniture, and how ornate furniture is a very important part of Chinese interior design (MakingTeaDesign.com, 2008). Chinese or oriental furniture is usually made from high quality wood, and will typically have a decorative carving, intricate inlays or ornate and beautiful painting with fancy handles. Chinoiserie is an art form in which furniture and accessories are patterned after the detailed embellishments and complex decoration of Chinese designs. According to the article in “Making Tea,” there are only basic descriptions of Asian design characteristic, not complete Asian design elements guideline for designers to use.

Thailand design master Suwan Kongkhunthien said, “Go back to see the origins of our culture, it will give you the most of understanding” (2007). As a designer coming from Taiwan, I see the ability of Taiwan’s traditional art to transmit thousand year old oriental aesthetics. Hence, I decided to study Taiwanese traditional aesthetics by this thesis and discover Eastern aesthetic elements. In turn, I will generalize some rules and aesthetics factors of styling guidelines to apply to product design and contribute to modern furniture design. These design guidelines will equip the Western designer to deal with oriental style in furniture design.

### 1.3 Literature Review

Today, Western society is increasingly interested in Asian image elements. For instance, Japanese Manga books, which can be found in American bookstores, have sparked the manufacturing of such Manga-related products as t-shirts, mugs, key chains, shopping bags, etc. Japanese Enka has even been formatted into the film *Memoirs of a Geisha*. Manga books and Enka all belong to a part of Asian entertainment, with entertainment as the most effective part these images have spread rapidly all over the world.

The culture of every nation possesses the elements of language, art, music, paint, dancing, performing, architecture, commodity, etc. Past theses have explored this issue. For example, a case study in *Nantou* County; design research of the *Meinung Hakka* culture; a case study of *Sandimen* township in *Pingtung* county, and a case study of aboriginal *Paiwan* artist “*Sakuliu*.” There are many minority races in Taiwan, each with their own cultures. Because they represent minorities, their culture does represent, as a whole, Taiwan’s culture.

There are some studies that use a commodity to understand Taiwanese culture, for instance, a traditional Chinese bed, an altar, traditional kitchen stoves, tableware design, contemporary ceramic teapots, incense, furniture or bamboo stationery. These products have an important common thread - they are the products most closely related to Taiwanese people in their daily lives. “In order to survive, humans created many kinds of products, and these products follow cultural meanings to reflect people’s need, social status, technique, and manufacturing” ( Translated from: 人類為了生存，創造設計了各種物品，而這些物品是承襲了文化內在和外在的相關意義後，反

映出當時人們的生活需求、社會情況、技術與生產方式。 ) (Quan, 官政能, 1991). In this commodity category, furniture is the most necessary product in everyday life.

“Furniture is used everywhere, for dining, for hanging clothes, for sleeping, and for sitting” (Chou, 邱茂林, 2007, p8). A thesis entitled The study of the shape of Taiwan traditional wooden furniture during the Japanese governance of Taiwan discussed Taiwanese furniture as a combination of styles from China, Japan, and the West to create unique and popular amalgamated styles. This research is extremely useful as it provides a history of Taiwanese furniture and reveals which cultures have had the strongest influence on Taiwan - assets which both aid in the development of special characteristics for the local furniture industry. Regardless of whether this style is widely popular or not, it is worth consideration. In summer 2008, I had an interview with the furniture expert *Tai-Qin Ye* (Figure 1). *Ye* is the director of Taiwan Furniture-Properties Association (TFPA), a director in Furniture Manufacturing ECO Museum in Taiwan, and is also a chairman in *Yung-Shing* Furniture Company. He said: “Imitation products, even if they are perfect imitations, fail. Only innovative, meticulous design can give furniture a life and add deep cultural meaning to the value of the age.” Moreover, he introduced one of the chair designs from their company, using the concept “*Hakka* blue shirt”, (Figure 2) which is from the Taiwanese minority group of *Hakka*. This chair applies the shirt style to the backrest and the shoes style to the bottom of the chair leg (Figure 3).



**Figure 1:** Furniture expert *Tai-Qin Ye* (Source: *Yung-Shing Furniture Company*)



**Figure 2:** *Hakka* blue shirt (Source: [http://www.flickr.com/photos/lu\\_s/3172974239/](http://www.flickr.com/photos/lu_s/3172974239/))



**Figure 3:** *Hakka* blue shirt concept chair design (Source: This picture was taken from *Yung-Shing* Furniture Company)

The furniture expert *Tai-Qin Ye* also mentioned that every nation has their own furniture style, and that by looking at furniture, one can observe the effect of cultural values on the people. He also encouraged designers to go back to see their own local culture, merge with ergonomic design, and then create comfortable, useable cultural style furniture that not only satisfies the body, but satisfies the spirit as well.

The cultural aesthetics he mentioned are Taiwan *Hakka* and aborigine culture. “According to cultural differences, designers should understand the culture and apply the design elements to create the style that people want and enhance popular aesthetics taste” (Translated from: 隨著文化的差異，設計師應該利用各種設計元素，深入了解所設計對象的文化與時代背景，創新出該文化所認同的外觀，提升觀眾的美學



鑑賞力。) (Liang, 梁若珊, 1996). Furniture expert *Tai-Qin Ye*'s recommendation to use Taiwanese traditional costume design elements as an inspiration for furniture design is still a rarely studied type of design.

Taiwanese traditional costume, as we can see from Taiwanese performing art, denotes entertainment as the most crucial element and has spread the world over. Taiwanese performing art, includes Taiwanese Opera, *Cloud Gate Dance Theatre* of Taiwan, Taiwanese puppet show, etc. Are not only popular in Taiwan but also in other countries in the world of these performances, the Taiwanese Opera is the longest running performance in Taiwan. It has run since 1920 and is the only opera native to Taiwan. "Taiwanese Opera is the opera native to Taiwan and it represents popularization and geniality in localized opera. It is also the most effective performance in showcasing Taiwanese culture" (Translated from: 歌仔戲是台灣土生土長的劇種，為具通俗性、親切性的本土戲劇代表，最能展現台灣文化特色，所以歌仔戲正是「以台灣戲演台灣故事」的最佳展演形式。) (Chang, 張繻月, 2006, p.2).

"Traditional opera hinges on the visual effect of the costume, as it is the most notably recognized among other nations" (Translated from: 傳統戲曲表演上最具影響力的視覺感官及輔助延伸表演部份，服裝為別於其他民族不同的藝術表現手法元素之一。)(Yu, 俞國唯, 2004, p.4). Additionally, "Chinese philosophical thinking costumes and the overall aesthetics concept"(Translated from: 中國哲學的思惟影響了服裝穿戴的方式及服儀美學觀念。) (Hua, 華梅, 2001). Analyzing the costume of Taiwanese Opera must therefore begin with studying its history.

Taiwanese Opera is the only one opera native to Taiwan. Additionally, it was a

very important activity in uniting Taiwanese within their agricultural society. The opening act in the Taiwanese Opera is a folk song that developed from *gezai* and combines *chegu* show's figure in *ZhangZhou* of *Fujian*, China. Originally, it was an art of entertainment performing for evocation. It gradually became a professional performance art. Six phases transpired during 1920 to 2009 in the opera. There was the local *gezai* era that performed without permanent stage in 1920, an indoor stage era in 1923, the era of Japanese occupation from 1937 to 1945, an outdoor stage era in 1945, an era of televised opera in 1962, and finally the era of theatre performance that began in 1990 and continues today. The costumes of each era were analyzed as follows:

1. Local Taiwanese Opera without permanent stage era 本地歌仔

In 1920, the costume style in this era was simple and crude. Performers wore their everyday robes but refined them to match the particular role (see Figure 4). The costume material was coarse and used any cheap jewelry or a low quality silk scarf as an embellishment. The head ornament was a wig boasting a chignon at the back of the head with three incense sticks used as hair pins. The simplicity of the costume was representative of the reduced living conditions of the era.



**Figure 4:** Local Taiwanese Opera without permanent stage era (Source: 光影·歷史·人物 歌仔戲老照片 [Old pictures of Taiwanese Opera], p15)

史·人物 歌仔戲老照片 [Old pictures of Taiwanese Opera], p15)

## 2. Indoor stage opera era 內台歌仔戲

In 1923, an indoor stage became popular due to the influence of the Chinese Opera. This era of Taiwanese Opera's costume style was also similar to the Chinese Opera (Figure 5). The costume emphasizes delicate and ornate embroidery. Traditional costumes for men and women, old or young are all very serious in design, and embody the proverb, better to wear a broken costume than to wear the wrong costume



**Figure 5:** Inside stage opera performed status (Source: *光影·歷史·人物 歌仔戲*

*老照片* [Old pictures of Taiwanese Opera], p18)

### 3. Era of Japanese occupation 日據時代歌仔戲

From 1937 to 1945, Taiwanese Opera experienced a huge change and became a truly refined opera. During this era, the Japanese military occupied Taiwan and forced the Taiwanese people to pledge loyalty to Japan, even forcing them to become Japanese citizens. Women's costumes changed to a Japanese kimono (Figure 6). The actor playing the emperor wore a formal dress, the actor of civil official wore the uniform of a Japanese official, and the actor playing a military officer wore a Japanese military uniform. The script of the opera was also modified to extol the Japanese president and renamed *Huang Min Hua Ju* 皇民化劇.



**Figure 6:** Japanese kimono, 1938

(Source: <http://www.bookmice.net/darkchilde/japan/khist10.html>)

#### 4. Outdoor stage opera era 外台歌仔戲

In 1945, when Taiwan was free from the Japanese occupation, Taiwanese Opera began to resuscitate its native cultural elements at a stunning speed, and became a fad in Taiwan. During that time, there were five hundred performing groups of Taiwanese Opera. People were quick to imbibe fashion elements from outside Taiwan to include in the opera. Designers gradually developed their own style of Taiwanese Opera (Huang, 黃雅蓉, 1994). In order to create a luxurious stage effect, they used sequined costumes and fluorescent fabrics and accessories (Figure 7). Costume emphasis shifted from the elegance of embroidery to the wildly fashionable glitz of sequins.





**Figure 7:** Outdoor stage opera era costume (Source: 光影·歷史·人物 歌仔戲老

照片 [Old pictures of Taiwanese Opera], p162)

#### 5. Era of Televised Opera 電視歌仔戲

In 1962, Taiwanese Opera began airing on television. To suit the camera and the new and broader audience, costume design reverted back to that of the *Ming* and *Qing* dynasty. The performers' make-up was lighter, not heavy as was necessary on stage. The costume style sought to draw in its new audience by incorporating sequins, already twenty year old trend by then. Viewers rejected the switch, and so designers returned to the use of more classical embroidery (Figure 8).



**Figure 8:** Televised Taiwanese Opera

(Source: [http://140.124.25.14/.../part\\_5/item\\_1\\_3.htm](http://140.124.25.14/.../part_5/item_1_3.htm))

#### 6. Era of theatre performed opera 現代劇場

The first Taiwanese Opera performed in the theater was by the *Li-Hua Yang* performing group. The drama was called “*Yu Niang 漁孃*”, and was performed in National Dr. Sun Yat-sen Memorial Hall. This is the latest performing style of Taiwanese Opera, and is the style still performed. For costume design, theater designers refer to several ancient costumes such as the *Ming* and *Qing* dynasty styles while simultaneously incorporating modern fashion elements that will be easily distinguishable to a contemporary audience (Figure 9).

“Taiwanese Opera theater performance tends to be highly refined” (Yang, 楊馥菱, 2002).



**Figure 9:** Theater performance

(Source: [http://140.124.25.14/.../part\\_5/item\\_1\\_3.htm](http://140.124.25.14/.../part_5/item_1_3.htm))

According to the costumes of Taiwanese Opera's developing process, we can see the tendency of design to favor the audiences taste. The four primary roles in Taiwanese Opera are *Sheng*, *Dan*, *Jing*, and *Chou*. *Sheng* is a male role, *Dan* is a female role, *Jing* is a justice, and *Chou* is a comic role. The roles of *Sheng* and *Dan* have seen the most obvious transition in costume style. The reason for transitional style in Taiwanese Opera is that the opera responds to the innovation of other performing arts to maintain its vitality among Taiwanese performance art (Chen, 陳郁經, 1993, p1).

Another thesis devoted to the costumes of the Taiwanese Opera analyzed the role of *Sheng* and *Dan*, female costume style in the *Tang* dynasty; western female head ornaments of the 18<sup>th</sup> century, and then compares them to similar elements present in doll costume design. This thesis does not analyze the role of *Sheng* and *Dan*, but rather general head ornament and costume styles in the context of historical



integration. Another author studied the role of *Chou* particular to the era of outdoor performance in Taiwanese Opera. The author analyzed *Chou's* performing style and the market demand for *Chou*, but did not discuss the costume of *Chou*. Yet another author studied Taiwanese ideology from a Taiwanese Opera's script. The author analyzed it to understand Taiwanese literature in order to publish this literature into school textbooks, and help children to understand Taiwan's traditional culture.

Each of these studies highlights the cultural value of Taiwanese Opera, comparing each role's complete aesthetic elements to the construction of each role's costume. As mentioned above, each role has its own costume according to the personality of the character. Therefore, this thesis will analyze *Sheng, Dan, Jing* and *Chou's* head ornament, in order to construct a guideline for applying the elements into furniture design. Not only will Western designers benefit from these guidelines, but Taiwanese designs will also have a standard to preserve in the future.

#### 1.4. Objectives of Study

- To study *Sheng, Dan, Jing, and Chou's* costume types
- To analyze each role's head ornament, costume, shoes, and patterns used
- To develop each role's outfit design guideline
- To develop the design process frame of how to transfer the aesthetic elements of Taiwanese Opera's costume aesthetic into product design
- To apply the guidelines on furniture design
- To transform the 2D image of Taiwanese Opera's costume patterns into the 3D form of furniture to illustrate a series of four roles

## 1.5. Definitions of Terms

Manga - the comic book from Japan.

Enka - type of music from Japan since the end of 19 century.

Hakka - subgroup of the *Han* Chinese people based in the provinces of *Guangdong*, *Jiangxi*, and *Fujian* in China.

Gezai 歌仔 - ditty generally called *gezai*, using language from *Min-Nan* in China called *Min-Nan yu* 閩南語.

Chegu show 車鼓戲- a type of folk performance from *Fujian* in China. This performance has only three to six actors.

Huang Min Hua Ju 皇民化劇- a drama written to extol a Japanese president. Performed only during Japanese occupation of Taiwan from 1937 to 1945.

Sheng- leading male role in Taiwanese Opera.

Dan- leading female role in Taiwanese Opera.

Jing- male role, also called the face-painted role in Taiwanese Opera.

Chou- comic role in Taiwanese Opera. The gender of this role can be male or female.

## 1.6. Assumptions

This study was directed based on the following assumptions:

- Asian design is drawing an increasing amount of attention all over the world.
- Furniture design possessing the characteristic of Taiwanese Opera will gain

higher market value.

- Few studies of Asian aesthetic design guidelines exist. Few designers know how to apply Asian aesthetic elements into their products.
- Through this research, Western designers, will be able to better understand Asian design.
- People who do not understand Asian culture are still able to differentiate between Asian style products and non-Asian style products.

### 1.7. Scope and Limits

For this study, the scope will be limited to 1999-2009. The focus will be theatrical performance in Taiwanese Opera today. “The theatrical performance in Taiwanese opera since the 90’s through today tends toward a more refined stage” (Yang, 楊馥菱, 2002). There are around 300 Taiwanese Opera performance groups, but this study will be limited to the three largest groups: *Li-hua Yang*’s performance group, *Holo* performance group and *Ming-hua-yuan* performance group. Only the four roles of *Sheng*, *Dan*, *Jing*, and *Chou*’s costumes design elements were chosen for research. Additionally, the focus was on the inherent meanings of the designs used as well as the design itself for each role’s characteristics which transfer the abstract meaning into visual elements. The visible elements were studied from each role’s costumes, including design configuration, pattern and proportion. In this study, the color of the costume was not a consideration of the furniture design, and because of time limitations, only one role's guideline is applied to the full size model.

## 1.8 Procedure of study

This study was both investigative and developmental. The procedure consisted of five steps for each of the roles of *Sheng*, *Dan*, *Jing*, and *Chou*.

### I. Study the costume type and characteristic

Select the primary costume type of the role and choose one or two elements from the costumes. Then select six different types of the costume to analyze. Analyze the characteristics of each role.

### II. Divide costume into three parts

Divide each outfit into three parts, including head ornament, body, and shoes parts. Analyze each according to its individualized design elements.

### III. Analyze the head ornament, body, and shoe design elements

This step analyzes configuration, pattern and proportion.

#### A. Configuration

The configuration is the shape of each part and shares the same configuration in the six different costumes but will vary in the specific guidelines.


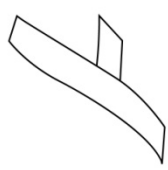
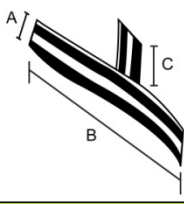



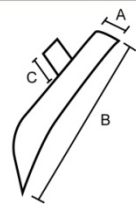

#### B. Pattern

The pattern is arranged according to the needs of the designer and then becomes part of the guidelines.

#### C. Proportion

The proportion analyzes the same section of six different costumes and uses the average proportion of the part to create.

Analyze the head ornament, body, and shoe design elements, using *Sheng's* body as an example (Figure 10).

Style(S)		Rule(R)	R1	R2	R3	S4~
S1						
				$A:B:C = 1:7:1.5$		
S2						
				$A:B:C = 1:7:1$		
S3 } S6						

Configuration
  Pattern
  Proportion

**Figure 10:** Analyzing *Sheng's* body

#### IV. Design guideline and elements application

This section summarizes each role's specific design configurations, proportion, and patterns in six steps. Each step will help the designer apply different design elements to their chair designs.

#### V. Develop a design process frame for applying the design elements

The design frame has four main steps which include choosing a topic, analyzing the topic, design integration, and a conclusion. Design integration has

three parts as well which are function development, style development, and manufacturing development.

This research will be divided into four parts for each of the roles *Sheng*, *Dan*, *Jing*, and *Chou*. Each section will study the characteristic and costume history of the role, and analyze for each the head ornament, body, and shoes. Each part will also include the configuration, pattern, proportion as well as the meaning of the patterns used. Finally, the guidelines will be applied to the process frame for furniture manufacturing.

## CHAPTER TWO: CHARACTER OF *SHENG*

There are four kinds of roles in Taiwanese Opera. And each role's characteristic is according to the role's sex, personality, age, job, society, position, etc.

The basic rule is that people named *Sheng*, *Dan*, *Jing*, and *Chou* use the opposite metaphor. For the first example, *Sheng* means "out of practice" in Chinese, but actually he is acting like an experienced role; therefore, the meaning of the opposite metaphor is *Sheng*'s role. Second, *Dan* means "sunrise" in Chinese and in the *Yin-yang* theory, *Yin* means the moon and *yang* means the sun. Woman belongs to *Yin*; therefore, the opposite metaphor is *Dan*. Third, *Jing* means "clean", but *Jing* is a face-painted role that has many colors on his face, which is unclean, so it is named *Jing*. Fourth, in Chinese philosophy *Chou* is cow and the characteristic of cows is clumsiness. Actually, *Chou*'s characteristic is clever and lively so *Chou* is the opposite metaphor.

This study analyzes each role's costumes. According to the historical record, Taiwanese Opera's costumes principally distinguish the roles' identity and sex, and actors did not have to wear different costumes in different dynasties, so actors can wear the same costumes whether the story's background is *Ming* or *Qing* dynasty.

"Taiwanese Opera's costume is splendid and each role's costume and makeup is matched and coordinated, therefore, compared with other traditional operas, it represents diversification and avant-garde style" (Lin, 林紋守, 2002).

As mentioned above, in each age, costume designers use the story background

and people's characteristics to come out with design rules and identify the inner meaning of each shape to apply to costumes. "Each of the basic shapes has its own unique character and characteristics and to each attached a great deal of meaning, some through association, some through arbitrary attached meaning, and some through our own psychological and physiological perceptions" (Dondis, 1973, p. 44).

### *2.1. The connection between character and costume design for Sheng*

*Sheng* is a male leading role in Taiwanese Opera. There are two kinds of roles for *Sheng*: one is a scholar and the other is a martial arts role. In this thesis, however, I will only analyze the scholar role because in Taiwanese Opera, this is the role primarily associated with *Sheng*. This role's personality is that of a gentleman, and he is said to have an iron hand in a velvet glove. His acting is casual and very elegant, and his appearance is pretty. Therefore, this kind of *Sheng* could have the role of a scholar, loyal courtier, dutiful son, or virtuous person.

In order to analyze the characteristics of *Sheng*, the research method analyzed six costumes and divided each costume into three parts as follows: head ornament, body, and shoes, all of which are related.

### *2.2 Characteristics of head ornament of Sheng*



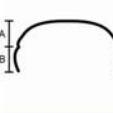

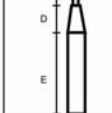
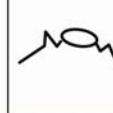



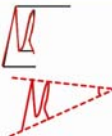

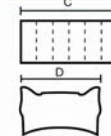
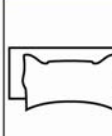


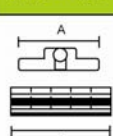
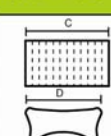



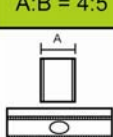

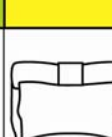


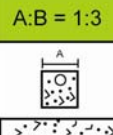
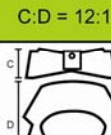



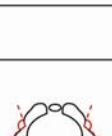





There are two categories of head ornament styles in *Sheng*: one is "soft scarf" and the other is "stiff headgear." The first category known as "soft scarf" has another name - "square scarf" (四方平定巾); it is for the scholar who is primarily a student, as seen in examples S2, S3, S4 and S5 (Table 1). The second category is "stiff



headgear;" it is for the scholar who holds a government position, as seen in examples S1 and S6 (Table 1).

As a result of culture variations, designers have to study varied design line configurations, patterns, and proportions from the specific culture and innovate the design elements with which people can identify (Liang, 梁若珊, 1996). Therefore, the analysis will be based on three parts: configuration, pattern, and proportion.

### 2.2.1 Configuration, pattern and proportion of the head ornament

Rule(R)		R1	R2	R3	R4	R5	R6	R7
Style(S)								
S1								
		$\angle = 100^\circ$	A:B = 1:1		C:D:E = 1:1:3			
S2								
		$\angle = 30^\circ$	A:B = 1:3	C:D = 6:5				
S3								
		$\angle = 100^\circ$	A:B = 4:5	C:D = 12:11				
S4								
		$\angle = 40^\circ$	A:B = 1:3	C:D = 12:11				
S5								
			A:B = 1:3	C:D = 1:3				
S6								
		$\angle = 105^\circ$						

Configuration
  Pattern
  Proportion

**Table 1:** Sheng's head ornament style S1-S6

#### A. Configuration

1. The head ornaments are symmetrical (Table 1).
2. Sheng's head ornament has two layers and one or two folds, example R1 column (Table 1).
3. It is rectangular in the back and has a small protruding horn on the corner of

the foreground rectangle, examples S2-R4 and S3-R4 (Table 1).

4. It has a bow style in the back and a small protruding horn on the corner of the foreground rectangle, examples S4-R4 and S5-R4 (Table 1).

5. The rectangle bands are perpendicular to one another, R2 column of examples S2 through S5 (Table 1).

6. The center of the front or sometimes back band has an elliptical marking.

7. It uses a stair-like shape as in examples S1-R1 and S6-R1 (Table 1).

According to the methods results, there are some inner meanings to the configurations people used. First of all, in the Ming Dynasty, people designed a head ornament with two layers, called a Square Scarf (四方平定巾). The inner meaning is a metaphor for political and social stability (政治安定), because people believe scholars can contribute civility to a society. Second, people designed head ornaments with a stair-like pattern, the inner meaning being one of attaining prominence step-by-step (步步高升).

