An investigation into the elements of a successful methodology for influencing contemporary interior design environment of tourist class globally-branded hotels based in China

by

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Abstract

The main purpose of the study is to investigate the possibility of achieving global hotel design diversification through the utilization of traditional cultural characteristics. The focus of this study is global hotel design in local countries of China. The research investigates using glocalisation design (which means the localization plus the globalization) in hotels, to challenge the global hotels' design style that the same in many different countries and cities. This research addresses the relationship between local cultural element styles and the design of global branding hotel style efficacy within hotel in local countries of China.

Relevant literature on the nature of global hotel design style was reviewed. Three stages of primary research (a critical review, observations and interviews) were also conducted in this study. The critical review examined the use of traditional local cultural elements in contemporary hotels.

The observation studies identified the relationship between visitor behaviors and local cultural information within a range of global hotels. However, due to the fact that international tourists have different backgrounds and cultural knowledge, the international guests are not necessarily able to understand traditional local cultural information. In response to primary research findings, a novel design guideline will be created, this guideline is based on traditional design method and links between locations' culture and global hotel design style. Initial user testing indicated that the guideline was appropriate and did significantly improve global hotel design style. Hence, developing a common cultural symbol is becoming main research direction in this study which links with proportion, visual and local symbolism. The interviews further elicited interior design staff views and were used to test the hotel design guideline.

A theoretical design reference model was developed. Initially based on the Le Corbusier design model, the model consists of three phases: analysis, design and assessment. A hotel design guideline was built and tested through user experience testing and expert interviews. Evaluation of this showed that the design guideline blending with global cultural points and local elements. The global cultural points can

easy be accept and understand by foreign guest, meanwhile add some local cultural characteristic that can help guest understand local cultural information. The hotel design guideline that has been developed encourages the related global hotel design style, further shows the local cultural elements and ultimately improving global hotel design style.

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Chapter 1 Introduction

1.1 Introduction

This research relates to the concerns of glocalisation (Robertson, 1995) as the key word in this research. Glocalisation incorporates the complexities of globalization with an emphasis on location. For the purposes of this study glocalisation means globalistion plus location. This study utilizes ‘glocalisation’ as meaning global hotel design would accept Eastern localisation features blending with global branding hotel design style. In the same way, the Chinese local cultural symbol should fit with European cultural background. Hence, one of the unique aspects of this research will be the emphasis on identifying common cultural points within hotel interior design.

In recent years, the number of hotels has increased dramatically. There has been an ongoing discussion about the status of the global hotel brands design in local cities (Walters, Brown, 2004; Blick, 2009). However, studies of the hotel design knowledge have identified noteworthy design problems, including the resolution of global hotel design in local cities (Ernst & Young, 2013). In addition, the designers have to pick some local cultural characteristic when they designed global hotel. This blends local information with global design style is hotel design develop trend. (Kerremans, 2007, Ijsselsteijn and Riva, 2003).

The research considers the above in relation to a suitable hotel design guideline test environment; one that will be challenging and will benefit from the ability to allow access to information that is otherwise difficult to convey to these global brand hotels design in local cities’ environments. According to Robertson (1995) surveys indicate that there is a trend toward global blending with local cultural elements. The glocalisation creative by Robertson (1995), suggested that global business cooperation should regard local business custom and local business law. This research has taken “glocalisation” surveys integrated application, created using the hotel design guideline, will be investigated to meet the requirements of the global hotel design in local city. Moreover, the hotel design guideline to allow customers to experience and understand the local cultural information emphasizing the

importance of local cultural symbols in adopting the integrated application of global hotel design style in local cities.

1.2 Motivation

This research concerns how Glocalisation (which means Globalistion plus location) relates to cultural elements and to the use of geometrically based design linked with symmetrical styles which influences hotel general spaces, such as lobby, reception and guest room of global branded hotel design in a provincial city in China. Globalisation has been a historical trend associated with increased trading routes, but modern communication systems have escalated this trend to such a degree that now most of the world's populations recognize global brands more readily than home based brands. Globalisation has made the world seem smaller, but it has also enabled the dominance of global trends in all areas of our lives. However, Globalisation in general and problems related to global hotel brands design, every hotel design style is the same even in different countries and cities.

In sum, Globalisation is a process leading to new configurations in economic organization and in the relationships between countries. Global branded hotels have emerged in this Globalisation period. These are the benefits of Globalistion, however, Globalisation also brings the problem of each country losing its local cultural identity. For example, the global hotels' design styles used by the same hotel brand in different counties and cities. Hence, a glocalised approach to design within the Chinese hotel industry the aim of this PhD.

At the present time, the world has become globalised. Many businesses and other organisations are pursuing globalization. The global hotel brand is also looking for global design style and many international hotels is focus on simply comfort and convenience and good service, and ignores the local characteristic. Hotel designers neglect certain traditional styles and customs. Hence, the main problem of current hotel design is the application of the same hotel design style in different cities and countries, while neglecting to employ traditional cultural elements.

The hotel design guideline that will be created as part of this thesis will combine global hotel design style with local cultural symbolism. These are the aims

and objectives of the proposed research, starting with an investigation and utilizing the finding from observations, questionnaires and interviews. Then a design guideline will then be developed and evaluated fully.

1.3 Aims and Objectives of the Research

This research project aims to address the issue of creating design guidelines for hotel design from a holistic perspective. Furthermore, the proposed research deals with glocalisation, to establish a new approach for applying evolutionary hotel guestroom design.

The motivation for this research is to create guidelines to help the designer emphasise traditional local cultural character when designing global hotels in local cities. The aims of the research are presented in detail as follows:

> Aim: To develop a methodology and an associated set of design parameters for the integration and reconciliation of traditional Chinese design elements; into contemporary global hotel interiors in China.

The objectives of this research are dealing with the glocalisation and the production of a hotel design guideline application. This study will consider the various guest room design processes, from preparation to the detailed design, and their integration with the suitable guideline tools, and the facilitation of hotel designers' collaboration through the use of guidelines. To achieve this aim this research will:

- Identify, examine, analyse and interpret examples of Chinese traditional design symbols and geometrical designs which have been successfully introduced into the interior design of Global Hotels located in China.
- To investigate achieving global hotel design diversification through the inclusion of local traditional cultural characteristics.

- Analyse the historical, cultural, and geometrical significance of traditional Chinese design elements as typically employed in interior environments.
- Explore the use of geometrical shapes based on the golden section, within the design of reception areas and hotel guest rooms, etc.
- Compare the common points of design systems from Western and Eastern cultures, and apply these to the global hotel located in China. The internationalization of the design can be highlighted, but should also reflect local characteristics.
- To better enable local hotel designers to incorporate traditional cultural elements within international global hotels in order to effectively promote local cultural values.
- Re-introduce / reflect the value of cultural elements in the design. Utilising appropriate cultural symbolism within the interior environments of hotels in a way that genuinely reflects local culture, and which can be understood and appreciated by international visitors.
- How the project could lead to future study.

1.4 Methodology

1.4.1 Documentary Research

This study is a detailed account of the processed involved in researching global hotel brand design in local city, within this study an awareness of interior spatial areas, elements and perceptions of spatial design within a global hotel design scheme is essential. The general literature search was undertaken to explore the characteristics of global hotel branding design, as well as the local cultural environmental influences hotel design style.

1.4.2 Framework Development

The organization of the thesis is built around the motivations and the objectives of the research. In this research, the researcher visited global and local

hotels in Nanjing and took photographs as data; to find the common cross cultural points between Western and Eastern design. Furthermore, the research employed the mixed method approach, using the sequential strategy of literature review, initial quantitative data collection through the use of questionnaires and interviews with hotel designers, hotel managers and guests. These were done in order to cross check and corroborate findings from different sources, such as questionnaire, interview and guideline of design model testing in the end.

The formulation is to ascertain whether the infrastructure, which is the glocalisation hotel design guideline, created by the author, is of optimal performance after investigating the testing, and then creating and evaluating the proposed integrated application, the hotel design guideline.

The structure of the thesis is divided into seven chapters:

- **Chapter 1 introduction** --- describes the research motivation, the statement of the research problems, aims and objectives of the research, and the overall structure of the thesis.

- **Chapter 2 literature reviews** --- is the literature review which consists of six sections, including: 1) history of hotel development, 2) due to globalisation trend, how can develop of the global branding hotel, 3) analyses hotel develop trend and hotel design evolution, 4) how can local cultural symbols effect the global hotel design in local city, 5) current issues about glocalisation ideal whether taken in global hotel design, 6) application of cultural elements in hotel design.

- **Chapter 3 methodology** --- covers the methodology, overall research framework, and will reflect upon the effectiveness of the adopted methods. In addition, the qualitative method and statistical analysis methods will be outlined

- **Chapter 4 observation studies and critical review** --- is concerned and visited global hotels in local city, whether they have accepted the local cultural information in hotel design and testing the design method

that deals with the addressed problems of global hotel design in local city.

- **Chapter 5 testing of the proposed solution** --- the creation of the proposed hotel design guideline application in the guest bedroom and reception. This guideline will accept a local cultural characteristic and link with common cultural point between the Western and Eastern.

- **Chapter 6 the development and evaluation of the guideline model in hotel area** --- gives an appraisal of the created hotel design guideline. The hotel design guideline will be making up with local cultural symbols and evaluated through testing by end users and interview with various experts.

- **Chapter 7 conclusions and recommendations** --- discusses overall processes of the study, starting with addressing problems, then the methods proposed as solutions, and lastly determination to acquire the results of each research aim.

To sum up, this is the structure of the whole research plan. The research more details and progress will be described in the following future chapters.

1.5 Research Limitation and Constraint

1.5.1 Definition

To effectively classify the research constraints, the key terms and definitions of the research are described below.

1) Localisation (chapter 2, 5)

   The localisation process is most generally related to the cultural adaptation, and a process to facilitate globalization by addressing linguistic and cultural barriers. Localisation can be regarded as a means to help achieve globalisation.

   This study will explore the characteristics of the local culture, and how this can be blended with global hotel design style. The addition of local cultural

elements to the global hotel makes its design style more colourful and interesting.

2) Glocalsation (chapter 2,4)

Glocalistion means localisation plus globalisation. This study intends to use local cultural elements blending with global hotel design style. The local cultural elements relate to cultural symbolism in this study. Global design style still complies with the hotel brand's design rules.

3) Common cultural point (chapter 5)

Due to the different cultural backgrounds, the European would not understand the Oriental culture. So this study will accept the cultural common point which is suitable between Eastern and Western.

4) Cultural symbolism (chapter5,6)

Cultural symbolism is divided into two parts in this research: non-abstract, such as nature; abstract, such as shape, colour, and number. They have many hidden meanings for Chinese people. A local Chinese person may understand all of this but a Westerner may not. Hence, this study adopts the common cultural symbolism.

1.5.2 Limitation of Research

The design guideline can be applied in interior spatial areas such as: entrance area (reception), guest room bed headwall. Other areas considered include: corridor, staircase area, shower room etc. Nonetheless, as some of those areas are considered to be merely transitional spaces or are not included at all in some schemes, it was concluded that these areas did not have much significance in this study. Thus, in order to promote more consistent data, these particular spaces were excluded from the study.

Due to the limit time of this study, a creative guideline of hotel design will try to test on generally hotel area, such as reception and guest room. Additionally, it was concluded that issues related to traditional cultural elements and deep cultural background would not suit the purpose of this study and, therefore, were excluded.

General discussions of the research problems and difficulties raised will be explored in more detail in Chapter 6.

1.6 Research Outcome

The major benefits to be obtained from good hotel design are to reduce the design cost and introduce local cultural information, thus achieving a considerable improvement in the quality of the hotel design. Therefore, this research is aimed at exploring a multi-methodological approach to determining research direction. Particularly, within research involving hotel design, these methodologies can be repeated and adapted for use in other studies.

Therefore, the results of this research are important in two respects. Firstly, they provide information on which spatial areas and design elements hotel guest pay particular attention to, and secondly improves global hotel design style in local city by introducing links with local cultural symbolism into the global hotel brands design.

Chapter 2 Literature Review

2.1 Introduction

This chapter presents a wide range of studies on relevant literature relating to hotel development. The aim of the literature review to gather knowledge of global hotel and identify existing problems in current hotel design and find suitable design solutions for in the global hotel design in local cities. The literature research also aims to formalise a research question which will be addressed at length in subsequent primary research works.

The literature review is divided into five sections, including: 1) history of hotel development, 2) globalisation trend, and the development of the global brand hotel, 3) analyse hotel development trends and hotel design evolution, 4) current issues about Glocalisation ideal whether taken in global hotel design, 5) application of cultural elements in hotel design.

2.2 History of Hotel Development

The history of hotels goes back to the earliest civilizations. The Code of Hammurabi in the 1800s B.C. specified the first known rules for tavern owners (McDonough, Hill, Glazier, Lindsay & Sykes, 2001). In fact, hotels have existed for more than 2000 years, as evidenced by historical record of the Silk Road. At that time, a hotel was called an Inn, and due to the prevailing conditions and economic constraints, the early hotel only naturally reflected the local environment and materials and all it offered was simple accommodation, room and service.

The first hotel located in America was recorded in the year 1607. The first publicly held hotel was the City Hotel which opened in New York in 1792. The first modern hotel was the Tremont which opened in Boston in 1809 and the first business hotel was the Buffalo Statler, opened in 1908 (Table 2.1). (The History of Hotels, 2012)

Table 2.1 Origins of the hotels

Year	Name	Features and notions
1607	Inn	Sleeping place
1792	The City hotel	Public hotel
1809	The Tremont	Modern hotel
1908	The Buffalo Statler	Business hotel

2.2.1 Hotel Concept

The word hotel is derived from the French hôtel meaning hostel. A hotel is an establishment that provides paid lodging on a short-term basis. From this the concept of a hotel has developed as a location or a building which can offer food, accommodation and service for customers. The International hotel & restaurant association (IH&RA)[1] defines a hotel to be an establishment with a minimum of six letting bedrooms; at least three rooms must have attached private bathroom facilities. Hotels are classified into 'Star' categories (1-Star to 5-Star) with a rating by American Automobile Association Organization[2]. Hotel ratings depend on a range of facilities and quality of service. As a rough guide: A 1-Star hotel provides a limited range of amenities and services, but adheres to a high standard of facility-wide

[1] IH&RA (http://www.ih-ra.com/) is an international trade association representing the interests of the hotel and restaurant industries. It was officially founded in November 1947 in London.

[2] American Automobile Association Organization: From 23 September 1949 it was registered by the French government and was headquartered in Paris, France from 1949 to 2007. It had been known as the International Hotels Alliance, which had initially formed in 1921. American hotel associations only began to join in 1960. On 1 November 1997, it joined with international restaurant associations to become the IHRA. As of January 2008, the corporate headquarters is located in Lausanne, Switzerland. (http://www.ih-ra.com/index.php)

cleanliness. A 2-Star hotel provides good accommodation and better equipped bedrooms, each with a telephone and attached private bathroom. A 3-Star hotel has more spacious rooms and adds high-class decorations and furnishings and a color TV. It also offers one or more bars or lounges. A 4-Star hotel is much more comfortable and larger, and provides excellent cuisine (table d'hôtel and a la carte), room service, and other amenities. A 5-Star hotel offers most luxurious premises, widest range of guest services, as well as a swimming pool and sport and exercise facilities.

2.2.2 Reasons Behind Hotel Development

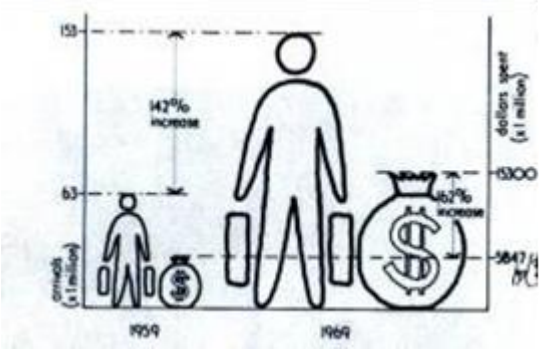


Figure 2.1 Increase in world tourism from 1959-1969, (Source: Principles of hotel design)

Figure 2.1 shows the volume of tourism was increased by 142% from 1959-1969. The Golden age of hotels was from the late 18th —19th centuries and in the mid -1950s, the motel chains such as Holiday Inn, Marriott and Hilton made their appearance. This rise in number of hotels has some main factors, such as an enormous growth in international business trips, better and chapter transport facilities, and importing standards of living. People started to travel more and this encouraged investment in hotels. Another reason for the increase in numbers of hotels was the influence of the United Nations which was founded in 1945. Since then, the United Nations has for 60th years led the development and rapid spread of globalisation to change many of the world's perceptions and values. This international organisation led to the introduction of contemporary globalisation of an international nature and establishment of the international bodies, such as Olympic

Games World, UNESCO (United Nations Educational, Scientific and Cultural Organisation) and other international relief organisations, together with increased activity in the field of tourism. This phenomenon has driven growth of tourism, international conferences, and business, thus promoting hotel development. Another factor is the enormous increase in the availability of economic air travel, so that ordinary people can afford even intercontinental travel (Principles of hotel design, 1970).

Nowadays, tourism is one of the leading growth sectors of the global economy. The volume of tourism is increasing which encourages developers to build hotels. Over 500 international hotel brands were having emerged in multiple countries (Kyriakidis, 2014). According to MKG hospitality database (2008)[3], the British group IHG (InterContinental Hotels Group) occupies first place on the world Top 10 list (Table 2.2). It is increasing the number of hotels it owns by 5.2% per year. Until to 2008, IHG represents 3,949 hotels and 585,094 rooms throughout the world and should reach 600,000 rooms in the near future. Its development pipeline is in good shape with more than 1,600 hotels and 225,000 rooms for the years to come. (MKG Hospitality, 2008)

[3] Established in 1985 by Georges Panayotis, MKG Group has built a solid reputation for business expertise and substantial European-based know-how in the fields of tourism, lodging and food service. MKG Group meets the needs of each of its clients by providing valuable analytical and decision-making skills necessary for success. www.mkg-group.com

Table 2.2 Top 10 hotels in the world (2008) Source: MKG Hospitality

Top ten hotel groups in the world

Rang 2008 (2007)	Groupe	Hôtels 2008	Hôtels 2007	Evol. hôtels	Chambres 2008	Chambres 2007	Evol. chambres
1 (1)	IHG	3 949	3 741	208	585 094	556 246	5,2%
2 (2)	Wyndham Worldwide	6 544	6 473	71	550 576	543 234	1,4%
3 (3)	Marriott International	2 901	2 775	126	517 909	502 089	3,2%
4 (4)	Hilton Hotels	2 959	2 901	58	497 365	497 736	-0,1%
5 (5)	Accor	3 857	4 121	-264	459 494	486 512	-5,6%
6 (6)	Choice International	5 516	5 316	200	445 254	429 401	3,7%
7 (7)	Best Western	4 035	4 164	-129	308 636	315 401	-2,1%
8 (8)	Starwood Hotels & Resorts	897	871	26	274 535	265 596	3,4%
9 (9)	Carlson Hospitality	971	945	26	148 551	145 933	1,8%
10 (10)	Global Hyatt	720	733	-13	138 503	141 011	-1,8%
	Total	32 349	32 040	309	3 925 917	3 883 163	1,1%

International tourism arrivals are forecast to reach over 1.56 billion by 2020—doubling the number of people currently traveling. Due to such an increase, the hotel industry will need to accommodate the demand by providing more properties. (Baker, 2005)

Although, these over 500 international hotel brands are very important for success in the global market, the majorities of hotel owners only focus on making money, but do not use the glocalisation design concept in hotel design in different countries. Hence, this study will try to expose the global hotel design's drawbacks.

2.2.3 Different Types of Hotels

A hotel rating is generally defined by a number of stars awarded by a rating organisation. For instance, the American Automobile Association (AAA, 1902, Chicago) in the United States regularly reviews with a scale based on one star to five stars. According to these stars, a traveler knows which hotel rate they can expect to book.

Hotels have become adept at providing facilities and service for both business and recreational travelers to enjoy. There are many classifications of hotels, such as luxury, middle grade, resort, business. However, most hotels will fall into three

categories which are based on different cost and quality. (Principles of hotel design, pp33).

Some hotels have interesting and unusual features. These hotels depend on local terrain for their inspiration. (Curtis, 2001) For example, the cave hotel was build up in the rock hill in Cappadocia, Turkey. This cave hotel used the local geological resources, because the region of Cappadocia has very many mountain ranges (sierras). This is notable for being built into natural cave formations.

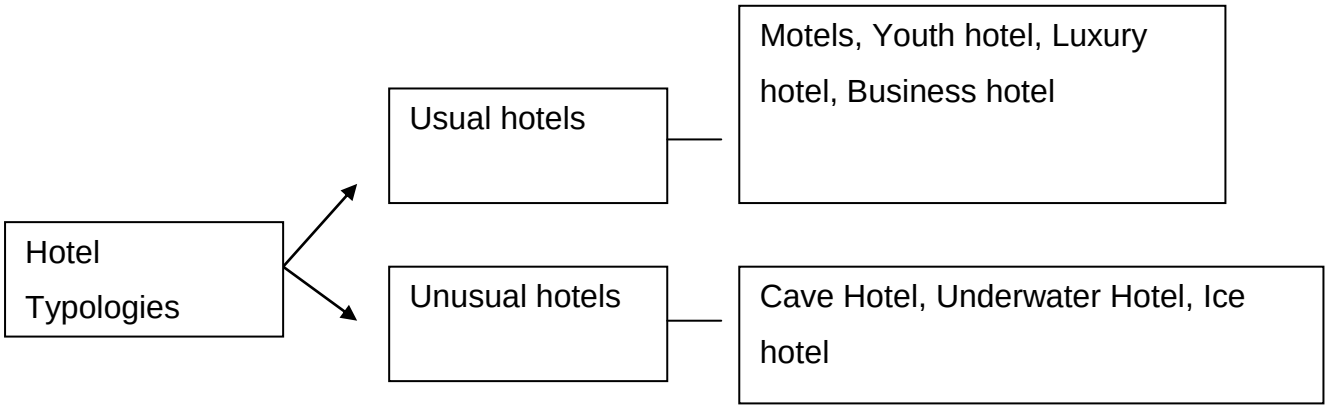


Figure 2.2 Hotel Types

Table 2.3 The hotel type frameworks

Type		Features
Usual	Motels (20th century 30s')	• Minimal lobbies and public spaces with minimal formality • Simple details, common materials, and durable finishes • Small and quiet guest rooms with adequate storage • Minimal bathroom fixtures with ample water flow • Limited back of house areas and a minimal level of guest service
	Business hotels (in the end of 19th century—mid-20th century)	• Lobbies and public spaces that accommodate high volume • Areas for large meetings and business centres • Solid construction materials and durable finishes with a degree of richness • Adequately sized and efficient guest rooms with the latest technologies • Adequately appointed bathroom fixtures with reliable water flow • Efficient back of house areas that support a high volume and turnover.
	Luxury (the end of 18th century—in the middle of 19th century)	• Grand lobbies and public spaces with a degree of formality • High level of detailing, premium materials, and fine finishes • Large, well-appointed, and quiet guest rooms with generous storage • Luxury bathrooms with strong water flow • Larger back of house areas to provide a high level of guest service

Unusual	Cave Hotel (Turkey)	• Built within a rock hill
	Underwater Hotel (Dubai)	• Built underwater
	Ice Hotel (Sweden)	• hotel made up of snow

2.3 Global Hotel Branding Development

2.3.1 Global Hotel Branding Context

Branding concerns hotels retaining aspects that facilitate recognition of the brands, so it still looks familiar to guests regardless of location. Because that every brand has a certain image to potential customers. The brand power comes with being part of a franchise. The recognition and the consumer awareness can be extremely powerful and beneficial (epmadmin, 2013).

Despite commercial branding having a history more than 100 years old (Rooney, 1995), the function of a brand as distinguishing the goods or services of one producer from those of another has remained unaltered (Murphy, 1998). Kotler (2000) defines a 'brand' as follows: 'A name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors.'

Brands have also been shown to benefit, or add value, to the companies that own them. By adopting effective branding strategies, companies can achieve competitive advantage in a number of ways. These include generating consumer loyalty to the brand, having less vulnerability to the marketing actions of competitors, increasing effectiveness of marketing communication activity, achieving greater profit margins than competitors, and creating licensing opportunities and additional brand extension opportunities (Keller, 2002).

The international hotel industry is fiercely competitive (Athiyaman and Go, 2003). Many hotel groups seek competitive advantage through branding strategies (Olsenet al., 1998). According to Sangster (2001) 'the big hotel operators now almost universally accept that the right brands can give competitive advantage'. The growth in the prevalence of hotel industry branding looks set to continue. In 2002, it was estimated that 31 per cent of all hotel bedrooms worldwide were affiliated to a branded hotel chain, a figure forecast to increase to half of the total by 2030 (Slattery,2003). In Table 2.4,

the ‘Top 10’ branded hotel chains (ranked in terms of number of bedrooms) and the hotel group that owns each brand are shown.

Table: 2.4 The ‘Top 10’ branded hotel chains

WORLDWIDE RANKING OF HOTEL BRANDS (AS AT 1 JANUARY 2003)

	Hotel brands	Hotel group	No. of hotels	No. of bedrooms
1.	Best Western	Best Western	4,060	308,627
2.	Holiday Inn	InterContinental	1,567	293,346
3.	Comfort Inns	Choice	2,268	169,750
4.	Marriott Hotels	Marriott Int.	450	165,200
5.	Days Inn	Cendant	1,912	159,851
6.	Sheraton	Starwood	396	133,519
7.	Super 8 Motels	Cendant	2,089	127,254
8.	Hampton Inn	Hilton Hotels Corp.	1,206	123,041
9.	Ramada Franchise System	Cendant	979	116,762
10.	Express by Holiday Inn	InterContinental	1,352	109,205

Source: MKG Consulting (2003).