## B. Pattern

1. Animal patterns (Eastern dragon and bat)

2. Plant patterns (flower and leaf)

3. Other pattern (*Ruyi* 如意)

The inner meanings of these patterns vary. First, the eastern dragon is a propitious symbol of power. Second, the bat carries a meaning of good luck in all walks of life. Third, the flower and leaf patterns symbolize purity and a sense of high morals. The final pattern is that of *Ruyi* (Figure11), which is the name of a Buddhist

ceremonial scepter that conveys positive images of joy, satisfaction, and comfort. This can be seen in S1-R7 (Table 1).



**Figure 11:** Red sandalwood *Ruyi*

(Source: <http://www.jysls.com/thread-229269-1-1.html>)

### C. Proportion

1. The angle of the stair-like pattern is  $100\pm 5$  degrees, examples S1-R1 and S6-R1 (Table 1).
2. The largest ratio in width of the back band to the foreground band is 1:3, examples S2-R2, S4-R2, S5-R2, and S5-R3 (Table 1).
3. The ratio in size of the back and front layers is around 12:11, the front layer being just a little bit smaller than the back layer, examples S3-R3, S4-R3 (Table 1).

### 2.3 *Characteristics of body*

According to the following research, there are two types of costumes for *Sheng*.

The first is a one-piece costume known as “tuck” (摺子) (Figure 12), without a waistband. The second is a two-piece costume which is called “refined costume,” and it includes a waistband (Figure 13). “Even refined costume combines with modern design concepts, but people can still recognize it is from an ancient period” (Wu, 吳孟芳, 1991, p100). “Different periods have different costume designs, conforming with history” (Guo, 郭寬澤, 1999). The next section is an analysis of the two kinds of costume of *Sheng*.



**Figure 12:** Tuck (摺子)



**Figure 13:** Refined costume

Lines not only construct the frame of the costume, but they also affect the costume's outfit and configuration. Additionally, people have basic ideas of the outline, collar, and buttons of the costumes (Liang, 梁若珊, 1996). Therefore, the configuration in the body section of the costumes can provide people with some ideas for design. What follows is an analysis of the special parts of *Sheng's* costumes: collar, waist band, sleeves, and pattern.

### 2.3.1 Configuration, pattern and proportion of the body

Style(S) \ Rule(R)		R1	R2	R3	R4	R5	R6	R7
S1								
		$\angle = 50^\circ$	A:B:C = 1:7:1.5			C:D = 4:1		
S2								
		$\angle = 60^\circ$	A:B:C = 1:7:1.5	D:E = 1:1.5		F:G = 1:3		
S3								
		$\angle = 60^\circ$	A:B:C = 1:6:3	D:E = 1:2		F:G = 1:1.5		
S4								
		$\angle = 75^\circ$	A:B:C = 1:7:1	D:E = 1:1.5		F:G = 1:2	H:I = 1:1	
S5								
		$\angle = 70^\circ$	A:B:C = 1:8:2	D:E = 1:1.5		F:G = 1:5	H:I = 1:1.25	
S6								
		$\angle = 60^\circ$	A:B:C = 1:6:1			D:E = 7:1		

Configuration
  Pattern
  Proportion

**Table 2:** *Sheng's* body style S1-S6

#### A. Configuration

1. The collar is not symmetrical; the shape instead resembles the lowercase letter y, example R4 column (Table 2).
2. Most of *Sheng's* costumes have a waist band in the middle to divide the upper and lower body, R3 column of examples S2, S3, S4, and S5 (Table 2).

3. The sleeve openings are wide and drooping, and the length takes it over the hands, example R5 column (Table 2).

4. The position of the arms in the sleeves is to have one in front and the other hidden in the back, examples S2, S4, and S5 (Table 2).

According to the methods results, the collar shape instead resembles the lowercase letter y. This type, called "right collar 右衽" (Figure14), requires two steps to make. First, pull the right side cloth to the left chest. Second, pull the left side cloth to the right chest. The reason for this is that it allows the wearer of the robe to conceal objects inside the fold of the robe and retrieve it with the right hand. One of the wisest philosophers in ancient China was Confucius (circa 551-479 BC). He said: "right collar" fold is representative of orthodox Chinese culture. However, according to the *Sheng's* collar result some Taiwanese Opera fashion designers do not follow the "right collar" rule.



**Figure 14:** "Right collar 右衽"



## B. Pattern

1. Animal patterns (Eastern dragon)
2. Plant patterns (flower, leaf and bamboo)
3. Other pattern (repetition circles and *Ruyi*)
4. The plain costume has a complicated pattern; conversely, the complicated costume has a plain pattern. Compare S5 with S1, S2, S3, S4, and S6 (Table 2) to see the difference.

Earlier, I detailed the inner meanings of eastern dragon, bat, flower and leaf and *Ruyi* patterns in the head ornament in section 2.2.1. The same analysis can be applied to the additional patterns found in *Sheng's* body. First, bamboo symbolizes outstanding character and a sense of high morals. Second, the repetition circles symbolize good interpersonal skills and a tender personality. Finally, there is a slightly different form to *Ruyi's* pattern when compared to its shape on the head ornament, yet the meaning is the same. This can be seen in example S6-R6 (Table 2).

## C. Proportion





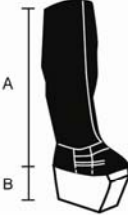
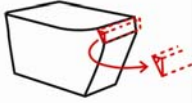
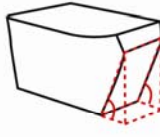

1. The angle of the collar is from 50 to 75 degrees. Most angles are 60 degrees, as seen in example R1 (Table 2).
2. The most common proportion of collar elements is A: B: C=1:7:1.5, as seen in examples S1-R2 and S2-R2 (Table 2).
3. The most common proportion of the collar to the waistband is 1:1.5, as seen in examples S2-R3, S4-R3, and S5-R3 (Table 2).
4. The proportion of the collar to the decoration band is 1:1; sometimes the ratio widens to 1:1.25, as seen in examples S4-R6 and S5-R6 (Table 2).

5. There are two layers of the sleeve; the proportion is around 1:2, as seen in examples S3-R5 and S4-R5 (Table 2).

#### 2.4 Characteristics of Shoes

In Taiwanese Opera, *Sheng*'s shoes are for practical use, so the style is not too important (Wu, 吳孟芳, 1991, p100). In this section, I will show two kinds of shoes related to *Sheng*: one is normal style shoes and the other is boots, as seen in examples S1 and S2 (Table 3). The "normal style shoes" is for a commoner, poor scholar, or a monk. Wearing these shoes requires special socks which are called "long socks." As implied by the name, these long socks finish right under the knee. The "boots" are for scholars or justices. There are three special designs inherent in these boots. The first is a two to three inch high bottom, the second features oblique cuts, and the third has a square top. What follows is an analysis of the configuration, pattern, and proportion of these two kinds of shoes.

### 2.4.1 Configuration, pattern and proportion of the shoes

Style(S) \ Rule(R)		R1	R2	R3	R4
		S1			
		A:B = 2.5:1			
S2					
		A:B = 5.5:1	$\angle = 50^\circ$	$\angle = 85^\circ$	

Configuration
  Pattern
  Proportion

**TABLE 3:** Sheng's shoe style 1 and 2

#### A. Configuration

1. The front of the normal style shoes has a round shape, and the bottom is one half of one inch high, as seen in example S1-R2 (Table 3).
2. The front of the boots has a square shape, and the bottom is two to three inches high, as seen in example S2 (Table 3).
3. The bottom has two oblique cuts on it, as seen in examples S2-R2 and S2-R3 (Table 3).

#### B. Pattern

No pattern.

#### C. Proportion

1. The proportion of the two layers in the normal style shoes is 2.5:1. The

bottom layer is one half of one inch high, as seen in example S1-R1 (Table 3).

2. The proportion of the two layers in the boots is 5.5:1, with the bottom layer two to three inches high, as seen in example S2-R1 (Table 3).

3. The first oblique cut is from the top and has an angle of 50 degrees, as seen in example S2-R2 (Table 3).

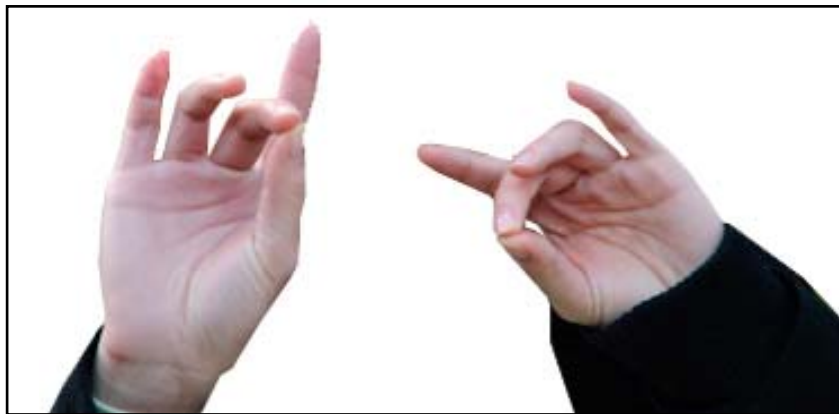
4. The second oblique cut is from the bottom and has an angle of 85 degrees, as seen in example S2-R3 (Table 3).

The reason for designing the bottom layer of the higher bottom boots two to three inches high is so people can feel this role's character: tall, handsome, and courteous. Additionally, the oblique cuts are for more balanced walking.

## CHAPTER THREE: CHARACTER OF DAN

### 3.1. *The connection between character and costume design for Dan*

*Dan* is a leading female role in Taiwanese Opera. There are three kinds of roles for *Dan*: the first is a modest woman; the second is a nimble young girl; and the third is an old woman. In this thesis, however, I will only analyze the modest woman role because in Taiwanese Opera, this is the role primarily associated with *Dan*. This role's personality is modest and virtuous. Her acting is elegant and the special pose performed by the hands is called the "lotus gesture" (Figure 15). Thus, this kind of *Dan* could have the role of a virtuous woman or a modest mother.



**Figure 15:** Lotus gesture

### 3.2 *Characteristics of head ornament of Dan*

*Dan*'s chignons follow the fashion of the *Ming* dynasty. Royalty of the *Ming* dynasty used fake chignons to connect with real hair. There can be one to two

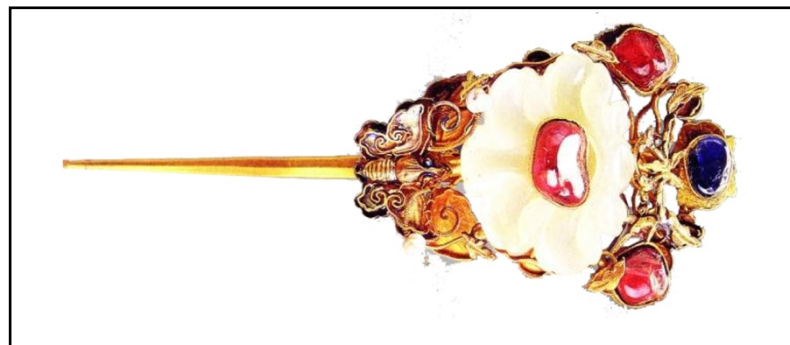
chignons on the top of the head (Figure 16). The second significant part is the tassel (Figure 17). Chignons worn by the *Ming* dynasty used jewels to make a flower shape called “*tiao xin* topknot 挑心髻” (Figure 18). In the following section the results will show that some of *Dan*’s topknots have been simplified from the flower to a rectangular shape.



**Figure 16:** One and two chignons’ style



**Figure 17:** Tassel



**Figure 18:** *Tiao xin* topknot 挑心髻

### 3.2.1 Configuration, pattern and proportion of the head ornament

Style(S)		Rule(R)	R1	R2	R3	R4	R5	R6	R7
S1									
		A:B = 3:1							
S2									
		A:B = 3:1							
S3									
		A:B = 4:1							
S4									
		A:B = 3:1							
S5									
		A:B = 3:1							
S6									
		A:B = 8:1							

Configuration
  Pattern
  Proportion

**TABLE 4:** Dan's head ornament style S1-S6

#### A. Configuration

1. There can be one to two chignons on the top of the head, example S1-R4, S2-R4 and S4-R4, S5-R4 (Table 4).
2. The single chignon is oval-shaped, example S1-R4 and S2-R4 (Table 4).
3. The double chignons are rectangular, with the ends of the chignon flat and

the corners round, examples S4-R4 and S5-R4 (Table 4).

4. The hair ornaments are on the hair edge, example S1-R3 (Table 4), or in the concave line, examples S2-R3, S3-R3 and S4-R4, or in the middle of the hair, R3 column of examples S2, S4, S5 and S6 (Table 4).

5. There are two kinds of tassel on Dan's head ornaments. The first configuration is rectangular with beads and the second is a flower with beads, examples S2-R5, S2-R6 and S4-R5, S5-R5 (Table 4).

## B. Pattern

### 1. Plant patterns (flower and leaf)

In *Sheng's* section 2.2.1, the flower and leaf patterns symbolize purity and a sense of high morality. But in *Dan's* section, flower and leaf patterns symbolize elegance and beauty.

## C. Proportion

1. The proportion of chignons to the head is 3:1, as seen in the R1 column of examples S1, S2, S4 and S5 (Table 4).

### 3.3 *Characteristics of body*

According to the study of *Dan's* costumes, the results show two basic kinds of costumes. One is a traditional high, round collar and the other is a deep symmetrical v-shaped collar. The line of the traditional round collar is clean and simple; additionally, adding some patterned embroidery around the collar would enhance



elegance. The symmetrical collar type is a v-neck top, a kind of Chinese-style jacket similar to that of the *Ming* dynasty (Figure 19).



**Figure 19:** A woman in *Ming* dynasty (《燕寢怡情》 *Ming* dynasty ancient book)

### 3.3.1 Configuration, pattern and proportion of the body

Rule(R)		R1	R2	R3	R4	R5	R6	R7
Style(S)								
S1								
		$\angle = 90^\circ$	A:B = 4:1	C:D:E = 1:2:1				
S2								
		$\angle = 90^\circ$	A:B = 7:1	C:D:E = 1:1.5:1				
S3								
		$\angle = 90^\circ$	A:B = 7:1	C:D = 1:2				
S4								
		$\angle = 100^\circ$	A:B = 6:1	C:D = 1:1.2				
S5								
		$\angle = 110^\circ$	A:B = 6:1	C:D = 1:1				
S6								
		$\angle = 110^\circ$	A:B = 6:1	C:D = 1:1.2				

Configuration
  Pattern
  Proportion

**TABLE 5:** Dan's body style S1-S6

#### A. Configuration

1. There are two kinds of collars. One is a high, round and the other is a low, v-neck collar, examples S1, S2 and S3 through S6 (Table 5).
2. There are two different styles of sleeves. One is three layers, and the other is two layers on each sleeve, examples S1, S2 and S3 through S6 (Table 5).

## B. Pattern

1. Animal patterns (butterfly)
2. Plant patterns (tree peonies and leaf)
3. Other pattern (repeating circles)

Previously, the symbolism of the leaf and repeating circle patterns in the head ornament and body were detailed in sections 2.2.1 and 2.3.1. *Dan*'s body pattern also has leaf and repeating circle. The new patterns in *Dan* are butterfly and tree peonies. The butterfly symbolizes freedom, beauty and love, example S3-R6 (Table 5). Tree peonies represent one of the main motifs of Chinese decorative arts. It has been cultivated in China since the seventh century and was considered the "flower of the emperor", and also the "empress of flowers." The exterior of the tree peony is delicate and luxuriant. Therefore, it represents feminine beauty, wealth and rank, examples S2-R7, S4-R5 and S5-R5 (Table 5).

## C. Proportion

1. The angle of the collar is  $100\pm 10$  degrees, as seen in the R1 column (Table 5).
2. The most common upper body and waist band proportion are 6:1, the R2 column of examples S4 through S5 (Table 5).
3. The three layer sleeve's proportion is around 1:2:1, examples S1-R3 and S2-R3 (Table 5).
4. The two layer sleeve's proportion is 1: 1.2, as seen in examples S4-R3 and S6-R3 (Table 5).

### 3.4 Characteristics of shoes

*Dan*'s shoes follow the characteristic shape of *Manchu*<sup>1</sup>'s shoes of the *Qing* dynasty. They are called “*Qi* shoes 旗鞋” (Figure 20). The shape of the heel is like a Chinese style wine cup, and measures five inches high (Figure 21). The heel has also been likened to an upside-down flowerpot; therefore, it has earned the name “Flowerpot Bottom.” The other flat shoe is called an “embroidered shoe 彩鞋 (繡鞋)” (Figure 22).



**Figure 20:** *Qi* shoes 旗鞋

(Source:<http://www.yain.com.tw/prodshow.asp?ProdId=B60514>)



**Figure 21:** Chinese wine cups in *Qing* dynasty (Source: <http://zjjixs.blog.163.com/>)

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<sup>1</sup> *Manchu*: Since 1635, more than eight tribes combined in east-north China which are called *Manchu*.



**Figure 22:** Embroidered shoes 彩鞋 or 繡鞋

(Source: <http://www.yain.com.tw/prodshow.asp?ProdId=B60514>)

3.4.1 Configuration, pattern and proportion of the shoes

Style(S)		Rule(R)						
		R1	R2	R3	R4	R5	R6	R7
S1								
		A:B = 1:1	C:D = 1:1					
S2								
		A:B = 1:1	C:D = 1:1.5					
S3								
			C:D = 1:1					
S4								
		A:B = 1.5:1	C:D = 1:1					

Configuration    Pattern    Proportion

**TABLE 6:** Dan's shoe style S1-S4

### A. Configuration

1. Most shoes have two layers, with the bottom layer smaller than the top one, examples S1, S2 and S4 (Table 6).
2. The shape of the sole is a trapezoid, examples S1-R3 and S2-R3 (Table 6).
3. There is a tassel on each shoe's toe, the shoe tassel is shaped like a tear drop, pointed away from the *Dan* R4 column of examples S1 through S3 (Table 6).

### B. Pattern

1. Animal patterns (phoenix)
2. Plant patterns (tree peonies and leaf)
3. Other pattern (*Ruyi* 如意)

The meanings of the tree peonies outlined in section 3.3.1 remain constant for the *Dan*'s body pattern and shoe pattern. The newest patterns in Table 6 are the phoenix and *Ruyi*. The phoenix symbolizes propitious and eternal life, example S4-R5 (Table 6). There are two kinds of *Ruyi* patterns already discussed in 2.2.1: *Sheng*'s head ornament and body pattern. Table 6 has the third kind of *Ruyi* pattern. These simplified patterns look like a succession the lower case *w*, examples S1-R6 and S2-R6 (Table 6).

### C. Proportion

1. The ratio of the shoe height to heel is 1:1, example S1-R1 and S2-R1 (Table 6).
2. There is a line dividing the two patterns of the shoe, and the proportion of the space is 1:1, the R2 column of examples S1, S3, and S4 (Table 6).

## CHAPTER FOUR: CHARACTER OF *JING*

### 4.1. *The connection between character and costume design for Jing*

*Jing* is a male role, also called the face-painted role in Taiwanese Opera. In the beginning of Taiwanese Opera this role did not exist, but due to the continual influence of the Chinese Opera's style, the skill of the face-painted character emerged. Although Taiwanese Opera has the role of *Jing*, face-painting is not a serious part in Taiwanese Opera. Therefore, the majority of these roles have only some representative patterns painted and some have none at all. There are also two kinds of *Jing* in Taiwanese Opera; one is a justice like “*Bao Gang* 包公” and the other is a general like “*Guan Gang* 關公” and “*Xiang Yu* 項羽”. All of them represent famous historical personages. This role's personality is that of a calm, steady, and impressive man. His acting exhibits great power, and his appearance evokes great fear.

### 4.2 *Characteristics of head ornament*

As noted previously, there are two kinds of *Jing*, one a justice and the other a general. The justice's head ornament is called “*Xiang Sha* 相紗” (Figure 23) which is a type of gauze hat. This head ornament has three characteristics. First, it has a slightly rounded form. Second, it has stair-like layers which escalate from front to back. Third, the symmetrical protrusions are called ‘wings’ which insert into the back

on both sides at a length around 12 inches and 1 inch wide. The ends of the wings are bent. Another name for these wings is “to open 展”, which carries the implication that the wings are ready for flight, and auspiciously symbolize promotion. The characteristic is derived from a historical requirement among the *Sui Tang* 隋唐 dynasty in which all civil officials wore gauze hats. Until the *Bei Song* 北宋 dynasty, the emperor ordered all civil officials to change to the winged gauze hats to prevent them from talking during his royal addresses. If the officials did speak during these times, the wings would tremble, notifying the emperor instantly.

In contrast, the general’s head ornament is called “general helmet 帥盔” (Figure 24). The shape is like a bell decorated by several soft red balls. The decoration on the top is called a pike. In this section, six head ornaments that will be analyzed: three for “Xiang Sha 相紗,” examples S1-S4, two for “general helmet 帥盔”, examples S5 and S6, and one as a blend of the two, example S4 (Table 7).



**Figure 23:** *Xiang Sha* 相紗



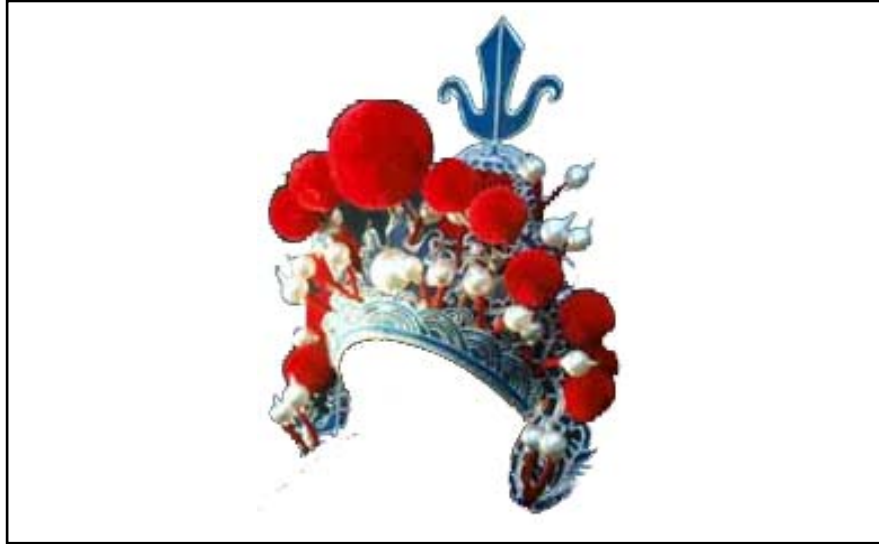


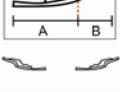


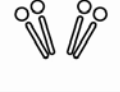









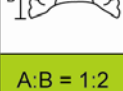














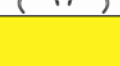



Figure 24: General helmet 帥盔

#### 4.2.1 Configuration, pattern and proportion of the head ornament

Style(S)	Rule(R)	R1	R2	R3	R4	R5	R6	R7
S1								
		A:B = 1:2	A:B = 2:1					
S2								
		A:B = 1.5:1	A:B = 3:1					
S3								
		A:B = 1:1	A:B = 3:1					
S4								
		A:B = 1:2						
S5								
S6								

Configuration
  Pattern
  Proportion

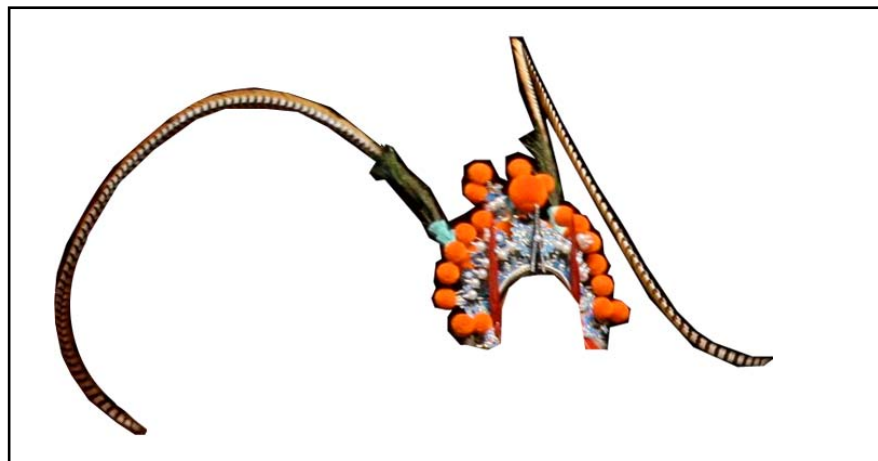
**Table 7:** Jing's head ornament style S1-S6

#### A. Configuration

1. The head ornaments are symmetrical (Table 7).
2. The head ornament is a round form with stair-like layers which begin low in the front and build towards the back, the R1 column of example S1 through S4 (Table 7).