In recent years, the design of the hotel itself has been gaining a great deal of attention both from customers and from the press. More and more hotels use design and style as a way of differentiating themselves from other properties or brands, and as a way of attracting an affluent and socially active clientele. In a crowded and very competitive marketplace, and bold design is one effective way to accomplish this. (Robson, 2005)

Hence, branding in hotel design has become big business: image helps customers easily with the product (hotel chain) to identifiy.

2.3.2 Global Hotel Design Rules

Many hotel companies are following the example of W Hotels (part of the Starwood Hotel Group) by strongly emphasizing unique and cutting-edge design as a brand identifier.

In addition, branded hotels also have main hotel design style rules. For example, the Premier Inn is the largest and fastest-growing hotel brand in the UK, with over 600 budget hotels and more than 44,000 rooms. In 2011, Premier Inn was named ‘Hotel Chain of the Year’ for the second year running, a significant accolade for the company as this is voted for by the general

public. (http://www.premierinn.com/en/news/news_category/premier-inn-wins-best-budget-hotel-award-133.html)

Steve Conway (2011), Head of Marketing at Premier Inn, said “Premier Inn’s corporate image is very effective in attractioning attention. For example, purple is the dominant coulour used in the design, and this theme continues from the logo to interior furnishing and staffs uniform. The purple colour becomes the main branding symbol, which is easy to recognise.”

Figure 2.3 Premier Inn.
(Source: http://www.premierinn.com/en/book.action)

The Booking.com CEO (2013) said: “In the age of the internet, brands need to adjust to deliver customer expectations. Your brand promise needs to have differentiation as well.” As the online consumer now has more choice, brands still play an important role (Alice, 2013).

Figure 2.4 Premier Inn bedrooms in Manchester and Leicester
(Source: http://www.hoteldesigns.co.uk/review/review_420_1.html)

Therefore, the Premier Inn keeps the main design style in different cities. Durnell who is manager of Premier Inn, he says, “Hotels have tried different strategies to stay relevant in the current market. Several owners stick to just a brand’s classic looks in an attempt to avoid a ‘dated’ and “same design style” appearance. http://hospitality-investments.com/designer-brand-hotels.html

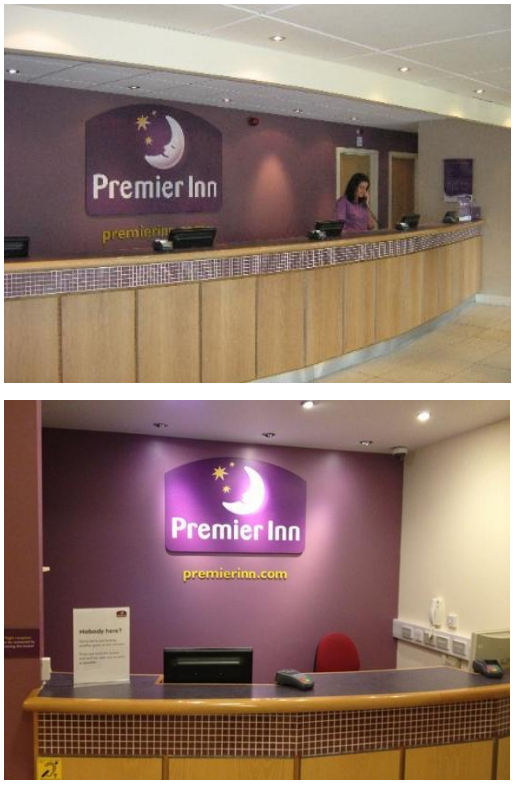


Figure 2.5 Premier Inn receptions in Manchester and Leicester

(Source: http://www.asiarooms.com/en/hotel-reservations)

As Figure 2.5 shows the reception application of purple and brand logo. The Premier Inn design is following the branding guideline and this helps customers to easily recognise, however it has lost local cultural characteristic.

Branding hotel's advantages	Branding hotel's disadvantages
Easy to recognise	lose personalization image in different cities
Emphasis on business image	Lost local cultural characteristic

Hence, the branding global hotel style helps guests to identify the hotel brand, but whether the global design style is suitable for every hotel in different countries, is an issue that will find out in the future study.

2.3.3 Global Hotel Development in China

Hotel and tourism development in China are very recent phenomena. In 1979, the year of the “open door” policy[4], there was essentially no tourism industry and very few hotels. After twenty years, China has become the fifth-ranked tourist destination in the world. The number of hotels has increased from mere hundred in 1979 to over 10,000starrated properties by 2002. China is already making significant impacts on global tourism movements and business. (Zhang, pp1-10)

A people's Daily article in 2008 stated that China has become an important tourism destination in Asia and the fifth-largest tourism country in the world.

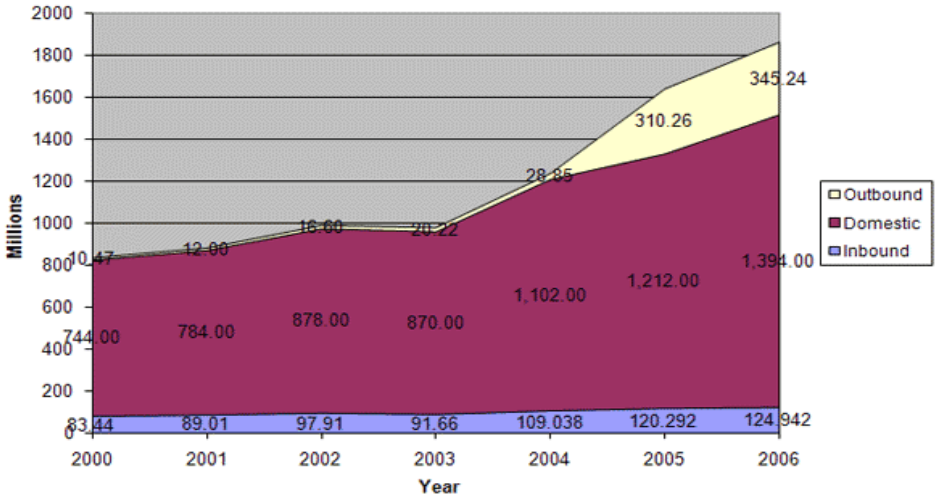


Figure 2.6 China Tourism Statistics (2000-2006)

Source: China National Tourism Administration

[4] The Open Door Policy is a concept in foreign affairs, initially used to refer to the United States policy in late 19th century and early 20th century that would grant multiple international powers with equal access to China, with none of them in total control of that country.

Figure 2.7 China Quarterly Development Trends (2008-2010)

A brief analysis of the results is as follows: domestic tourism and outbound tourism developed extremely rapidly from 2003 to 2006. The number of domestic tourists was increasing to 1,394 million in 2006.

The developments of China's tourism industry is main reason for Chinese hotel numbers increasing China is the world's third largest economy and the fastest growing. Beijing, capital of China, in 2008 had 1248 hotels totalling 336,349 rooms. Some 454 hotels or 79,915 rooms are global hotels. The Chinese government's stimulus and directed lending programs, as well as low interest rates, have invigorated developer sentiment and hotel construction. This renewed impetus is readily evident in Construction Starts, the rate of project migration up the Pipeline toward construction, which have accelerated recently, as the availability of financing has facilitated projects getting off the ground. At 223 projects/45,288 rooms in 2010, China has the highest number of hotel Construction Starts of any other country or even any region in the world (Asia Pacific Real Estate Trends Report, 2010).

New Project Announcements in the Pipeline are also at new highs. With 215 projects/41,387 rooms, it is the second highest amount in the world for 2010. Apart from the United States, one would have to combine New Project Announcements from rest of the world to rival the count in China.

With an astonishing 79% of total Pipeline projects and rooms already under construction, China's New Openings are scheduled to exit the Pipeline at accelerated rates. China will have the highest number of rooms coming

online annually through 2012 of any country worldwide. LE[5]'s Forecast for New Hotel Openings expects 765 hotels/116,465 rooms to open in 2010, with 449 hotels/92,830 rooms in 2011 and 290 projects/93,353 rooms in 2012.

According to the inspiring forecasts by the WTO (World Tourism Organization), China will be the world's number one visited destination in 2020, with annual arrivals of around 130 million (Zhang, H; Pine, R, 2005, pp39).

Nation (Area)	Tourists (1,000 people)	Proportion (%)	Increase 1995-2020 (%)
China	137,100	8.6	8.0
United States	102,400	6.4	3.5
France	93,300	5.8	1.8
Spain	71,000	4.4	2.4
Hong Kong/China	59,300	3.7	7.3
Italy	52,900	3.3	2.2
Britain	52,800	3.3	3.0
Mexico			

Figure 2.8 Part show result from the forecast of The World Top Ten Tourist Destination Countries in 2020 (Source: Tourism and Hotel Development in China)

After 1978, 'open the door policy' many global businesses and products came into China including the hotel, as a global product. Hence, with global economic development, top-tier international brands have promptly occupied the China market. In 1988 the CNTA (China National Tourism Administration) established a star rating system for hotels. This system, adapted from international standards, aimed to provide clear differentiation of hotels and improve facilities and services (Qiu, Zhang, 2005, pp168).

As shown in Figure 2.9, China's hotel industry has grown from a base of only 137 hotels with 15,539 rooms in 1978 to 10,481 hotels and 948,182 rooms in 2000. This development happened quickly and the global hotel chains were also growing in China. Many hotel chains adopted market

[5] Lodging econometrics

penetration strategies in other countries through the growth of their brands to enter a large number of locations (Zhang, and Pine, 2005, pp192).

	Hotels		Rooms		Beds	
Year	Number	Cumulative growth (%)	Number	Cumulative growth (%)	Number	Cumulative growth (%)
1978	137	–	15,539	–	30,740	–
1979	150	9.5	17,149	10.4	34,021	10.7
1980	203	48.2	31,800	104.6	76,192	147.9
1981	296	116.1	43,300	178.7	101,084	228.8
1982	362	164.2	51,600	232.1	122,696	299.1
1983	371	170.8	59,600	283.6	141,627	360.7
1984	505	268.6	77,000	395.5	171,888	459.2
1985	710	418.2	107,740	593.4	242,913	690.2
1986	974	610.9	147,500	849.2	332,321	981.1
1987	1,283	836.5	184,710	1,088.7	400,727	1,203.6
1988	1,496	992.0	220,165	1,316.9	478,321	1,456.0
1989	1,788	1,205.0	267,505	1,621.5	580,900	1,789.7
1990	1,987	1,350.4	293,827	1,790.9	634,300	1,963.4
1991	2,130	1,454.7	321,116	1,966.5	679,458	2,110.3
1992	2,354	1,618.2	351,044	2,159.1	737,674	2,299.7
1993	2,552	1,762.8	386,401	2,386.7	811,521	2,540.0
1994	2,995	2,086.1	406,280	2,514.6	834,818	2,615.7
1995	3,720	2,615.3	486,114	3,028.3	987,275	3,111.7
1996	4,418	3,124.8	594,196	3,723.9	1,199,714	3,802.8
1997	5,201	3,696.4	701,736	4,416.0	1,411,708	4,492.4
1998	5,782	4,120.4	764,797	4,821.8	1,524,224	4,858.4
1999	7,035	5,035.0	889,430	5,623.9	1,769,825	5,657.4
2000	10,481	7,550.4	948,185	6,002.0	1,855,965	5,937.6

Figure 2.9 Cumulative Percent Growth Rates for Hotels, Rooms and Beds, 1978-2000 (Source: The yearbook of China Tourism Statistics, 2005)

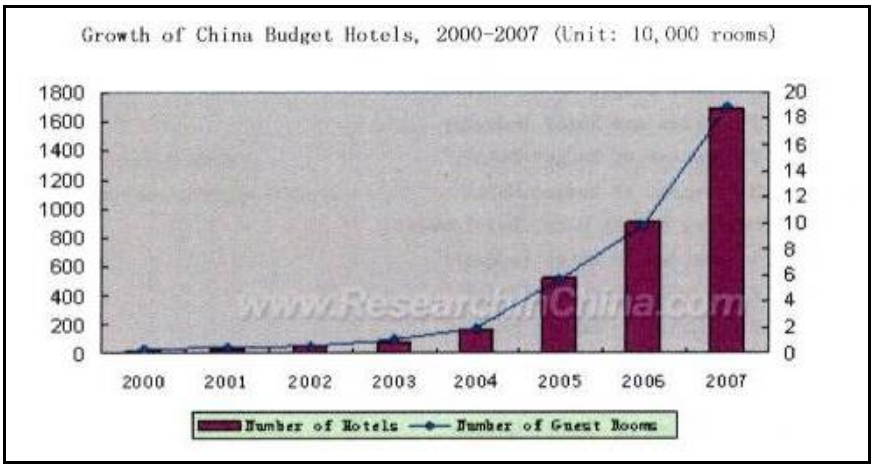


Figure 2.10 Budget Hotels in China (2000-2007), source: research in China, 2008

International tourism to China has increased exponentially along with the country's remarkable economic development, which has become more and more apparent to the eyes of the world. China's dynamic economy Gross Domestic Product was estimated at $10.21 trillion in 2006. This has also stimulated more business travel (Chen, Fang, 2008).

The Chinese Academy of Social Sciences (CASS) Tourism Research Centre reported that business travellers are the major demand generators for economy hotels, representing roughly 65% of the economy hotel market in 2006. As Figure 2.11 shows, the business travellers comprise approx. 65%, the remaining 35% being tourist travellers, groups and meeting attendees. The meeting and group contingent comprised 9% of the total, and leisure demand generated the remaining 26%.

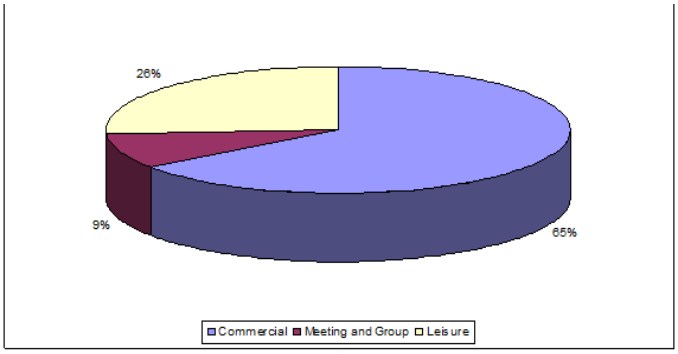


Figure 2.11: China Economy Hotel Development Report by CASS Tourism Research Centre (2007)

2.4 Global Hotel Design Evolution

Design offers an innovative view of design thinking and design practice, envisioning ways to combine creative design with a participatory approach encompassing aesthetic and democratic practices and values. The authors of Design Things look at design practice as a mode of inquiry that involves people, space, materials, and aesthetic experience, following the process of transformation from a design concept to a thing (Lawson, 2006).

Chinese design is on the verge of a revolution. After China’s “opening up”, cultural tourism has been growing as a direct result of the rising interest for art, culture and history, and the government has made massive investments in design and innovation, supporting design and creative activities. Chinese design has more freedom to create as the Chinese designers have to thinking about more. China is in a period of evolution of Chinese design and innovation, and design is blending with culture and politics (Justice, 2012).

The hotel's design evolution is a trend which is based on social development. Panoramic Video is one way to provide the experiences of “being there”, in a retrieved nature scene. It is a development originating from sleeping area, through to hotel branding images, and local characterise. Figure 2.12 shows the evolution of hotel design process.

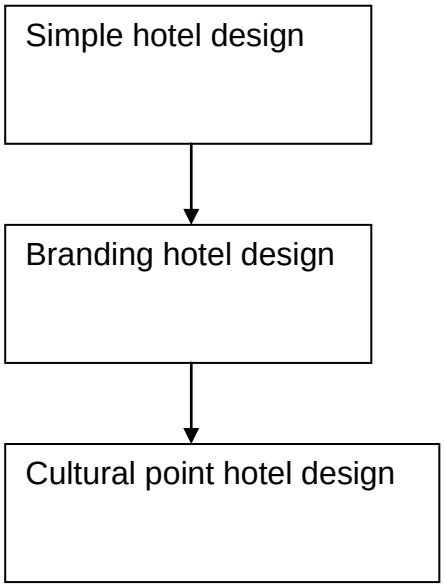


Figure 2.12 Hotel Design Evolutionary Process

Therefore, this hotel study will be bases on branding design rules and the addition of add some special Chinese cultural characteristic. For example, a hotel design application local cultural element which is easiest recognizes and understands the local cultural characteristic. The future study will find out it.

2.5.1 Boutique Hotel Design Evolution

From the beginning of the 21st century, designers have explored new ways to change the sense of individual and cultural identity within hotels. In the author's opinion, the hotel design revolution communicates world styles, thus developing the humankind mind. It provides a view of the world which profoundly transcends indigenous culture. Hence, the designer must look for international, transcultural, and multicultural concepts in order to extend design horizons beyond his and her culture. Boutique is one of the words being used as a special term in the hotel industry. It refers to a uniqueness of design, to the creation of a special hotel design style. The concept of boutique hotels design is coincides with the application of traditional local decorations. Most of the guests, who stay in boutique hotels do so because they are fashionable and convenient. This type of hotel not only meets customer demand for the local culture, it also can bring certain benefits to operators (Lucienne, 2001).

The boutique hotel is a new way to challenge and explore hotel design. This type of hotel emphasises the ethnic and regional uniqueness of a particular country. The tourist will find their meals, entertainment and ambiance typical for the locality and distinguishable from other regions, such as culture, nature, inhabitants, and customs. This hotel revolution is reflecting on a combination of spatial and philosophical antidotes and encourages designers to challenge hotel design notions (Howard, 2005, pp7).

The hotel revolution also affected Chinese hotel design. At first, in the 1970s, Chinese Hotels only provided basic accommodation. Hotel design then was very simple. Also the staff attitude to service provision was poor. This situation started to improve with the opening of the Janguo Hotel in Beijing; this Hotel provided a model of successful operation based on the previous international experience of the Janguo Hotel management. Between 1978 and 1983, it was based on 'openness' and the improvement in the economy. As a result of foreign influence, many products and ideas were imported into China; these included Western style Hotels which were introduced by European &

US developers in urban areas in China, such as in Bejing. Chinese developers, influenced by these new developments, themselves, began to develop Hotels which incorporated many of the features and design characteristics of local Western style hotels. Apart from the China Open Door policy (1978), and increases in global communication, the main point is that Chinese hotel designers were thinking to take and copy some Western design style and use these for Chinese hotel designs as an easy way to make money.

The information and communication technology is developing. However, as people incorporated global design style into design with social interactions, Chinese designers ignored the traditional design culture. This results in a tendency to lose touch with social nuances, cultural values, and the characteristics of traditional society. Yet others appeared to pay attention to Chinese traditional culture. Vickers (2005) also argues that the cultural factors of design need to be introduced into the ways in which modern design blends with traditional elements. Many designs are lacking cultural preferences or features. Therefore, this research presents the case of cultural concern which is a part of a particular traditional culture in global hotels, China.

Hence, the 21st century hotel design principle is responsible for more bold, colourful and imaginative creations which are looking for a role of social and culture. In many success hotels case, the key is designers try combine innovation with cultural awareness at both a local and international level (Howard, W, hotel revolution, 2005, pp7-8 & Otto Riewoldt, new hotel design, pp5).

This study will focus on local culture works within global hotel chains in China. Glocalisation theory defines the emergence of a global cultural system. The definition is by Robinson (1995) who first popularized the term. He defined the term as follows: “the tailoring and advertising of goods and services on a global or near global basis to increasingly differentiated local and particular markets.” He suggests that global culture is brought about by a variety of social and cultural developments, such as the existence of world

information systems; the emergence of global patterns of consumption and consumerism; the emergence of global sport like World Cup soccer; the spread of world tourism and the growth of global military and economic systems. It involves a consciousness of the world as a single place. Therefore, it is suggested that Robinson's idea of glocalisation should be applied to all international markets. For example, if European products are imported into other countries they should follow local sales law. Moreover, according to the local culture some local elements such as text on a product should be added to align that product closer to local customs and to make it understandable (Robertson, 1995, pp28).

The word Glocalisation comes from the words "Globalisation" and "Localisation" which means a global product should be linked with local culture. These products can be adapted or made suitable for local consumers preferences. This process makes the product effectively "Glocalised" which can attract more customer interest (Thorns, 1997, pp189-208).

2.6 Current Issues in Global Hotel Design

The global hotel design is facing major issues that need to be dealt with, including the global design style and the problem of feeling comfortable.

2.6.1 The Global Design Style Problem

As mentioned earlier, China is moving towards internationalization. Globalization is a good chance to help China form links with other countries. It refers to the trend toward countries joining together economically, through education, society and politics, bringing people of all nations closer together, especially through a common medium such as the internet (Robertson & White, 2007, pp.54-56).

The number of interior designers in China is rapidly growing and the standard of design is constantly increasing. Chinese designers' duty is to narrow as soon as possible the gap with developed countries on the planning and design of hotels, thus raising the level of hotel design.

Nevertheless, the phenomenon of globalization is not necessarily good for design, because it results in everywhere looking the same, ignoring the special culture of each locality. Most Western countries are developed and have many technological advantages where their product and design trends are concerned. For instance, many Chinese designers are following where globalization leads and turning out design, which could have come from any country. McDonald's is a good example of foreign, fast food culture. McDonald's first came to China in 1992.

Figure 2.13 McDonald Design in China

However, McDonald's has been changed by China (Figure 2.13). They have had to absorb Chinese food influence and change their product to suit local taste (Yan, 2006, pp39-76).

Nevertheless, the Chinese McDonald restaurant interior design model is similar in every city. From these pictures, it is very difficult to distinguish which dining room is in England and which is in China. This problem of identical design style is not unique to McDonald's, but is a common problem in contemporary design. Designers blindly copied the Western model, and forget local elements. The Chinese McDonald merely copies the Western design. A designer should consider combining elements of local culture with modern design style and high-technology. The reason for this phenomenon is that many global companies are based in the United States, such as Coca-Cola, McDonald, and Americanization is a term for the influence the United States has on the culture of other countries, such as technology and business

practices. Hence, the Chinese McDonald style is also following the Americanization way, ignoring local cultural factors.

Consistent with Aaker's (1991) view that brand equity should be defined within specific contexts, it is argued that, because of its distinctive characteristics, the hotel industry necessitates a bespoke definition of the concept of brand equity. However, it has been found that hotel design style is international, which implies that local design characteristics are lost.

Robertson (2005) suggested that one aspect of hotel design that is changing is the international design style. The "boutique" hotel market is creating many decorative design elements which blend with local culture characteristics.

International design style is the fundamental problem of current design. Many hotels only follow branding hotel rules and ignore local cultural characteristics.

Holiday Inn is one example of a global hotel chain. It was the first international brand hotel which came to China in Beijing, 1984.

However, its design style in China is the same as in other countries. As Figure 2.14 shows, the Holiday Inn Head office is in UK. When this hotel brand came to China, there was no attempt to adapt the design to suit the local context same as McDonalds Customers cannot distinguish which city they are in. Also the hotel did not display any Chinese cultural characteristics as a global hotel brand in a Chinese city.

Figure 2.14Holiday Inn in Different Countries & Cities

Many international chain hotels in China also have the same characteristics regarding design style. Hotel designers in China have largely ignored local cultural features in interior design. The resultant effect is that almost all designs use the same: simple and global modern style. Although this standardised design method and technology can provide brand unification, it has lost the opportunity to develop special characteristics and create design identity. Hence, this investigation will improve on the current common problem of the same design style in Chinese global hotel chain.

2.7 Application of Cultural Elements in Hotel Design

The Glocalisation design style has advantages. It is based on the popular trend of Globalistation in design, and combines localisation together with global design style, without losing traditional cultural content. It can clearly be seen that Glocalisation is having a more and more profound effect on traditional symbols within the Globalized atmosphere and environment. All the definitions of Glocalisation suggest it could be hybridization, but the author suggests that it is not directly hybridization. Hybridization is just a process whereas Glocalisation is a design planned and structured to blend with cross cultural aims. Glocalisation design is not merely to put global style design together with local design symbols that is too simplistic and people find it difficult to accept. This study will specifically analyse how to make global style designs that link with local styles.

2.7.1 The Chinese Five Elements

The initial solution to global hotel brand design in China was to consider the Chinese traditional Five Elements.

Chinese Cosmology is an important attribute of Chinese culture; the role of cosmology is to make a harmonious relationship between humans and the universe. Chinese cosmology is a framework of conceptions and relations in an immense system of correlation-building, based on the interlacing of the natural Five Elements. The Five Elements theory was and is used in architecture and design with the goal of harmony, nature and symmetry. (Wang, 2000, pp2-8)

Figure 2.15 Five Elements Creative Cycles (Source: Chinese element theory, http://www.andrew-may.com/zendynamics/elements.htm)

Wood, fire, earth, metal and water are the five Chinese traditional design elements employed as devices in many fields of early Chinese thought, including seemingly disparate fields such as geomancy. This is a system of traditional design regulations, which are employed as devices in many fields of early Chinese thought. They refer to some mysterious worldly phenomena with developed concepts as a symbolic language to explain a meaning. This cycle principle of the Five Elements refers to the relationship between humans and nature, as well as health and wealth. For instance, traditional Chinese architectural style employs balance and symmetry

according to the principles. The main structure is basically on the central axis balance of a regularly shaped building on each side. The room on either side mirrors each other exactly. Normally, traditional temples, and palaces all follow these same basic principles (Fu, 2002).

These Chinese Five Elements focus on Chinese philosophy. When applying this approach to the human system and nature, this design concept includes not only the sense of ruled order, but also a sense that there can be no violation of this. The laws of the Five Elements should be seen as descriptions of the tendencies toward transformation within the Five Elements framework. These Five Elements systems are particularly good at organizing this information through the creative four cycle concepts. Figure 2.16 shows the system is a loop, it can create the energy of harmony and balance. The Five Elements work together with shapes, colours, textures and even people can be categorized in one or more of the Five Elements (Matsumoto & Birch, 1983, pp. 1-7&50-81).

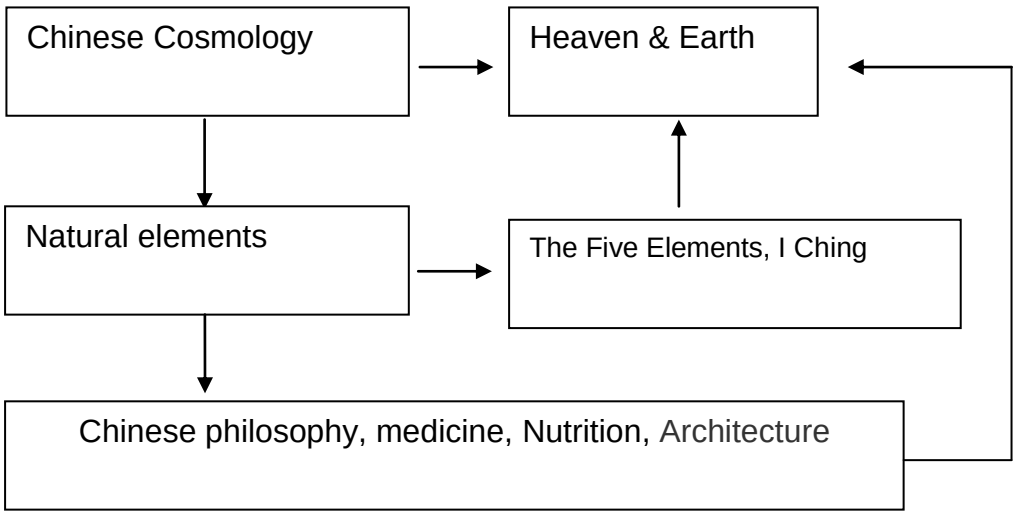


Figure 2.16 Analysis of Chinese Cosmology Structures

The Five Elements can bring the power of design spirit. For example, ancient Chinese believed that using red in a room can bring good luck to them. They believed used of the Five Elements could bring the magic powers. This power put in the interior design will produce harmony and comfort, sense of well-being. This is the core, the soul and the mission of interior design. It is the understanding of and belief in that mission that gives design a new spirit.

Although the process and style of work often differ due to the customer, the climate or natural features, this spirit, attitude, and excitement form a common denominator. People search Ching for spiritual experiences (Knackstedt, 2008, pp.246-247).

In the design field, the Five Elements have meaning relating to colour, and direction. It focuses on human factors and according to Chinese philosophy the Five Elements link with colour, orientation, season, spirits, passion, taste and range. These are functions can apply to many design areas such as architecture, Chinese gardens, and dwellings (Matsumoto & Birch, 1983, pp.97).

Table 2.5 Analyses the Five Elements

Elements	Water	Earth	Wood	Metal	Fire
Colours	Black, Blue	Ochre, Yellow	Green, Brown	Gold, White	Red, Maroon
Season	Winter	Long-Summer	Spring	Autumn	Summer
Direction	North	Center	East	West	South
Planets	Mercury	Saturn	Jupiter	Venus	Mars
Shape					

These elements relate to relationships between nature and humankind to effect harmony and balance. These Five Elements are used in interior designs can create a harmonious and comfortable environment. It also can refer to colour, direction and materials in design. These functions are particularly relevant and applicable to the design process.

Also some designs have accepted these elements in design. An example as following:

2.7.1.1 Symmetry and Harmony

Figure 2.17 Symmetrically Designed Room contrast

(source: http://www.google.co.uk/imgres?q=Symmetrically+Designed+room&start)

In addition, creating balance and harmony is the essential purpose of the Five Elements. It can make the environment feel comfortable and in balance. It emphasises basic interconnection with nature to establish balance to create energy. Without balance one does not have harmony. Blending Oriental and Western style to create balance in a peaceful design is mixing these elements in a variety of interiors to inspire their application. This action is growing with design communication in harmonious interiors. It has created diversity in the use of furniture, fabric, colour and accessories. The whole room form is taking modern and traditional ideas to create a more interesting interior with a very personal statement. Elements of both are becoming more blended to create an interesting, and meaningful interior environment statement (McArdle, 2000).

The researcher also thinks this is an interesting design. Its main design style is symmetry; each piece of furniture is arranged according to the axis, symmetrically. However, the interesting thing is two horizontally decorative paintings, the picture content is not symmetrical, and the frame sizes are different which contrasts the main symmetry style compared with asymmetry, thus making the design more interesting and introducing a highlight.

2.7.1.2 Hidden Meanings

Figure 2.18 Four Seasons Hotel (The lounge and the bar in Hongkong)

Source: http://www.fourseasons.com/hongkong/

In the Five Elements there are also hidden meanings with symbols used in the design. For instance, the Four Seasons Hotel in Hong Kong took one of Chinese traditional elements 'water' and adopted water streamline outline to create unexpected results in design. Actually, it not really water on the background, its material is unevenly surfaced stone, under the lighting, and it produces a wave style creating the illusion of water. It is typically a place based on Five Elements for solitary enjoyment and nature. It focuses on the blending of nature with man-made structures (Keswick, Hardie, Jencks, 2003).

In this design, they used water because Hong Kong is a harbour and this hotel lies in Victoria Harbour. So the use of the 'water' element in the design is a successful with a reason behind it. In the Great Hall, ocean blue is the main colour which matches with the streamline space arrangement. The lounge and the marble bar have chosen the wave formation using glass and light illumination, so these decors have created the mysteriousness of a watermark. It also produced a feeling of calm and relaxation in customers as at the seaside. Its design emphasized harbor scenery and unifies the unique

art which created the noble cultural atmosphere with a luxurious spatial feeling.

In addition, Hong Kong is international city; it has a mix of traditional culture with modern elements. From this idea comes the modern succinct natural circular stairs contrasting with vintage style sofa. This design style of mixing old with new is typical as well as characteristic of Hong Kong, producing a luxurious spalial atmosphere. Obviously, Hong Kong's Four Seasons Hotel design mainly has manifested her seaport characteristics. The design idea everywhere relates to the water (http://article.idchina.net/20061120112652.htm, 2007).

2.7.2 Proportion

2.7.2.1 The Rule of Third

The rule of thirds was the first design proportion in ancient China which was recorded in book of Luo-Shu. This was originally about mathematics and astronomy in China and describes a significant number of systems which were tools for ordering the universe. In early China, a regular cosmos was devised which dealt with mathematics, architecture and agriculture. It also applied to human and natural relationships.

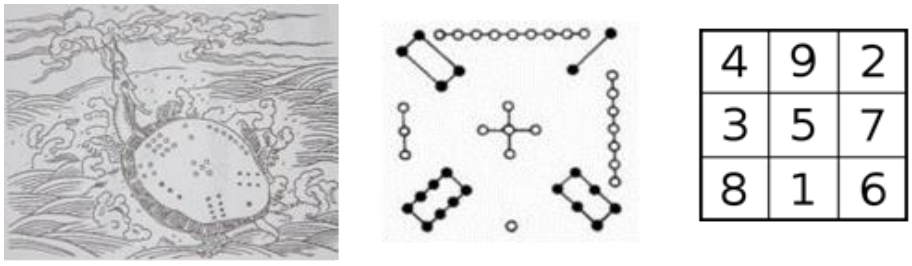


Figure 2.19 Luo Shu

(source: http://www.kanyuworld.net/index.php?main_page=page&id=19)

Luo Shu Magic Mathematics square system has been around for over 5,000 years from the Liangzhu culture (3310 – 2250 B.C). The legend of Lo

Shu is about how one day people found a huge tortoise in the River Luo and on its back were nine numbers. They are mystic numbers which whether added horizontally; vertically or diagonally always equal 15 (Figure 2.19). This is equal to the 15 days in each of the 24 cycles of the Chinese Lunar year in the oldest Chinese calendar.

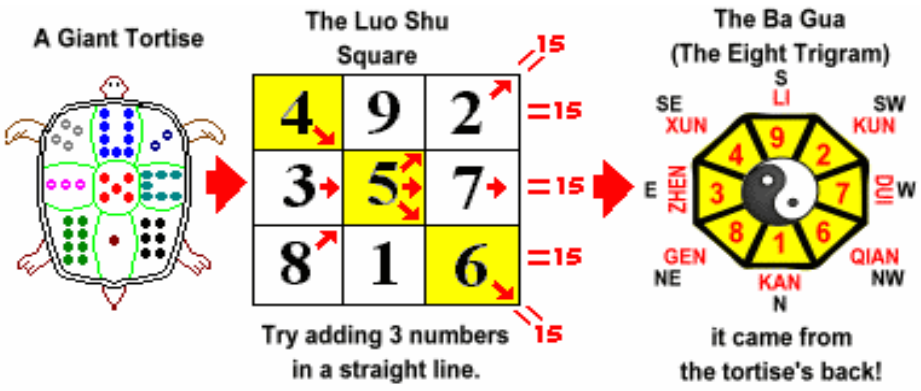


Figure 2.20 Analyse the Rule of Third

(source:http://www.luo-shu.com/book/part_one/chapter_four/agriculture_jing_well_field_system_lo_shu_altar_soil_and_earth)

In ancient Chinese times, these magic numbers represent each different direction. The Luo Shu Square with its 3 x 3 grid is also used in Compass School and Feng Shui. The Luo Shu Square helps the Feng Shui practitioner to analyze a site, a house, and an office space or building. It is used to unlock the time dimension of Feng Shui and allows the practitioner to accurately know when is the best time to make changes to the site, the home or the interior decoration (Hirayama, 1983).

The origin of the Luo Shu has been lost in the mists of time. But it discovered the principle of nature and gave revelatory information about time as in the calendar and space as in the Pythagorean Theorem. The ancient Chinese believed this magic square can bring benefit to humankind. In agriculture, people used magic square layouts for ancient cities and villages. They hoped that the mathematics culture could influence their annual harvest and bring maximum benefit to them. In architecture this square layout was

also used for the design of temples. These nine numbers represent a language which refers to information about the Cosmos, Time and Space. Hence, the Luo Shu numbers were magic elements, which were important to the ancient Chinese.

The language of numbers can be understood by examining the mathematics behind the magic square. Magic Squares seem to communicate a language in the form of numbers. They are the oldest Semiotics which is a tool to help explain the two important concepts of the T-shape, or as it is also known in Europe, the right angle triangle theorem (Pythagoras had proved at 6th century) and calendar. Magical numbers represent the universe. It means space and time. For example, the odd numbers were constructed in this unique format. It represents the planets: Mars, Jupiter, Mercury, and Venus; and these nine numbers mean six directions: South, East, West, North, Southeast, etc. The mathematics of the Luo Shu helped to establish order of the cosmos and helps humankind to adjust action with nature and man.

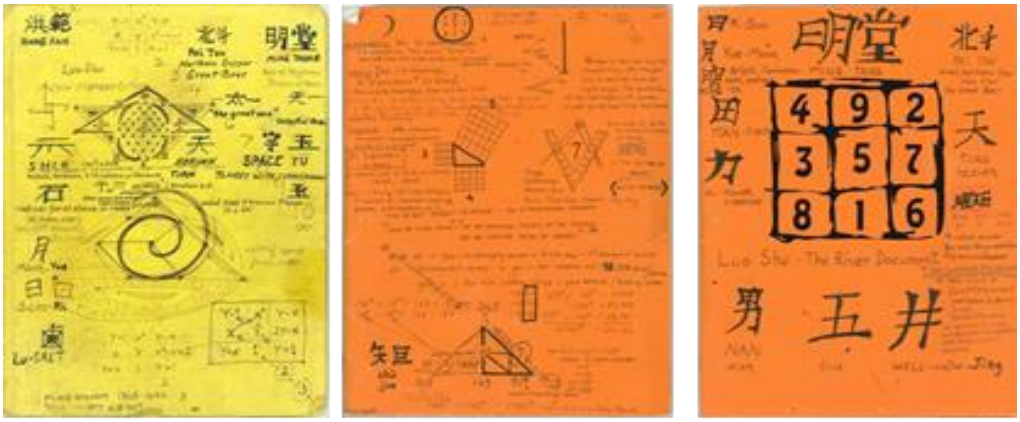


Figure 2.21 Luo Shu Note Book

In early China people believed that numbers were the basis for the stars and earth. They believed an order of numbers could influence people's life. The Chinese believed that numbers could have a positive effect on the Yinyang balance. The objective of this mathematics was to help create relationship between Heaven and Earth.

In the Luo Shu square there are many mathematical relationships from the Zhou Bi Suan Jing which is most important in the right angle triangle theorem.

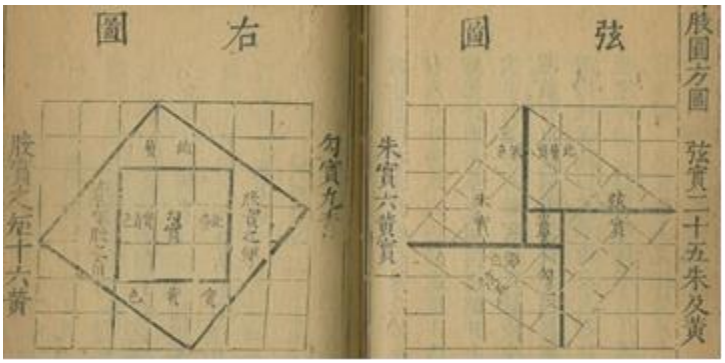


Figure 2.22 The Zhou Bi Suan Jing (Pythagorean Theorem Proof)

The Zhou Bi Suan Jing is the oldest of the ancient Chinese mathematical classics in 1100BC and has a sacred place in Chinese cosmology. The Arithmetical classic shows the relationships between the Gnomon (right angle triangle) and the Circular Paths of Heaven. It is about how to use the right angle triangle to measure heights and distances, earthly and celestial.

According to the sun's position giving different shadows on earth to derive the right angle on different sides at different times. This is a practical application to help humankind to understand the planets, and even helps mankind to understand the solar cycle and the four seasons. Mankind is also using these regular rules to arrange lifestyle.

In addition, the right angle triangle also appears in the Luo Shu magic square model. All magic squares in the Luo Shu format show the relationship between two consecutive whole integers. The very first magic square is of the order three, a relationship between 1 and 2, squared.

2*2 – 1*2 = 3 (left of Centre cell) 1*2 + 2*2 = 5 (Centre cell)

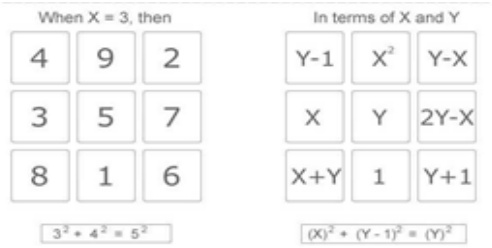


Figure 2.23 A New Definition of The Luo Shu Square

All magic squares in the Luo Shu format explain the relationship between two consecutive whole integers. The very first magic square is of the order three, a relationship between 1 and 2, squared. The concept of the Luo Shu model indicates the most important relationships with the right angle triangle theorem (Swetz, 2002, pp121-140).

2.7.2.2 Application to Design and Architecture

In the 15th century, the temple and church's' constructions incorporated the sacred combination of the square and circle. The square symbolizes the earth and the circle represents heaven in the early Chinese culture. The oldest temples help us to better understand the earth, heaven and magic numbers. For example, many Byzantine churches used the quincunx pattern as the ground plan that incorporated the square, the circle, the right angle triangle and the mathematics of Luo Shu.

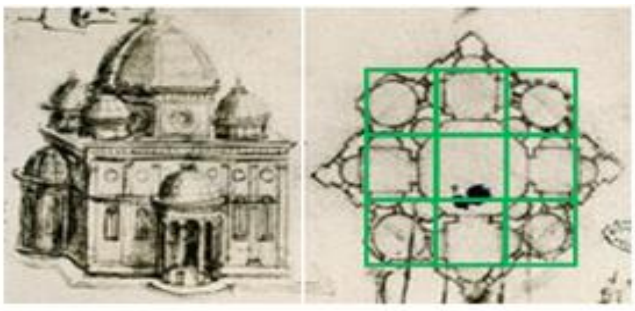


Figure 2.24 Church Drawing by Leonardo da Vinci in 15th Century

Leonardo da Vinci was a mathematician as well as being artist, architect and designer. When he was drawing this church plan; which he considered to incorporate sacred geometry (the square, circle, and right angle triangle) into architectural design, he produced many drawings with these concepts in mind, including a polygon pattern (sacred geometry) in the church design plan.

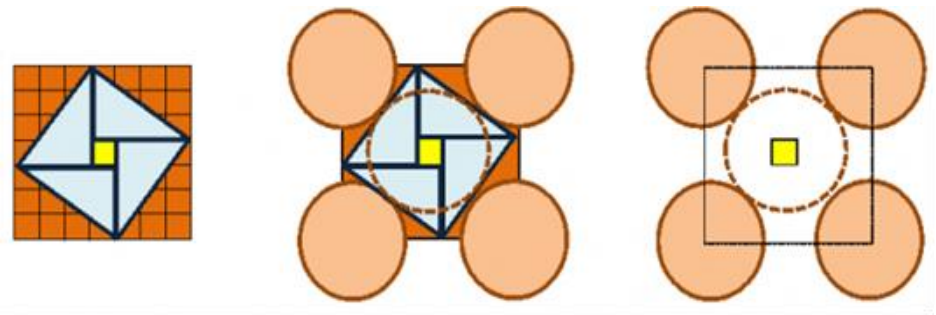


Figure 2.25 The Right Angle Triangle Theorem (The Pythagorean Theorem)

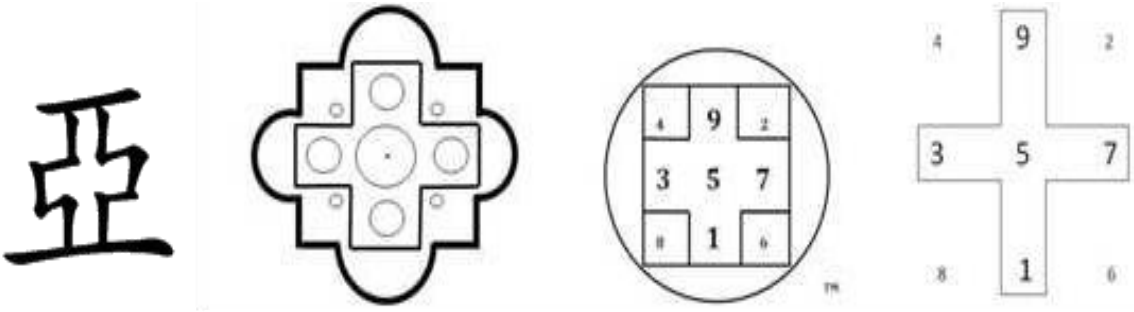


Figure 2.26 The Quincunx Design with Ya Shape & Magic Square with Cross of Odd Numbers

The polygon design type is similar to the Chinese traditional word “Ya”, so we called this design type “Ya shape”; and this Ya shape includes the odd numbers in Luo Shu square. The odd numbers symbolize Heaven, Yang. The cruciform shape seems a spiritual center. That is why the temples and churches always use these models in architecture.

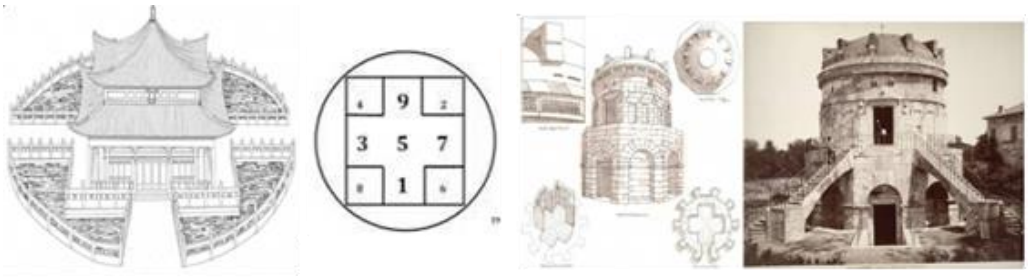


Figure 2.27 Analyse the Ming Dynasty Temple and the Early Byzantium Mausoleum

In the Ming Dynasty and other early periods, the Chinese used this model in architecture for their sacred temples. The building on the left means the earth represents the centre of all things. The temple serves as the centre of the universe and it represents the convergence of the four corners of the earth.

The early Byzantine Mausoleum (on the right) did the same with the polygon shape church design. The ground plan used a Ya shape, the circle and dome. The dome represents heaven and the hexagon shape represents the earth. The twelve stone right angles mean the star balls. Hence these oldest and best examples prove the Chinese traditional models' symbols to influence the arts and architects. It also shows the humankind strives to seek a balance with heaven and earth. Therefore, the symbols for the gnomon and the Luo Shu magic square have a long established tradition in both early Chinese and Christian art and architecture. (http://www.luo-shu.com)

Among these symbols, some of which are purely mathematical symbols, are:

Table 2.6 The Mathematical Symbols

Symbol	Symbol Represents	Similar Symbols
The Gnomon	The shadow of the gnomon followed the path of the sun and identified the four seasons (Time). The shadow also generated the right angle and the resulting Pythagorean theorem (Space). Earth, female, even numbers, and yin energy.	gnomon, the right angle triangle, Pythagorean theorem, the square
Luo Shu	cross of odd numbers represent Heaven, the four quadrates of even numbers represent earth; Time and Space	A 3x3 square grid, the quincunx pattern. the Ya shape
Cross in square	Heaven and earth, the axis centre, the cross of odd numbers in the magic square,	The quincunx design, the nine-bay church design

The Luo Shu is a great symbol which is incorporated in all aspects of: agricultural, art, city layout and design. It crossed many thousands of years, as a cultural symbol. The Luo Shu has original function in geometry, using the circle and the right angle triangle. It has a role of magic cultural symbol and will continue to be applied in the future.

These Geometry patterns are also found in nature and cosmology. It has important value with symbols and structures in design which general point to help design achieve elegant symmetry, harmony and relaxation.

2.7.2.3 The Golden Ratio

The golden ratio is the most well know ratio in the world. It makes a beautiful shape. It also known as the divine proportion, it is a special number that equals approximately 1.618. It was first used in textbooks in the mid-1800s, but dates back to 400 B.C. in the architecture of ancient buildings. The

golden ratio can be defined as follows: *If a line is divided into two parts so that the ration of the longer part to the smaller part is also equal to the ration of the whole length divided by the longer part, then this represents the golden ratio.* The equation is applied to art and architecture, as it is believed that the golden ratio makes the most pleasing and beautiful shape with balance idea (Livio,2002).

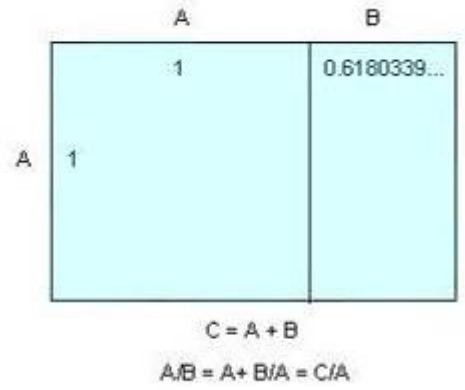


Figure 2.28 Analysis of the Golden Section

The golden ratio may be applied in art, architecture, music and design concerning beauty and balance. The golden ratio has fascinated generation after generation; the basic concept can be expressed succinctly in the ratio of the number "1" to the irrational number[6] "1.618034…." (Livio,2002).

The golden section is a famous theory in geometry. Throughout history, thinkers from mathematicians to theologians have pondered the mysterious relationship between numbers and the nature of reality. The Golden Ratio was discovered in 6 BC by Pythagoras. It was applied to great works of art and to masterful furniture designs from the 18th century. It has some unique mathematical properties and is often tied to patterns observed in nature like the graceful volute in a nautilus shell. In simple geometric terms it's formed by dividing a square in half and using the diagonal from the half square extended

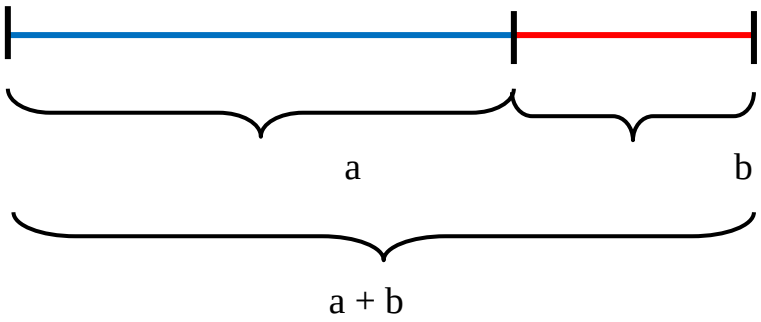
[6] Informally, this means that an irrational number cannot be represented as a simple fraction. Irrational numbers are those real numbers that cannot be represented as terminating or repeating decimals. It makes the meaning clear to readers who are not mathematicians.

out to form a rectangle with a ratio of 1:1.618…. It has 2,400 years history at least. （Ryan, 2008. An Exploration into the Golden Ratio）

Ancient Greek mathematicians first studied what we now call the golden ratio because of its frequent appearance in geometry. Since the 12th Century, the golden ratio has been represented by the Greek letter Φ or φ. The formula is the ratio of the golden section. This φ figure became the most significant of interest.

$$\varphi = \frac{1+\sqrt{5}}{2} = 1.61803\,39887\ldots$$

This special number is approximately equal to 1.618. It appears many times in geometry, art, architecture and other areas. The idea behind the golden ratio can be described in a simple way as fulfill. If we divide a line into two parts as shown in below:



a /b= (a + b)/a=1.618…..=φ

Throughout history, thinkers from mathematicians to theologians have pondered the mysterious relationship between numbers and the nature of reality. In Mario Livio's book be tells the tale of a number at the heart of that mystery: phi, or 1.6180339887...This curious mathematical relationship, is widely known as "The Golden Ratio". Since its discovery then it has shown a propensity to appear in the most astonishing variety of places, from mollusk shells, sunflower florets, and rose petals to the shape of the galaxy.