3. A bent wing protrudes from each side of the ornament, examples S1-S3 (Table 7).
4. The head ornament is bell-shaped, example S5 and S6 (Table 7).
5. Several soft red balls decorate the rim of the helmet, example S5 and S6 (Table 7).
6. The large ball is at the pinnacle of the head ornament, with two medium balls on either side at the bottom of the rim, example S4-S6 (Table 7).

From analysis of the justice's “*Xiang Sha* 相紗,” we can easily see that certain costume designers in Taiwanese Opera still retain two main characteristics: stair-like layers of the hat and the bent ‘wings’ which insert into the back on both sides. The forms of the “general helmet 帥盔” remain close to the original design, but have shifted from prominent use of the pike design to more prominent use of the antelope horn design (Figure 25).



**Figure 25:** Antelope horn

## B. Pattern

### 1. Other pattern (sun and wave)

The symbolisms of these patterns vary. The sun is symbol of power, energy, and righteousness, example S5-R4 and S6-R4 (Table 7). The wave symbol is representative of continuous propagation, retention of the throne and national territory, and that the world is at peace.

## C. Proportion

1. The ratio of the back to front layers is 1:2, examples S1-R1 and S4-R1 (Table 7).
2. The ratio of the sharp wing front the flat to bent portion is 3:1, examples S2-R2 and S3-R2 (Table 7).

### 4.3 *Characteristic of body*

In the *Ming* dynasty, civil officials and military officers had to wear “round or right collar 盤領右衽” and “36 inch wide sleeved 袖寬三尺” robe for formal occasions (Figure 26).



**Figure 26:** Civil official in *Ming* dynasty










(Source:[http://big5.hwjyw.com/zhwh/traditional\\_culture/zgfs/ld/200705/t20070521\\_1110.shtml](http://big5.hwjyw.com/zhwh/traditional_culture/zgfs/ld/200705/t20070521_1110.shtml))

Additionally, the most interesting part of the official robe is “*Bu Zi* 補子” (Figure 27). The pattern of *Bu Zi*’s patches sewn on the front and back side is a label telling the official’s rank. Furthermore, the *Bu Zi* of the civil officials bore images of birds; whereas the robes of military officer used beasts (Figure 28 and Figure 29). The result of analysis for *Jing*’s costume design shows how designers today also follow this rule and use these patterns to decorate. Most of *Jing* characters have had long beards reaching to their waist, another recognizable attribute of the role of *Jing*. Lastly, *Jing*’s sleeve has been shortened in width to around 6-10 inches.



**Figure 27:** *Bu Zi* 補子










(Source:[http://big5.hwjyw.com/zhwh/traditional\\_culture/zgfs/ld/200705/t20070521\\_1110.shtml](http://big5.hwjyw.com/zhwh/traditional_culture/zgfs/ld/200705/t20070521_1110.shtml))

 <p>文一品 仙鹤补</p>	 <p>文二品 锦鸡补</p>	 <p>文三品 孔雀补</p>
<p>First rank crane</p>	<p>Second rank chicken</p>	<p>Third rank peacock</p>
 <p>文四品 云雁补</p>	 <p>文五品 白鹇补</p>	 <p>文六品 鹭鸶补</p>
<p>Fourth rank wild goose</p>	<p>Fifth rank silver pheasant</p>	<p>Sixth rank egret</p>
 <p>文七品 鹓鶵补</p>	 <p>文八品 黄鹂补</p>	 <p>文九品 鹌鹑补</p>
<p>Seventh rank purple mandarin ducks</p>	<p>Eighth rank oriole</p>	<p>Ninth rank quail</p>

**Figure 28:** Civil official's *Bu Zi* 補子

(Source: <http://big5.showchina.org:81/.../sw/200806/t195463.htm>)


































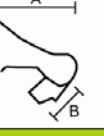

 <p>武一品 狮子补</p>	 <p>武二品 狮子补</p>	 <p>武三品 虎补</p>
<p>First rank lion</p>	<p>Second rank lion</p>	<p>Third rank tiger</p>
 <p>武四品 豹补</p>	 <p>武五品 熊补</p>	 <p>武六品 彪补</p>
<p>Fourth rank leopard</p>	<p>Fifth rank bear</p>	<p>Sixth rank liger</p>
 <p>武七品 彪补</p>	 <p>武八品 犀牛补</p>	 <p>武九品 海马补</p>
<p>Seventh rank liger</p>	<p>Eighth rank rhinoceros</p>	<p>Ninth rank sea horse</p>

**Figure 29:** Military officer's *Bu Zi* 補子

(Source: <http://big5.showchina.org:81/.../sw/200806/t195463.htm>)



### 4.3.1 Configuration, pattern and proportion of the body

Style(S)		Rule(R)					
		R1	R2	R3	R4	R5	R6
S1							
				A:B = 3.5:1			
S2							
				A:B = 5:1			
S3							
				A:B = 6:1			
S4							
				A:B = 4:1			
S5							
				A:B = 2:1			
S6							
				A:B = 2:1			

 Configuration     Pattern     Proportion

**Table 8:** *Jing's* body style S1-S6

#### A. Configuration

1. Most of the beards have a small protruding horn at each top corner and an arc at the top center, R1 column of examples S1, S2, and S6 (Table 8).

2. There are two shapes of beard ends; one is a trapezoid and the other is oval-shaped, examples S1-R1, S2-R1 and S3-R1, S6-R1 (Table 8).

3. The length of the beard extends to the waist, R2 column of examples S1, S2, S3, S4 and S6 (Table 8).

#### B. Pattern

1. Animal patterns (bird and tiger)

2. Other pattern (wave, cloud and rainbow)

As already noted above, the civil official uses the birds' pattern, the military officer uses the beasts' pattern. Additionally, the bird represents civilized manner and tiger represents power and majesty, example S3-R5 and S5-R5 (Table 8). The wave, cloud and rainbow patterns are all nature phenomena, and because the ancients could not explain them with science, they awed the power of nature; therefore, patterns of natural phenomena, example S2-R4, S2-R5, S4-R4, and S5-R4 (Table 8).


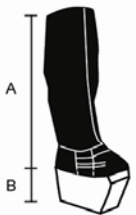
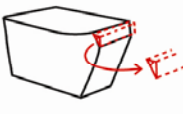
#### C. Proportion

1. The ratio of length of the arm to width of the sleeve is around 5:1, example S2-R3 (Table 8).

#### 4.4 *Characteristic of shoes*

*Jing's* shoes mirror the pattern and shape of *Sheng's* boots. Refer to section 2.4.1-S2.

4.4.1 Configuration, pattern and proportion of the shoes

Style(S) \ Rule(R)		R1	R2	R3	R4
		S1			
A:B = 5.5:1	$\angle = 50^\circ$		$\angle = 85^\circ$		

Configuration
  Pattern
  Proportion

**Table 9:** Jing's boots

A. Configuration

Refer to section 2.4.1-S2.

B. Pattern

Refer to section 2.4.1-S2.

C. Proportion

Refer to section 2.4.1-S2.

## CHAPTER FIVE: CHARACTER OF *CHOU*

### 5.1. *Connection between character and costume design for Chou*

*Chou* is a comic role in Taiwanese Opera. The sex of this role can be male or female. “In Taiwanese Opera, there are three kinds of roles for male *Chou*: civil official, martial artist and *san-hua* 三花. Additionally, *Chou* has a very important position in Taiwanese opera, one which leads an interesting performance” (Translated from: 歌仔戲的丑角分成三類: 有武丑、文丑、三花 , 並認為丑角在歌仔戲中佔有十分重要的地位 , 他是居於帶動整齣戲趣味的角色。 ) (Yang, 楊馥菱, 1999). Moreover, the official emphasizes the spoken part; the martial artist places importance on kung fu, and *san-hua* 三花 places importance on face expressions. In this thesis, however, I will focus on analysis of the male role of civil official, because in Taiwanese Opera this is the role primarily related with *Chou*. “*Chou* in Taiwanese Opera does not just entertain the audience, in fact, it represents a genre of Chinese history which includes satire, a carefree spirit, individual consciousness and *Chou's* consciousness” ( Translated from: 丑角在戲曲中所呈現出的不只是單純的插科打暉而已 , 實際上它代表的是深厚基墊著歷史文化的基因;諷刺傳統、樂天精神、個體意識和丑角意識。 ) (Wu, 鄔元江, 1997, p 82).

*Chou* can range from an honorable man to a scoundrel. The honorable man's

personality is nimble, humorous, and resourceful. The scoundrel's personality is treacherous, cunning and selfish. His acting is comical and boorish. Therefore, this kind of *Chou* could have the role of an underclass civilian, a fisherman for example.



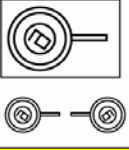







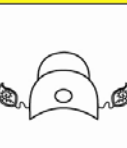




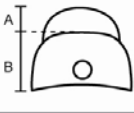















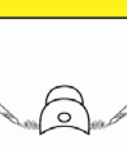










### 5.2 Characteristics of head ornament of Chou

As we noted earlier, Taiwanese Opera was derived from Chinese Opera. In Chinese Opera, the civil official role of *Chou*'s head ornament is another type of gauze hat which is called "round wing gauze hat 圓翅紗帽" (Figure 30), The characteristics of it are the front and the back parts are very round, more round than the hat of *Jing*. Also, the 'wings' are round but do not bend. The "round wing gauze hat 圓翅紗帽" is for muddled and corrupt officials. Beside the head ornament, specific look of the eyebrows, moustache and mole are characteristic of *Chou*.



**Figure 30:** Round wing gauze hat 圓翅紗帽

5.2.1 Configuration, pattern and proportion of the head ornament

Style(S)		Rule(R)	R1	R2	R3	R4	R5	R6
S1								
		A:B = 1:2						
S2								
		A:B = 1:2.5						
S3								
		A:B = 1:2						
S4								
		A:B = 1:2.5						
S5								
		A:B = 1:2.5						
S6								
		A:B = 1:2						

Configuration
  Pattern
  Proportion

**Table 10:** Chou's head ornament style S1-S6

A. Configuration

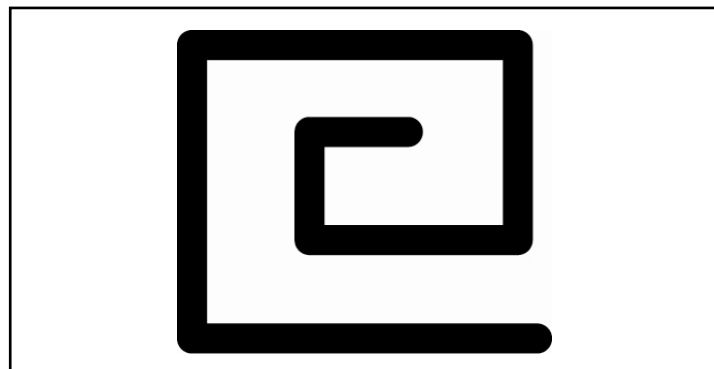
1. There are four kinds of 'wings': round, leaf, diamond, and rectangle, example R2 column (Table 10).

2. The head ornament is a round form and has stair-like layers which begin low in the front and build towards the back, example R3 column (Table 10).
3. The eyebrow and short moustache are like the Chinese character for the number eight “八”, R4 column of example S2, S3, S4 ,and S6 (Table 10).
4. There is often one mole located under the eye, R4 column of example S2, S3, and S5 (Table 10).

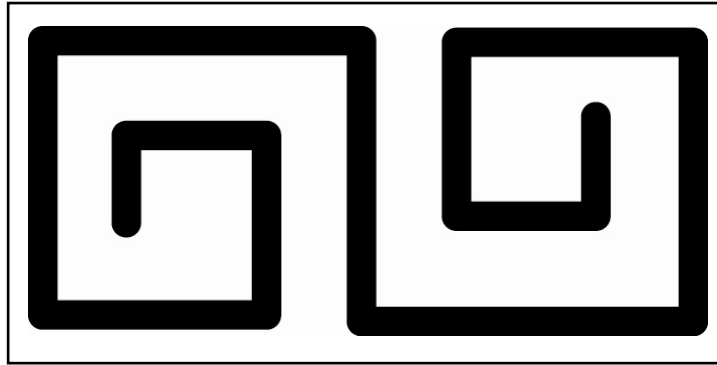
## B. Pattern

1. Other pattern ( *Hui* pattern 回紋 and organic pattern)

“*Hui* pattern 回紋” (Figure 31) is the geometric pattern developed from “*Lei* pattern 雷紋” (Figure 32) in bronze ware (Figure 33) decoration. *Hui* pattern is named from the Chinese character “*Hui* 回”. The meaning of the *Hui* pattern is wealthy and eternal honor. In *Chou*, the *Hui* pattern has been simplified, example S1-R5 (Table 10). The organic patterns in *Chou* do not have any similar pattern source but are a new design pattern from Taiwanese Opera, R5 column of example S2, S3, and S6 (Table 10).



**Figure 31:** *Hui* pattern 回紋



**Figure 32:** *Lei* pattern 雷紋



**Figure 33:** Bronze ware (Source: <http://detail.china.alibaba.com/.../239709643.html>)

### C. Proportion








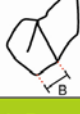





























1. The ratio of the back to front layers is 1:2 or 1:2.5, R1 column of example S1, S3, S6 and S2, S4, S5 (Table 10).



### 5.3 Characteristic of body

The civil official role of *Chou*'s body costume is the same as justice of *Jing*, see section 4.3 *Jing*'s characteristic of body.

#### 5.3.1 Configuration, pattern and proportion of the body

Style(S)		Rule(R)	R1	R2	R3	R4	R5	R6	R7
S1									
S2									
S3									
S4									
S5									
S6									

 Configuration     Pattern     Proportion

**Table 11:** *Chou*'s body style S1-S6

### A. Configuration

1. The collar is rounded, R1 column of example S1 to S5 (Table 11).
2. Two types of *Bu-Zi*: square and round, example R3 column (Table 11).

### B. Pattern

1. Animal patterns (bird and Eastern dragon)
2. Other patterns (sun, wave, and *Hui* pattern 回紋)

The patterns from *Chou*'s costumes share similar patterns to *Jing*'s, such as the bird, sun, and wave patterns (see 4.2.1 and 4.3.1). As mentioned above, *Chou*'s head ornament uses the *Hui* pattern 回紋, as does *Chou*'s body, but the *Hui* lines on the body are more twisted than those represented on the head, example R5 column (Table 11).


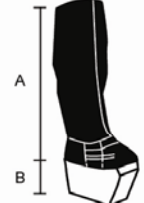
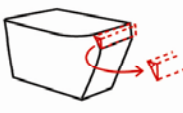
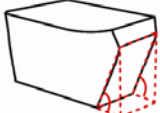

### C. Proportion

1. The angle of the collar ranges from is 65 to 110 degrees. Most angles are 100 +/- 10 degrees, example R1 column (Table 11).
2. The ratio of length of the arm to width of the sleeve is around 4:1, example S2-R2 (Table 11).

## 5.4 Characteristics of shoes

*Chou's shoes are identical to Sheng's boots. Refer to section 2.4.1-S2.*

### 5.4.1 Configuration, pattern and proportion of the shoes

Style(S)		Rule(R)			
		R1	R2	R3	R4
S1					
		A:B = 5.5:1	$\angle = 50^\circ$	$\angle = 85^\circ$	

Configuration
  Pattern
  Proportion

**Table 12:** *Chou's boots*

#### A. Configuration

Refer to section 2.4.1-S2.

#### B. Pattern

Refer to section 2.4.1-S2.

#### C. Proportion

Refer to section 2.4.1-S2.

## 5.5 Design guideline and elements application

This section summarizes each role's specific design configurations, proportion, and patterns in six steps. Each step will help the designer apply different design elements to their chair designs. There are three summary Tables for the role of *Sheng*.

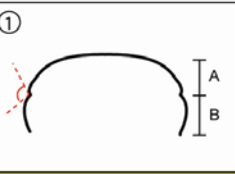

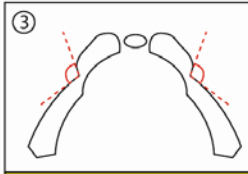
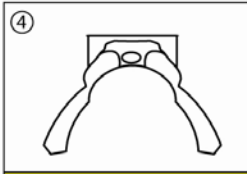
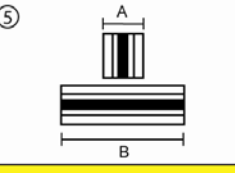

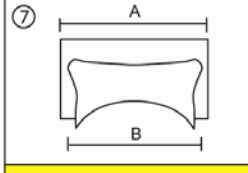
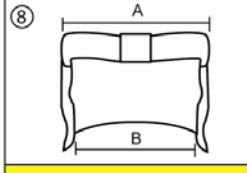
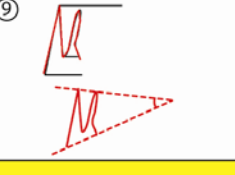
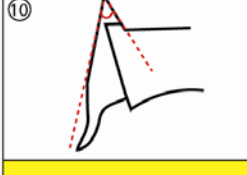







### A. *Sheng*

#### 1. Corresponding part:

As mentioned above, I divided the costume into three parts: head ornaments, body (including sleeves), and shoes. In this step the head ornament will be matched to the chair top, body part to chair back, sleeve part to chair armrest and shoe to chair leg. Because the top and back are so close to each other, one application can be assigned to both the head ornament and body. For example, the head ornament can influence both the chair top and back, or the body can influence the chair top and back. Additionally, the patterns in each Table can be applied to every part of the chair.

#### 2. Selection of head ornament design elements:

Designers can choose a configuration number, under which is the most common proportion for that design. Additionally, they can choose one or more patterns with which to decorate the chair (Table 13).

<p>①</p>  <p><math>\angle = 100^\circ \pm 5</math>   A:B = 1:1</p>	<p>②</p> 	<p>③</p>  <p><math>\angle = 100 \pm 5</math></p>	<p>④</p> 
<p>⑤</p>  <p>A:B = 1:3</p>	<p>⑥</p> 	<p>⑦</p>  <p>A:B = 12:11</p>	<p>⑧</p>  <p>A:B = 12:11</p>
<p>⑨</p>  <p><math>\angle = 30^\circ</math></p>	<p>⑩</p>  <p><math>\angle = 40^\circ</math></p>		
<p><span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; margin-right: 5px;"></span> Configuration <span style="display: inline-block; width: 15px; height: 15px; background-color: lightgreen; margin-left: 20px; margin-right: 5px;"></span> Proportion</p>			
<p>①</p> 	<p>②</p> 	<p>③</p> 	
<p>④</p> 	<p>⑤</p> 	<p>⑥</p> 	<p>⑦</p> 
<p><span style="display: inline-block; width: 15px; height: 15px; background-color: orange; margin-right: 5px;"></span> Pattern</p>			

**Table 13:** Summary of *Sheng's* head ornament design elements

*Sheng's* head ornament design guidelines:

- I. The angle of the stair-like pattern is  $100 \pm 5$  degrees (NO.1 & 3).
- II. The largest ratio in width of the back band to the foreground band is 1:3 and the rectangle bands are perpendicular to one another (NO.5).
- III. The ratio in size of the back and front layers is around 12:11, and it is rectangular in the back and has a small protruding horn on the corner of the foreground rectangle (NO. 7 & 8).
- IV. *Sheng's* head ornament has two layers and one or two folds (NO. 9 & 10).

3. Selection of body design elements:

As with *Sheng's* head ornament, the same selection process applies to body design elements (Table 14).

<p>①</p>	<p>②</p>	<p>③</p>
<p><math>\angle = 60^\circ</math>    A:B:C = 1:7:1.5</p>	<p>A:B = 1:1.5</p>	<p>A:B = 1:2</p>
<p>④</p>		
<p>A:B = 1:1</p>		
<p><span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Configuration    <span style="display: inline-block; width: 15px; height: 15px; background-color: lightgreen; border: 1px solid black;"></span> Proportion</p>		

<p>①</p>	<p>②</p>	<p>③</p>
<p>④</p>	<p>⑤</p>	<p>⑥</p>
<p>④</p>	<p>⑦</p>	<p>⑦</p>
<p><span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black;"></span> Pattern</p>		

**Table 14:** Summary of *Sheng's* body design elements

*Sheng's* body design guidelines:

I. The collar is not symmetrical; the shape instead resembles the lowercase letter *y*, most angles of the collar are 60 degrees, and the most common proportion of collar elements is  $A:B:C=1:7:1.5$  (NO.1).

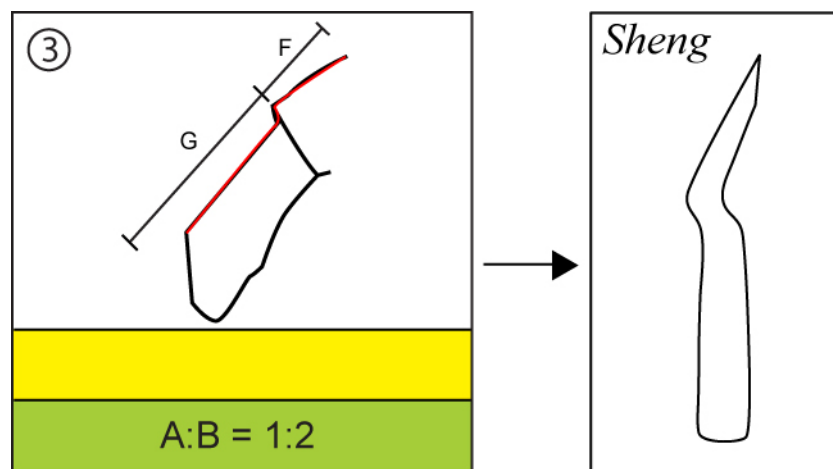
II. The most common proportion of the collar to the waistband is  $A:B=1:1.5$  (NO.2).

III. There are two layers of the sleeve; the proportion is  $A:B=1:4$  (NO. 3).

IV. The proportion of the collar to the decoration band is  $A:B=1:1$  (NO. 4).

#### 4. Selection of sleeve design elements:

The chair armrest corresponds to each role's sleeve (Table 14). For example, in devising a style, a designer could choose one sleeve configuration and a line segment within that configuration. This is an illustration of *Sheng's* chair armrest style (Figure 34).