Psychological studies have investigated the Golden Ratio and shown it to be the most aesthetically pleasing proportion extant (Boulton, 1995).

The Golden Ratio is believed to hold the key to the secret of beauty. The Golden Ratio originates as far back as the ancient Greeks and has been discovered in numerous patterns of nature, such as flowers, and many other designs (Ghyka, 1946, pp60-68).

The Golden Ratio knowledge was transmitted from Egypt to Greece. So after analysing much ancient architecture in Greece, it can be demonstrated that they designed with the golden section (Gardiner, 1994). The aesthetic valuation of the golden ratio was transmitted to the Romans as well and its beauty extolled by Vitruvius (Watts, 1986).

The golden section also was employed by Medieval and Renaissance architects and artists (Coldstream, 1991, pp33).

- In Architecture

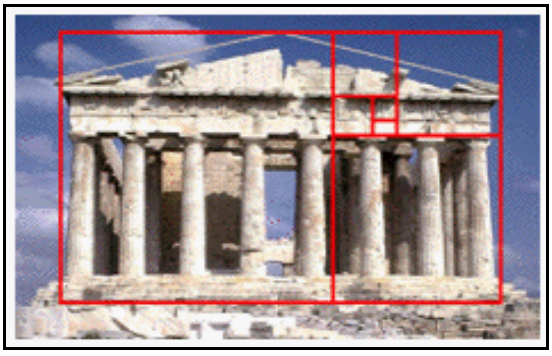


Figure 2.29 Parthenon Temple

In ancient Greece, much of the architecture follows the golden ratio rule. The Parthenon temple is a good example of a mathematical approach to architecture. The ratio for length/ width of rectangles of 1.6180339887 has been considered the golden proportion. The Greek sculptor Phidias sculptured many things including the bands of sculpture that run above the

columns of the Parthenon. There are golden rectangles throughout this structure which is found in Athens, Greece.

- In Geometry

The Golden Ratio is also found in geometry, appearing in basic constructions of an equilateral triangle, square, pentagon and hexagon placed inside a circle where the ratio of AC to AB, CC to CE are 1:1.618 (Elam, 2011).

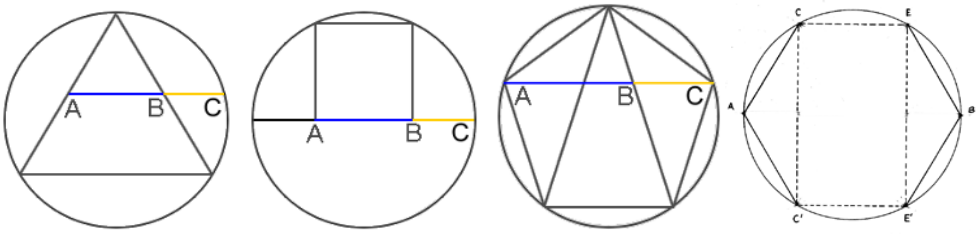


Figure 2.30 Geometrical Shape

- In Design

Mies van der Rohe is best known for his monumental architecture of steel and glass skyscrapers. The building of IIIinois Institute of Technology Chapel is a good example of his use of proportioning on a smaller scale. The entire area is in the proportion of a golden section 1:1.618. The building is also perfectly subdivided into five columns by golden rectangles and when those rectangles are repeated in a pattern, the building is a model of 5*5 horizontal rectangles (Elam, 2011, pp76).

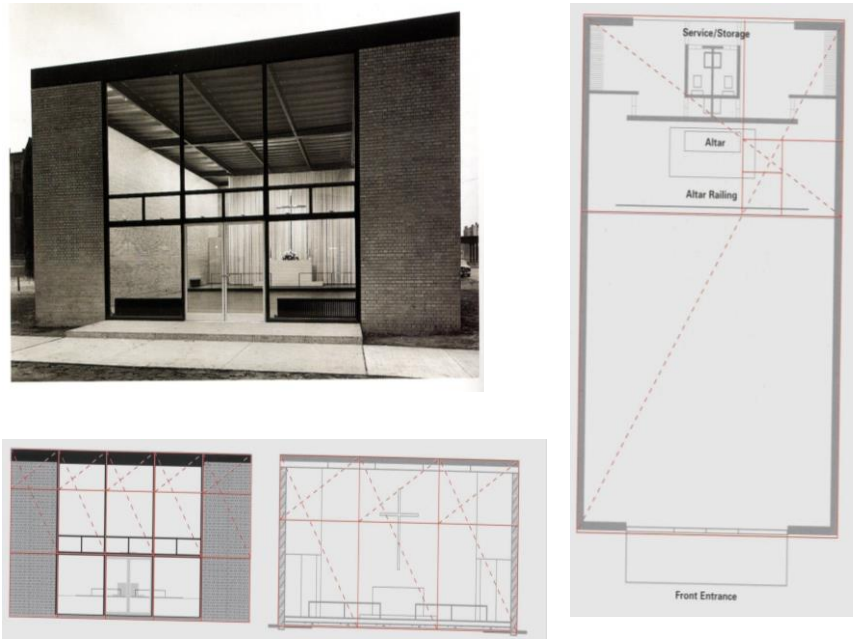


Figure 2.31 IIlinois Institute of Technology Chapel

In the author's opinion this is a successful design, because its feature is that plan (2 dimensional) and elevation (3 dimensional) can both follow the golden ratio theory. Also the same design shows the golden ratio by 2D and 3D whichever method is acceptable in this study.

- Graphic Design

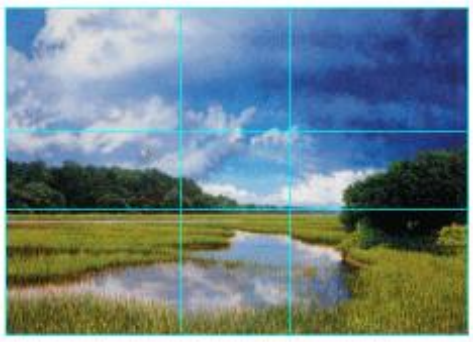


Figure 2.32 Landscape Picture by Golden Ratio (source: http://www.sxc.hu/blog/post)

The graphic designer often uses a grid system to make a graphics which is also based on the golden section. This means a mathematical way of producing pleasing images. In its easiest form, the grid can be used by

applying a simple golden ratio point from each border as a guide to align key elements of composition, such as the position of a horizon on a landscape (Figure 2.31) Graphic designers often use the concept to help guide their compositions and create interesting designs. Using a square grid as a basic space planning tool in freehand space planning which is accepted by the architects and interior designers. In particular, the formula of the golden section has been applied in all areas of design.

2.8 Summary

This chapter presented a wide range of studies on relevant literature relating to the hotel development in order to gather knowledge of the global branding hotel, including global hotel design style, and identifies the existing problems of the global hotel design in local city, and Chinese theories based in maths which were investigates in case they held they key to applying the principles of Glocalisation to hotel interiors in China. The key findings from the literature review in relation to the aims of the research are now summarised and the key research question is formalised. The research question are does the global hotel brand need local cultural element with their design? Is the Chinese Five Elements philosophy the best choice of addition into the global hotel design in local city of Nanjing? .

It is important to clarify the main issues identified in this literature review. These are as follows:

1. The early hotel design accepted the local elements, because at this time the world did not have any communication. However, after globalisation, hotel design trend becomes global and loses the local elements. Hence, Glocalisation suggested by Robertson (1995) will be researched in later chapters.

2. Discover and analyse the reasons why global hotel brands came to China and how global hotels may develop in China. This literature review has also discovered the current hotel design problem: the uniformity of design style in different countries and cities. One

research tried will be to suggest how these hotel design problems can be solved in future.

3. The review showed the Chinese Five Elements symbols can represent Chinese Philosophy and Chinese culture. However, the suitability of the Five Elements to hotel design and its application in the global hotel brands in provincial cities of China will be researched and further discussed in later chapters.

4. The Initial solution is related to Glocalization which will use Chinese Five elements and the rule of third link with the golden ratio shape. Because the Five Elements include many traditional cultural patterns, and hidden meanings, designers need to have a deep knowledge of these meanings. The rule of third allows design in a scientific way (mathematics) to become more feasibility. In order to use them correctly in a modern design, these traditional symbols have interesting stories behind them, and this make the modern hotel part of its ancient culture. China is a very conservative culture and the use of traditional, symbolic designs in modern design is especially suitable there, but they must be the right symbols used in the right way, so it is preferable for the designer to be of that culture and understand the fine details. A Chinese designer, raised with the Five Elements Theory would have an instinctive understanding of it. If they had also studied modern design, it would come naturally to them to mix the modern and traditional in a way that brings deep cultural value to modern design.

5. The Chinese Five Elements has got many deeply Chinese traditional cultural meanings. However, whether these meanings can be used in future studies, is uncertain. This subject will be explored further in later chapters.

6. Western and Eastern design scale elements were reviewed, collated and analysed to see how these can be applied in art and

architectural areas. In future chapters the function and application of these scale elements will be further compared.

The next chapter will discuss methodology and the methodological framework of the study, to implement the research aims (see 1.3) and to discusses the reasons for the choice of research methods for addressing this research question.

Chapter 3 Methodology

3.1 Introduction

The last chapter describds the major research question of this study: does the global hotel brand need local cultural element with their design? Is the Chinese Five Elements philosophy the best choice of addition into the global hotel design in local city of Nanjing? In order to address this research question, this chapter will detail the rationale for choosing a set of research methods suitable for this research study, and the research framework, the general data analysis strategy of the research results will be elucidated afterward.

In relation to the research question, methods triangulation (Patton 2002) was considered as an appropriate methodology to be applied in this research project combining both qualitative and quantitative methods for data collection and analysis. This research study includes a documentary review on the history and development of hotels and global hotel brands (qualitative approach); a critical review and site survey of existing global hotel design in local city of Nanjing (qualitative approach), observations of visitors behaviours and post-observation questionnaire (mixed qualitative and quantitative approaches), semi-structured interviews with experts (qualitative approach) and an evaluation of the hotel guest room design guideline (mixed qualitative and quantitative approaches) in order to formulate research objectives.

Results from the secondary and primary research findings were used to propose a theoretical design reference model that could be used as a tool for hotel designers to help designers to “glocalise” their hotel designs. A guest room guideline was then developed based on this theoretical design reference model. The validation of the theoretical model was conducted by evaluating this guideline through user testing and expert evaluation based on the assessment phase of the theoretical model. Moreover, issues of validity and reliability for each of the two primary research works and the prototype evaluation are further explained at the end of this chapter.

3.2 The Research Methodology

The choice of correct methods applied to a research for investigation depends on a well-defined research question (Walonick, 1993). According to the research question defined by the literature review, the studies conducted in this research project involve multidisciplinary areas: current hotel design problems, traditional local (Chinese) cultural elements, and common cultural points between the Western and Eastern sensibilities. In terms of hotel design problems, the study dealt with the idea of glocalisation and its application in global hotel brands in Nanjing city. Regarding the local cultural elements, the study dealt with this by visiting some global hotels and local hotels, looking for cultural elements used in the current hotel design. Furthermore, concerning the common cultural points; this study compared Western and Eastern cultures to identify some common points (such geometry) to help hotel guests feel more comfortable and relaxed. In order to address the research question related to these multifaceted domains, methods triangulation[7] was therefore regarded as an appropriate methodology to be adopted in this research study using both qualitative and quantitative approaches for cross-checking the results.

[7] Methods triangulation is a form of triangulation which involves collecting both qualitative and quantitative data to check the consistency of findings (Patton 2002).

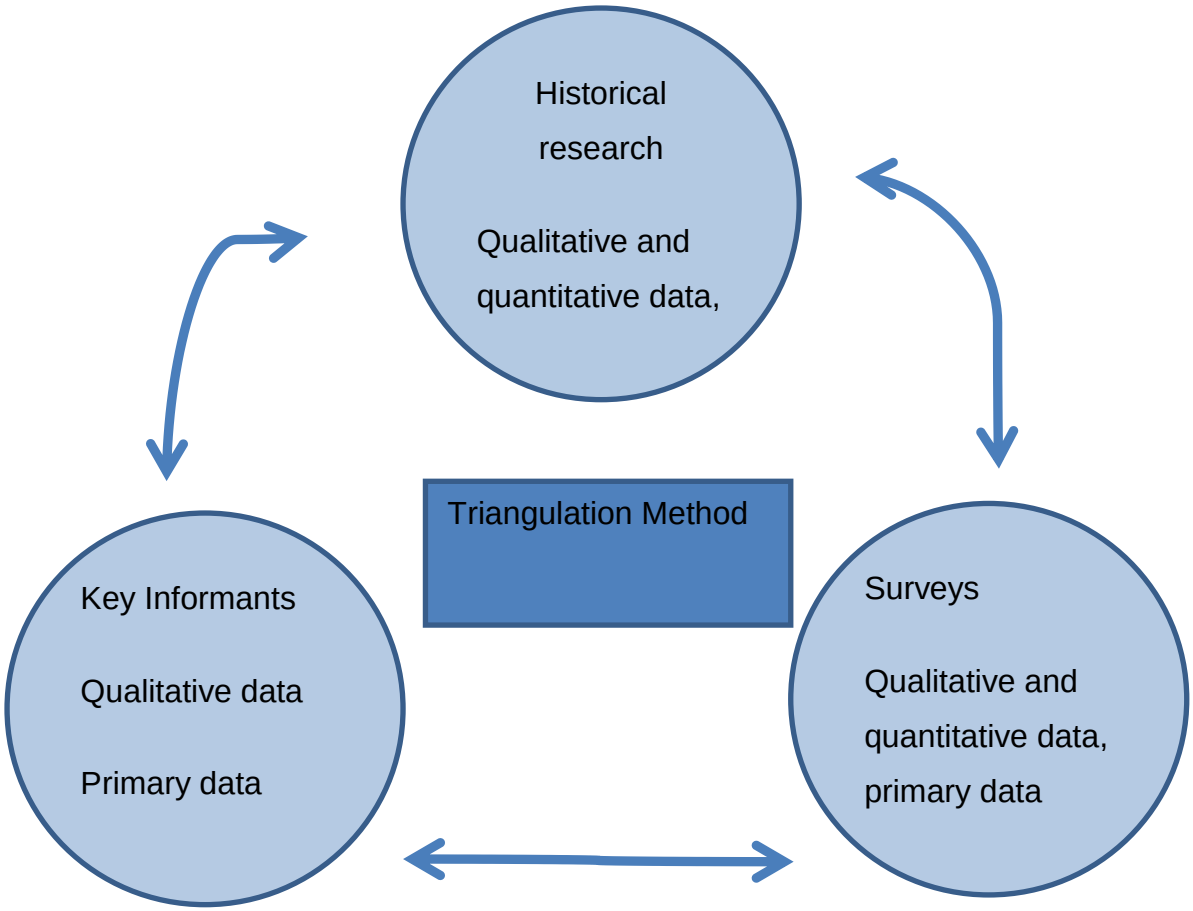


Figure 3.1 Triangulation Method

Moreover, Clarke and Dawson (1999) suggested that the employment of methods triangulation enables the strengths of one method to compensate for the weaknesses of another method, and then the measurement errors and the problems of intrinsic bias can be reduced to enhance the overall quality of the research data by using more than a single method. They advocated that one of the main benefits of employing methods triangulation as part of a mixed –method design, rather than a single method, is to allow the researcher to have confidence in the research findings (Clarke and Dawson, 1999).

3.3 Outline

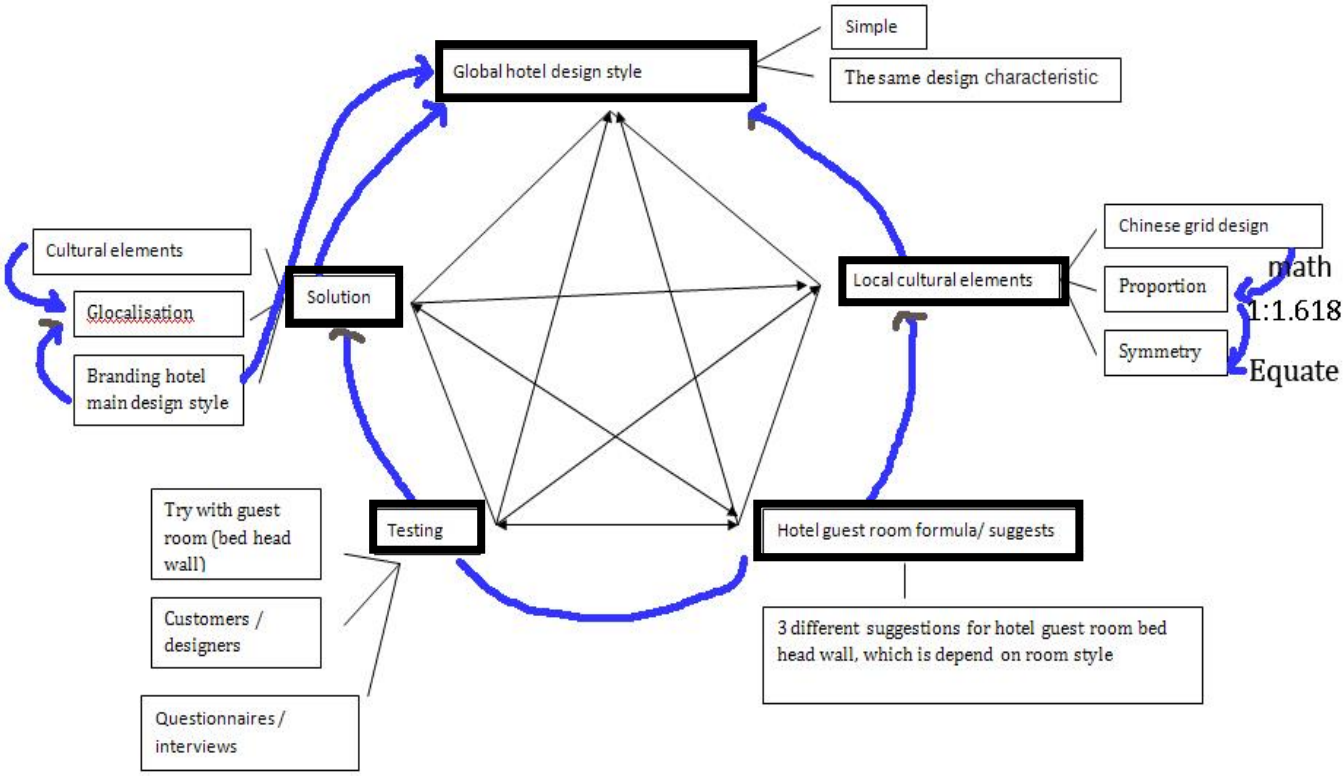


Figure 3.2 whole thesis brief diagrams

This research addresses the issue of global hotel design style in local cities of China. Global hotel design was reviewed and found the main problem was found to be the uniformity of design style in different cities. Hence, this study suggests incorporating local cultural elements into global hotels, using the Chinese grid design principle which is related to Chinese math, proportion and symmetry. Results and feedback was obtained through the research testing with users and experts were used to improve the design guideline.

3.3.1 Research Operation Procedure

A research operation procedure shows in Figure 3.3. There were five sections in this study. In section1, the questionnaire form was a step by step confirmation approach was adopted to increase reliability.

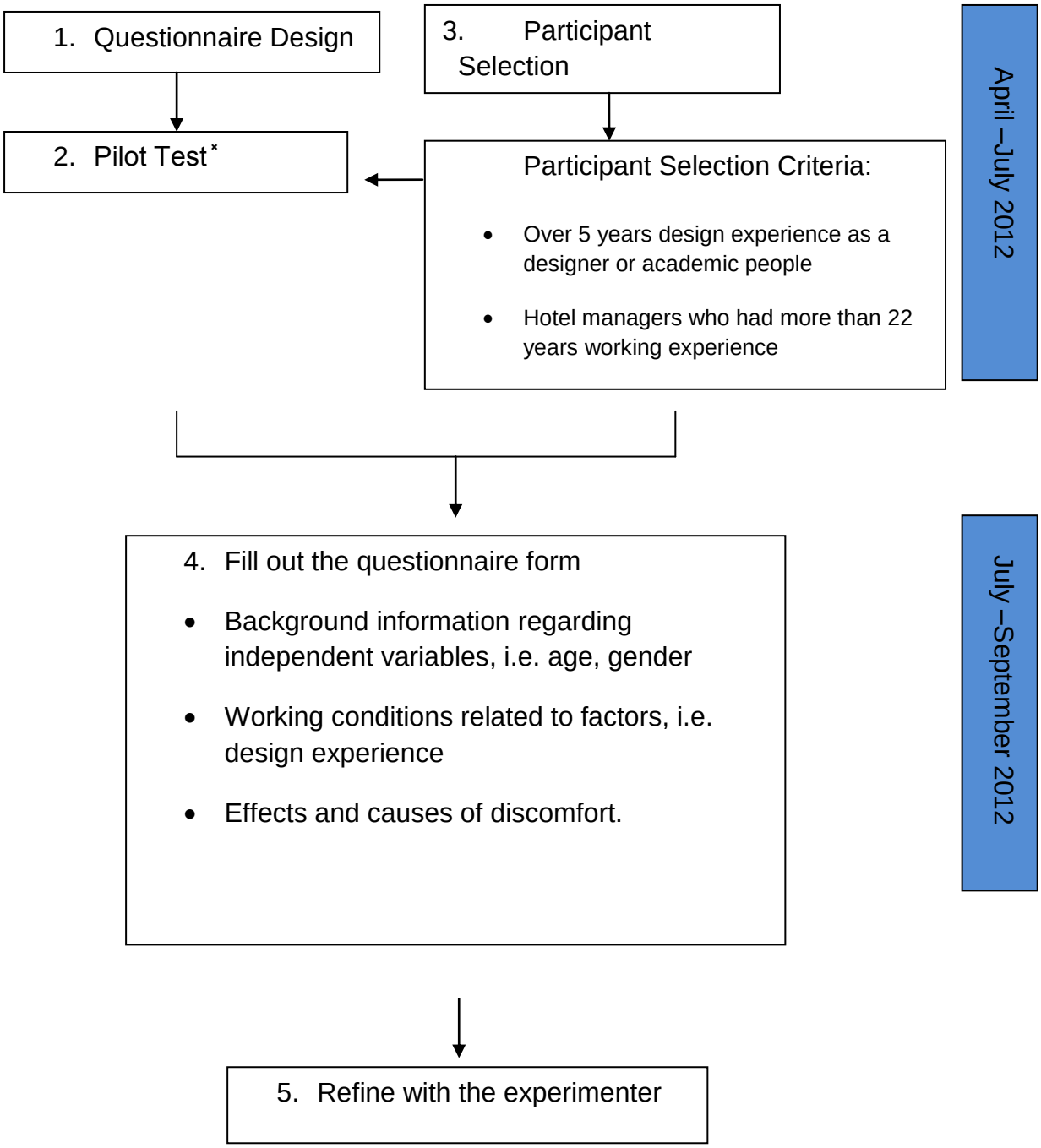


Figure 3.3 Research Operation Procedures

*continue to see Standard Operation Procedure

In section 2, a pilot test was based on after visited 2 global hotels brand and 4 local hotels in Nanjing, China. Collected some current hotel design problem issue carry study on.

In section 3, in order to maximize the response rate, 7 professional managers and designer has been chosen from 6 hotels.

In section 4, questionnaires were delivered to hotel brands and were later collected by the researcher.

In section 5, participants returned the form to the researcher when complete. In total, Thirty-two filled-out questionnaires were collected.

3.3.2 Research process stages

This research stage model systematically structured research process effectiveness research across four stages (see Figure 3.4). Stages 1 and 2 are components of formative evaluation in which the objectives and processes of research are conceptualized, drafted and refined. During these stages, researchers explore which hotel design elements and hotel design styles are most appropriate for this research.

Stages 3 and 4 are components of summative evaluation - a systematic attempt to determine whether the fully-developed research process is meeting its objectives as planned or desired (Scriven, 1967).

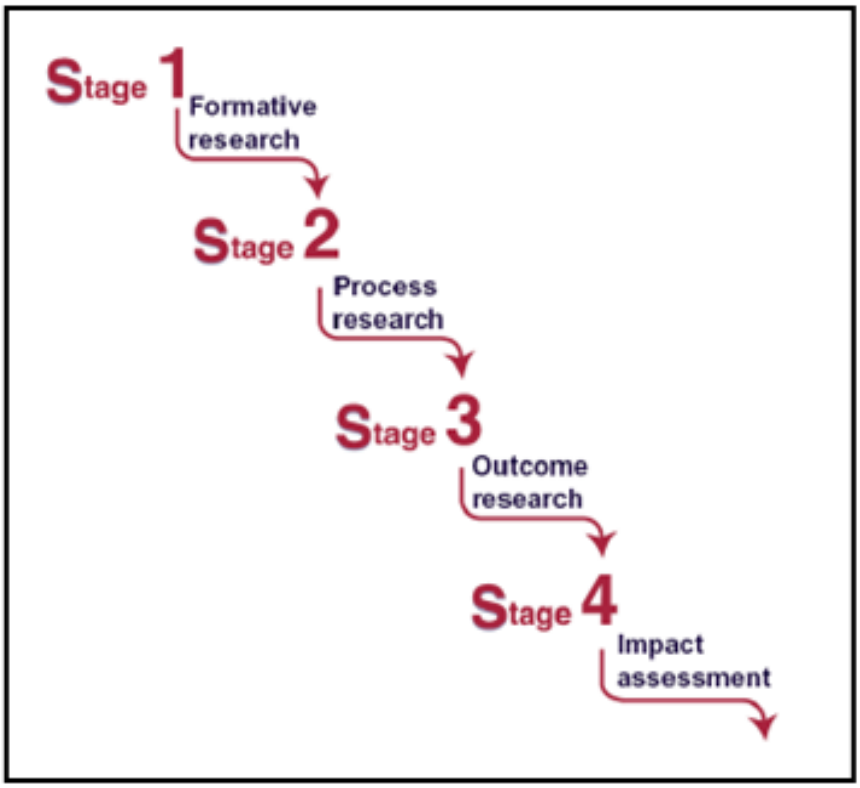


Figure 3.4: Logical and progressive stages for research process effectiveness research (Source:A Model for Research on Training Effectiveness)

The impact assessment framework recommended by research process stages are provided a good sample for the assessment of training effectiveness, shown in Figure 3.5. Use of the research process stage model will refine and focus the efforts of research process evaluation studies. The model will also provide researchers with practical knowledge of research design and consistency, such as start consider local cultural elements and try to accept the golden section, and with a reliable reference point for launching other investigations.

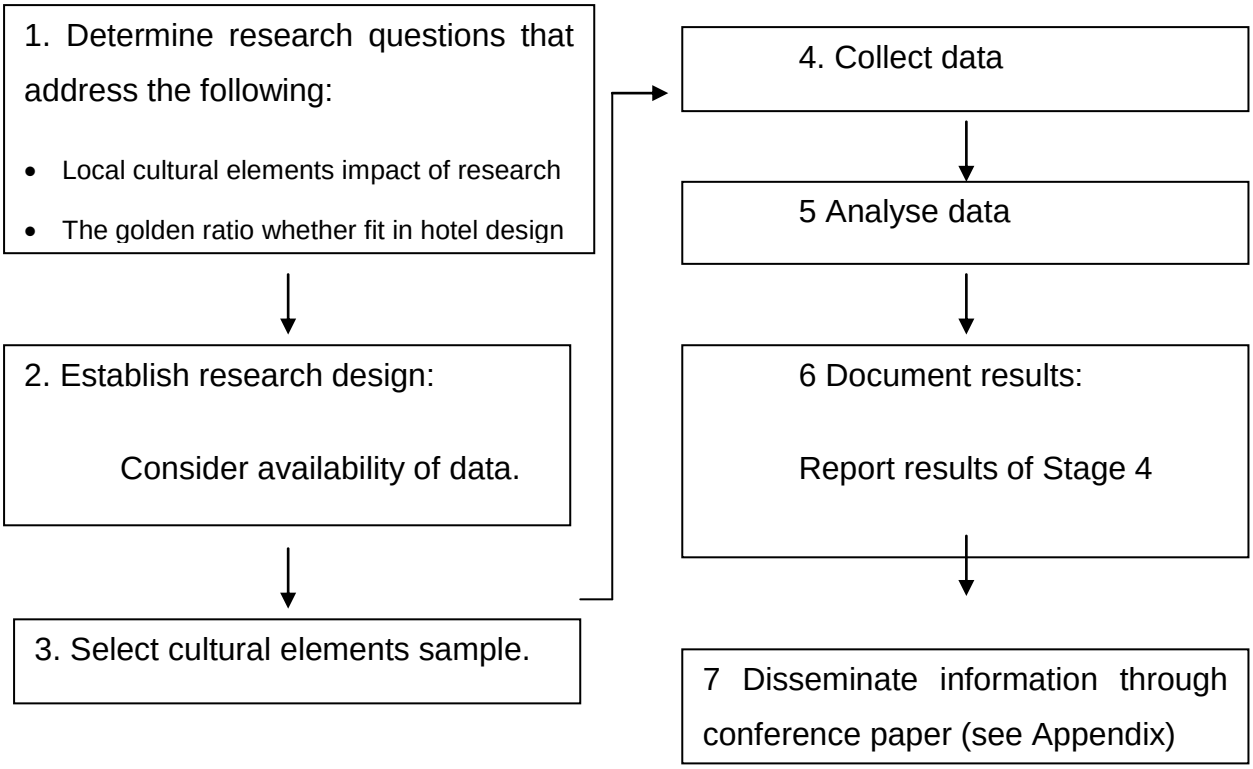


Figure 3.5 Impact Assessment Frameworks

3.3.3 Triangulation strategy

In order to answer the address in research questions: does the global hotel brand need local cultural element with their design? Is the Chinese Five Elements philosophy the best choice of addition into the global hotel design in local city of Nanjing? A systematic evaluation approach is proposed, as shown in Figure 3.6

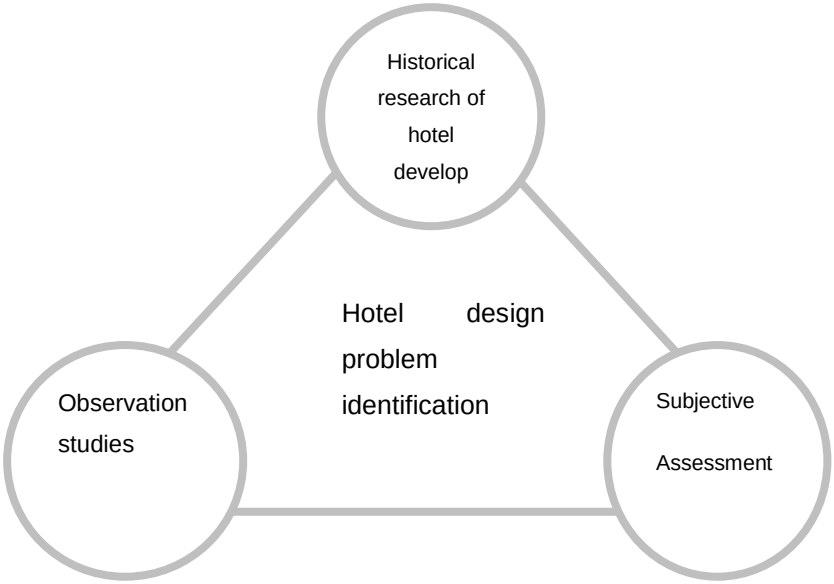


Figure 3.6: The triangulation strategy of the research study methodology

This approach uses a triangulation strategy based on the integration of three methodologies, i.e. hotel develop, subjective assessment and observation study. The hotel develop history reviewed kind hotel develop and analysis global hotel grows up in China (Chapter 2). Furthermore, the observation, via visited hotels analysis of really case of hotel design, also allows the further analysis of currently hotel design problems and the related causes (Chapter 4). Moreover, subjective assessment is also used to assess the traditional local cultural elements whether suitable in hotel design.

Based on the Triangulation Method evaluation approach, it is possible to identify the possible causes and effects on current hotel design style and existing problems, as following:

- Based on the Literature Review, to identify a kind of hotel design style common problem issue.

- Based on the result analysis obtained from the subjective assessment, it is possible to try use local cultural characteristic to solve the global hotel design problem.

- Based on the result analysis for the observation, it is possible to identify current hotel design style disadvantage.

- By gathering together the identified causes and effects, it is possible to draw up a problem causality list for further study.

Therefore, in order to address the research question related to these multifaceted domains, methods triangulation was therefore regarded as an appropriate methodology to be adopted in this research study using both qualitative and quantitative approaches for cross-checking the results.

3.3.4 Create Model for Hotel Design Guideline

Creative hotel design guideline model in design can be seen as the interaction between three different worlds as shown in figure 3.7. Situatedness in design can be seen as the interaction between three different worlds as shown in figure 3.7 (Gero 2002). These worlds are the natural world, the design world, and the interpreted world. The natural world is composed of representations outside the designer's mind. The interpreted world is built inside the designer's mind based on experiences, perceptions, and concepts. The design world is to be produced by the designer's actions in order to solve the problem. The link between these three worlds is achieved through various processes namely: interpretation, focusing, and action.

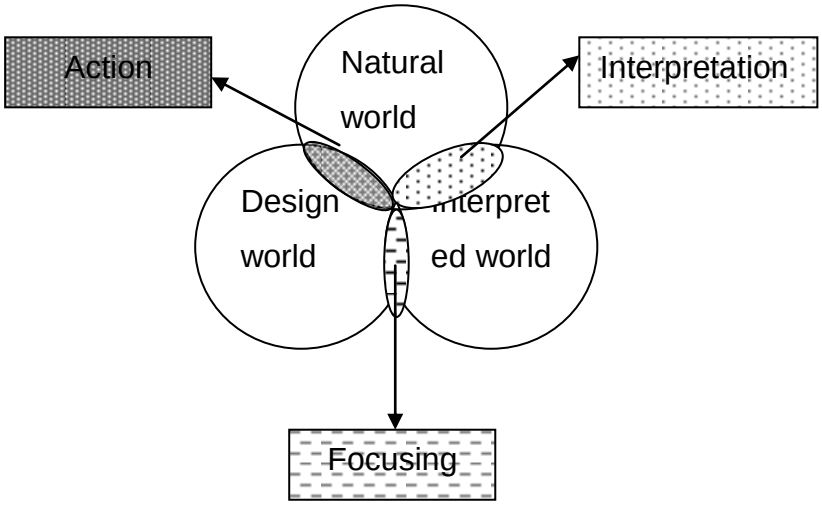


Figure 3.7 Creative hotel design guideline model (source: Gero, 2002)

Proper design guideline can help designer enforce the creative process towards achieving more creative solutions. It needs to be structured carefully to achieve the best results. Proposed hotel design guideline has been structured in a format to embrace several advantages for designer and the incorporated tools taking into consideration several important issues:

- Hotel design guideline is become on easier and more detailed system of design program.
- The local cultural characteristic of hotel design solutions.
- The methods and techniques developed in hotel creative tool which use design knowledge (proportion, the golden ratio) and local cultural features.

The developed hotel design guideline has been taken all the previously mentioned issues, such as symmetry, proportion. Further detailing of the design processes steps representation is discussed in Chapter 6.

3.3.5 The Advantage of the Adopted Methods

There are potentially six apparent advantages in using the Twin-Cycle method:

1. Time effective: any proposed method in creating design guideline is tested to completion in the bed head wall simulation environment.

2. Cost saving: the virtual 3D hotel room system design is tested in the test cycle.

3. Simulation scenes can be re-used: avoid such factors of visiting hotel again.

4. Evaluating the results from the design guideline evaluating result: the result of integrated application determination obtained by end users and experts will help add to the credibility, and make the findings stronger.

5. Eliciting more potential hotel areas in the application field: the expert evaluation provides opportunities to enlarge the design guideline formula utilizations.

6. Testing and integrated application development can exist independently: this flexibility can be used in developing design styles for global hotel in local cities or integrated application separately.

In this thesis the Twin-Cycle method has been further subdivided into five phases as follows:

3.4 Overall Research Framework

A research framework defines the categories of outputs that research can produce. It also defines a set of different research activities. Moreover, it defines what kind of research can be used to produce specific outputs (Jokela, 2001). The research framework outlines all the developed phases of the research process, which involve the Twin-Cycle method, as shown in Figure 3.8.

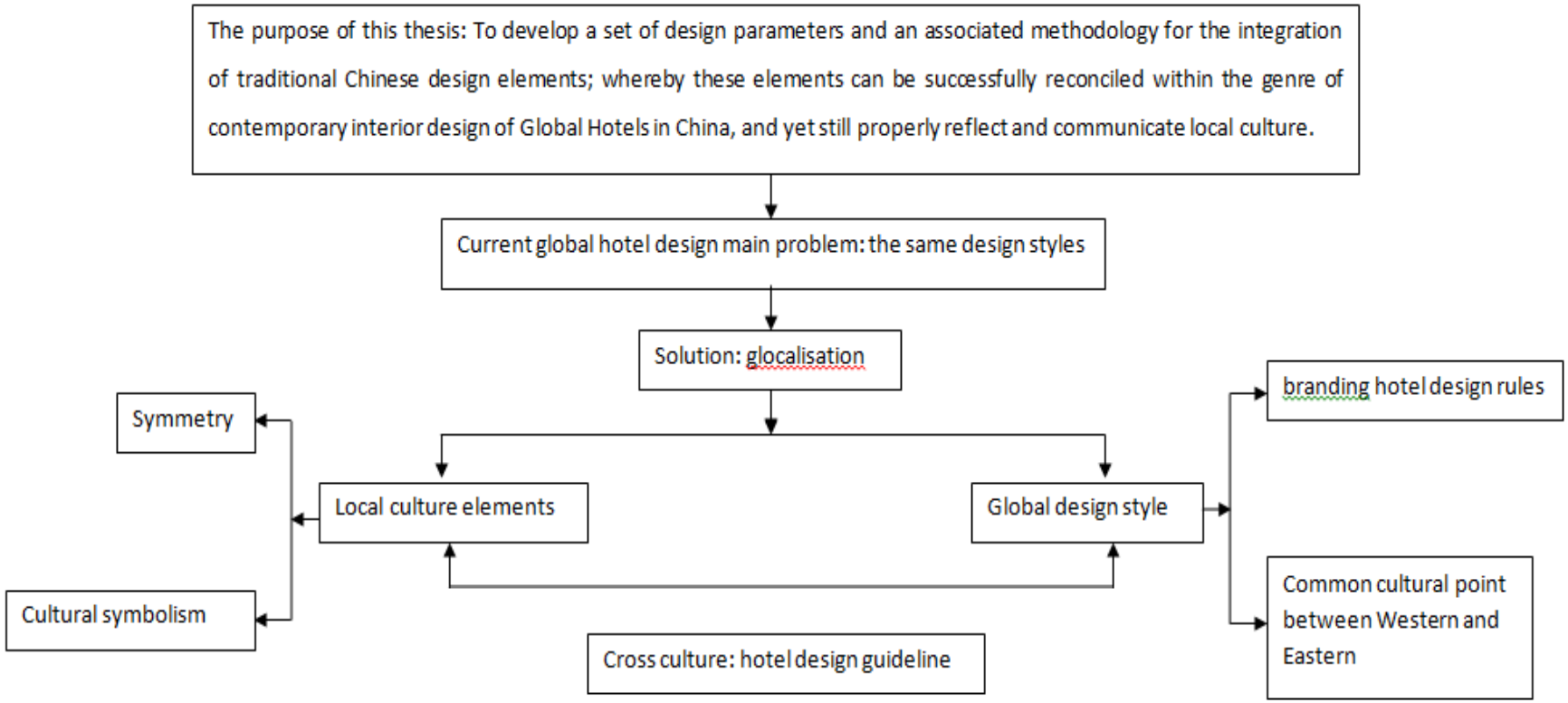


Figure 3.8 The structure of thesis purpose

The purpose of this thesis is to identify, examine, analyse and interpret examples of Chinese traditional design and symbolism, and create a guideline for their application into global hotel design in China.

Knowledge of the hotels development history, and issues concerning the generation of global hotel brands and current global hotel design style has been acquired through the literature review. Briefly, the main problem was the use of strict brand design styles in different countries and cities. Thus, this research has taken glocalisation Roberston (1995), originally is used in global business and applied the notion to in hotel design.

Glocalisation is formed from the words localisation plus globalisation. The local cultural elements relate to symmetry and cultural symbolism in this study, whilst global relates to design styles and global branding hotel design rules. Finally a common cultural point between Eastern and Western, such as the golden ratio, similar to the rule of third, is found.

Therefore this cross cultural approach would concentrate on cultural information to create a hotel design guideline, to help designers design a global hotel in local cities.

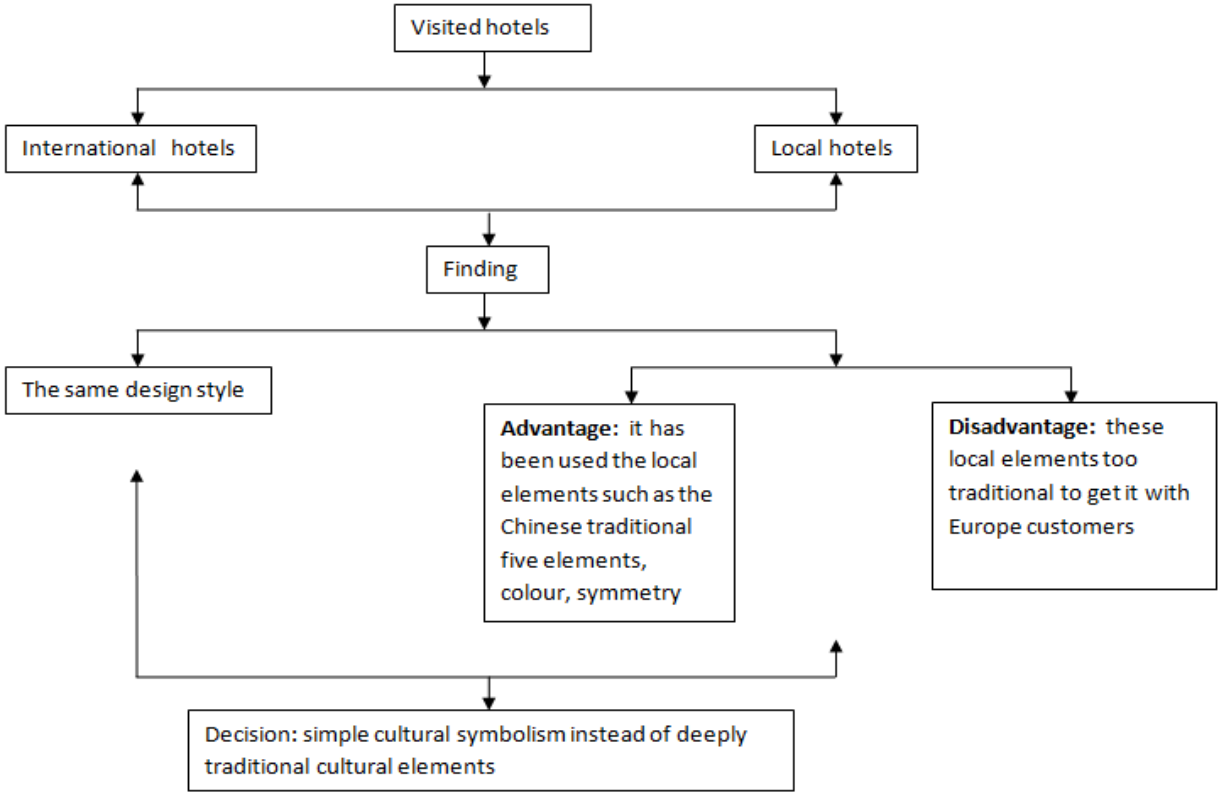


Figure 3.9 process of main research

The strategy for this study includes visiting hotels and collecting photographs from the site survey.

Visiting hotels is essential to fully understand the problem of hotel design domain and has the benefit of exploring the possibility of the creating a guideline, and obtaining practical data of the requirements of the proposed guideline application from the global hotel.

This confirmed that the international hotel design continues to use a branded design style, whilst some local hotel brand had tried to use local cultural information in design. However, these traditional cultural elements have many hidden meanings too complex for most Westerners to understand. Hence, the decision for the guideline is to use simple cultural elements, such as natural forms, rather than the more traditional but complex symbolism.

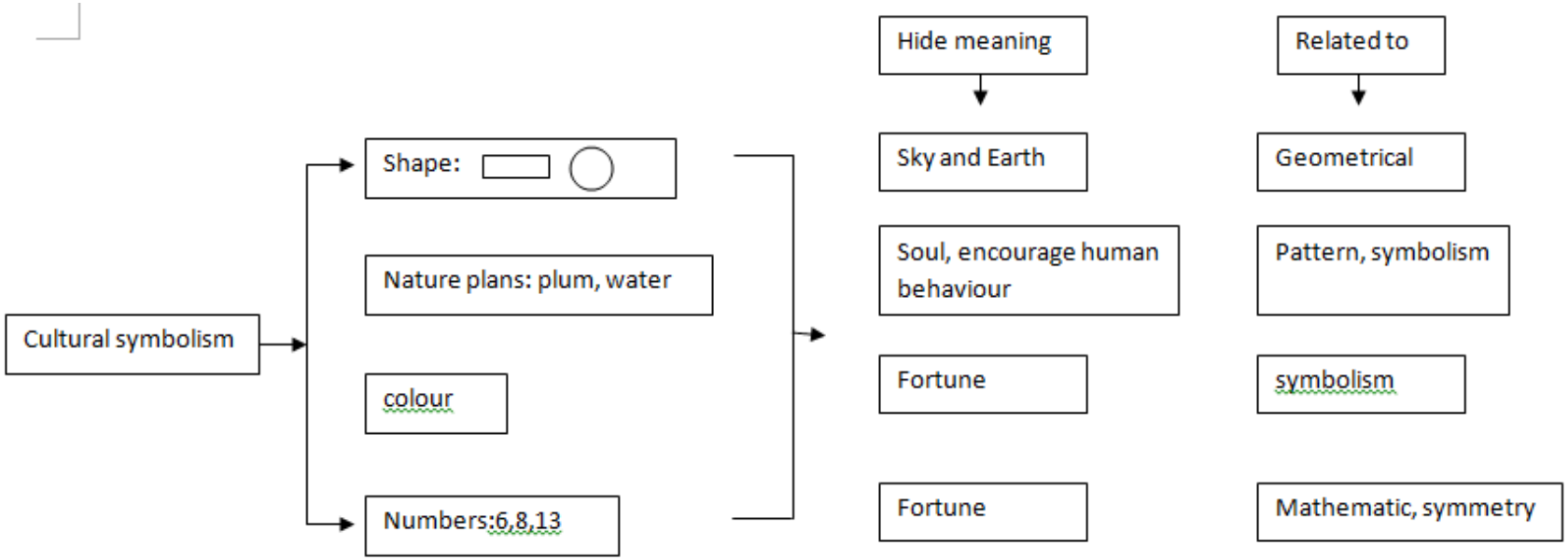


Figure 3.10 analyse the cultural symbolism in thesis

Cultural symbolism relates to shapes, natural elements, colour and signs in this study. Each has many hidden meanings, for example, a square means earth, and a circle means heaven; the natural elements are deeply embedded in the Chinese soul, and normally encourage/ affect a person's behaviour. Colours for example, relate to fortune and numbers also symbolise fortune, whilst also expressing symmetry and maths.

These elements will appear in the hotel design guideline. The initial idea about the design guideline looks closely at the golden ratio background area, such as the bedhead wall in a guest room, or the reception background (back of desk wall), and uses mathematical theory to subdivide these areas. The guideline will also relate to symmetry.

Part of the hotel design guideline is based on 'Modulor' by Le Corbusier (1954) which relates to the human body scale and the golden section, dividing many shapes based on the golden section proportion. However, there is no detail to explain how these Modulors are divided.

Furthermore, part of the hotel design guideline will divide areas for example the bedhead wall) by the golden ratio and analyse in detail using mathematics. Importantly this will help designers to understand the guideline. This guideline also includes the cultural information.

The phase will comprise end user testing and the expert interviews, and can be seen in the adopted Twin-Cycle method. In addition, the end user testing will include testing the proposed design method, which is now in the real environment.

A more detailed analysis is found in Chapter 6, and the building of the formula application production. Methods identified from the 3D model tests will be directly used to develop the guideline production. This will be done to form a representative test for real hotel and application development method.

Initial pilot testing of the guideline will take place before any main evaluation, to ensure proper parameter setting and to experience the

evaluation process. Pilot testing is an experiment, which is often used to test the design of a full-scale experiment and is frequently carried out before large-scale quantitative research in an attempt to avoid time and money being wasted on an inadequately designed project. The pilot test is usually carried out on members of the relevant population.

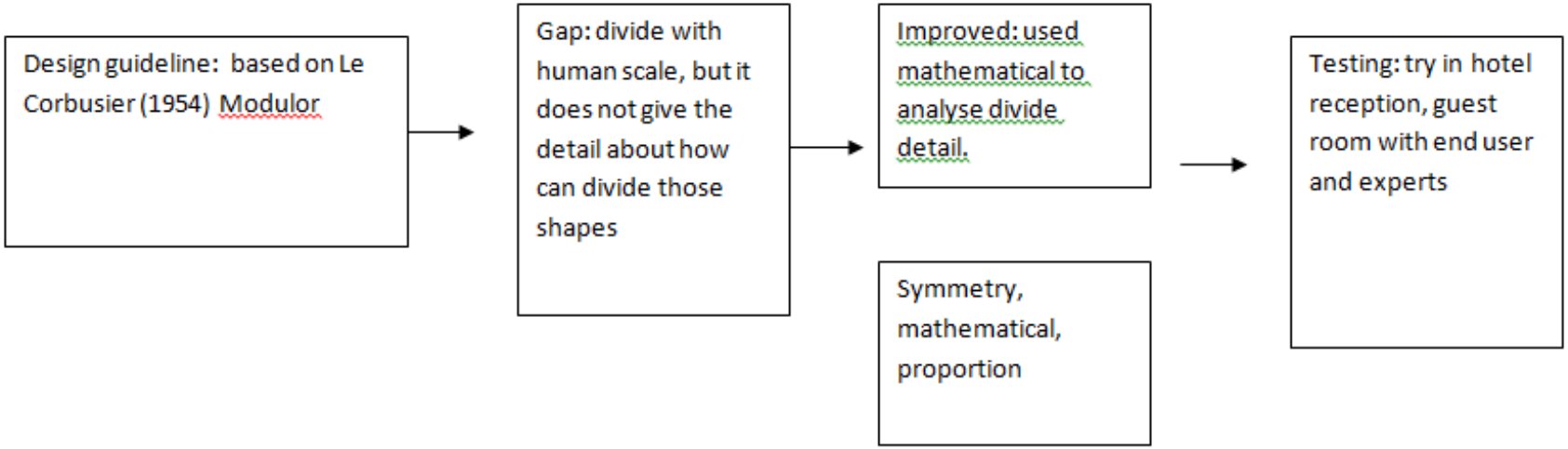


Figure 3.11 Hotel design guideline layout

This final phase will conclude the guideline of evaluation of the creation, in relation to the implementation of the research aims and to the research achievements. The details of the created production evaluation will be described in detail in Chapter 6. The overall conclusions, with the achievements and the recommendations of the research, will be stated in Chapter 7.