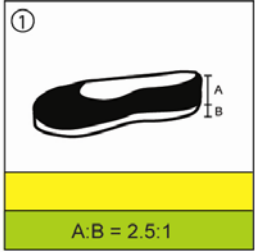

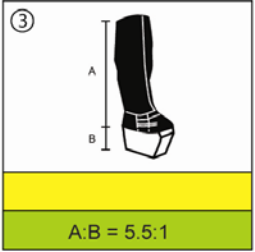
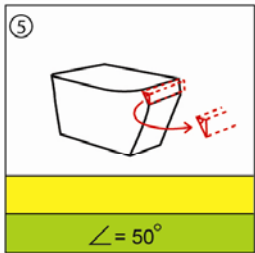
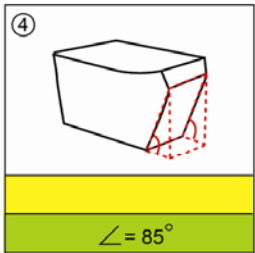
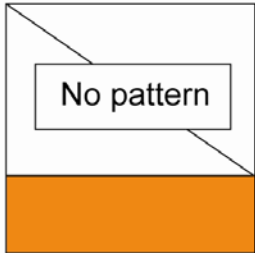


**Figure 34:** *Sheng's* chair armrest style



## 5. Selection of shoe design elements:

The selection of shoe design elements is the same as the head ornament and body design elements (Table 15).

<p>①</p>  <p>A:B = 2.5:1</p>	<p>②</p> 	<p>③</p>  <p>A:B = 5.5:1</p>
<p>⑤</p>  <p><math>\angle = 50^\circ</math></p>	<p>④</p>  <p><math>\angle = 85^\circ</math></p>	<p>Configuration    Proportion</p>
 <p>No pattern</p>		<p>Pattern</p>

**Table 15:** Summary of *Sheng's* shoe design elements

*Sheng's* shoe design guidelines:

- I. The front of the normal style shoe has a round shape, and the proportion of this shoe is A:B=2.5:1 (NO.1 & 2).
- II. The front of the boots has a square shape, and the proportion of the boots is A:B=5.5:1 (NO.3).

III. The bottom has two oblique cuts, one angle is 50 degrees and the other is 85 degrees (NO. 4 & 5)

6. Possible combinations:

There are four examples of possible combination styles. In combination styles one and two (Figure 35); designers can choose one configuration and one or more patterns in each part to formulate a design style. The chair armrest is an optional function. In combination styles three and four (Figure 35), the design style can be implemented with either a distinct body part or head ornament, respectively.

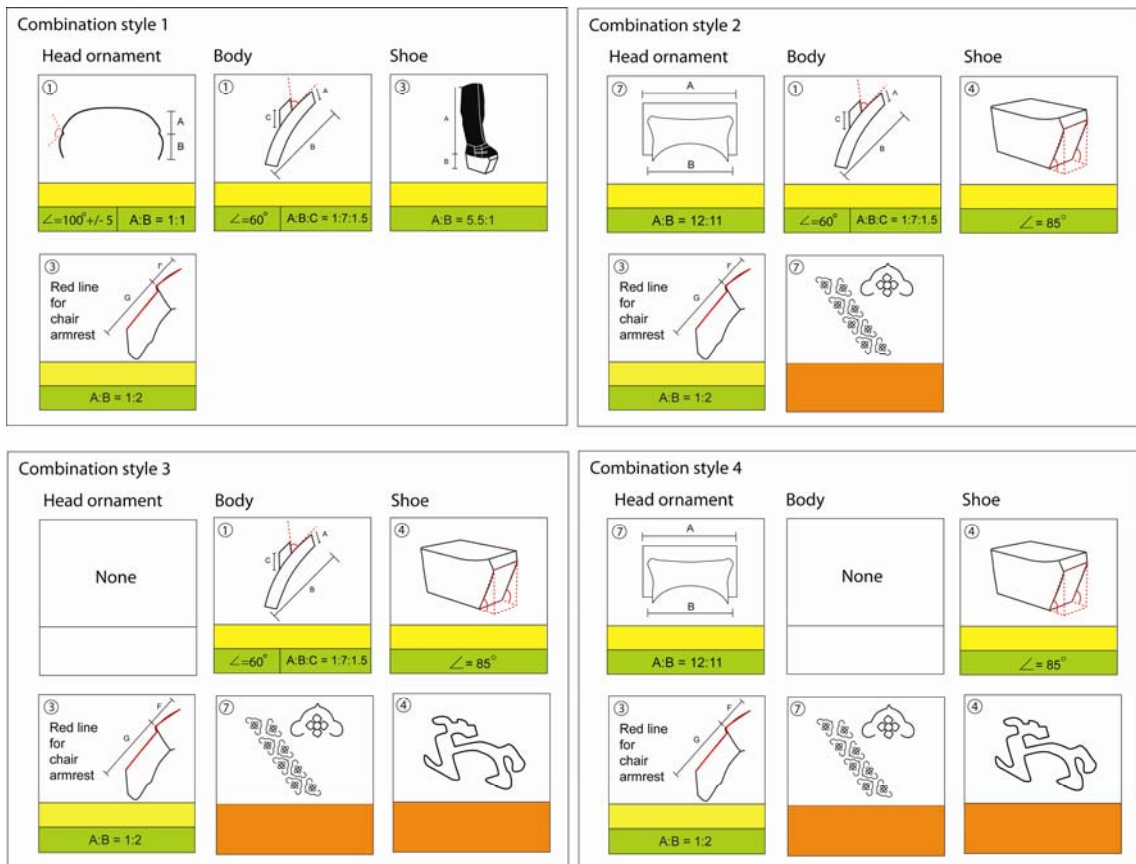


Figure 35: Combination styles one to four

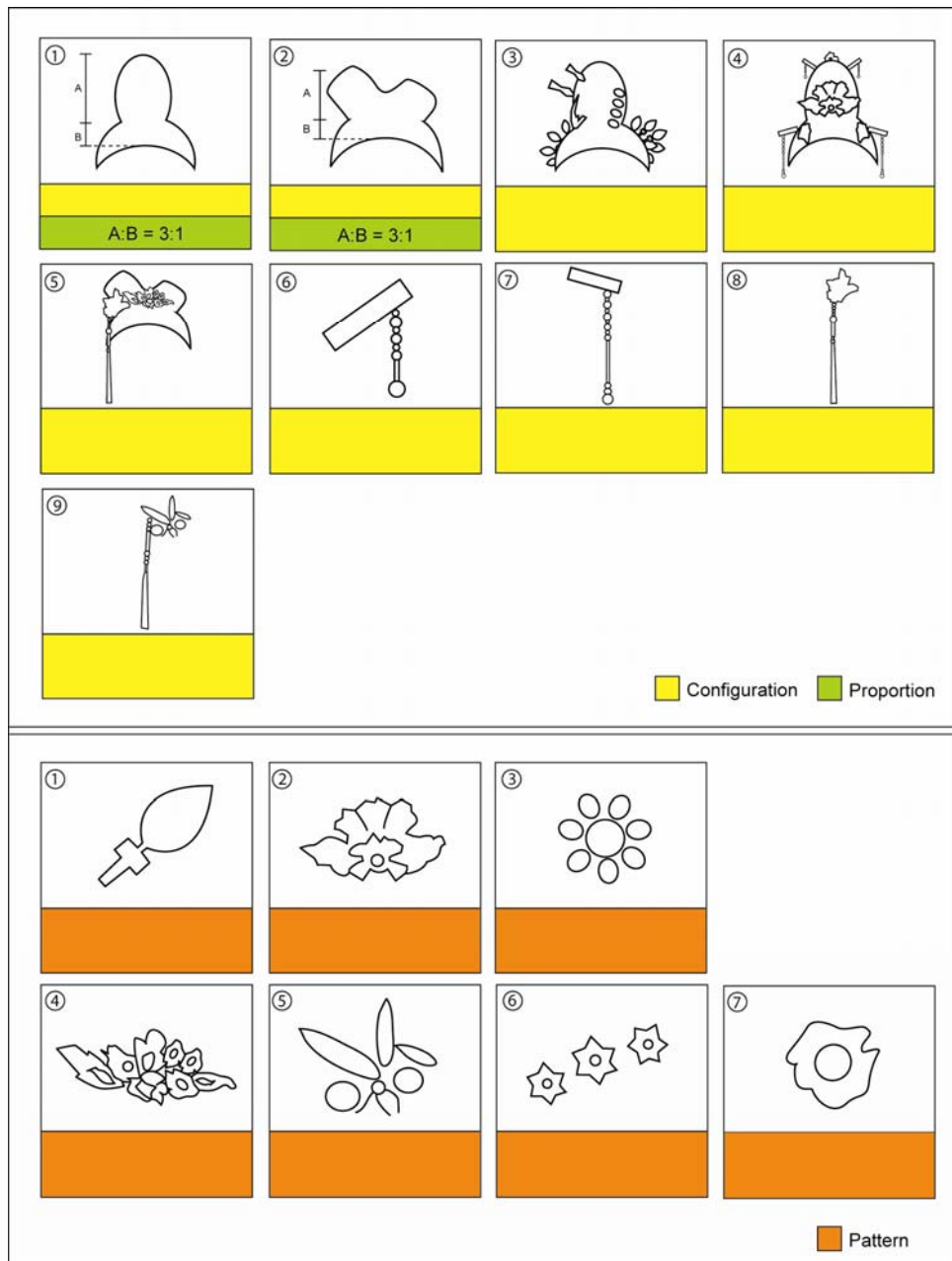
## B. *Dan*

### 1. Corresponding part:

As mentioned above, I divided the costume into three parts: head ornament, body, and shoes. In this step the head ornament will be matched to the chair top, body part to chair back, and shoes to chair leg. Because the top and back are so close to each other, one application can be assigned to both the head ornament and body. For example, the head ornament part can influence both the chair top and back or the body part can influence the chair top and back. Additionally, the patterns in each Table can be applied to every part of the chair.

### 2. Selection of head ornament design elements:

Designers can choose a configuration number, under which is the most common proportion for that design. Additionally, they can choose one or more patterns with which to decorate the chair (Table 16).



**Table 16:** Summary of *Dan*'s head ornament design elements

*Dan*'s head ornament design guidelines:

I. There can be one to two chignons on the top of the head and the proportion of chignons to the head is 3:1 (NO.1 & 2).

II. The hair ornaments are on the hair edge (NO. 3, 4, & 5).

III. There are two kinds of tassel on Dan's head ornaments. The first configuration is rectangular with beads and the second is a flower with beads (NO. 6, 7, 8, & 9).

3. Selection of body design elements:

As with *Dan's* head ornament, the same selection process applies to body design elements (Table 17).

①	②	③	④
Configuration Proportion $\angle = 100^\circ \pm 10$	Configuration Proportion A:B = 7:1	Configuration Proportion A:B:C = 1:2:1	Configuration Proportion A:B = 1:1.2
⑤			
Configuration     Proportion			
①	②	③	④
⑤	⑥	⑦	⑧
⑨	⑩	⑪	⑫
Pattern			

**Table 17:** Summary of *Dan's* body design elements

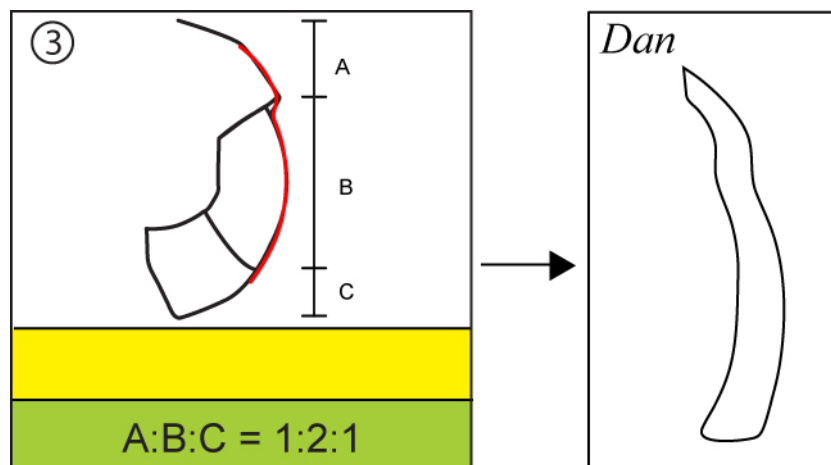
*Dan's* body design guidelines:

- I. The angle of the collar is  $100 \pm 10$  degrees (NO. 1).
- II. There are two kinds of collars. One is a high, round and the other is a low, v-neck collar (NO. 1 & 5).

III. There are two different styles of sleeves. One is three layers, and the other is two layers on each sleeve. The three layer sleeve's proportion is around 1:2:1 and the two layer sleeve's proportion is 1: 1.2 (NO. 3 & 4).

4. Selection of sleeve design elements:

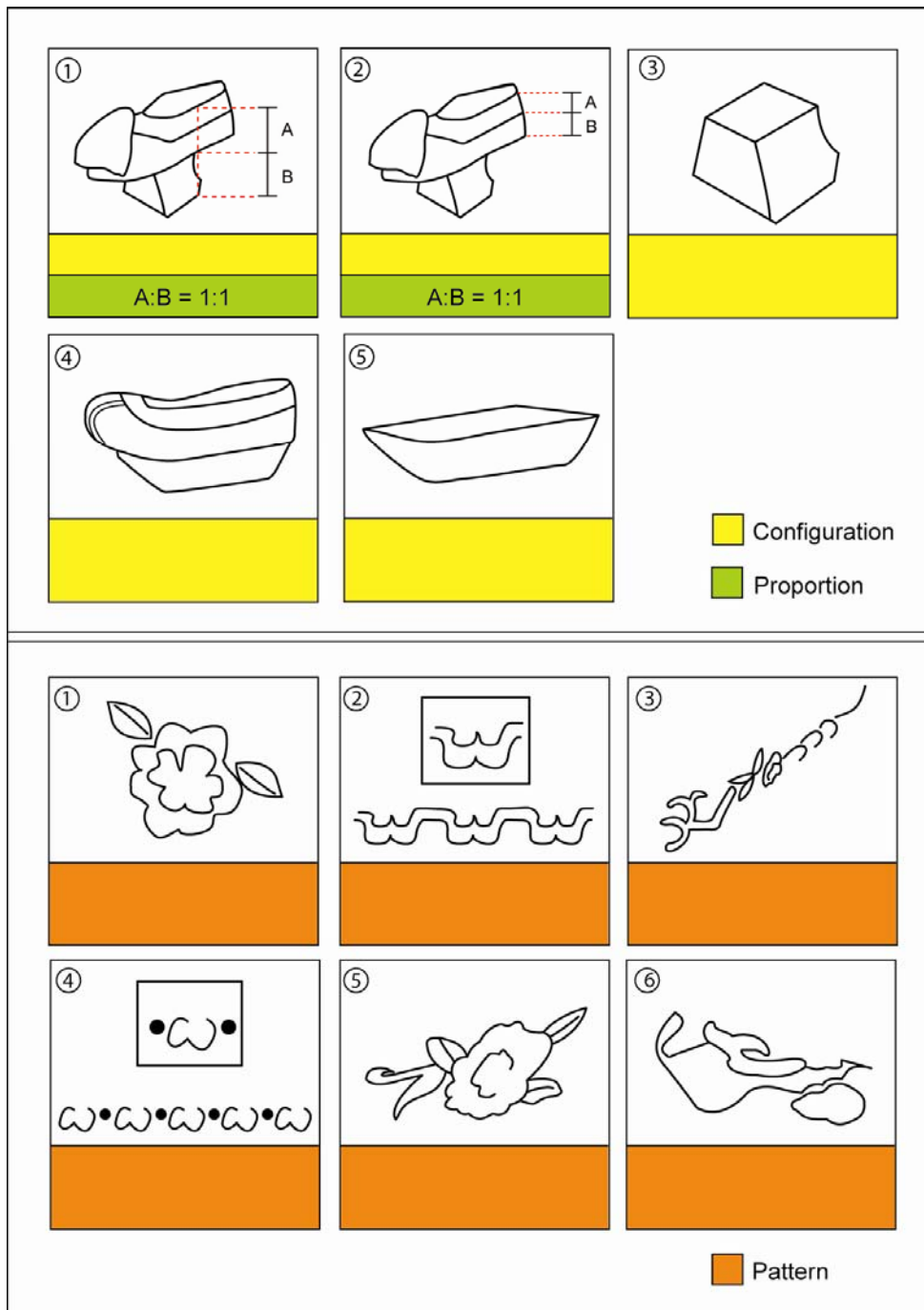
The chair armrest corresponds to each role's sleeve (Table 17). This is the same design method as *Sheng's* armrest. *Dan's* armrest style is as follows (Figure 36).



**Figure 36:** *Dan's* chair armrest style

5. Selection of shoe design elements:

The selection of shoe design elements is the same as the head ornament and body design elements (Table 18).



**Table 18:** Summary of *Dan's* shoe design elements

*Dan's* shoe design guidelines:

- I. Most shoes have two layers, with the bottom layer smaller than the top one and the ratio of the shoe height to heel is 1:1 (NO. 1).



II. There is a line dividing the two patterns of the shoe, and the proportion of the space is 1:1 (NO. 2).

III. There is a tassel on each shoe's toe; the shoe tassel is shaped like a tear drop (NO. 1 & 2).

#### 6. Possible combinations:

There are the same four possible combination styles as *Sheng* (Figure 28).

### C. *Jing*

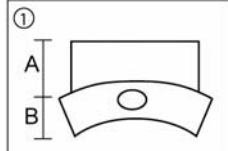
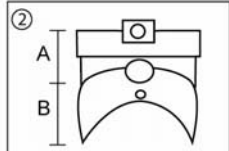
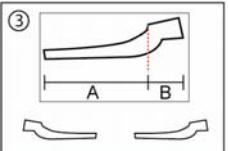
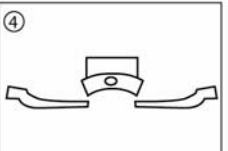
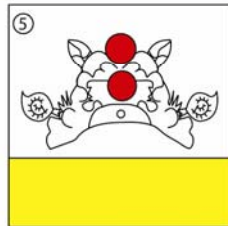
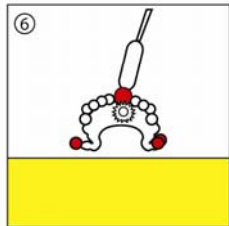
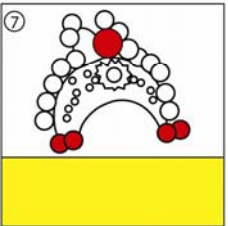
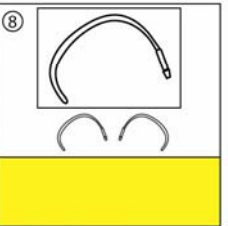
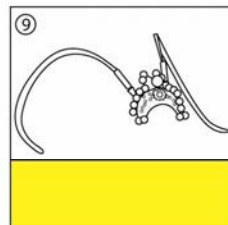


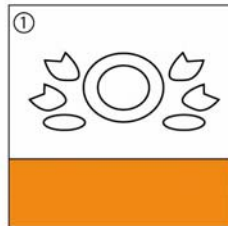
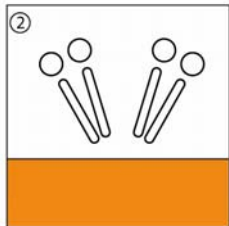
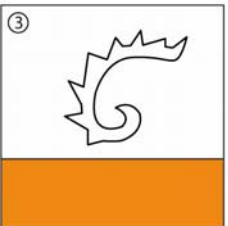
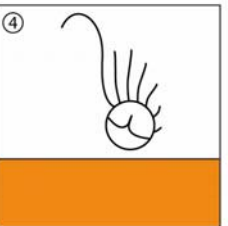
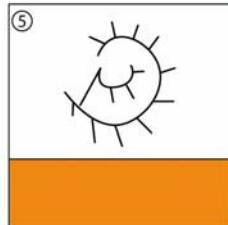
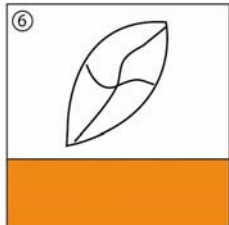
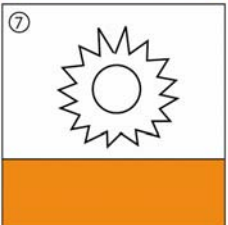
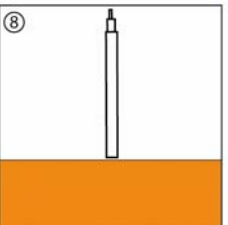

#### 1. Corresponding part:

As mentioned above, I divided the costume into three parts: head ornament, body, and shoes. In this step the head ornament will be matched to the chair top, body part to chair back, and shoes to chair leg. Because the top and back are so close to each other, one application can be assigned to both the head ornament and body. For example, the head ornament part can influence both the chair top and back or the body part can influence the chair top and back. Additionally, the patterns in each Table can be applied to every part of the chair.

#### 2. Selection of head ornament design elements:

Designers can choose a configuration number, under which is the most

common proportion for that design. Additionally, they can choose one or more patterns with which to decorate the chair (Table 19).

 <p>A:B = 1.5:1</p>	 <p>A:B ≐ 1:1</p>	 <p>A:B = 3:1</p>	
			
			
 Configuration  Proportion			
			
			
 Pattern			

**Table 19:** Summary of *Jing*'s head ornament design elements

*Jing's* head ornament design guidelines:

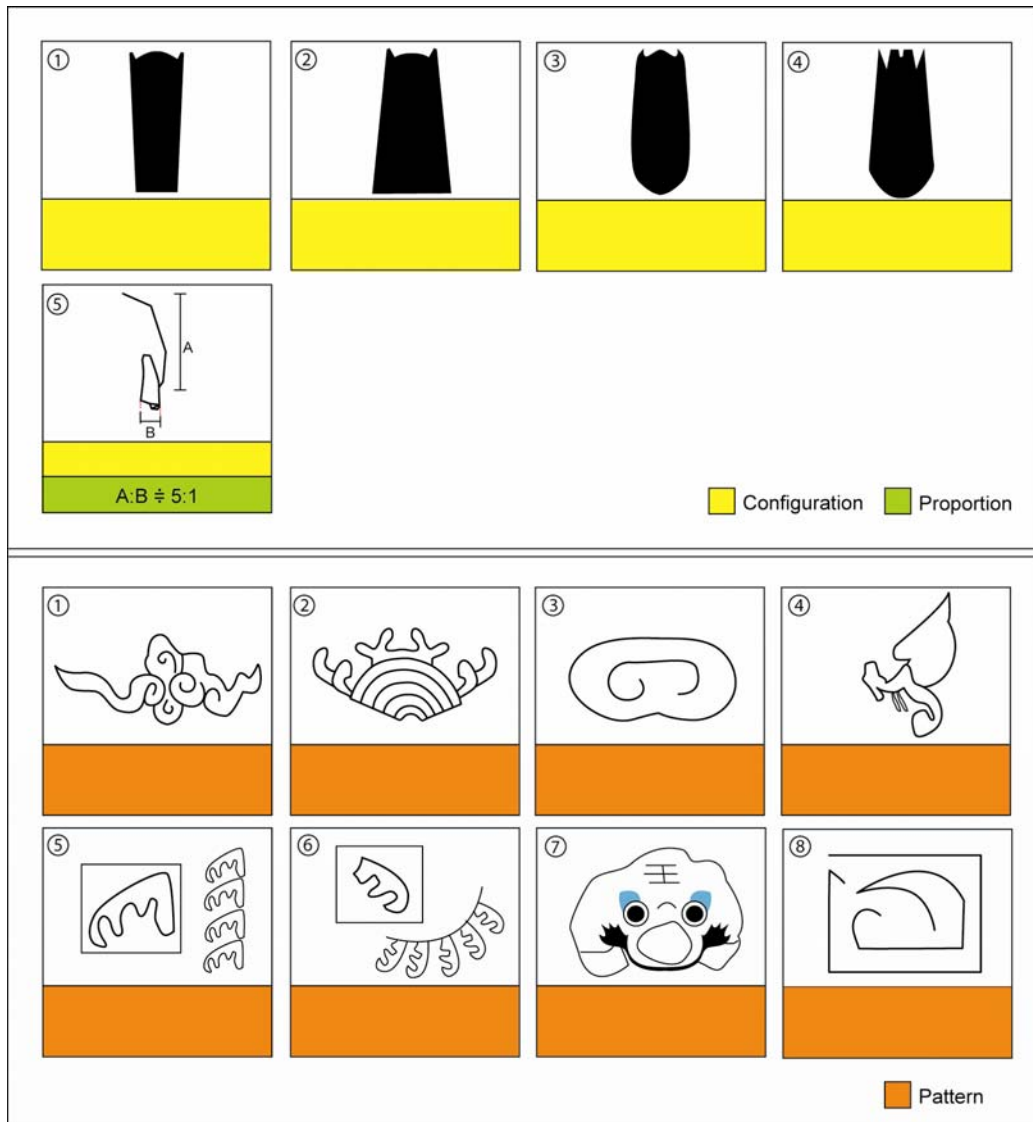
I. The head ornament is a round form with stair-like layers which begin low in the front and build towards the back and the ratio of the back to front layers is 1:1 or 1.5:1 (NO. 1 & 2).