3.5 General Methods of Data Analysis

The data is received from the process of triangulation methods located in the research framework, including quantitative and qualitative evaluation methods for analysis, to obtain the research results.

3.5.1 3Quantitative Data Analysis

There are two kinds of quantitative data that are expected to be obtained from analysing the user testing evaluations of the research. One is received by the determination of a single design; the other is a comparison of two related designs by the same participants. The quantitative data of the single design will be received in part of Phase 2, whereby the data is obtained by evaluating the proposed method, and in Phase 5 whereby the data is obtained by determining the requirements of the production of the integrated application.

As is common in such studies, the questions will be scored on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) for all user testing (Sulaiman et al, 2007; Kraljic, 2008). This is the most commonly used format for assessing participants' opinions of usability (Dumas, 1999), and is easy to use because people often enjoy completing a scale of this kind (Robson, 1993; Neuman, 2000; Hilary, 2003). The range is also not so large that users have an ambiguity in selecting a response.

The average point of the results' for the single design is calculated and displayed together with the 85% confidence interval calculated using Microsoft Excel. This will aid an initial visual comparison and exploratory data analysis.

3.5.2 Qualitative Data Analysis

The qualitative data received in the phases of the research framework will occur during the triangulation methods: the added comment portion of the questionnaires on user testing tests and the received opinions from expert interviews.

The qualitative data of end user testing will be organized so as to relate to the research question, and are expected to elicit further applications, the integrated application improvement and suggestions, and mainly, the requirement determination opinions.

3.6 Summary

This chapter has presented the overall research framework which consists of five phases of research in order to address the research question: does the global hotel brand need local cultural element with their design? Is the Chinese Five Elements philosophy the best choice of addition into the global hotel design in local city of Nanjing? In order to address the research question, a triangulation of methods was applied to the research project through the use of both qualitative and quantitative data collection and analysis. Each stage was first introduced and then research work was discussed in terms of the selection of the qualitative and quantitative approach in order to achieve the formulated research objectives.

The initial literature review (Phase one) also reviewed design proportion which relates to the golden section, the rule of thirds. These scale rate elements will come with the Chinese Five Elements to find out in future

chapters which is most appropriate within a global hotel design, in order to glocalise the hotel guest room.

The findings of the secondary literature review and primary research were used to develop a theoretical design reference model which could be used as a tool for hotel designers when applying the hotel design guideline. The design of a guideline for design of guest room bed headwall was developed to experimentally test the efficacy of the system. The validation of the model was conducted through two evaluation strategies: user testing and expert evaluation. The final section of this chapter described issues of validity and reliability for each of the two primary researches and the prototype evaluation strategies.

Based on this overall research framework, the contents of the next phase, which is described in detailed in the next chapter, is going to focus on proposing and testing the design method to deal with the problems identified. This review is discussed in the next chapter.

Chapter 4 Testing of the Proposed Solution Contents

4.1 Introduction

The literature review of global hotel develop background in the last phase (see Chapter 2) identifies issues such as current hotel design problems, and how it will affect the local cultural elements of any application. In addition, the information enhancement of the recommended elements investigated by former experts' research to obtain more environment information, needs to be tested before a design guideline application is made. These issues present the requirements for developing new solutions to deal with the issues, and to determine the elements before creating any guideline application. This chapter is to propose the latest and considered best design method, as solutions and as guidance to develop the proposed design guideline.

This chapter focuses on the evaluation of design resources such as proportion, symmetry which relate to cultural elements. To test whether resources can continue to be used in overall research. This research method detailed in Chapter 3.3.1.

Hypotheses were formulated for these design elements' (which were collected from Chapter 2). The hypotheses were the basis of a set of questions to be asked in the questionnaires given to teams currently working in hotel design, interior design or having experience in spatial design disciplines. The questionnaires address the main research question of this study: what is the most appropriate relationship between a global hotel design and local culture and the creation of guideline for bedroom design to ensure it can be utilised. In addition, the interview studies aimed to identify a series of topics and issues regarding the biggest problems in designing global hotel in local city and the importance of local cultural features in hotel design guideline. These topics and issues are covered with each question, subjects' opinions and suggestions were analysed, put into discussion and used to

improve the research methodology for future study (Chapter 3, Twin-Cycle method) or to make these available to researchers interested in adopting these methodologies.

At the end of this chapter, the findings from the questionnaires concerning the research direction will subsequently be used to create the design guideline for hotel guest room as part of the overall research.

4.2 Aim of Questionnaire

This chapter is to propose the latest and considered best design method, as solutions and as guidance to develop the proposed. The aim of these questionnaires is to evaluate whether the results with evidence from previous tests.

4.3 Rationale

Questionnaires about the Golden section, symmetry and colour, there are can be used to test research hypothese through eliciting respondents' point of view and experience (Kvale, 1996). These questions will both provide an in-depth understanding of the design elements and methods applicable to the hotel design as well as either support or rejection of the research hypotheses. These results will form the basis for creating the design guideline based on the cultural elements. Furthermore, the results from these questionnaires were utilized to evaluate and validate the research findings. The hypotheses proposed from the observational studies are as follows:

- If the guideline features include rich geometrical formats (i.e. the gold ratio and balance) it will provide a high level of attraction and there will be a greater possibility to improve visitors' interest.

- If the design guideline is based on traditional cultural information, it will lead guests to a deeper understanding of the local culture.

- If a guideline needs to present its cultural features for designer and guests, the constructivism approach will provide the greatest potential to lead them to a deeper engagement (e.g. look at images, read labels and study exhibits).

4.4Methodology

4.4.1 Methods

With regard to this research, the method of semi-structured interviews is used to elicit designers' views and experiences of a bed head wall design guideline and the research hypothesis. This is because the main objective of semi-structured interviews focuses on capturing 'the respondent's point of view (Livesey 2003).' In addition, this method can obtain information through open-ended questions about aspects of a particular topic to be explored in detail and depth. Therefore, these interviews employ the method of semi-structured interviews in order to identify a series of topics using open-ended questions which are covered with each subject who has created bed head wall design on their own real life hotel project.

4.4.2 The Types and Sequencing of Questions

There are four different types of questions to ask people in interview research as follows (Patton 2002):

- Experience and behaviour questions: these focus on eliciting the respondent's behaviours, experiences, actions and activities.

- Opinion and values questions: these aim at investigating the respondent's cognitive and interpretive process related to their opinions, judgments and values.
- Knowledge questions: these identify the respondent's factual information.
- Feeling question: these focus on understanding the respondent's emotion concerning their experiences and thoughts.

The first three categories of questions (i.e. experience and behaviour, opinion and values, and knowledge,) are used to construct semi-structured interviews with consideration of reliable data collection based on the objectives of this research. However, feeling and sensory questions are not applicable to this interview research because the aim of the interviews is to determine interviewees' views, knowledge and experiences of developing bed head wall design rather than the impact on their senses and emotions. Hence, this questionnaire's structured in in a black-white style to avoid emotional effects.

As mentioned early, the validity of interviews includes the logic of the elicitations through sequential questions. Patton (2002) has suggested that 'standardized open-ended interviews must establish a fixed sequence of questions to fit their structured format.' In using open-ended questions format in this research, the sequence of questions suggested by Patton in the format of this semi-structured interview with consideration of question types for reliability (discussed in Section 4.4.1) is explained as follows:

- Experience and behaviour questions: these questions are presented at the beginning of the interview in order to examine the interviewee's activities and experiences (e.g. current work)

for straightforward descriptions. The aim of these questions is to elicit in depth information and greater details.

- Opinion and values questions: once several experiences have been described, then opinions can be solicited, building on interpretations of the experiences (Patton 2002). The use of opinion and values questions is to identify interviewees' opinions in order to evaluate the research hypotheses.

- Knowledge questions: the use of knowledge questions in interviews relies on the context because they may be threatening if asked too abruptly (Patton, 2002). It can be useful to ask knowledge questions by following up experience questions which have a bearing on knowledge.

The detailed questions used in the interviews with designer can be found in 4.7 and Appendix 4.

4.5 User Testing Results

The results of the user testing are presented in three parts: participant profile, Performance Data Summary and their preference on the tested hotel design elements based on the post-test questionnaire. The original data can be found in Appendix 4.

4.5.1 Participant Profile

This questionnaire was sent to 284 people, and 203 were returned and completed by different groups as follows:

Table 4.1: general information on participants

Characteristic	Range	Number of participants
Gender	Female	92 (45%)
	Male	111(55%)
Age	19-25	3 (1%)
	26-35	31(15%)
	36-45	52(27%)
	46-55	64(32%)
	56-65	45(22%)
	65+	8(3%)
Nationality	Chinese	128(63%)
	European	75(37%)

In general, the participant profile for the user testing conducted matches this study target consumer profile as identified in Table 4.1. Most of the participants are highly educated with advanced design degrees and they have design knowledge and design skills.

This questionnaire was sent to a particular group of people, they had experience in design area. The most of them had more than 5 years' experience in hotel design and some of them are business man, they also had chance to travel each year.

4.5.2 Performance Data Summary

According to a survey response rate is viewed as an important indicator of survey quality. Many observers presume that a higher response rates assure more accurate survey results.

This project used Excel to analyse the data, the participants were asked several questions about fundamental hotel information, hotel design style testing. The type of questions included both single-choice question and multiple-choice questions.

Table 4.2 Broad Results of questionnaires

Questions	%of participants range	% of gender	% of age	% of nationality
1 How much would you expect to pay for stay in a 4 star rated hotel, per night (excluding meals)?	£96-150 (45%)	54%(male)	36-45(32%)	European (65%)
2. For what reason you will stay in a 4 star rated hotel per year?	Tourist (88%)	68% (female)	46-55(35%)	China (78%)
3. How often do you live in hotel per year?	3-5 (55%)	52% (Male)	56-65(48%)	European (65%)
4. Which area would you spend more time?	Guest room (98%)	85% (female)	26-35(52%)	China (92%)

5. Which design elements do you think important in hotel design?	Furniture (45%)	65% (female)	46-55(44%)	European (65%)
6. Please rate the importance of the design elements in the different area that are mentioned below?	. Entrance area (decoration 40%) .guest room (furniture/equipment 75%) . Shower room (lighting 45%) .lift (furniture/equipment 55%) . passage (decoration 30%)	85% (female) 75% (male) 45% (female) 85% (female) 45% (male)	46-55(75%) 26-35(63%) 36-45(31%) 56-65(45%) 36-45(32%)	China (69%) European (67%) China (78%) European (65%) European (58%)
7. Which style of room would you prefer?	C (65%)	85% (female)	46-55(56%)	China (76%)
8 Would you prefer to select a room with cultural feature in a hotel if the prices are the same?	Strongly agree (60%)	65% (male)	46-55(43%)	European (65%)
9. Do you think modern hotels should contain traditional elements?	Strongly agree (42%)	85% (female)	36-45(45%)	China (55%)
10. Are you interested in staying a hotel with both traditional and modern elements in	Strongly agree (53%)	78% (male)	46-55(44%)	European (67%)

the future?				

The participants' performance throughout the questionnaire was presented and discussed during the PhD study. For each question, participants' preferences were used to inform the ongoing research direction. Moreover, the participants' subjective evaluation of the hotel design elements chosen was summarised. Their attitudes and opinions toward aesthetics issues, gathered from the post-test questionnaires, were also presented and discussed at the end.

According to Table 4.2 results the highest response rates were found in four groups' which are age group 26-35, 36-45, 46-55, 56-65 (C means Chinese, E means European, F means Female, M means Male, Q means questionnaire) .

Table 4.3 comparison of four groups

Age groups	Gender number of %	Nationality of %	Fairly high % in response
26-35	**31 --** a number of people,15%(F 20, 10%, M11, 5%)	C(18, 9%) E (13, 6%)	Q6,63%,E,M
36-45	**52**,25% (F18, 9%. M34, 16%)	C(22,11%)E(30,15%)	Q9,45%,C,F
46-55	**64**,31%(F37,18%, M27, 13%)	C(34,17%)E(30,15%)	Q7,56%,C,F
56-65	**45**,22%(F8, 4%, M37, 18%)	C(22,10%)E(23,11%)	Q3,48%,E,M

Table 4.3 shows an overall comparison of four different age groups, on average percentage of groups, a fairly low percentage of age 26-35 group compared with the other three groups, only 15% of the participants in 26-35

age group. Moreover, 31% of participants in 46-55 age group is highest percentage in this questionnaire.

From the data, Chinese female group in age 36-45, 46-55 are interesting at question 7 and 9. European male are more interesting at question 3 and 6. In terms of hotel design style, Chinese female more interesting than European; however, European spend more time for tourist in hotel more than Chinese.

The Table 4.3 summarises the participants' subjective measures for the hotel design trend in this study. The participants' attitudes and opinions toward certain usability and aesthetics issues were gathered via the use of the post-test questionnaires later in the study.

Question 8, 9, 10 are the most significant to the study. These questions represent the participants' personal views. In addition, 5-point Likert scale (Chapter 3) was developed for questions about the hotel design in order to generate a theoretical platform from which to develop new design ideas for the hotel industry. Table 4.4, 4.5, 4.6 give detailed statistical analysis of the findings, as below:

Table 4.4 shows an age of 46-55, European male accounted for a high proportion of this question 8.

Table 4.4 analyse question 8

8. Would you prefer to select a room with cultural feature in a hotel if the prices are the same?									
Age	rate	Nationality	Gender		5-point Likert scale (1-5 means strongly disagree – strongly agree)				
			M	F	1	2	3	4	5

19-25 (4)	2%	Chinese 2% European 0%	0%	2% CF				2% all CF	
26-35 (18)	9%	Chinese 9% European 0%	5% CM	4% CF				4% 1% CF, 3%CM	5% 3%CF 2%CM
36-45 (47)	23%	Chinese 13% European 10%	10% 4%CM 6%EM	13% 7%CF 6%EF					23% ALL
46-55 (87)	43%	Chinese 3% European 40%	25% 25%EM	18% 15%EF 3%CF			3% 3% EF	10% 5%EF 5%EM	30% 3%CF 7%EF 20%EM
56-65 (30)	15%	Chinese 5% European 10%	13% 4%CM 9%EM	2% 1%CF 1%EF				5% 2%CM 3%EM	10% 1%CF 1%EF 2%CM 6%EM
65+	8%	Chinese 3%	6%	2%					8%

(17)		European 5%	2%CM 4%EM	1%CF 1%EF					ALL

The most respondents is in age group 46-55, that is highest rate in whole subjects group, the number of them is over 43%. The table 4.2 shows 60% participants were strongly agree with question 8, and the choices of European men from age group 36-65, were significant in this question, particularly because he European men can be seen as the group who do a lot of traveling per year.

In relation to question 9 of the question survey, the responses obtained are shown Table 4.5 below.

Table 4.5 analyse question 9

9. Do you think modern hotels should contain traditional elements?									
Age	Rate	Nationality	Gender		5-point Likert scale (1-5 means strongly disagree – strongly agree)				
			M	F	1	2	3	4	5
19-25 (15)	7%	Chinese 5% European 2%	2% 2% EM	5% 2% CM 3% CF				7% ALL	
26-35	17%	Chinese 8%	2%	15%			2%	15%	

(35)		European 7%	2% CM	6% CF 7% EF			2%CF	2%CM 4%CF 7%EF	
36-45 (91)	45%	Chinese 23% European 20%	13% 7% CM 6% EM	32% 18% CF 14% EF				12% 2%CM 5%CF 3%EM 2%EF	33% 5%CM 13%CF 3%EM 12%EF
46-55 (32)	16%	Chinese 14% European 2%	2% EM	14% CM			7% 7%CM	7% 6%CM 1%EM	2% 1%CM 1%EM
56-65 (28)	14%	Chinese 5% European 9%	5% 2% CM 3% EM	9% 3% CF 6% EF				6% 2%CM 1%CF 3%EF	8% 3%EM 2%CF 3%EF
65+ (2)	1%	Chinese 0% European 1%	0%	10% EF					1% ALL

It is apparent from Table 4.5 above that preferred modern hotels should contain traditional elements is an age group 36-46. It can also be observed that the interesting of this question 9 is European man.

Table 4.6 analyse question 10

10. Are you interested in staying a hotel with both traditional and modern elements in the future?									
Age	Rate	Nationality	Gender		5-point Likert scale (1-5 means strongly disagree – strongly agree)				
			M	F	1	2	3	4	5
19-25 (6)	3%	Chinese 0% European 3%	2% EM	1% EF			1% 1%EM	2% 1%EF 1%EM	
26-35 (7)	3%	Chinese 1% European 2%	3% 1% CM 2% EM	0%				3% ALL	
36-45 (35)	17%	Chinese 7% European 10%	14% 6% CM 8% EM	3% 1% CF 2% EF			5% 1%EF 4%CM	7% 2%EF 5%EM	5% 1%CF 2%CM 3%EM
46-55	44%	Chinese	33%	11%				10%	34%

(89)		12% European 32%	9% CM 24% EM	3% CF 8% EF				3%CM 7%EM	3%CF 6%CM 8%EF 17%EM
56-65 (65)	32%	Chinese 15% European 17%	25% 13% CM 12% EM	7% 2% CF 5% EF			3% 3%CM	13% 2%CM 11%EM	16% 8%CM 2%CF 5%EF 1%EM
65+ (1)	1%	Chinese 1% European 0%	1% CF	0%					1% CF

As can be seen in table 4.6 above, the overall result of interested in staying a hotel with both traditional and modern elements participants are age group of 46-55, and European man accounted for a high proportion of this question 10. Specifically looking at the EM 46-55 has provided strong answers in this questionnaire. In particular, these participants had more than 4 times hotels experience per year. Although this is a more broadly spread answer. But the tendency is for stage of 36-65 ages to strongly agree 36-55(84%). Within this result it can be seen that between these ages EM had many business trips and get a rich experience staying in hotels. Access to this resources can inform future post-test questionnaires.

4.5.3 Data Analysis and Interpretation

Table 4.2 broadly summarises the participants' subjective measures for the hotel design questionnaires. Their attitudes and opinions toward certain usability and aesthetics issues were gathered via the use of the questionnaires.

Then through interrogating the questionnaire results, some important research findings were identified and regarded as important to the proposition of a design method for hotel guest room bed head wall guideline, and identification of the common strengths of design elements within the hotel design. Hence, how to create a new way of incorporating traditional elements is the next research step.

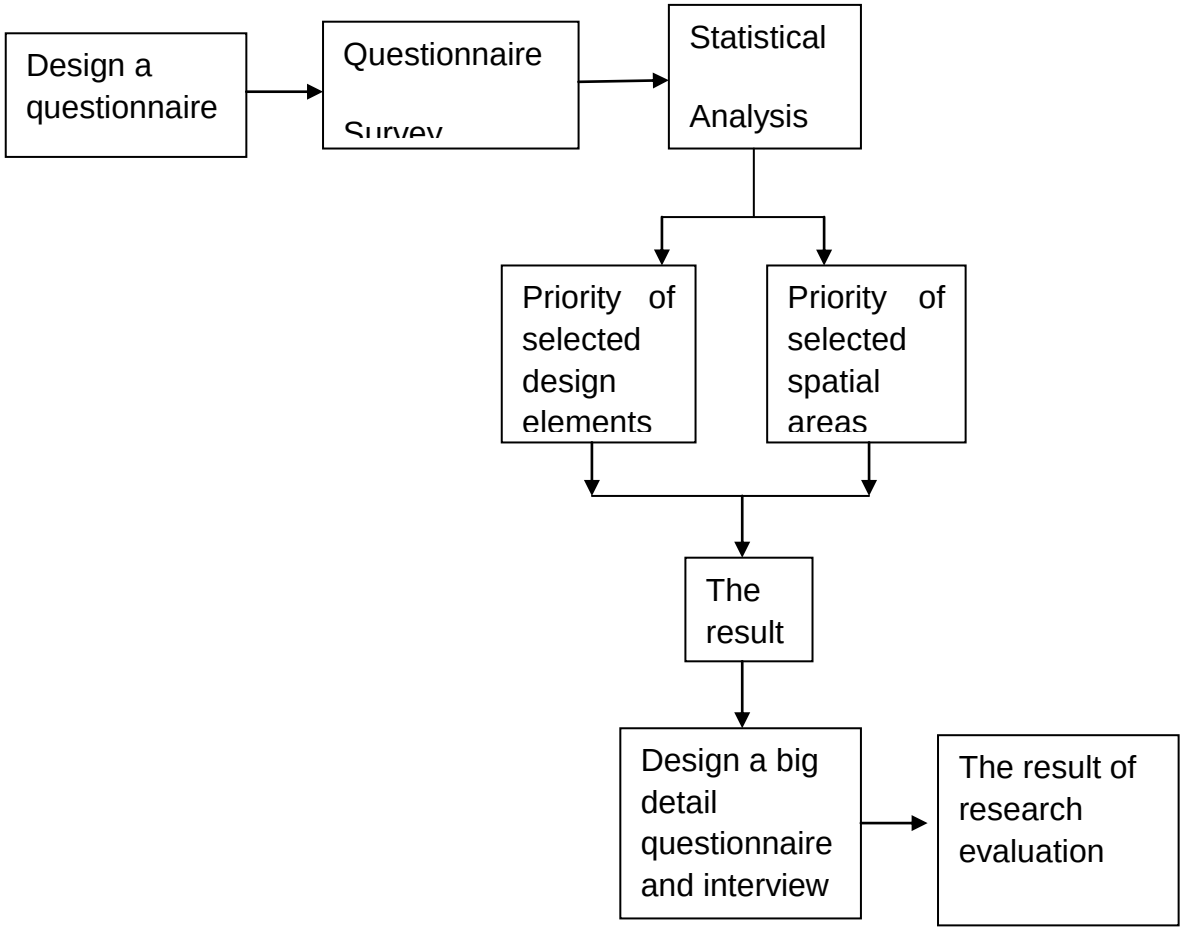


Figure 4.1 process for next step of studying

4.6 Result Analysis

Concerning the purpose of qualitative interview analysis, Gorden (1980) asserts that it can be helpful to use an audiotape during the interview in order to reproduce a full text of interview content for detailed analysis of the results. During the process of the interviews, the contents of interviews were accurately recorded through an audio recorder in order to transcribe into text documents. Email-based interviews with specialist participants provided textual information through expressing their opinions and experiences in writing. The transcribed interview contents via telephone and the text-format contents through Email interviews were both used for in-depth analysis.

According to Diamond (1999), the method of content analysis is useful for dealing with qualitative data to organise them in terms of central themes, patterns and issues.

Besides, she points out that 'the use of quotations is an important element in the analysis and presentation of qualitative research (Diamond 1999).' This is because quotations are regarded as the most effective way of conveying participants' experience and views. Therefore, these qualitative interview data were analysed using the method of content analysis to organise the data under the established themes and issues through the use of quotations from a series of semi-structured interviews with designers.

The analysis of the results consisted of two parts: the subjects' views and experiences of developing a bed head wall design guideline, together with their opinions and support for the hypotheses.

4.6.1Standard operating procedure

A Standard operating procedure (SOP), shown in Figure 4. 2, was used as a checklist to ensure reliability of the observation and the related analysis. There were four sections in the experiment.

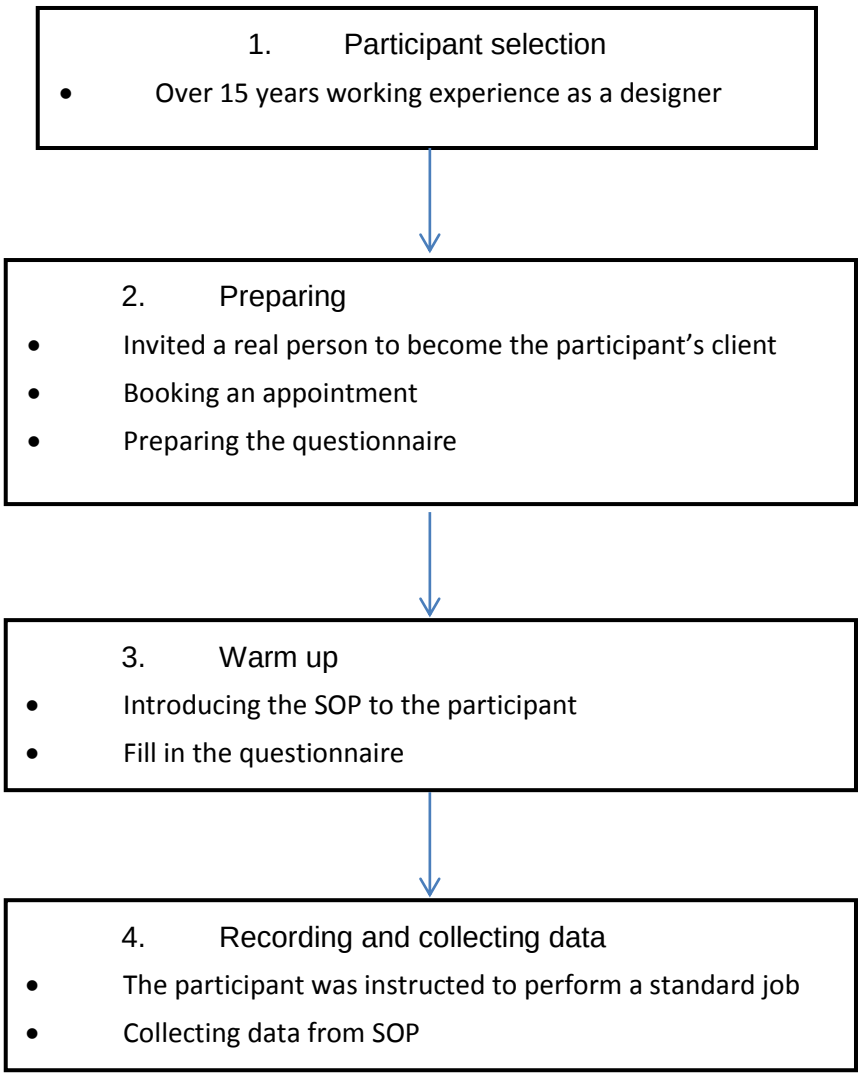


Figure 4.2 Standard operation procedures (SOP) for the observation in Chapter 4

In section 1, 32 designers who met the selection criteria volunteered to join this study. Then, in section 2, the study invited a real person to become the participant's client.

Next, section 3 was the administration of the questionnaire and finally in section 4, the participant results were calculated using Microsoft Excel, to aid an initial visual comparison and exploratory data analysis.

4.6.2Gold Ratio Questionnaire

4.6.1.1 Reviewed the Preview: the Gold Ratio Tests

This questionnaire (see App 4B) is intended to confirm whether the golden section is still favoured at the present time. This questionnaire took the idea from Gustar Fechner's (1876) exploration of the golden ratio and it was designed with these 10 different shapes (Figure 4.3) keeping all shape widths is the same and the lengths increasing in ratio. The, ten shapes are put together in one row to compare. Subjects are required to choose which shape that feels most comfortable for them.

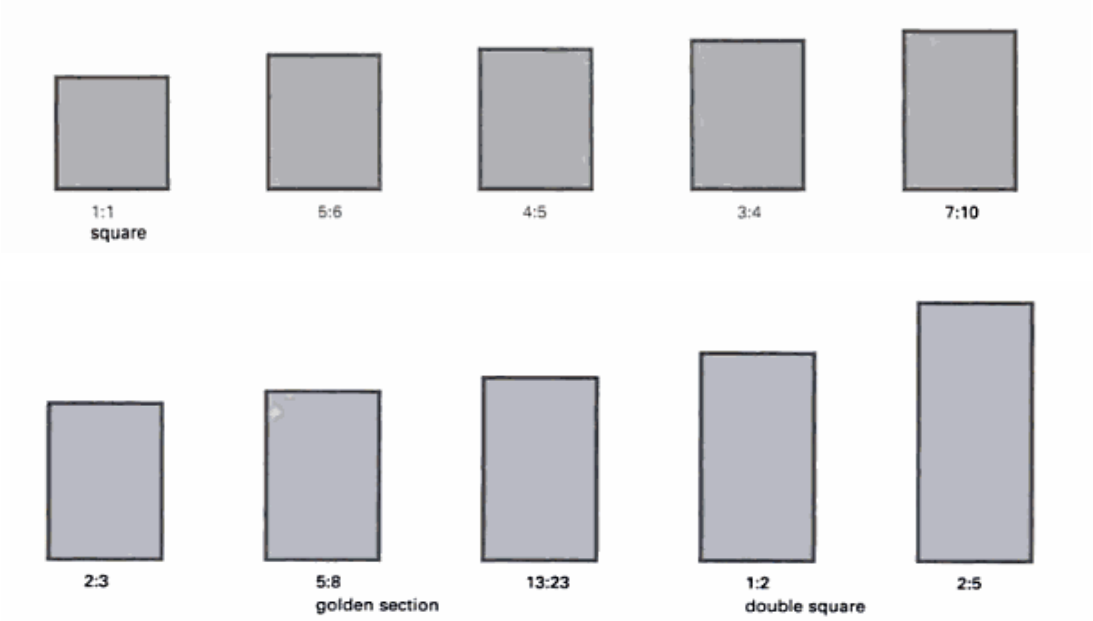


Figure 4.3 Gustar Fechner's testing with 10 different shapes

Also according to the literature, there have been two well-known tests of golden ratio in history: Fecher's (1876) and Lalo (1908). Both of their questionnaires got the same result—the golden section is the most preferred ratio (Elam, 2001).

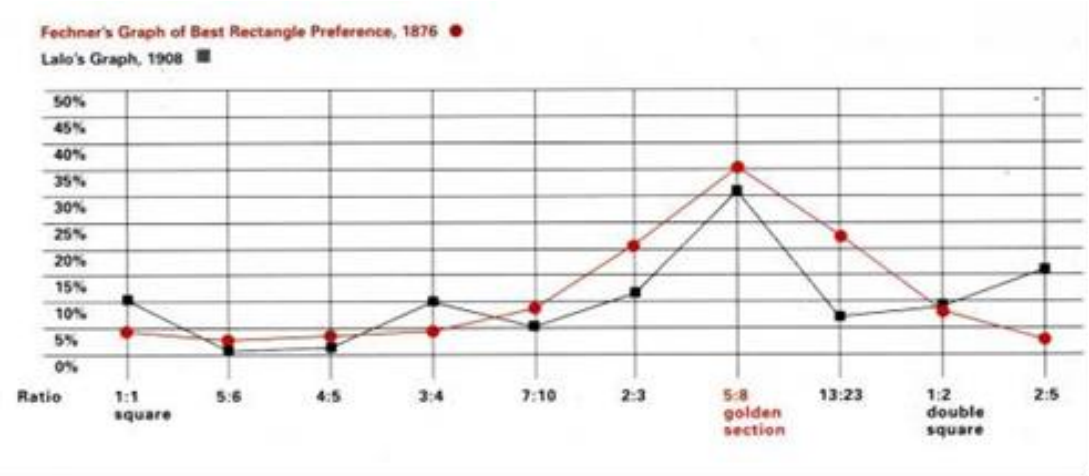


Figure 4.4 the results of the rectangle preference from Fechner and Lalo

4.6.1.2 The Gold Ratio Finding

This questionnaire obtained very significant results which were the same as Fechner's and Lalo's. The questionnaire proved the golden section is still considered to be the perfect ratio up to the present day. 32 people were asked 37.5% of the respondents chose the golden section shape and nobody disliked this shape. 46.88% of the respondents regarded this shape as their favourite. Hence, this survey confirms that the golden section is still the preferred ratio.

Table 4.7 Rectangle Proportion Preference

10 Rectangle Shapes Ratio	like	dislike	most perfect
1:1	6.25%	3.13%	0.00%

5:6	6.25%	12.50%	0.00%
4:5	3.13%	12.50%	3.13%
3:4	6.25%	9.38%	3.13%
7:10	3.13%	6.25%	6.25%
2:3	12.50%	3.13%	15.63%
5:8	37.50%	0.00%	46.88%
13:23	15.63%	3.13%	25%
1:2	3.13%	15.63%	0.00%
2:5	6.25%	34.38%	0.00%

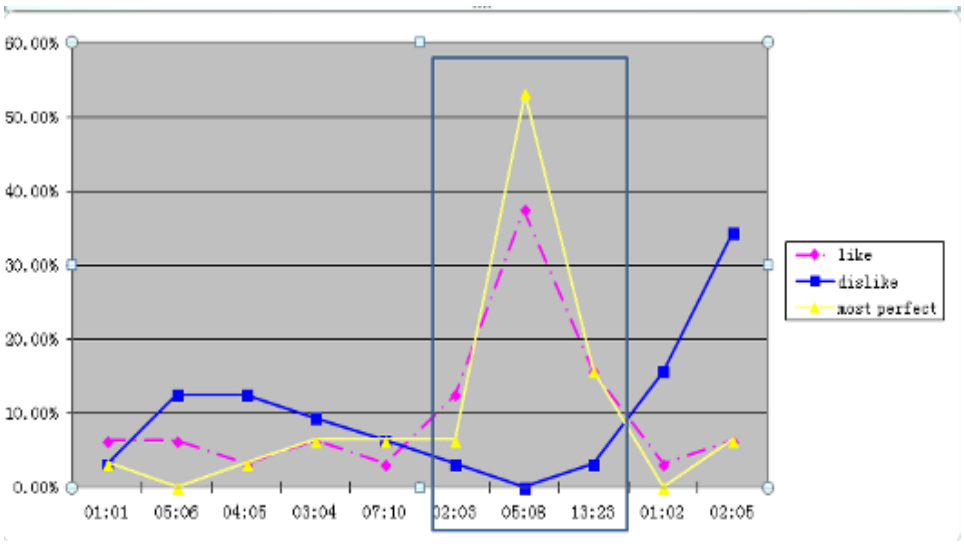


Figure 4.5 The Result from The Golden Section Shape Questionnaire

37.5% respondents selected the golden section shape and no one disliked this shape. 53.13% respondents regard this shape as being their favourite (Figure 4.5).

Table 4.8 Compares the Result of the Golden Section

Researcher	Result of the golden section
Fechner	35.5%
Lalo	30.3%
Author	53.13%

This questionnaire has got really important results which were the same as Fechner's and Lalo's, and proved the golden section is still considered to be the perfect ratio in modern times.

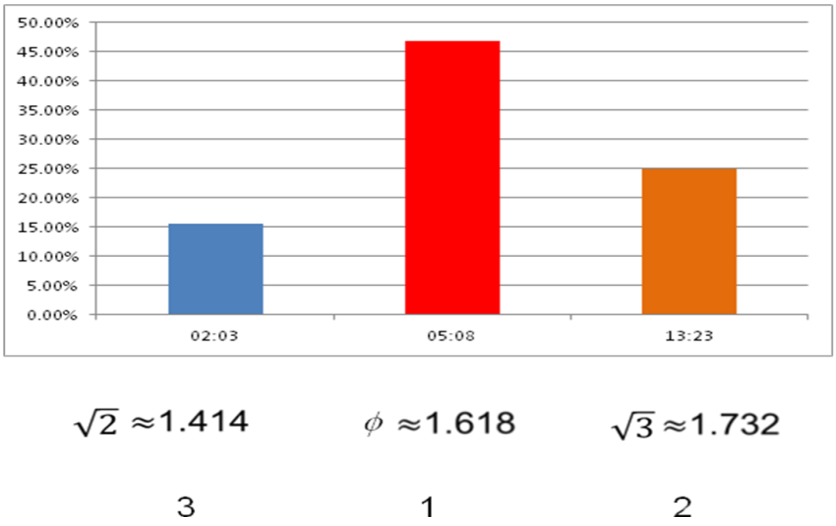


Figure 4.6 Comparisons the Root 2, Golden Section and Root3 Stations

Further analysis of the questionnaire shows the ratio more preferred by people is 5:8, followed by 13:23 and the least preferred is 2:3. All of these ratios are close to the golden section, √3 and √2. The √3 is closest to the golden ratio which explains why √3 is the second most preferred shape in questionnaires.

4.6.2Colour Questionnaire Survey

4.6.2.1 Review Previous' colour tests

Colour preference is a secondary issue and not pursued in great depth in this study. Also this questionnaire only requires identifying which colour

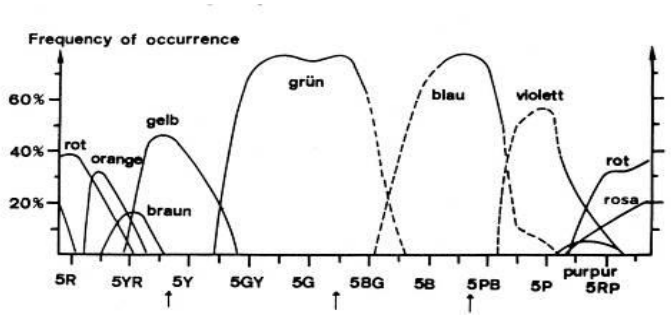
system is preferred. In this questionnaire there are also findings surrounding sex differences regarding color preferences and looking for possible differences in colour preferences associated with sexual orientation (Ellis, 2001).

Throughout the research of colour, many people used colourimetric models and the whole idea of colour systems was developed. Some examples include: Johann Heinrich Lambert (1722) created a pyramid model established on a trichromatic base; Jakob Christoph Le Blon (1735) built upon the work of Lambert with a geometric shape resembling a prism that displayed various colours according to the order of their tonal emission; Johann Tobias Mayer (1745) developed a principle of chromatic inversion with two pyramids attached at their bases, consisting of a light upper vertex and a dark lower vertex; Ignaz Schiffermuller (1772), from Versuch eines Farbensystems, designed a romantic color circle that was published in Vienna (Jodhua, 2006).

Zollinger (1999) wanted to know which colour system is more preferred by different nationalities. He had chosen colours based on the framework of Berlin and Kay's work categorising into two to eleven basic colour terms. This experiment tested subjects who were native speakers of German, French, English, Hebrew, Japanese and Kekchi (Figure4.7). There were three culturally distinct locations: European, Arabic and Asian. Based on cultural influences, they had different names for colours. For example, in Kekchi language, only five terms were selected in the naming test: sacc (white), qkecc (black), ccan (yellow), cacc (red) and rax (green, blue). (Zollinger, 1999, pp141-147)

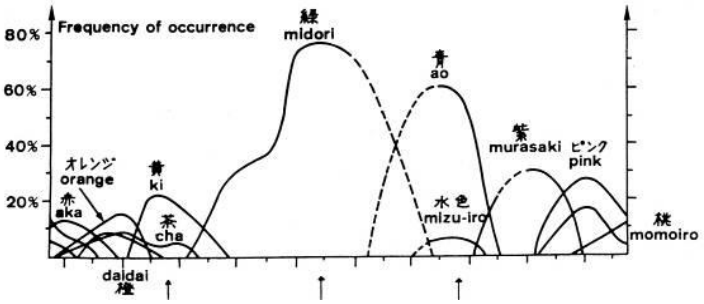
German[30] (42)	French[30] (31)	English[30] (8)	Hebrew[32] (19)	Japanese[33] (55)	Kekchi[31] (21)
weiss	blanc	white	LAVAN	SHIRO	sacc
grau	gris	gray	afor	kai(-iro)	
schwarz	noir	BLACK	SHAKHOR	KURO	qkecc
GELB	JAUNE	YELLOW	TSAHON	KI	ccan
	ocre				
orange	ORANGE	ORANGE	katom	daidai	
beige	beige				
braun	BRUN	BROWN	khoom	cha(-iro)	
	rouge carmin				
ROT	ROUGE	RED	ADOM	AKA	cacc
	rose	pink	varod	pink	
	mauve	mauve		murasaki	
		purple	tekhelet		
violett	VIOLET	violet	segol		
	indigo				
BLAU	BLEU	BLUE	KAKHOL	AO(I)	RAX
	turquoise			kon	
GRÜN	VERT	GREEN	JAROK	MIDORI	

Figure 4.7 Colour Terms Name in Six Languages



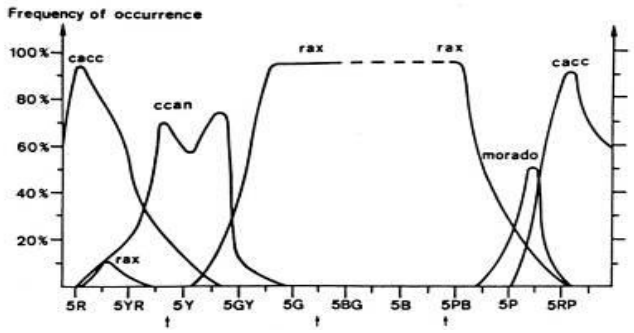
(A)

This result comes from the German sample. Subjects selected the green and blue as most preferred colours; secondly is violet and yellow.



(B)

This result is from the Japanese sample. Nearly 80% of subjects selected the green and 65% of subjects selected blue as most preferred colours.



(C)

Figure 4.8 Result for Colour Text with Three Countries (A-C)

This result is from Kekchi. Kekchi does not have much language concerning colour, there just the division of colour sorts. But the result is the same as other countries, with green and blue being the most preferred colours.

Therefore, Zollinger's colour test results show although subjects were from different cultural backgrounds, they almost all preferred the same cold tone colours (Figure 4.8).

4.6.2.2 The result from colour Questionnaire

At the beginning is a simple review about the types of colours. In nature, RYB (red, yellow, blue) are the main primary colours. In TVs and computer monitors the main colours are RGB (red, green, blue). In this questionnaire only RYB were chosen as primary colours for testing because

there are also original colours in an art. A secondary colour is a colour made by mixing two primary colours. They are MYC (magenta, yellow, cyan). Tertiary colours are combinations of primary and secondary colours. For example, if one primary and one secondary colour is mixed together this will produce a tertiary colour (Zollinger, 1999, pp66).

There were four questions in the colour questionnaire (See App. 4C). The first question asks about the primary colours, which are red, yellow and blue. The second question concerns secondary colours. These colours are mixed from the primary colours. For example, green=yellow + blue; purple = blue + red; orange = red + yellow. The third question relates to tertiary colours which are red-orange, yellow-orange, yellow-green, blue-green, blue-violet and red-violet. The fourth question is about combining all these colours together. In addition, black and white which are non-colours, were included. Subjects were required to choose one as a favourite.

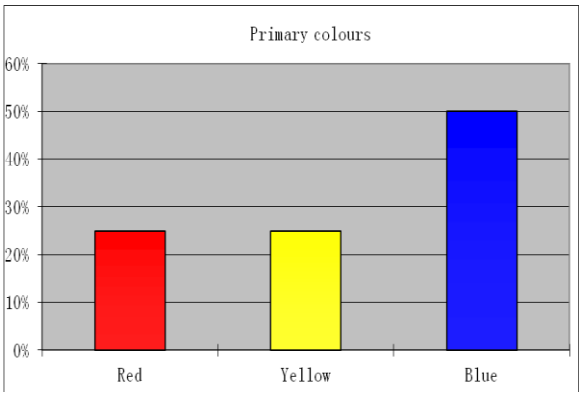


Figure 4.9 Primary Colours Result

The colour questionnaire's question relates to primary colour, and the result is shown above. The favourite primary colour was blue as chosen by 56.25% of this questioned. 25% of the people chose yellow, only 18.75% chose red (Figure 4.9).

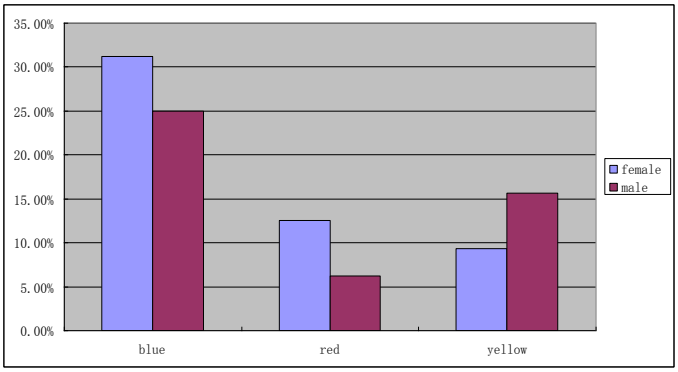


Figure 4.10 A Primary Colour Selected by Female and Male

Female liked blue and red more than the males. But the males preferred yellow more than females (Figure 4.10).

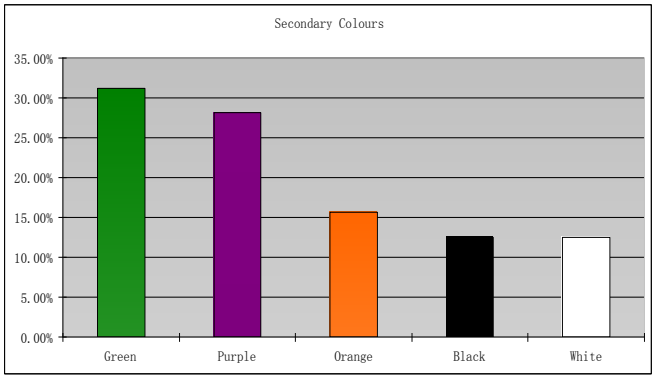


Figure 4.11 Secondary Colours

As figure 4.11 shows the most popular choice in secondary colours was green as chosen by 31.25% and purple as chosen by 28.13%. A further 15.63% chose orange, 12.5% chose black and white.

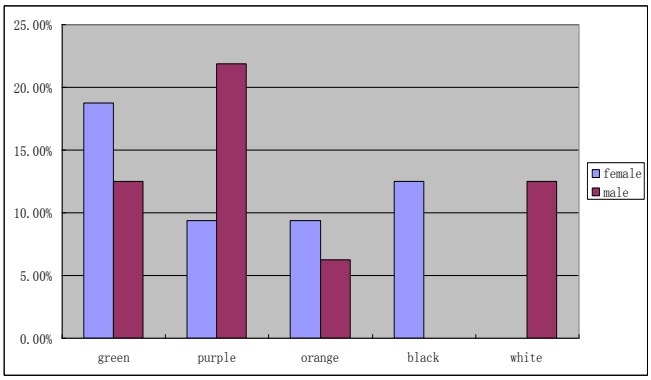


Figure 4.12 Secondary Colours Select by Female and Male

As Figure 4.12 shows colour choice according to sexual orientation. Males preferred purple more than females. 12.5% female chose black as preferred, no male chose this colour. However, 12.5% male chose white.

Figure 4.13 Mixed Colours

Figure 4.13 shows 59.38% chose pink as their favourite among mixed colours. Then, in order, grey was chosen by 28.13% and brown was chosen by 12.5%.

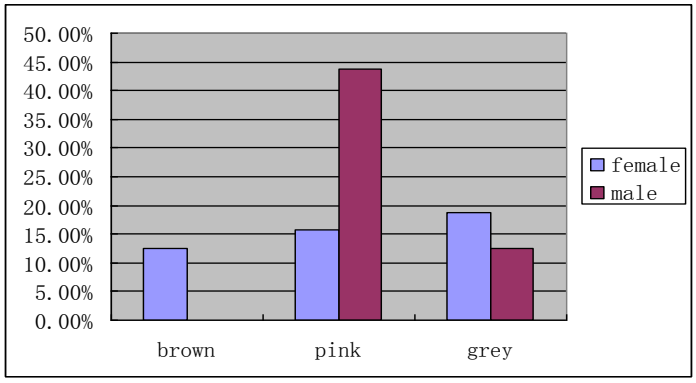


Figure 4.14 Mixed Colours Select by Female and Male

43.75% of males preferred pink. No male chose brown as a preferred colour. The female selections were spread relatively uniformly amongst the different colours (Figure 4.14).

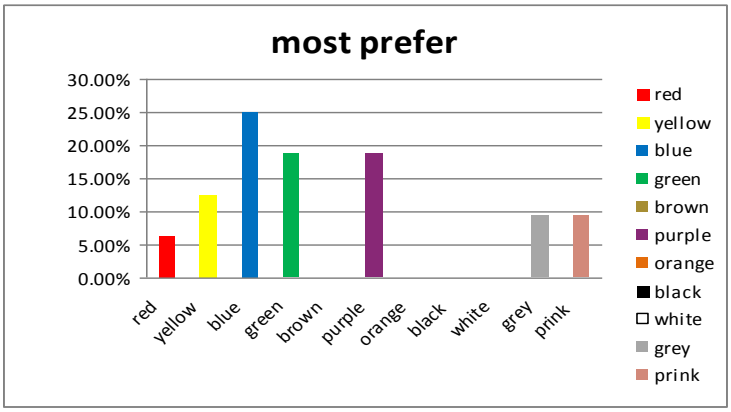


Figure 4.15 The Most Preferred Colours

Now put all eleven colours together, this is including the non-colours: white and black. A brief analysis of the results is as follows (Figure 4.15): blue was the most preferred type as chosen by 25%. Next preferred colours were purple and green by 18.75%. 8.33% chose red, yellow, and grey and pink.

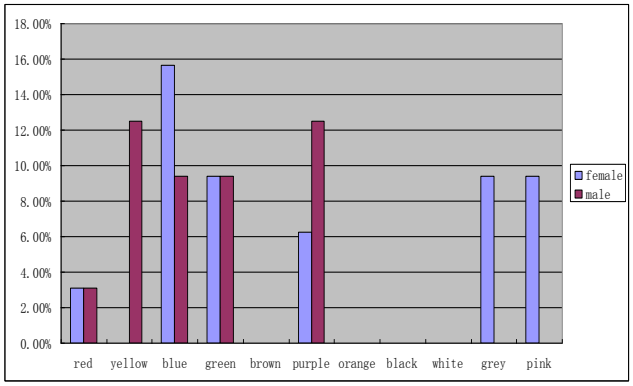


Figure 4.16 The Most Preferred Colours Select by Female and Male

Figure 4.16 displays the female most preferred blue, the male chosen yellow and purple as most preferred colours.

Table 4.9 Compare the Colour Result

Researcher	Result of colours		
Zollinger	German	Japan	Kekchi
	85% of green and blue	80% of green and 65% of blue	95% of green and blue
Author	British & international	Female	male
	Green of 18.75%, blue of 25%	9% green, 16% blue	9% green and blue

This colour survey result is the same as Zollinger's (1999). It also obtained more detail than Zollinger's questionnaire, because it examines he effect of gender on favourite colours. Also investigated colour preferred was investigated from the primarily colour, secondary colour and tertiary colour. However, the result is very similar to the Zollinger's, ie. The most people whether female or male preferred green and blue to other colours.