II. A bent wing protrudes from each side of the ornament and the ratio of the sharp wing front the flat to bent portion is 3:1 (NO. 3).

III. The head ornament is bell-shaped, several red soft balls decorate the rim of the helmet and the large ball is at the pinnacle of the head ornament (NO. 5, 6 ,& 7).

3. Selection of body design elements:

As with *Jing's* head ornament, the same selection process applies to body design elements (Table 20).



**Table 20:** Summary of *Jing*'s body design elements

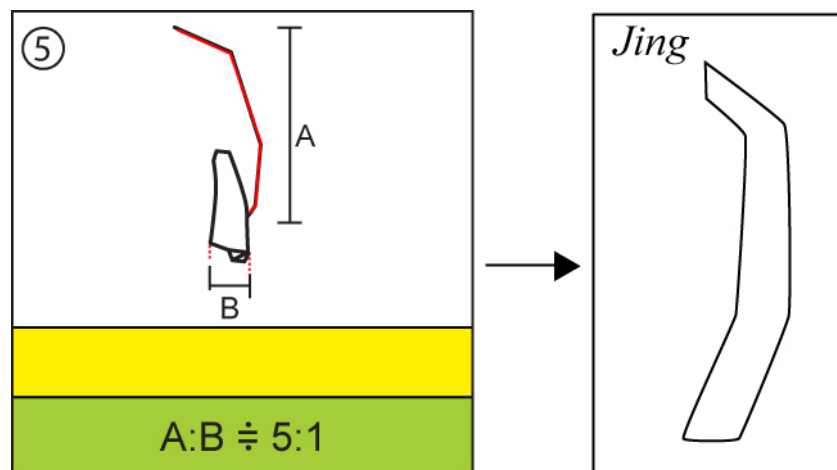
*Jing*'s body design guidelines:

I. There are two shapes of beard ends; one is a trapezoid and the other is oval-shaped. Also most of the beards have a small protruding horn at each top corner and an arc at the top center (NO. 1, 2, 3, & 4).

II. The ratio of length of the arm to width of the sleeve is around 5:1 (NO. 5).

#### 4. Selection of sleeve design elements:

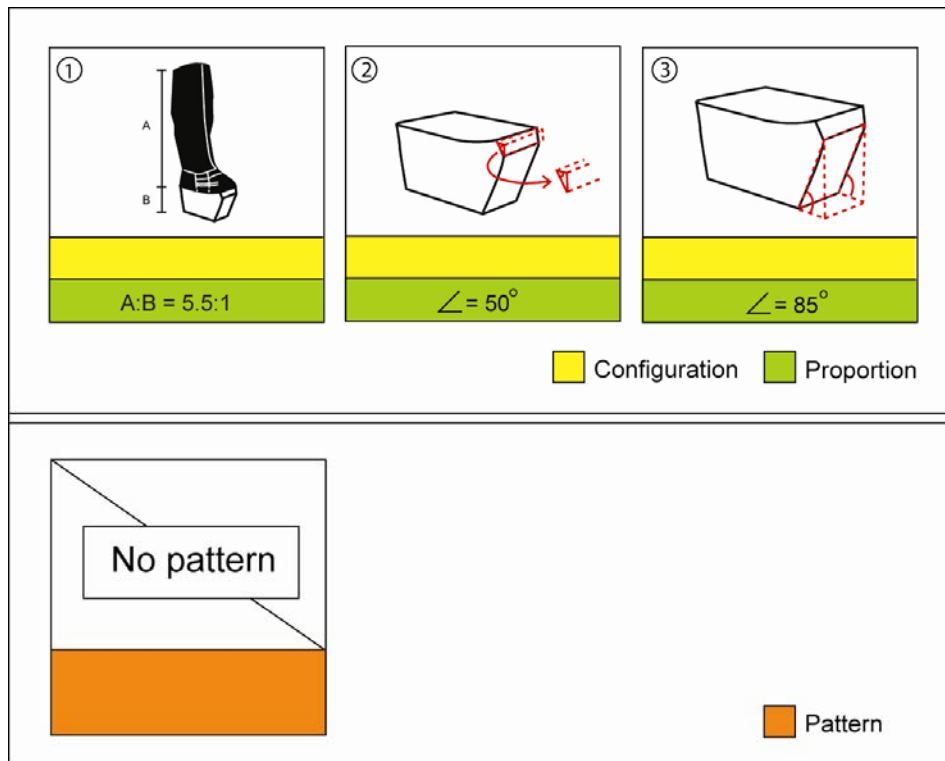
The chair armrest corresponds to each role's sleeve (Table 20). This is the same design method as *Sheng's* armrest. *Dan's* armrest style is as follows (Figure37).



**Figure 37:** *Jing's* chair armrest style

#### 5. Selection of shoe design elements:

The selection of shoe design elements is the same as the head ornament and body design elements (Table 21).



**Table 21:** Summary of *Jing*'s shoe design elements

*Jing*'s shoe design guidelines:

I. The front of the boots has a square shape, and the proportion of this boots is A:B=5.5:1 (NO.1).

II. The bottom has two oblique cuts, one angle is 50 degrees and the other is 85 degrees (NO. 2 & 3)

6. Possible combinations:

There are the same four possible combination styles as *Sheng* (Figure 28).

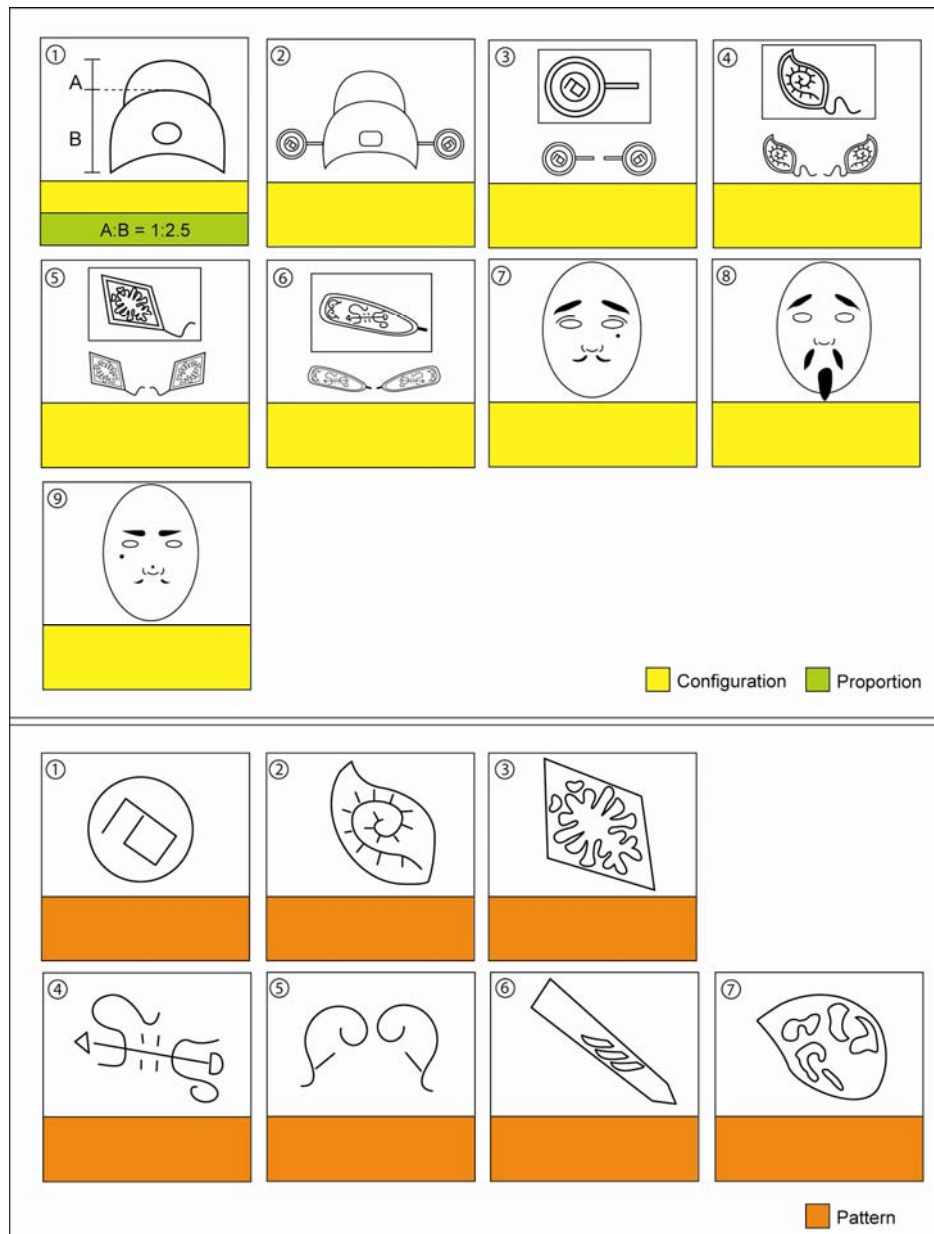
## D. *Chou*

### 1. Corresponding part:

As mentioned above, I divided the costume into three parts: head ornament, body, and shoes. In this step the head ornament will be matched to the chair top, body part to chair back, and shoes to chair leg. Because the top and back are so close to each other, one application can be assigned to both the head ornament and body. For example, the head ornament part can influence both the chair top and back or the body part can influence the chair top and back. Additionally, the patterns in each Table can be applied to every part of the chair.

### 2. Selection of head ornament design elements:

Designers can choose a configuration number, under which is the most common proportion for that design. Additionally, they can choose one or more patterns with which to decorate the chair (Table 22).



**TABLE 22:** Summary of *Chou's* head ornament design elements

*Chou's* head ornament design guidelines:

- I. The head ornament is a round form and has stair-like layers which begin low in the front and build towards the back and the ratio the back to front layers is 1:2.5 (NO. 1).



II. There are four kinds of ‘wings’: round, leaf, diamond, and rectangle (NO. 3, 4, 5, & 6).

III. The eyebrow and short moustache are like Chinese character for the number eight “八” (NO. 7, 8, & 9).

IV. There is often one mole located under the eye (NO. 7, 8, & 9).

3. Selection of body design elements:

As with *Chou*’s head ornament, the same selection process applies to body design elements (Table 23).

① 	② 	③ 	④ 
∠=100°±10	A.B = 4:1		
⑤ 	⑥ 	⑦ 	
			Configuration Proportion
① 	② 	③ 	④ 
⑤ 	⑥ 	⑦ 	⑧ 
⑨ 	⑩ 	⑪ 	⑫ 
⑬ 	⑭ 		
			Pattern

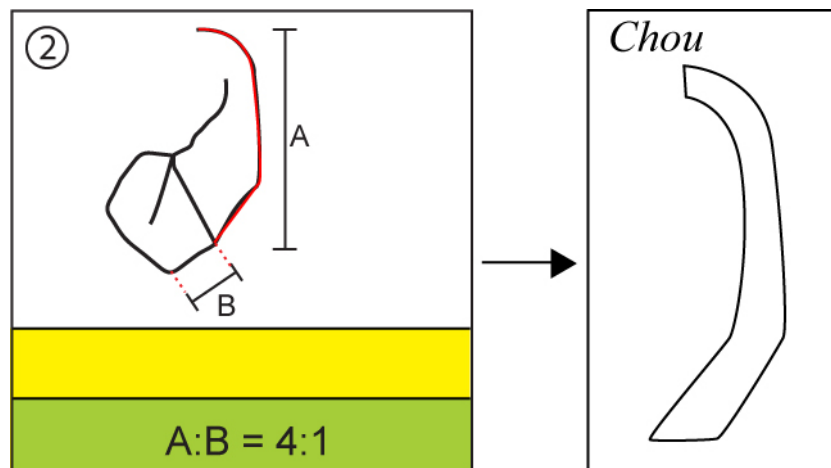
**TABLE 23:** Summary of *Chou's* body design elements

*Chou's* body design guidelines:

- I. The collar is rounded and the angle of the collar is  $100 \pm 10$  degrees (NO. 1).
- II. The ratio of length of the arm to width of the sleeve is around 4:1 (NO. 2).
- III. Two types of *Bu-Zi*: square and round (NO. 3, 4, 5, 6, & 7).

4. Selection of sleeve design elements:

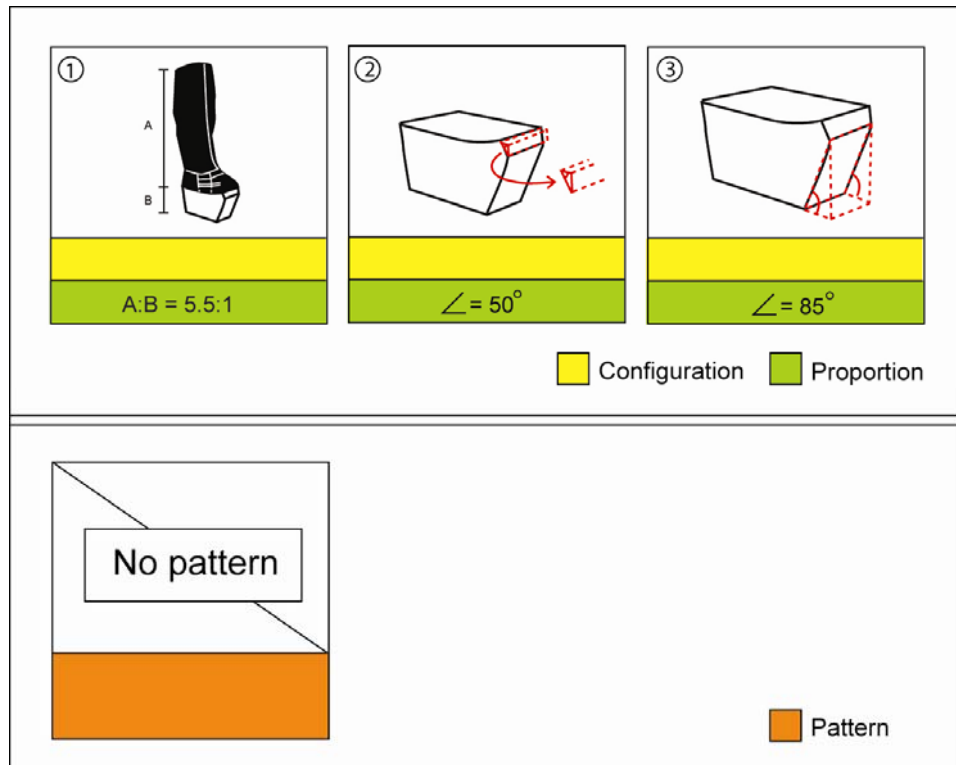
The chair armrest corresponds to each role's sleeve (Table 23). This is the same design method as *Sheng's* armrest. *Chou's* armrest style is as follows (Figure38).



**Figure 38:** *Chou's* chair armrests style

5. Selection of shoe design elements:

The selection of shoe design elements is the same as the head ornament and body design elements (Table 24).



**TABLE 24:** Summary of *Chou's* shoe design elements

*Chou's* shoe design guidelines:

I. The front of the boots has a square shape, and the proportion of this boots is  $A:B=5.5:1$  (NO.1).

II. The bottom has two oblique cuts, one angle is 50 degrees and the other is 85 degrees (NO. 2 & 3)

6. Possible combinations:

There are the same four possible combination styles as *Sheng* (Figure 28).

The next step is to develop a design process frame. There are two methods for applying these guidelines to a product. The first is choosing the role's guideline and then deciding upon a suitable product to apply the process to. The other method is choosing the topic and then apply each role's guidelines to the product. This thesis will use the second method to develop the design process frame which can have more design results to compare.

CHAPTER SIX: THE DESIGN FRAMEWORK OF CULTURAL ELEMENT  
INTEGRATED CHAIR DESIGN (DFCEICD)

6.1 DFCEICD design framework

This thesis developed a cultural product design system (DFCEICD) (Figure 39). DFCEICD uses a basis of four steps. The first step is choosing a topic, the second is analyzing the topic, the third is design integration which includes: function, style and manufacturing development, and the last step is conclusion. The framework consists of the following:

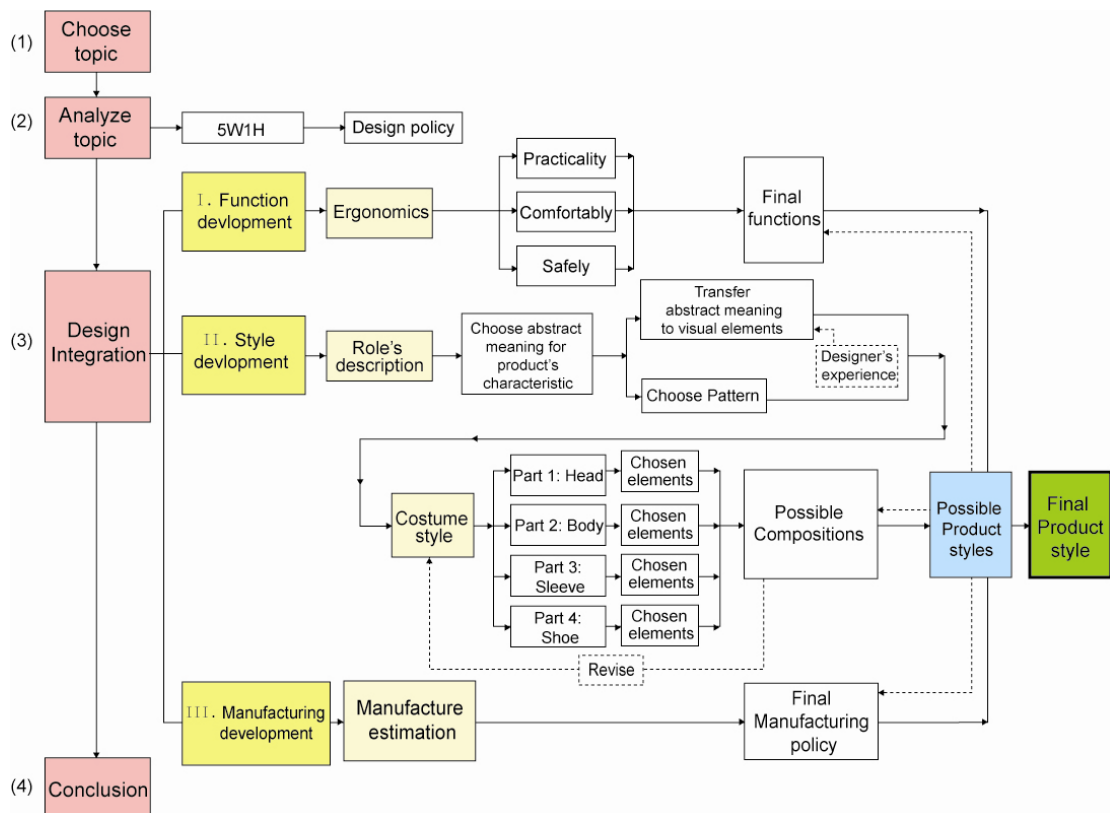


Figure 39: The Design Framework of Cultural Element Integrated Chair Design

(1) Choose topic

In this step the applicable products to develop must be chosen. A book was published by anthropologist Edward B. Tylor , in which he defined culture as “Culture, or civilization, taken in its broad, ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society”(1871). “Culture is an activity of the spirit and the substance of which is a human’s life. This activity acts on the product, which is a condition of human performing design, and is manufactured to enact outer and inner requirements” (Guan, 1995, p86). (Translated from: 文化是一種為經營某種生存、生活方式而醞釀出的種種精神與物質層面的活動，此一活動反應在器物上，即為人類透過設計，製造來反應外再與內在的需求狀態。)

As the quotes above indicate, the environment, humans and a product’s correlation is the constitution of a cultural product. Choosing the product to which you will apply a cultural design must take into account three elements. Selecting the product involves matching it with a suitable pattern, or design to enhance the product’s efficacy.

*Environment:* It considers where the product developed. Environment includes the society, culture and natural environment. Social environment involves social value and group preference; cultural environment is about culture continuity; and the natural environment considers proper product display.

*Human:* It considers the relationship between product and human. It includes a human’s interaction with the product. The usability and emotive energy has to be satisfied.

*Product:* It considers the relationship with product and culture. A product's cultural meaning and cultural context have to be considered while designing the product.

(2) Analyze topic

In order to identify the scope of the product, use the “5W1H” process to address the product's design policy. The 5W1H design method can help pinpoint the flaws associated with a product before design begins. It refers to the sequence of asking, and responding to six questions: the five “W’s” refer to who, what, when, where, and why; the “H” addresses the question how.

Who - to decide who is the user

What - to be clear about need and limit

Where - where to use

When - what kind of situation can use this product

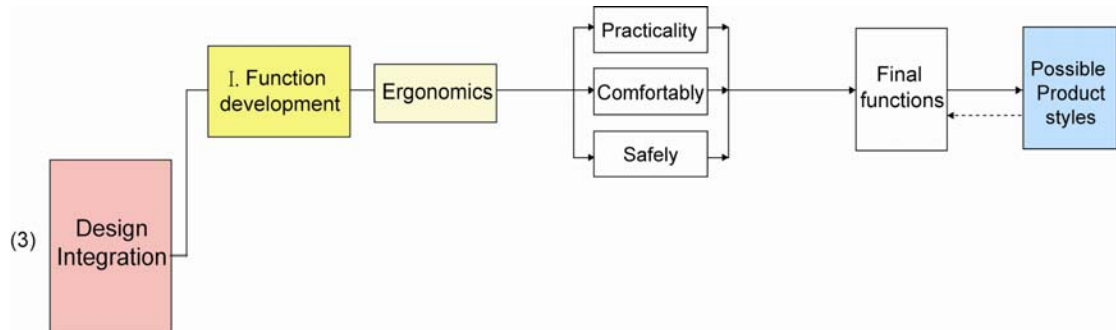
Why - design intent (include the detail of design, material and use direction)

How - how to use this product



### (3) Design Integration

#### I. Function development

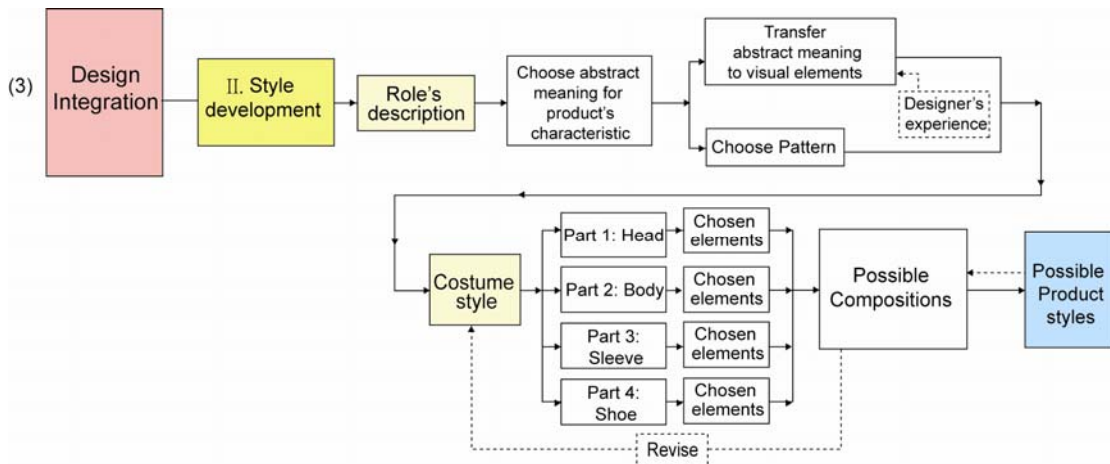


**Figure 40:** I. Function development

“The term *ergonomic*, which is used more and more as the total application of all human factors, comes from the Greek *ergos*, meaning work, and *nomos*, meaning natural laws” (Tilley & Dreyfuss, 1960, p9). After 1960, ergonomic theory grew in strength; it went from simple ergonomics to a complete research system of ergonomics which included: human, machine, and environment. “The approach of human factors is the systematic application of relevant information about human capabilities, limitation, characteristics, behavior, and motivation to the design of thing and procedures people use and the environment in which they use them” ( Sanders & McCormick, 1992, p5). Therefore, ergonomics is the interaction of the human body and is concerned with how our environment interacts with our work.

Moreover, today people’s lives are increasingly affluent so they are particular about practicality, comfort and safety; thus, ergonomics is an important area to consider in product design.

## II. Style development

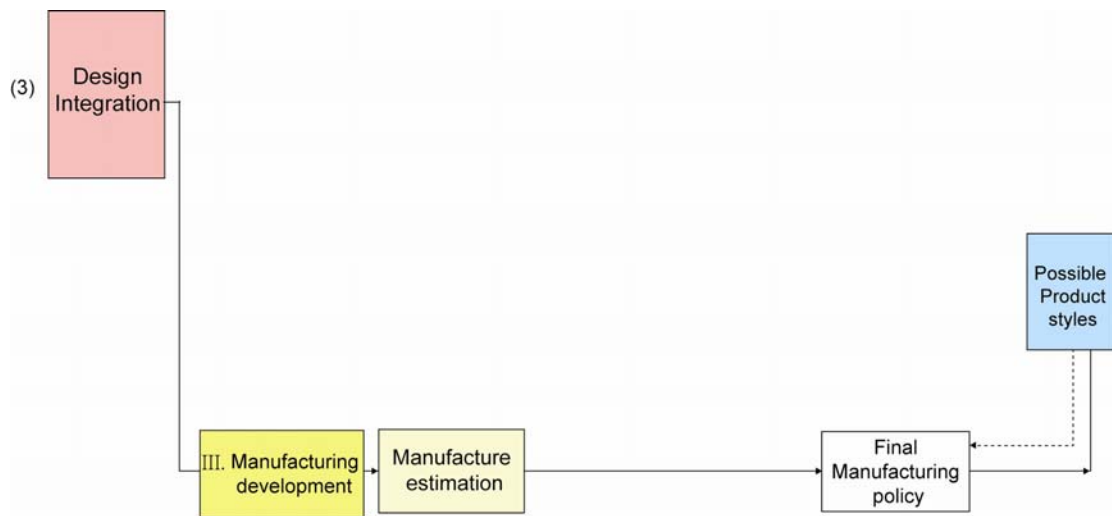


**Figure 41:** II. Style development

In style development, the first step is assessing the role's abstract meaning, which is the essence of the role's character. Then translate the abstract meaning to visual elements. For example, if this role's persona is serious, the designer may intuitively use sharp, straight lines. This step depends on the personal experience of the designer.

After translating the abstract meaning into visual elements, the next step is costume style, or visual elements. This system divides the costume into three parts: head, body, and shoes. For each designated element, possible compositions are sketched. If the result does not match the design expectancy, the designer can return to the composition step (Figure 41).

### III. Manufacturing development



**Figure 42:** III. Manufacturing development

The manufacturing of furniture has two possible forms: one is traditional hand made furniture; the other is modern manufacturing process.

#### 1. Traditional hand made furniture

Craftsmen's process for handmade furniture includes: choose lumber, template, cutting, combining all pieces, craft, modify, and lacquer. In choosing lumber, wood length, hardness and luster are the main things to consider. After the process of drying the wood, manufacturing can begin. According to luster and grain, cut the wood to separate heartwood<sup>2</sup> from side wood心材與邊材 for use in different capacities. In the traditional hand made furniture, craftsmen's design sense and hand made skill are the keys to affect the quality of the furniture. Additionally, the craftsmen's main skill is making the tenon joints and the other is carving skill. "Tenon joint is a very traditional skill in furniture making which can show a craftsmen's skill, sense of beauty and

<sup>2</sup> Heartwood: The measure of area is bigger than other wood which is called heartwood.

united functional artistry” (Translated from: 榫接是非常傳統的木工結合技法，可以展現工匠的技藝與美感，功能性與藝術性兼備。)( Chou, 邱茂林, 2002, p112).

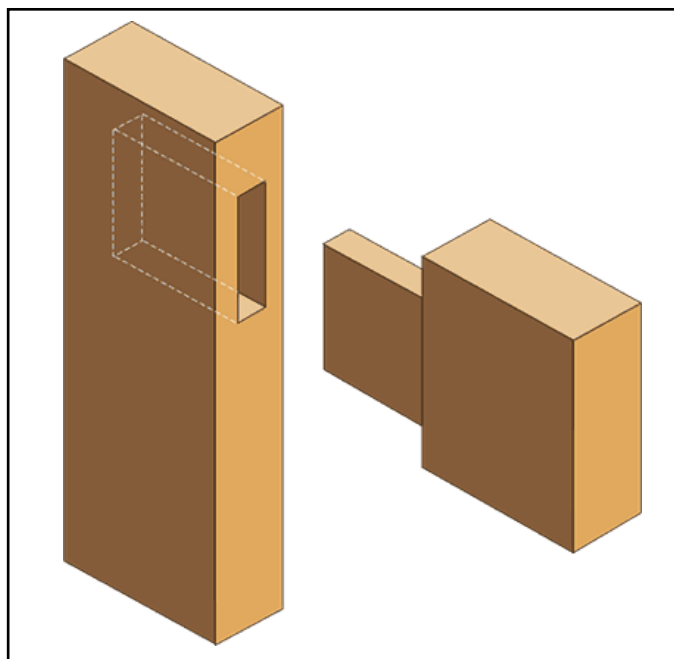
*Introduction to the main kinds of Tenon joint structure:*

A. Straight tenon joint 直榫:

Benefit: Straight tenon joint can resist outside force in every direction.

Straight tenon include: blind tenon 暗榫, one-third with through joint 三缺榫, through tenon joint 貫穿榫, haunched tenon joint 單添榫, and tenon joint with wedge 榫加木楔, etc.

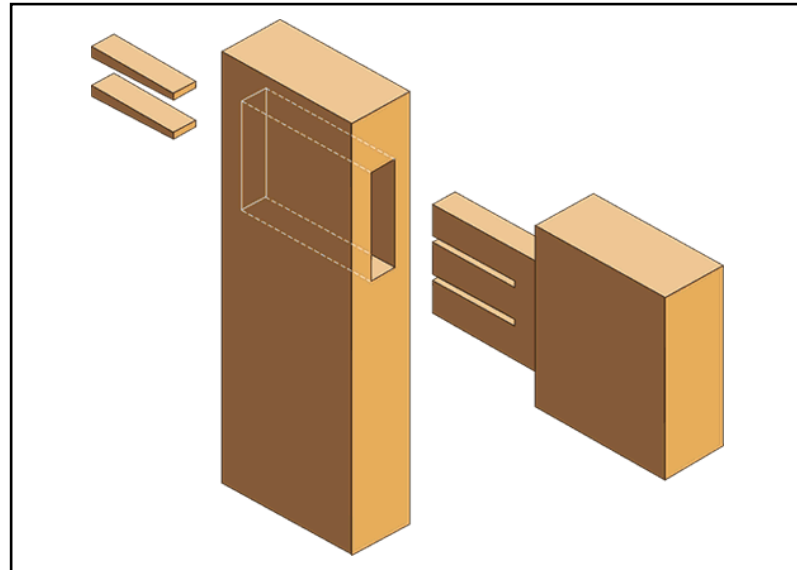
(1) Blind tenon use in column and crosspiece connection (Figure 43)



**Figure 43:** Blind tenon (Source: Various mortise and tenon joints - [www.lowes.com](http://www.lowes.com))

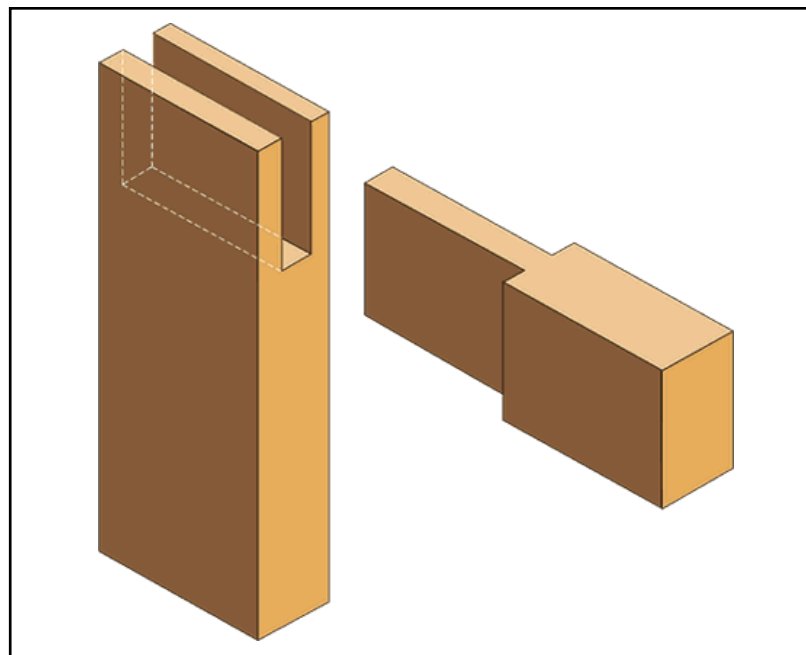
(2) Straight tenon joint also called a through tenon joint. It can strengthen the

frame structure, for example straight tenon joint with wedges can mend the furniture structure (Figure 44).



**Figure 44:** Straight tenon joint (Source: Various mortise and tenon joints - [www.lowes.com](http://www.lowes.com))

(3) The corner bridle joint's particular frame structure allows the joint to expose (Figure 45).

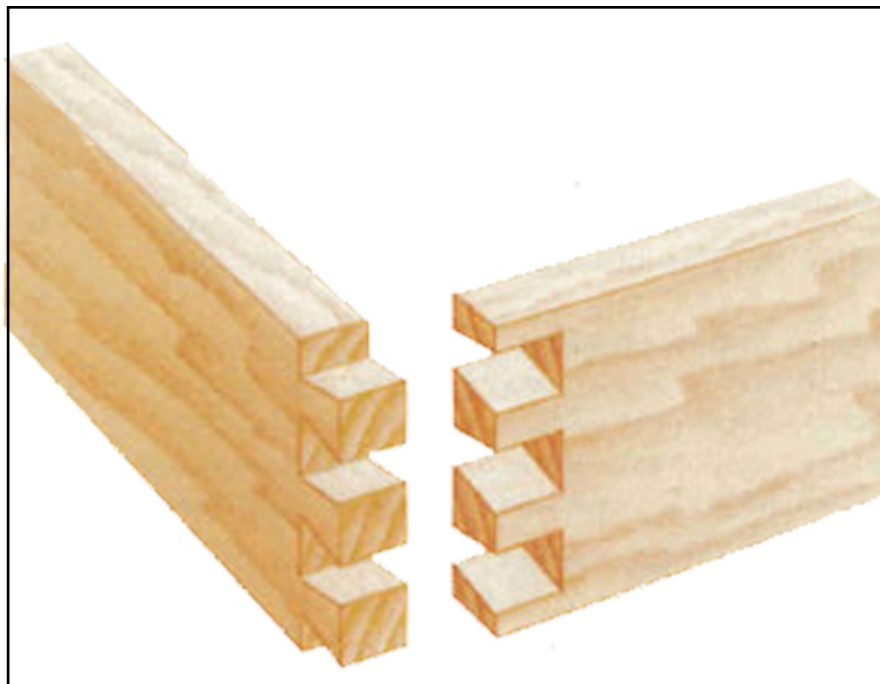


**Figure 45:** Corner bridle joint (Source: Various mortise and tenon joints – <http://www.lowes.com>)

## B. Dovetail joint:

Benefit: Dovetail joints can resist pulling force and thrusts, making it suitable for solid wood. Also, it is one of the strongest joints because it can resist every pulling force and thrust from every direction except the direction it insets into the joint.

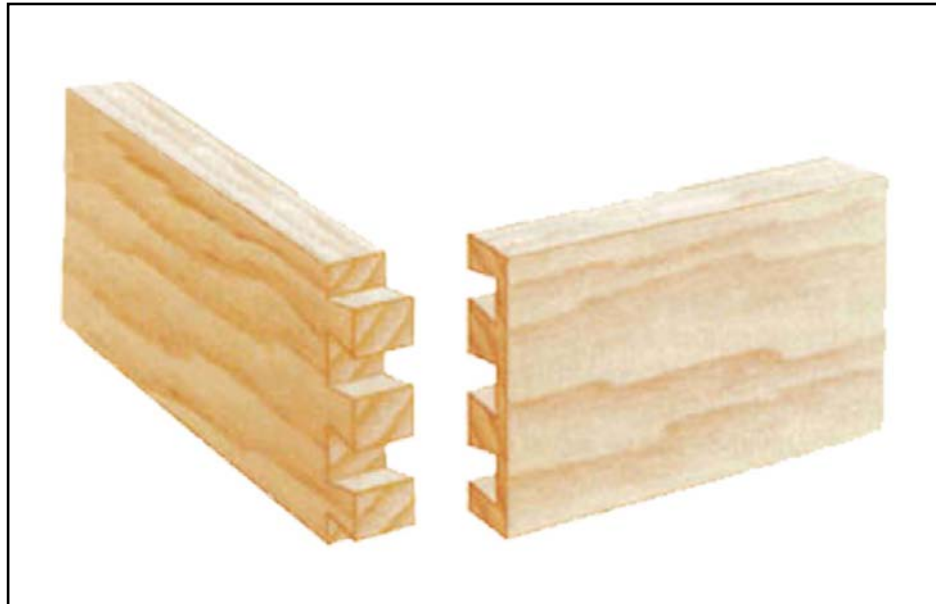
(1) Traditional furniture exposes the dovetail joint to representative good quality and hand made tenon skill (Figure 46).



**Figure 46:** Through dovetail joint

(Source: <http://www.efi-costarica.com/antique-furniture-joints.html>)

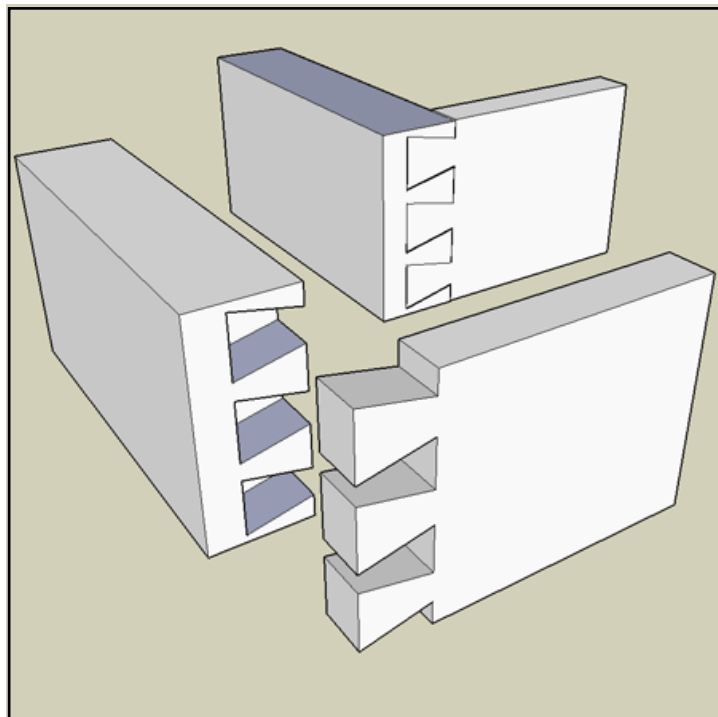
(2) Half-blind dovetail joint which is used in drawer mortise on the front and side board because it can resist pulling forces (Figure 47).



**Figure 47:** Half-blind dovetail joint

(Source: <http://www.efi-costarica.com/antique-furniture-joints.html>)

(3) The mortise of small, cubed pieces and wider boards can also use the half-blind dovetail joint (Figure 48).

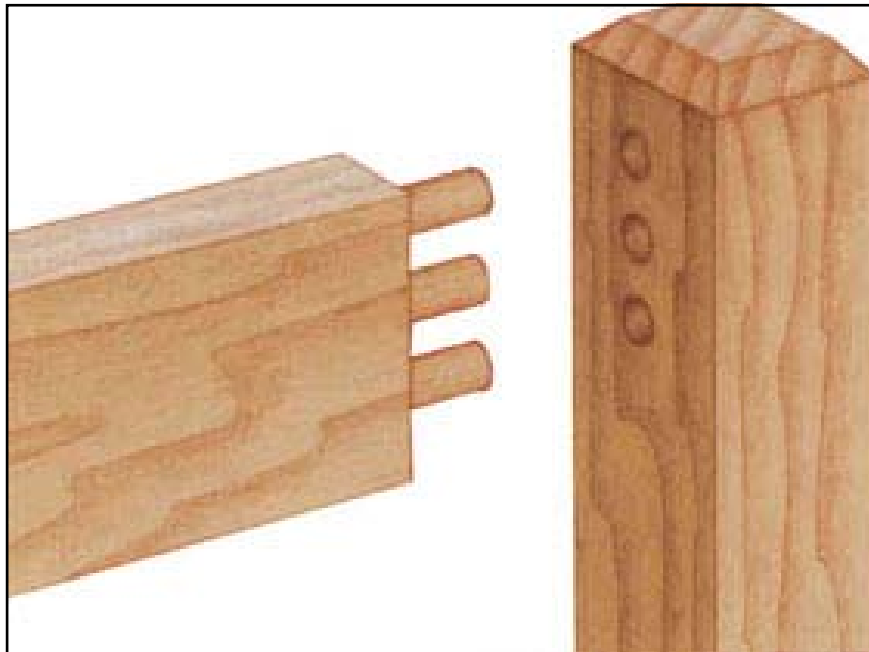


**Figure 48:** Half-blind dovetail joint

(Source: <http://en.wikipedia.org/wiki/File:Joinery-halfblinddovetail.gif>)

C. Other useful mortises:

(1) Artificial board can use the doweled joint (Figure 49).



**Figure 49:** Doweled joint

(Source: <http://www.efi-costarica.com/antique-furniture-joints.html>)

(2) Tapered finger joint used in end to end surfaces (Figure 50).

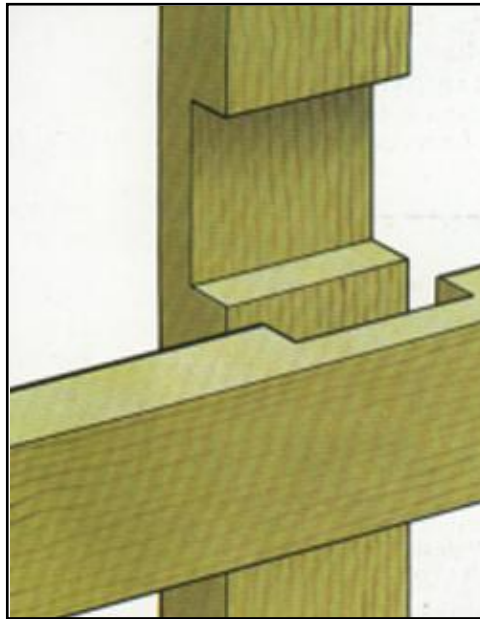


**Figure 50:** Tapered finger joint

(Source: <http://www.franklinadhesives.com/Wood-Adhesives-US/Wood-Adhesives/application/Finger-Joint.aspx>)



(3) Cross half lap joints can resist revolving force and are used on simple frame structures (Figure 51).



**Figure 51:** Cross half lap joint (Source: [http://www.diyinfo.org/wiki/What\\_Are\\_Angle\\_Or\\_Cross\\_Timber\\_Joints](http://www.diyinfo.org/wiki/What_Are_Angle_Or_Cross_Timber_Joints))

(4) The tongue and groove joint can fit similar objects together, edge to edge, which uses a wide board mortise (Figure 52).



**Figure 52:** Tongue and groove joint  
(Source: <http://www.mplustimber.com/parquet.html>)

Next, crafting is the traditional art applied to solid wood furniture. Adding crafting can enhance the quality of the furniture. The craftsman's skill can create 2D patterns to 3D embossments (Figure 53 and 54).



**Figure 53:** Professional craftsman crafting status (Source: Picture taken in *Yung-Shing Furniture Co.*)



**Figure 54:** Crafting detail (Source: Picture taken in *Yung-Shing Furniture Co.*)

Painting is the last step in the manufacturing process. This may be done using raw lacquer or a finishing coat.

#### (1) Raw lacquer

Raw lacquer is made from tree sap. There are ten steps to the manufacturing process. These steps span 10-14 days, and include sanding, priming, drying, dyeing, detail sanding, and painting. Cotton is dipped into the raw lacquer and then used to smear the lacquer onto the furniture, allowing it to soak into the wood. When the whole process is finished, the furniture will shine and be completely sealed by the lacquer.

#### (2) Finishing coat

The main stream method is using a finishing coat. Smear the water-based primer onto the wood and allow the primer to become dry to the touch. Then sand any rough areas and finally, apply the finishing coat. This way is much simpler and meets consumers' demand for fast, standardized, and inexpensive furniture.

## 2. The modern manufacturing process

Modern manufacturing process represents a huge change in wood furniture design (Chou, 邱茂林, 2007, p138). In the past, craftsmen used a saw and planer to cut

and plane the wood. Today, the industry is particular about efficiency, so mass production is the new mode for manufacturing and can reproduce a lot of product in a short time.

Mass production is a method of producing products in large quantities at low cost per unit. It began during the growth of the machine-tool industry. Therefore, when a designer designs a product, they have to consider modular common ability, ease to process and reduce the number of modules. Additionally, dividing the module into applicable pieces can reduce indirect and supply costs. Therefore, modern carpentry machines are a necessity to mass production. These include: band saw sharpener, sponge drum sander, stroke belt sander, router, variable-speed bench jointer, band saw, bark-peeler, boring machine, buffing machine, carving machine, disk sander, dust collector, etc. Hand tools include: wood chisel, jig, band saw clamp, block plane, bow saw, keyhole saw, etc.

After the introduction of mass production, carpentry machines and tools were used in furniture design. The whole design process has six steps: design concept, sketches, shop drawing, template making, assembly, painting, spray painting, and creating a marketing strategy.

While drawing sketches, the designer must confirm which material will be used, product structure and then analyze the structure and producing mode. As noted above, dividing the module into pieces for mass production if possible, and reducing the number of modules will help to achieve a low cost but good value product. When the work is to be produced in quantity, only one machine setting and only one set of tools are needed, attributing to the reduced cost.

Today, designers use 3D software to build the full size model and transfer it to 1/10 scale 2D drawing. Then the professional template maker uses this 2D drawing to

zoom in one by one to the full size drawing and attach the full-sized prints of the drawing to wood. Last, the cutter cuts the wood template and planes it according to the 2D drawing. Using the template to cut the quantity of wood and plane, the cutter then makes tenon joints to assemble. After the assembly of the furniture, the last steps of the process are sanding and painting.

Some high quality furniture is still sanded and painted by hand. However, lacquer spray is the main stream finish on the furniture today. The first step is to use the primer paint to fill the wood capillary membrane, and when the wood has dried continue to sand it. The next step is the finishing coat. Creating a marketing strategy, which identifies the marketing position, selling price, shipping system and advertisement can be completed at this point.

#### (4) Conclusion

The result of final product style.

## CHAPTER SEVEN: APPLICATION RESULTS

The guidelines and design system have been developed in previous chapters. This chapter will apply each role's design guidelines into DFCEICD's style development of chair design. For each role, an example of the style development process will be applied in full; for *Dan* both style development and the process will be applied in an example.

### *7.1 Choose topic*

In *Qiu's* interview with *Yung-shing* furniture company's vice president *Wen-yi Jiang*, he said: "Furniture is the product which is most representative of era and culture" (Qiu, 2007, p53). Various pieces of furniture such as the chair can be most representative of design thought (Qiu, 2007, p26). Since 220 BC, human life has used chairs as furniture. Even now, the chair is a necessary product in human life. In other words, the relation of chair to human is inseparable. In this chapter the design guidelines will be applied to the chair.

### *7.2 Analyze topic*

The major function is for sitting. The scope of this study was limited to chairs placed in professional waiting rooms and offices. The chair will have an

armrest and backrest. The target market for these chairs is ranging from 30-80 years of age.

### *7.3 Design integration of Sheng, Dan, Jing, and Chou*

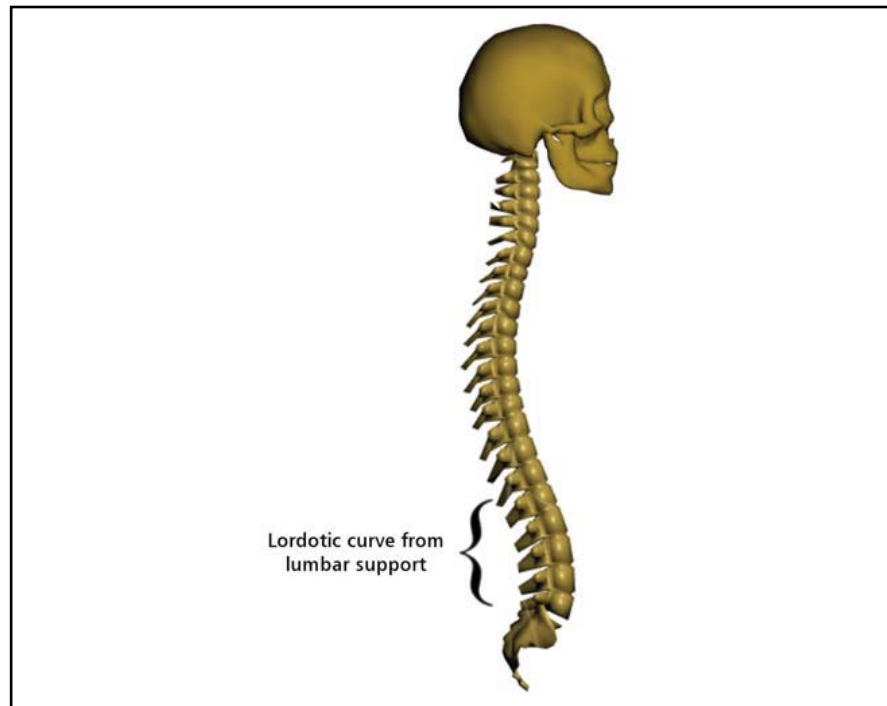
#### *7.3.1 Function development*

These particular chairs will include a backrest and armrest. “A good seated posture is one that is comfortable and does not put a lot of stress or strain on the user’s buttocks, back, or arm muscles, and allows the user’s feet to be on the floor”( Openshaw & Taylor, 2006, p14).

##### A. Backrest

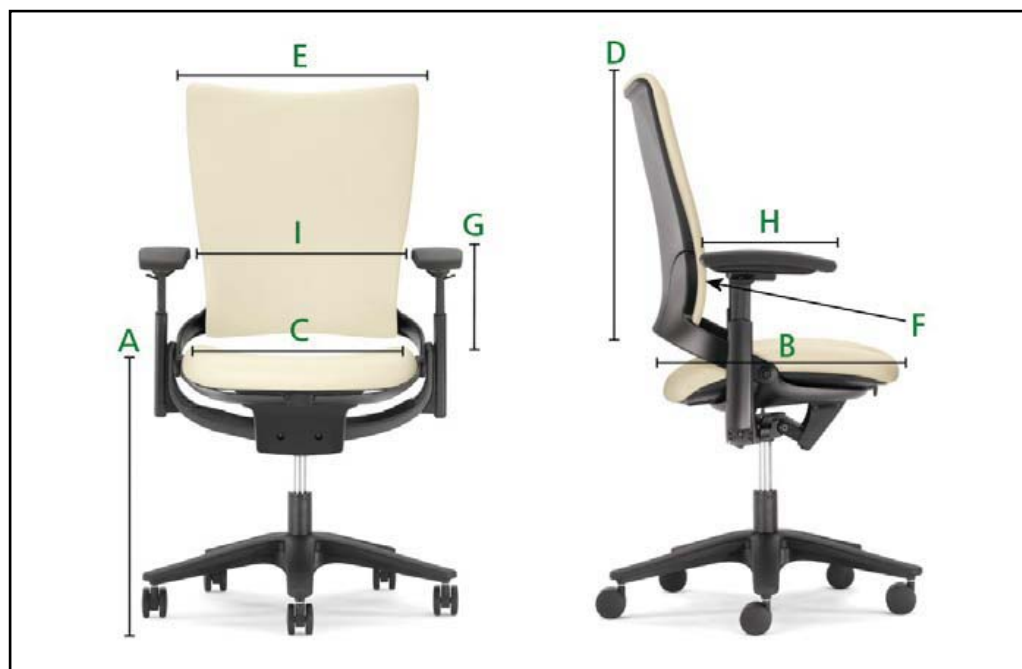
The backrest is essential to designing a chair according to these specifications. To be effective the backrest should conform to the contour of the spine to decrease stress on the back muscles (Openshaw & Taylor, 2006, p.25). “Prolonged sitting is generally accepted as a high risk factor in low back pain and it is frequently suggested that a lordotic posture of the lumbar spine should be maintained during sitting” ( Lengsfeld, Frank, Van Deursen, & Griss, 2000). According to these resources, people spend more time sitting in chairs than they do standing. As noted above, spine support in the chair is critically important (Figure 55). Thus, people determine which is a good chair to sit on based on the effectiveness of the backrest to support their aching back. According to the data of BIFMA chair design guideline measurements, the

most prominent point is 5.9”-9.8” from seat pan (Figure 56 & 57). Generally, chair measurements are given with and without the headrest (Figure 58).



**Figure 55:** Appropriate S-shaped curve of the spine

(Source: <http://www.allsteeloffice.com>)

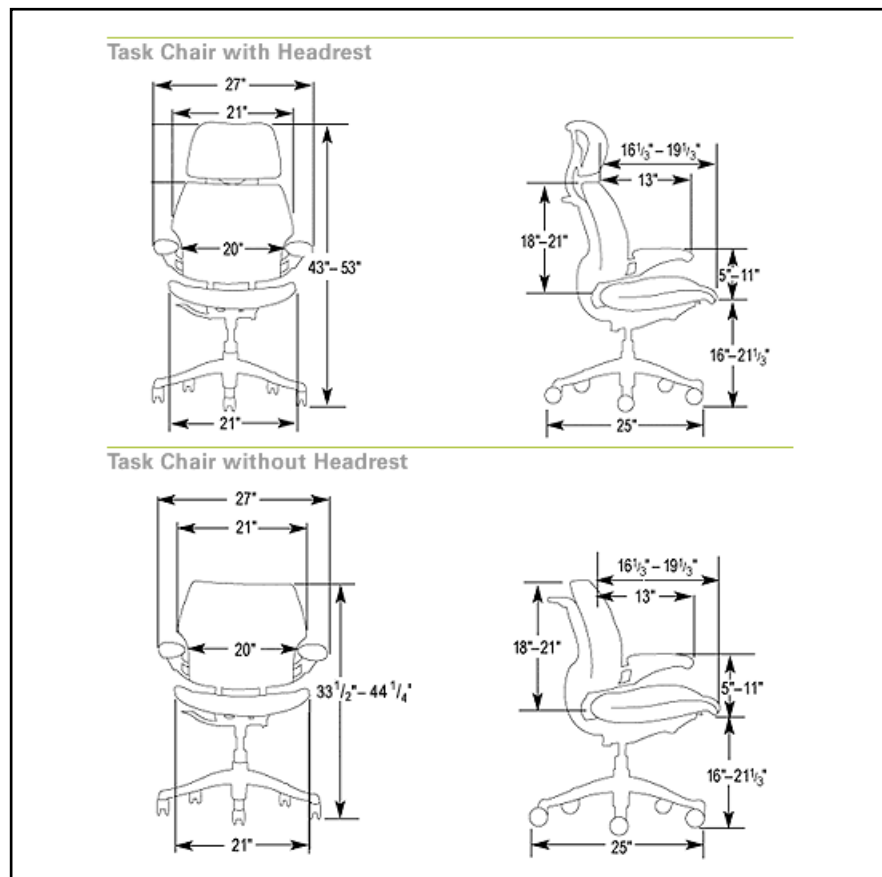


**Figure 56:** Measurements from BIFMA guidelines used for ergonomic chairs



		Measurement	Specifications BIFMA Guideline	Allsteel Sum Chair
Seat Height	A	Popliteal height + Shoe allowance	15.0" - 19.9"	15.0" - 22.25"
Seat Depth	B	Buttock-popliteal length- Clearance allowance	No deeper than 16.9" (fixed) 16.9" included (adjustable)	15.0" - 18.0"
Seat Width	C	Hip breadth, sitting+ Clothing allowance	No less than 18"	18.0"
Backrest Height	D	None	At least 12.2"	24.0"
Backrest Width	E	Waist breadth	14.2"	16.0"
Backrest Lumbar	F	None	Most prominent point 5.9"- 9.8" from seat pan, in and out 1	Infinite through ht. of back (AutoFit™ technology)
Armrest Height	G	Elbow rest height	6.9" - 10.8" 7.9" - 9.8"	7.0" - 11.0"
Armrest Length	H	None	None	10.5"
Distance Between Armrests	I	Hip breadth, sitting+ Clothing allowance	18" (fixed) 18" included (adjustable)	16.5" - 19.0"

**Figure 57:** Specific BIFMA chair design guideline measurements. All measurements are in inches



**Figure 58:** Common chair measurements (Source: Down Under Company)

## B. Armrest

Similar to the backrest, the armrest supports the neck, shoulders, and back by providing a surface for the arms to touch. This relieves pressure between the arms and the back (Openshaw & Taylor, 2006, p.25). As afore mentioned, people determine which chair to sit in, based upon the right curvature of backrest, and the functionality of the armrest. The armrest height measurement from the BIFMA chair design guideline shows 6.9"-10.8" or 7.9"-9.8" (Figure 57).

### 7.3.2 Style development

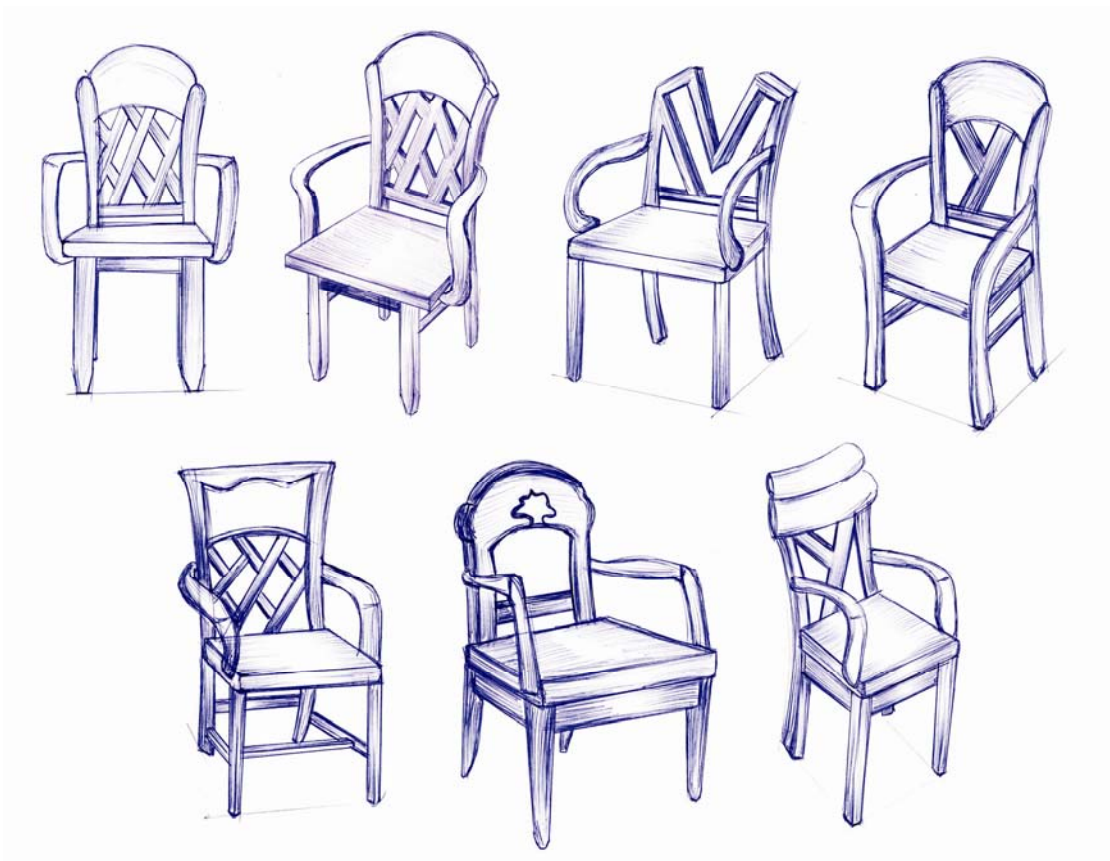
The next step is to develop the style of a chair for *Sheng, Dan, Jing, and Chou*. In this section, each role's sketches, 3D model, guideline application and scale model will be given.

#### A. Sheng style

*Sheng's* personality is that of a gentleman, and he is said to have an iron hand in a velvet glove. His acting is casual but elegant, and his appearance is pretty. Therefore, this kind of *Sheng* could have the role of a scholar, loyal courtier, dutiful son, or virtuous person. For example, he is a gentleman and elegant abstract elements can transfer to visual elements such as straight lines with a few soft curves. The next step is choosing a pattern from *Sheng's* guidelines. Choose visual design elements from head, body, and shoes from

*Sheng's* guidelines and design to yield possible compositions. Following are the sketches, 3D model, guideline application and scale model of *Sheng*:

i. Sketches



**Figure 59:** *Sheng's* chair style sketches

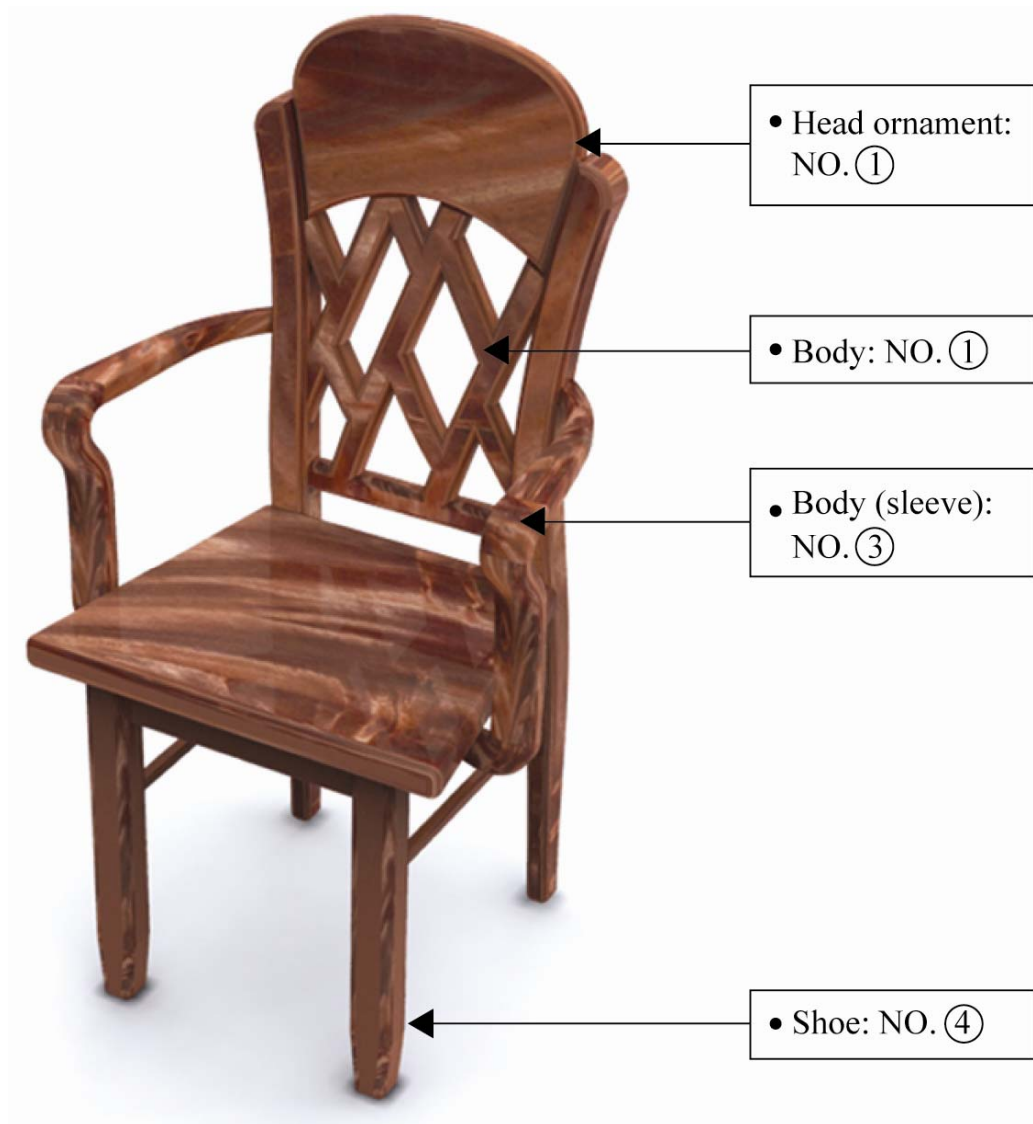
ii. 3D model



*Sheng* 生

**Figure 60:** *Sheng's* chair 3D model

iii. Design guideline application

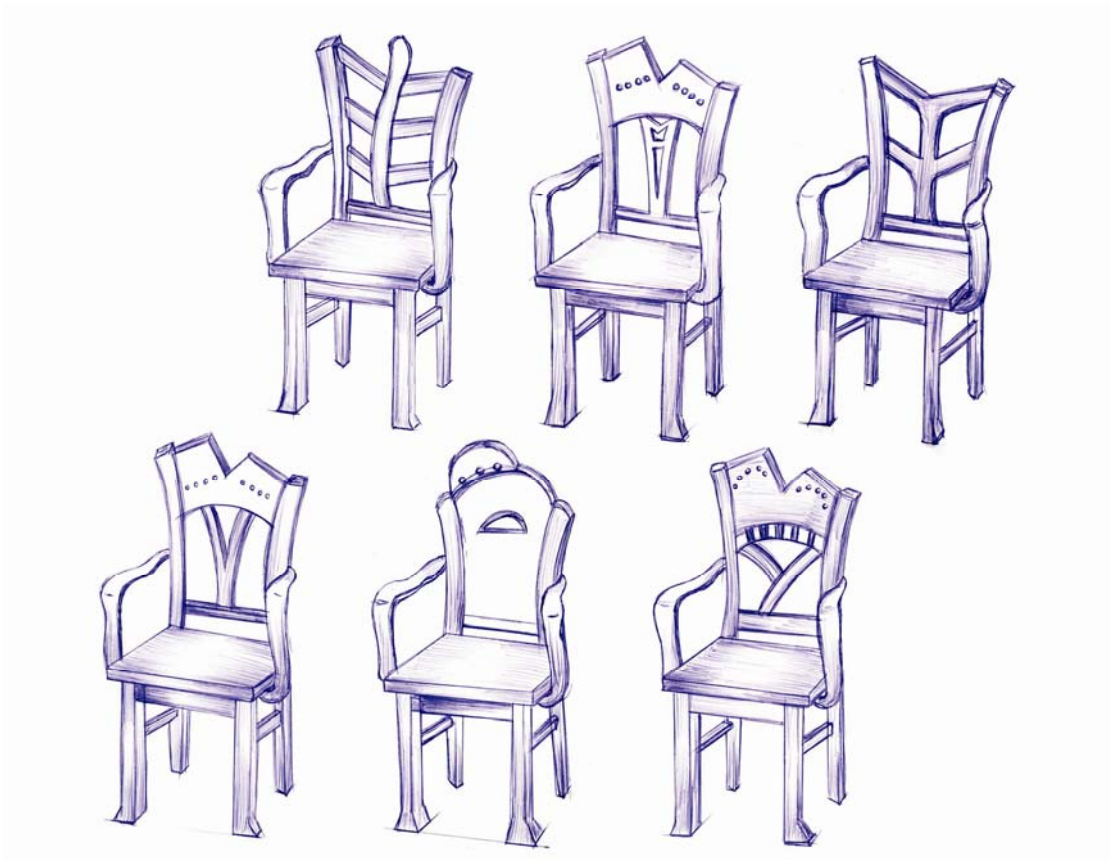


**Figure 61:** Design guideline applied to a model of *Sheng's* chair

## B. Dan style

The style development for *Dan* is similar to that of *Sheng*. The design of *Dan* possesses few straight lines but rather emphasizes the curved lines. Following are the sketches, 3D model, guideline application and scale model of *Dan*:

### i. Sketches



**Figure 62:** *Dan*'s chair style sketches

ii. 3D model



**Figure 63:** *Dan's* chair 3D model



iii. Design guideline application



**Figure 64:** Design guideline applied to a model of *Dan's* chair



### C. Jing style

*Jing*'s personality is that of a calm, steady, and impressive man. His acting exhibits great power, and his appearance evokes great fear. The visual representation of *Jing* appears in the sharp, straight lines of the character's chair.

Following are the sketches, 3D model, guideline application and scale model of

*Jing*:

#### i. Sketches



**Figure 65:** *Jing*'s chair style sketches

ii. 3D model



*Jing* 淨

**Figure 66:** *Jing's* chair 3D model

### iii. Design guideline application

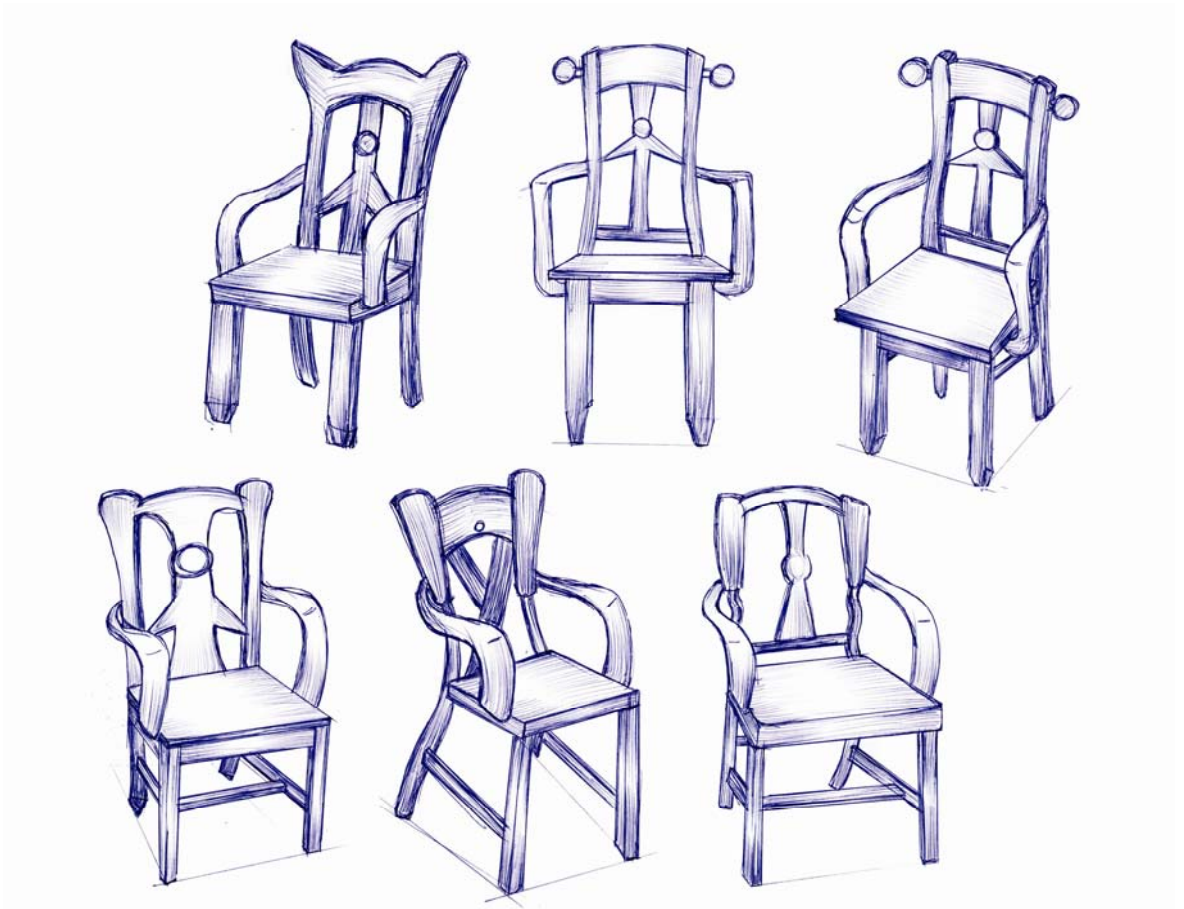


**Figure 67:** Design guideline applied to a model of *Jing*'s chair

### D. Chou style

*Chou* can range from an honorable man to a scoundrel. In both he possesses a humorous element that is reflected in the design of his chair. His acting is comical and boorish. The irregular and asymmetric lines of the chair reinforce the humor of the character. Following are the sketches, 3D model, guideline application and scale model of *Chou*:

i. Sketches



**Figure 68:** *Chou's* chair style sketches

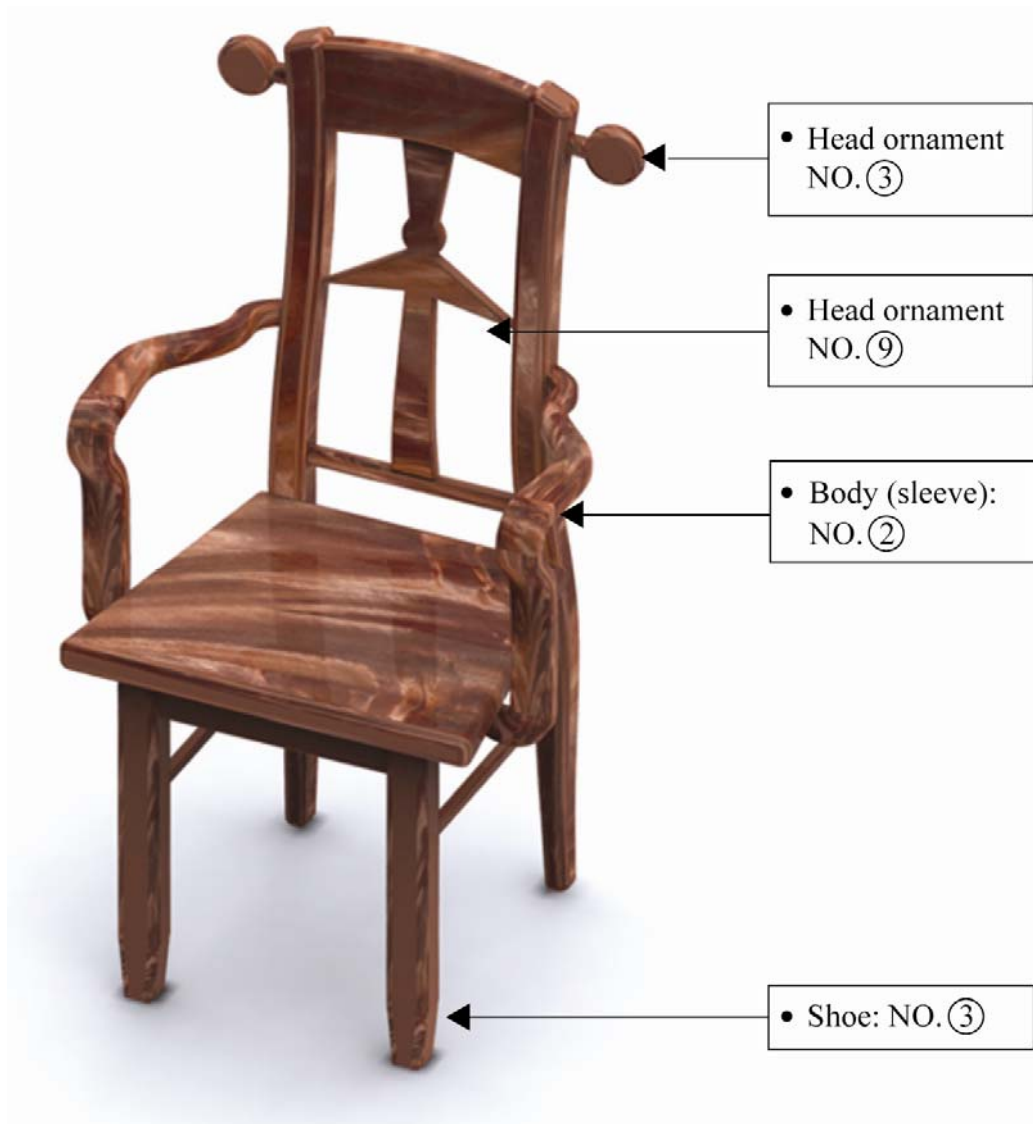
ii. 3D model



*Chou 丑*

**Figure 69:** *Chou's chair* 3D model

iii. Design guideline application



**Figure 70:** Design guideline applied to a model of *Chou's* chair



The scale models of *Sheng, Dan, Jing, and Chou*:



**Figure 71:** The scale models of *Sheng, Dan, Jing, and Chou*

### 7.3.3 Manufacturing development

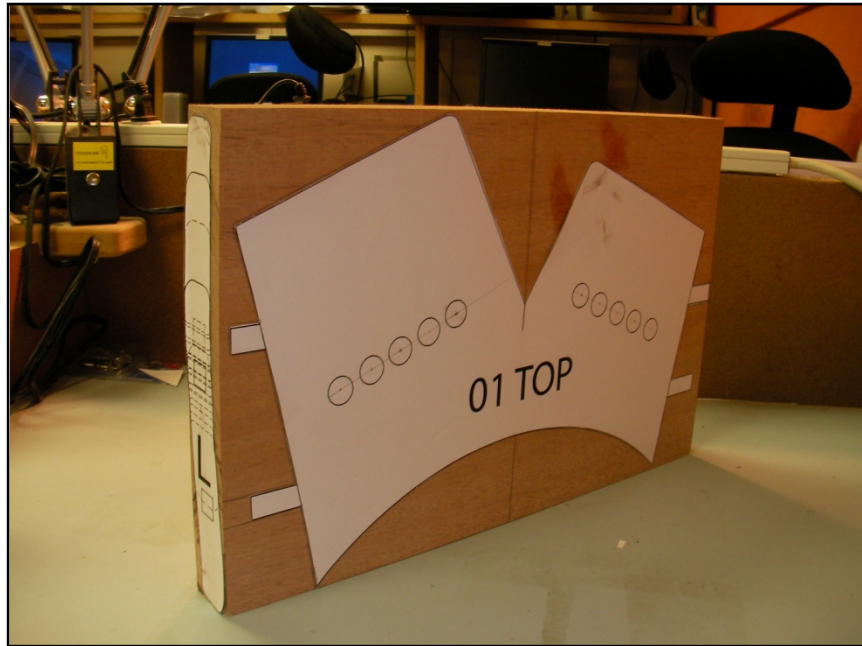
In this section, *Dan* will be used as the example of manufacturing development. According to several industrial designers, *Dan*'s style is the most unique. Therefore, this style was chosen for continued development. There are six steps in this process:

#### A. Building 3D model and technical sketches

Using 3D software, the full size model can be built precisely to the designer's specifications. There are 17 pieces used to construct *Dan*'s characteristic chair (Figure 72).







**Figure 74:** Template attached to the wood

### C. Cutting the pieces

Use the template to make the cutting process more efficient. Use a band saw to cut each piece (Figure 75).



**Figure 75:** Band saw

#### D. Make tenon joint and wood dowel joint

Estimate the suitable tenon joint to use on each piece and construct each piece, such as in the example as follows (Figure 76 to 82)



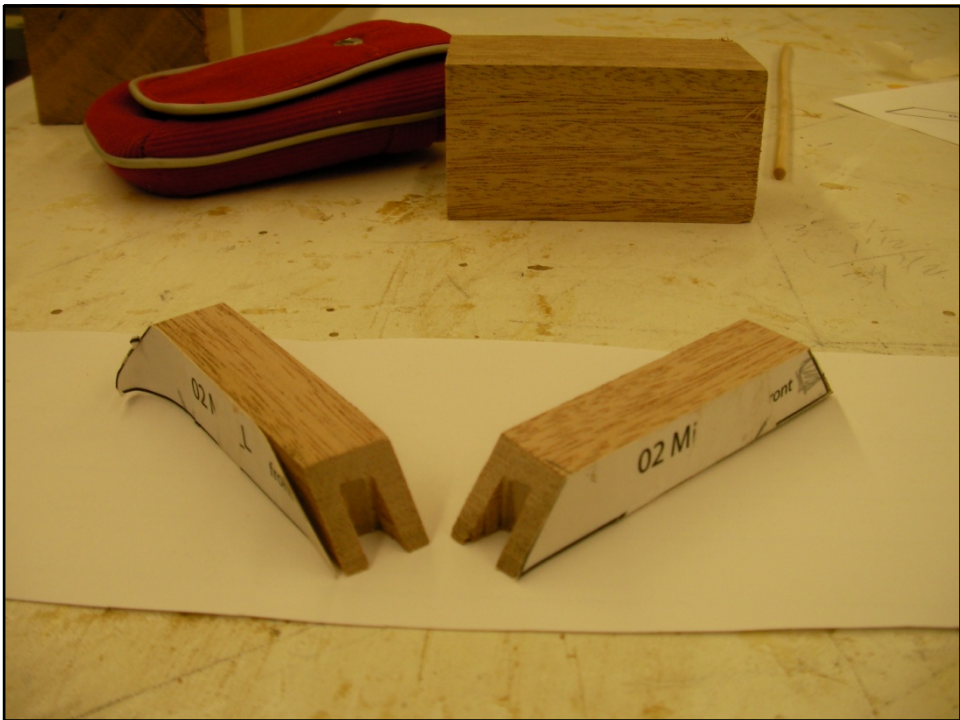
**Figure 76:** Before cutting this wood, the dowel joint must be drilled



**Figure 77:** Put the dowel into the hole



**Figure 78:** Cut the hole for the tenon joint



**Figure 79:** Finish cutting the holes





**Figure 80:** Insert a piece of wood into the hole to form the tenon joint



**Figure 81:** Cut the rest of the piece



**Figure 82:** Finished tenon joint



**Figure 83:** Backrest tenon joints



### E. Constructing each piece

Use a hammer to secure the tenon joint into the hole.



**Figure 84:** Securing the tenon joint using a hammer

### F. Sanding and Tung oil finishing

The last step involves sanding each piece and then preserving the furniture with Tung oil, protecting it from moisture.



**Figure 85:** Final sanding



**Figure 86:** Tung oil finishing used on the chair



**Figure 87:** The final chair model of *Dan*- front view





**Figure 88:** The final chair model of *Dan*



**Figure 89:** The final chair model of *Dan-* with cushion

#### 7.4 Conclusion

Using the Design Framework of Cultural Element Integrated Furniture Design (DFCEICD) to design the furniture increases efficiency. These four chairs are designed to demonstrate the application of these guidelines and the DFCEICD design process frame (Figure 90). To apply the design guidelines function and manufacturing must be considered, which many result in a necessary deviation from the original sketch.



**Figure 90:** 3D models of *Sheng*, *Dan*, *Jing*, and *Chou*

## CHAPTER EIGHT: DISCUSSION AND CONCLUSIONS

The intention of this thesis was to uncover a probable composition to transform the Taiwanese Opera costume design guidelines into furniture design. In this research, four roles of Taiwanese Opera - *Sheng*, *Dan*, *Jing*, and *Chou* – were used as the inspiration to create chairs bearing Asian influence. The results of this study suggest that the fashion designers of theater performance still follow the basic costume style from the *Ming* and *Qing* dynasties. Although the designers kept the basic costume style, there are new patterns incorporated into the design, creating a new costume altogether. These four chairs were designed to demonstrate the application of these guidelines and the DFCEICD design process frame and exhibit the developing trend of modernized classics.

Designers may use these guidelines for the head ornament, body, and shoes and apply them to the top, middle, and bottom part of a chair, and thereby choose the style concept from the composition. Moreover, the developments of function and manufacturing must be integrated in the style concept. As there are four guidelines and several items in each guideline, many different combinations are possible.

These design guidelines are used to help the designer build Taiwanese Opera or Asian style chair. This in turn will perpetuate the unique culture of the Taiwanese Opera.

Suggestion for future research:

Due to the limits of funding, research personnel, and time, some things were unable to be completely analyzed, such as:

1. Each role has more than one type, such as *Sheng* has two types of roles: one a scholar and the other a martial artist role. Because of time limitations, only one role was analyzed. Therefore, the research could continue to study it and develop the role's design guideline.
2. The research could develop the other process frame to apply on other products, such as electronics, tableware, etc.
3. This is not the only solution which demonstrates how to apply these design elements, the researcher could develop other methods to study the design elements of Taiwanese Opera costumes.

## References

### Books:

Anonymity (*Ming Dynasty*). *燕寢怡情*. 上海：藝苑真賞社.

Dondis, D.A. (1973). *A primer of visual literacy*. Massachusetts: The MIT Press.

Sanders, M.S., & McCormick, E.J. (1992). *Human factors in engineering and design* (p.5). Singapore: McGraw-Hill

Hua, M. (2001). *服飾與中國文化*. [Costume and Chinese culture]. Beijing:

人民出版社.

La Vie editorial department (2007). *泰國人憑什麼*. [Being slow & creative].

Taipei: 麥浩斯 [Mai Hao Si press]

Lin, H.Y. & Cai, X.X. (2004) *光影·歷史·人物 歌仔戲老照片*. [Old pictures of

Taiwanese Opera]

Tilley, A.R., & Dreyfuss, H (2002). *The measure of man and woman* (p.9). New

Jersey: Wiley press.

Qiu, C.L. 邱坤良 (1992). *日治時期台灣戲劇之研究(1895-1945)*. [A study of

Taiwanese opera in Japanese era]. Taipei :自立晚報出版部 [Zi Li

Wan Bao press].

Qiu, M.L., Hong, Y.C., & Chen, P.Y. 邱茂林, 洪育成, 陳珮瑜 (2007). 木家

具台灣新意匠. [Taiwanese wood furniture & new craftsmanship] (p.26).

Taiwan: 積木文化 [Cube culture press].

Tylor, E.B 1920 (1871). *Primitive Culture*. New York: J.P. Putnam's Sons.1

Quan, Z.N.官政能 (1995).*產品物徑*. [The process of design producing,

development and application] (p. 86). Taipei: 藝術家出版社 [Artist press].

Yang, F.L.楊馥菱 (2002).*台灣歌仔戲史*. [History of Taiwanese opera]. Taiwan:

晨星出版有限公司 [Morning Star press].

Yang, F.L.楊馥菱 (1999).*台灣歌仔戲*. [Taiwanese Opera]. Taipei:漢光文化

[*Han Guang* culture press].

Journal:

Lengsfeld, M., Frank, A., Van Deursen, D.L., & Griss, P. (2000) Lumbar spine curvature during office chair sitting, *Medical engineering & physics*, 22(9), 665-669.

Lin, D.L.林東龍 & Yu, J.F.余佳芳 (2005). 符號意象在產品造形上之探討-以

義大利設計風格為例, *Journal of Humanities and Social Sciences*, 1(1),

19-27.

鄔元江 (1994) 個體意志和丑角意識-戲曲丑角美學特徵的文化基因, *戲劇戲*

*曲研究*, 2, 74-83

Magazine:

Lin, R.T. 林榮泰, (2005, June). Learning Principles of Chinese Character for Product Design, *藝術欣賞* [Appreciation of Art].

Theses:

Chen, Y.J. 陳郁菁 (1993). *台灣野台歌仔戲丑角研究-以台南市秀琴歌劇團為例* [On the Role of Crown in Outdoors Taiwanese Opera Based on *Shiu-Kim* Taiwanese Opera Troupe in Tainan City ].成功大學藝術系研究所 [ Institute of Art Studies, NCKU].

Guo, Z.K. 郭澤寬 (1999). *從劇場演出看歌仔戲的現代化*. [ A study from theatrical performance effects Taiwanese opera today] 南華大學美學與藝術管理研究所 [ Department of Aesthetics and Arts management , *Nanhua* University].

Huang, Y.R. 黃雅蓉 (1994). *野台歌仔戲演出風格之研究*. [A Study of the performing styles of Taiwanese *yee-tair Ge-tzyy* Opera].

Miyazaki, K. 宮崎 清(2002). *地方工藝產業營運行銷策略國際研討會*. [Cultural arts marketing seminar]. Taipei : 文建會論文集 [Theses from council for cultural affairs, Taiwan].



Quan, Z.N.官政能 & Chen, M.C. 陳玫岑 (1991).*產品的文化特質示意性探討*

*討* [A study of product's culture distinguishing characteristic]. 工業設計

技術研討會論文集 [ Proceeding of conference on Industrial design  
technique].

Wu, M.F.吳孟芳 (1991).*歌仔戲坤生文化之研究* [A study of Sheng's

characteristic in Taiwanese opera].台大戲劇研究所[ Department of drama  
and theatre, National Taiwan University].

Zhang, X.Y 張縉月 (2006). *歌仔戲劇本中的臺灣意識研究- 以《東寧王國》*

*《彼岸花》《台灣，我的母親》為例*. [A study of Taiwan consciousness of  
Taiwanese Opera].

Video:

BIFMA International (Association). (2002, February 28). *Ergonomics Guidelines  
for VDT (Video Display Terminal) Furniture Used in Office Workspaces*.  
[Video]. Document G1-2002.

Websites:

BusinessWeek. *Asian Design Comes of Age*.

Retrieved December 14, 2007, from

[http://www.businessweek.com/globalbiz/content/dec2007/gb20071214\\_216  
249.htm](http://www.businessweek.com/globalbiz/content/dec2007/gb20071214_216249.htm)

BIFMA (The Business and Institutional Furniture Manufacturer's Association)

<http://www.bifma.org/>

Chen, C.N.陳其南 & Won, S.M.翁世盟 (2002).從文化創意產業的觀點看藝術與

人文領域的課程發展 [ The point of view of cultural product with course of the development of humane field] (p.138).

Retrieved August 25, 2009, from

<http://www.edunet.taipei.gov.tw/public/>

Furniture industry (2009). *In Encyclopedia Britannica*.

Retrieved October 11, 2009, from

<http://www.britannica.com/EBchecked/topic/222678/furniture-industry>

Modeling magazine, Jurgita.com. *Furniture trends 2008-2009*.

Retrieved June 22, 2008, from

<http://www.jurgita.com/articles-id2636.html#void>

Newberry, L.R. *Decorating Tips: Adding Asian Design Elements to your home*.

Retrieved August 17, 2005, from

[http://www.associatedcontent.com/article/6973/decorating\\_tips\\_adding\\_asian\\_deign.html?cat=30](http://www.associatedcontent.com/article/6973/decorating_tips_adding_asian_deign.html?cat=30)

Liang, R.S.梁若珊 (1996). Internet textbook: *百變造形說衣箱* [ Information of role's Costume ]

Retrieved February 10, 2008, from

<http://w95.bengzi.org.tw/index2.htm>

Lin, W.S. 林紋守 (2002). *歌仔戲藝術文化資訊站* [The information of Taiwanese opera]

Retrieved March 18, 2009, from

<http://www.twopera.net/article/compare.php>

Openshaw, S., & Taylor, E. (2006). Ergonomics and design a reference guide.

Retrieved August 05, 2009, from

[www.allsteeloffice.com/ergo](http://www.allsteeloffice.com/ergo)

國立中央大學 中文戲曲研究室 [ National Central University-Lab of Chinese opera].

Retrieved February 18, 2009, from

<http://kunopera.lib.ncu.edu.tw/KunOpera/Antiquemenu?kind=7>

中國華文教育網 [Overseas Chinese Language and Culture Education Online].

Retrieved September 19, 2008, from

[http://big5.hwjyw.com/zhwh/traditional\\_culture/zgfs/](http://big5.hwjyw.com/zhwh/traditional_culture/zgfs/)

Pictures:

*Hakka* blue shirt

[http://www.flickr.com/photos/lu\\_s/3172974239/](http://www.flickr.com/photos/lu_s/3172974239/)

Japanese kimono, 1938

<http://www.bookmice.net/darkchilde/japan/khist10.html>

Televised Taiwanese Opera & Theater performance

[http://140.124.25.14/.../part\\_5/item\\_1\\_3.htm](http://140.124.25.14/.../part_5/item_1_3.htm)

Red sandalwood *Ruyi*

<http://www.jysls.com/thread-229269-1-1.html>

*Qi* shoes 旗鞋

<http://www.yain.com.tw/prodshow.asp?ProdId=B60514>

Chinese wine cups in *Qing* dynasty

<http://zjjixs.blog.163.com/>

Embroidered shoes 彩鞋 or 繡鞋

<http://www.yain.com.tw/prodshow.asp?ProdId=B60514>

Civil official in *Ming* dynasty & *Bu Zi* 補子

[http://big5.hwjyw.com/zhwh/traditional\\_culture/zgfs/ld/200705/t200705211110.shtml](http://big5.hwjyw.com/zhwh/traditional_culture/zgfs/ld/200705/t200705211110.shtml)

Civil official's *Bu Zi* 補子 & Military officer's *Bu Zi* 補子

<http://big5.showchina.org:81/.../sw/200806/t195463.htm>

Bronze ware

<http://detail.china.alibaba.com/.../239709643.html>

Blind tenon, Straight tenon joint & Corner bridge joint - Various mortise and tenon joints

<http://www.lowes.com>

Through dovetail joint, Half-blind dovetail joint, & Doweled joint

<http://www.efi-costarica.com/antique-furniture-joints.html>

Half-blind dovetail joint

<http://en.wikipedia.org/wiki/File:Joinery-halfblinddovetail.gif>

Tapered finger joint

<http://www.franklinadhesives.com/Wood-Adhesives-US/Wood-Adhesives/application/Finger-Joint.aspx>

Cross half lap joint

[http://www.diyinfo.org/wiki/What\\_Are\\_Angle\\_Or\\_Cross\\_Timber\\_Joints](http://www.diyinfo.org/wiki/What_Are_Angle_Or_Cross_Timber_Joints)

Tongue and groove joint

<http://www.mplustimber.com/parquet.html>

Appropriate S-shaped curve of the spine

<http://www.allsteeloffice.com>

Down Under Company

<http://www.downunderchicago.com/op-human-scale-freedom-chair.html>