4.6.3Symmetry Questionnaire

4.6.3.1 Reviewed the Symmetry Testing

This part of questionnaire structure included the Two - dimensional and Three – dimensional. According to Ting (2011) testing about different responses between 2D and 3D, through most trials the results the 3D fluctuation is better level to affect human brain. Other amplitudes between 2D and 3D stimuli response became more similar (Figure 4.15). However, it was considered that the human brain's response to 2D versus 3D images is still different and further to get more accurate data. Hence, this questionnaire uses 2D and 3D to test a subject.

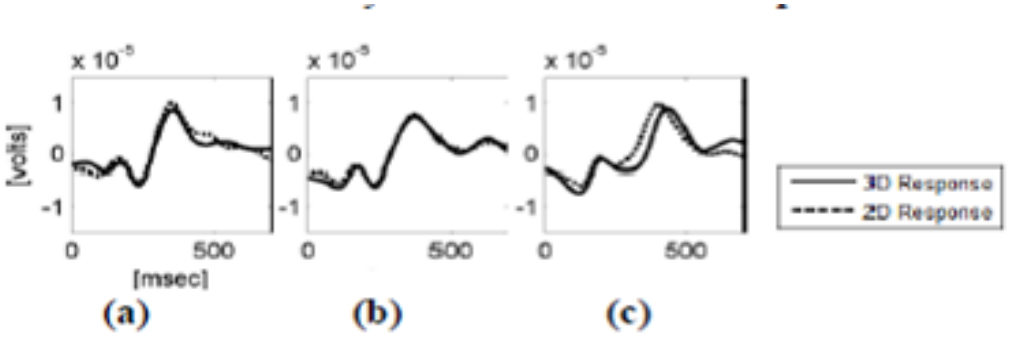


Figure 4.15 Grand averages for channel Cz for (a) 0% occlusion; (b) 30% occlusion; (c) 70%occlusion

The purpose of this questionnaire was to confirm the simple result from chapter 4 about popularity of symmetry or asymmetry. The questionnaire design chose the bed head wall and decorative painting as a scene. The first part consisted of 2-D pictures (see appendix 4D).These three rectangles were chosen from the result of the questionnaire on shape, belonging to the group of most preferred shapes via evaluation. The first group shape ratio is smaller than the golden section. The second group rectangle is based on the golden section; other groups' shape ratios are around the golden section. Each group has three different types: the middle type is symmetrical, because a rectangle is in the middle of the table; others are asymmetric: one is asymmetrical left,

the other is asymmetrical right. Through the result of the questionnaire, the researcher can determine preferences for symmetry or asymmetry.

4.5.3.2 the Symmetry Result

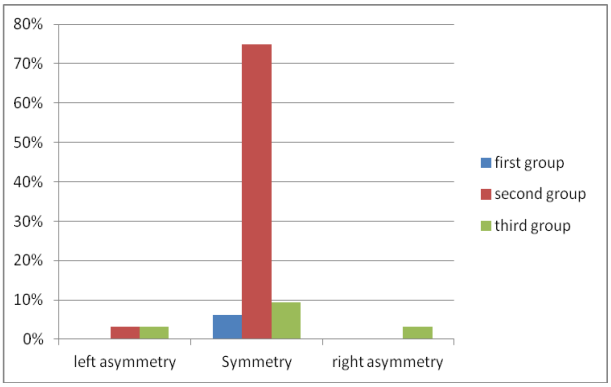


Figure 4.18 Symmetry or Asymmetry Result

As figure 4.18, the first group shape ratio is smaller than the golden section. No one chose left and right asymmetry in the first group; only 6.25% chose symmetry in this group.

The second group shape ratio is the golden section. 75% of the respondents chose the symmetry; only 3.13% chose left asymmetry; no one liked right asymmetry in the second group.

The third group shape ratio is bigger than the golden section. 9.38% chose symmetry; 3.13% chose left and right asymmetry each.

This questionnaire also proved again that the golden ratio shape is the most preferred shape.

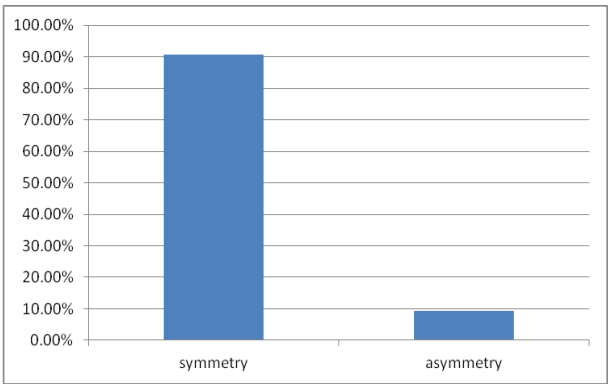


Figure 4.19 Symmetry or Asymmetry

Totally, 90.63% of the respondents chose symmetry and only 9.38% chose asymmetry. Among those who chose asymmetry. 25% chose left asymmetry; 3.13% chose right asymmetry. Hence, symmetry decoration is most popular.

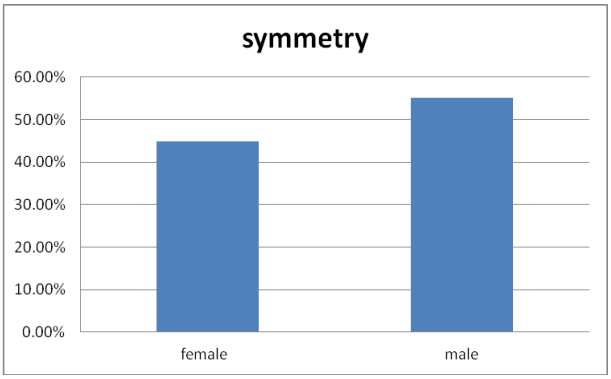


Figure 4.20 Symmetry Select by Female and Male

Through this questionnaire, we can see that more respondents prefer the decorational symmetry. In addition, of the 29 out of 32 people who chose symmetry, 44.83% were female and 55.17% were males. The males liked symmetry more than females (Figure 4.20).

Table 4.10 Result of Symmetry

Style	2D	3D	Female	Male

Symmetry	√	√	√	√
Asymmetry	-	-	-	-

This questionnaire result proved the golden section shape and symmetry are still most preferred (Table 4.10) by subjects. To further confirm this result, a second questionnaire was designed. The scene for the questionnaire was still based on the bed head wall but this time together with decorative paintings. Different groups of decorative paintings were shown hung on the wall in a double guest room and also a single room (see appendix 4D). 53.13% of the respondents chose two symmetrically arranged pictures on the bed wall in the double bed room---- 31.25% of males preferred two pictures decoration on bed background; in the female group 21.88% preferred two pictures decoration on the bed background. In the single bed room 78.13% chose two symmetry pictures as bed background ---- 37.5% of males' preferred two pictures on the bed background; 40.63% female preferred two pictures decorating the bed background.

The above results are from 2-D pictures. The 3-D model questionnaire was designed and printed in black and white in order to avoid colour factors affecting personal selections. In the 3D sketch pictures, 93.75% of the respondents chose two symmetry pictures on the double bed wall. 56.25% male chose two symmetry pictures; 37.5% of females chose a balanced picture. On the single bed wall, 90.63% chose two symmetry pictures. 50% of males chose this arrangement of two balanced pictures, 40.63% of female chose it.

In total, it is clear that most respondents preferred the two symmetrically placed pictures on a bed wall. But the use of 3D graphics was a better way to give respondents clear understanding of the question and to choose a more accurate answer. 3D is better visual way to show the graphics and makes the concept of picture.

4.7 Experimental Evaluation

There hypotheses need to further confirmed by experts. The aim of the interview was to provide an additional method to evaluate the research findings and methodologies used and to develop and improve the research methods following the suggestions and recommendations from interviewees. In order to achieve this, the objectives were:

- To select interviews and arrange interview schedule
- To design interview questions
- To interview the hotel managers, hotel designers and hotel guests
- To analyse the results from each interviewee

There were seven interviewees selected for the interview survey (Table 4.4): four interviewees are professional interior designers and have at least eight years practice in the hotel area. The designers were chosen because they have rich experience in hotel design, and can give suggestions on interior hotel design perspectives. Their viewpoints were maintained throughout the whole research in order to investigate and discuss the relationship between the hotel space and the guest. Therefore, their experience provides a practical input to the study.

Two interviewees are hotel managers. They have more than 22 years working experience in hotels;

One interviewee is a customer. He is a business man working for an international business and often travels overseas. His suggestions represent those of typical customers.

Furthermore, in order to carry out the interview survey a questionnaire was designed, with reference to standard interview procedures, to request the interviewee's permission to record the interview on a digital voice recorder.

Following this, all interview conversations were then transcribed and reviewed by use of both qualitative and quantitative methods.

Table 4.11 Background of Selected 7 Interviewees

Interviewee	Job title/ experiences	Duration(years) in the field of design or hotel manager or hotel guest
Pan	Designer	35
Liu	Designer	8
Shen	Designer	15
Guan	Designer	14
Jin	Hotel manager	22
Lin	Hotel manger	28
Tom	Technical Director	30

The open question technique was used for the interview because the essential aims of the interview were to gather a general opinion. Moreover, the adoption of open questions could possibly yield more detail of the participant's thought process and reveal the reasons behind their opinion, more so than closed questions (Gillham, 2005).

Prior to the interview, a questionnaire was designed incorporating standard operational procedures. Furthermore, this interview adopted the same description about the research followed by the questions to avoid any bias when conducting the interview, also making the results much easier to analyse. The interview questions were divided into three sections comprising nine questions in total, related to the research process, methodologies used and findings.

Initial questions were posed, to gain details of the individual people, including their working experience and current job responsibility.

The first section of interview questions discussed the global or domestic design style; The second section wanted to know which hotel guest room style was preferred in the interviewee's opinion. Some examples with 3D models which can clearly explain spatial information helped subjects choose from alternatives and give their opinion on the overall project. After these questions, six key points were taken for this interview. These six points related to pattern, scale, Glocalisation, symmetry, colour and golden section. These discussions provide a better way to understanding the designers' experience on how they deal with problems in hotel design, and discover which hotel design style is preferred by customers. Overall the interviews lasted between 45minutes and an hour (See appendix 4D).

The results from the questionnaire show that the experts and hotel customer' suggestions are similar to the results of this study.

- Data analysis

Being a qualitative study, the information received from the interviews uses qualitative discussion as the process of data analysis. However, by adopting this approach some information still remains in its original form and cannot be analysed. Hence, in this study, both a quantitative and qualitative analysis method was employed in order to extract more information from their input. Furthermore, by using a quantitative method, it becomes easier to determine the level of agreement in response to the question asked. There two methods of analysis are discussed in the next section.

The aim of the interview assessment is to analyse the narrative information obtained during the interview and assess what participants actually think in response to the questions asked. Moreover, this approach

allows integration of their responses as guidelines to improve the research for the future.

To analyse the information from the open questions, the narratives recorded during the interviews were transcribed into text. Furthermore, in order to clarify the issues arising from the narrative information, the transcribed data from the seven interviewees were closely examined to determine key sentences related to the questions asked. Finally, these were summarized as the interviewee's opinion and suggestions in regard to each question.

- Findings

Apart from asking the participants details about their work experience and background details, there were ten questions to which the participants were asked to respond. This section will describe the results analysed from the interview and the relation between those findings.

Initially, a discussion was instigated on the selected design elements and spatial areas for the research within the guest room. The subjects were generally in agreement with the design elements chosen. They thought that the majority of research elements chosen were suitable for current guest room design problems. From the results, the majority of subjects agree with these interview questions covering the chosen guest room design problems. It can be seen that most experts generally agreed with the choice of common cultural Western and Oriental design elements selected in this study and selected for comparison. They also suggest extracting several major issues from the interview questions which are related to the final study and to discuss these further in this interview.

The experts' expectations were questioned on the importance of the geometry of design which includes the dynamic patterns and golden section

theory. These geometric elements are applied to the bed head wall in guest rooms. Furthermore, the subjects' expectation was that the golden ratio can be used in guest room design because most believed that the golden ratio is a beautiful ratio.

Experts consider the current problems of hotel design include the need to improve the planning and design of hotels and analyse the geographic locations, the natural environment, culture and history. Analysis of the various types of guest is necessary because hotels are specifically designed to meet the needs of different categories of customers and provide a natural sense of friendly exchanges between guests. In the coming decades, the application of cultural elements will become a major development trend. When considering global hotels in a domestic situation the experts demanded that many new developments should have a distinct local character centered on hotel design. This local character should be full of rich historical and cultural connotations, and refer to local attractions and scenery. Local character is increasingly of interest to guests; therefore, designers must work hard to achieve customers' aspirations.

4.7.1Evaluation Measurements

A case study focuses on global hotel design style. It also analyses some hotel design such as Shangri-La in which attempts have been made to apply the cultural elements in the design. This is a successful hotel design; it not only used traditional cultural elements, but also considered the design function, such the inclusion of a tea break room which allows customers to both relax and enjoy the tea culture. Shangri-La hotel design is based on the traditional Asia's cultural information mixed with Western design style. Therefore, a great deal of information and inspiration can be taken from this hotel.

This chapter decides design direction which is from guest room design style results --- global style matched with local elements. Also selects effective design elements which are proportion, balance. Also reviewed is how they are applied in successful design. These elements will apply to a guest room in this research (Figure 4.21)

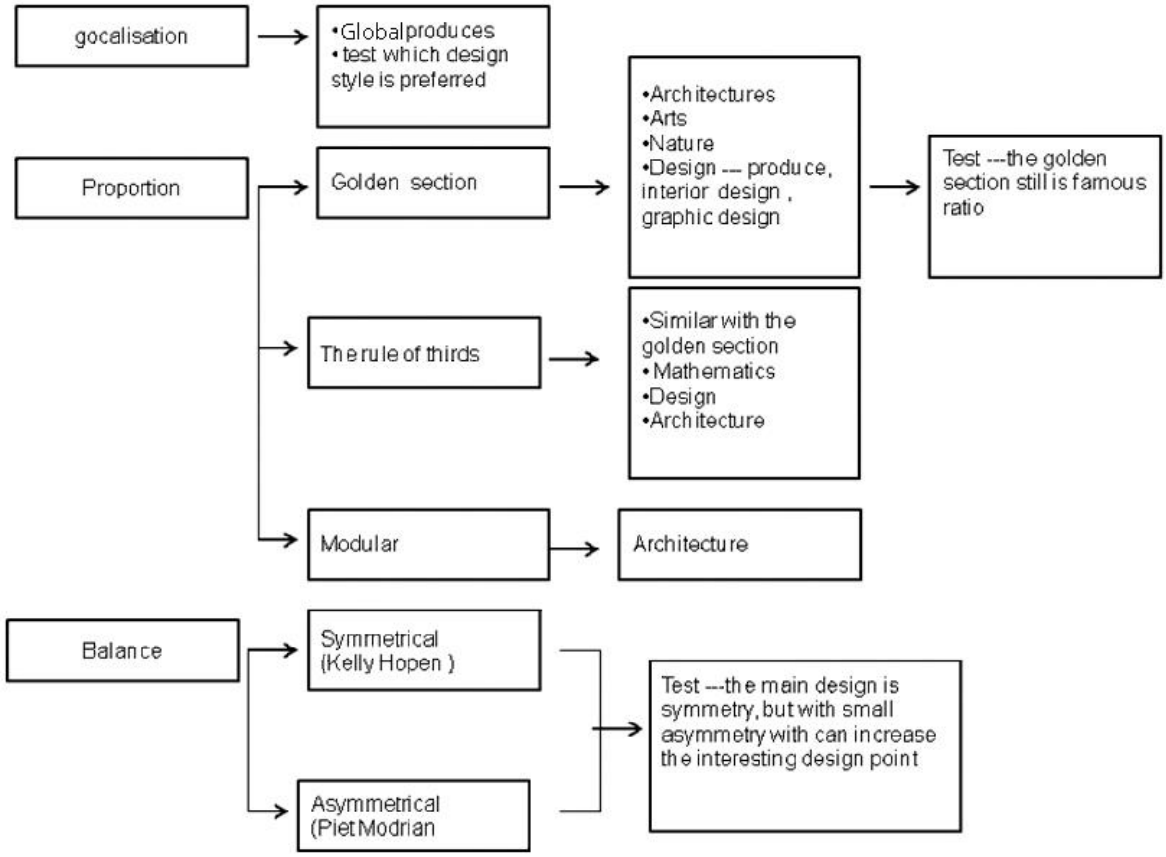


Figure 4.21 Collected Design Elements in this study

The results indicated that hypotheses appear to be supported. It based on their experiences and views. Moreover, although the two different backgrounds (reviewed the previous' testing results, and questionnaires) they had similar points of view which seemed to support the statements of hypotheses.

4.8 Summary

This time the questionnaire has obtained a more accurate answer which will help improve the guest design analysis in chapter 6.

Collected the results were from other researcher and experts about the golden section, colour and symmetry, and compared their result with result was from this research's questionnaires, the results were similar. That can prove the golden section, cold colours and symmetry still are popular style in design. Also this time questionnaire involves more and more detail such as different nationality, age and gender, which wants got more precise results.

In additional, a very valuable result comes from the interviews with experts. Basically, a lot of research ideas are consistent with those of the experts. Their opinions about the glocalisation are the same as this study aim: that is the global hotel chain in addition to maintaining its uniqueness of design patterns and facility characteristics, should also respect the customs, history and culture of the country where it is located, in addition to meeting the needs of tourists. Many global hotel chains are located in Chinese provincial cities; the design of these hotels should maintain their corporate design characteristics while strongly emphasizing local cultural styles. This is relevant to worldwide hotel chain design in Chinese provincial cities.

A second result from findings relates to the golden section. The experts agree what the theory of golden ratios provides beautiful proportion in design and arts. But they feel that the golden ratio calculation is complex, so they desire an easy method for applying the golden ratio to hotel design. This problem will be solved in Chapter 6.

Moreover, the experts also agree with the idea of symmetry in design. The reason is that symmetry is a traditional form that is accepted by all people. Symmetry and balance are applied in the design method. The

experts' advice symmetry can be used in the main design structural style. A small part of the space can blend with asymmetry which makes design more active.

The next chapter will review the emerged application cultural elements, to obtain design guideline and allow understanding of the current methods of local cultural related information, and acquiring the requirements as criteria of evaluating proposed cultural elements application that hotel design.

Chapter 5 Observation Studies and Critical Review

5.1 Introduction

After an extensive literature review (Chapter 2), there appears to have been little research into the effectiveness or the strengths and weaknesses of current global hotel design in the local cities.

As discussed earlier (Section 3.3), a critical review was therefore conducted to determine the existing problems within current global hotel design and identify the elements of effective design for presenting global hotel design style in local cities.

Six current hotels (2 global hotels, 4 local hotels) in the local city of Nanjing were chosen to reflect the distinctive characteristics for the major cultural feature types of hotels. As mentioned in the Chapter 3 the criteria to evaluate the six hotels design were based on methods triangulation (Patton 2002): Three fundamental components were chosen for the overall assessment, namely, the global hotel brand design standards informatics style, the use of cultural elements in improving access, and glocalisation as information and learning resources. The evaluation method used a qualitative approach to examine the characteristics of global hotels design concerning effectiveness and suitability in local cities design.

After the second literature review (earlier part of this Chapter), observational research into the three most effective and successful cultural design methods is presented in observation studies. These three design methods were chosen for observation studies because they were shown to effectively and clearly present their content in hotel design.

Observation studies (qualitative method), as mentioned in Chapter 3, can be supplemented by combining other quantitative approaches such as

questionnaires (quantitative method) in order to gather information and develop insight about visitors interact action with the designs . Therefore, two kinds of data, qualitative and quantitative, were collected during the observation research, to ensure the reliability of the investigative results.

Post – observation which is initial user test as mentioned in Chapter 3 Clarke's (1999) method, attempts to obtain test results and establish conclusion in Chapter 5.

At the end of this chapter, the important findings and design elements which are regarded as useful for the proposition of a new design method for the development of guest room design are identified. The observation result will be analysed to identify the potential relationship between visiting styles and learning activities at the end of this chapter. The findings through these observations will be important for the development of the guideline in guest room design model as part of the overall research.

5.2 Aim of Observation Studies

The aim of these studies is to conduct observations of visitor's behaviours interacting with current hotels design and a critical examination of potential or existing problems with current hotel design.

5.3 Rationale

This study focuses on potential or existing problems within global hotel design style in local cities. The purpose of this research is to critically examine the use of "Glocalisation", it is define by Robertson (1995) as effectiveness and usability and design informational resources in current global hotel in local cities. The review undertaken here aims to address the following questions:

- what is the most appropriate relationship between global hotel design style and local cultural elements?

- whether the Chinese Five Elements is the most appropriate approach in the global hotel design (Chapter2)

- How can glocalisation be developed to improve access to current hotel design?
- What are the advantages and disadvantages of current hotel design after collecting information on visitors' behaviour?
- What are the factors that determine the effectiveness and usability of global hotel design information and how can this be blended with local culture?

5.4 Methodology

5.4.1 Validity and Reliability

Validity refers to the means of assessment which is accurate and appropriate to the research (Diamond 1999). Reliability refers to 'the degree to which the finding is independent of accidental circumstances of the research (Kirk and Miller 1985).' Using appropriate methods and techniques for this research strategy will affect the validity and reliability of the investigative results. In order to gain an in-depth understanding of the strengths and weaknesses of current global hotel design informational aspects, the methods of data collection used are more qualitative than quantitative. The employment of quantitative approaches would have been ineffective and invalid in this review due to its objective nature; for instance, calculation of percentages and statistical analysis. For this research, a qualitative approach was therefore used to assess current global hotel design style which considers the local elements for cultural informational and learning resources through in-depth observation and an insightful understanding of the global hotel industry developed through.

5.4.2 Methods

The application of Robertson (1995) a framework for the development of global business in local countries and cities. This framework is effective and suitable for any type of global product, including global hotels.

Robertson's framework includes a main performance test and post-observation questionnaire. The design of the main performance test is to obtain data regarding visiting current style and performance tasks via direct observation. The post-observation questionnaire is to gain data based on participants' experience regarding the hotel design systems after the observation. The general nature of the procedure of the methods is shown as follows:

1. Defining the purpose of the observation studies
2. Identifying the quality of the global hotel design trend and assessment of the specific criteria of global hotel design.
3. Choosing useful local cultural symbols for investigation
4. Analysing the global hotel according to the stated criteria
5. Summarising the results

For the purpose of this study, detailed assessment criteria were applied to the three fundamental components, namely: the global hotel brand design standards informatics style, the use of cultural elements in improving access, and glocalisation. The evaluation methods using this qualitative approach are adopted to evaluate the characteristics of global hotel design as learning and informational resources. Although these three components of analysis have

multiple criteria, all criteria from the three foundation components are integrated into the overall assessment as in Figure 5.1.

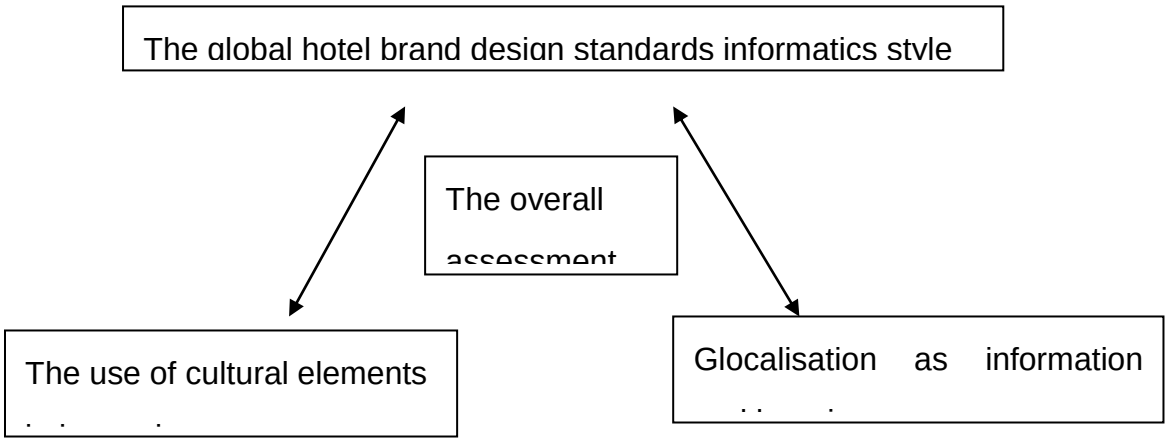


Figure 5.1 The three fundamental components for the overall assessment

5.5 Analysis of Observation Results

5.5.1 Visitor behaviour

This main purpose was of the visit was to examine the design style used by global hotel chains in Nanjing city, China. Nanjing was chosen because it was for a time capital of China and therefore has a rich traditional culture, together with the fact that it is the 2nd fastest developing city in the southern area of China. After the 'opening policy' (1978) was introduced many global companies came here and the numbers of global businesses and global hotel chains are still increasing. Chapter 2 mentioned the city of Nanjing was the capital of China for 600 years, the city still retains some ancient buildings, people can also experience the traditional culture of Nanjing, and also many new modern buildings are being developed. It is modern mixed with historic, fashion mixed with tradition, these are the special colourful features of Nanjing.

In the field study visits were made to global hotel chains rated up to 4 star and 5 star local hotels. The main methods were to take photographs; compare traditional cultural factors with hotel design; and to analyse some unusual design idea to determine whether suitable for global hotel design in a provincial city.

This visited hotel chosen the two kinds of hotel brand which are global hotel brand and local hotel brand. Two global brand hotels and four local hotels have been chosen and comprise the typical business economy rooms: bedroom, bathroom, and a small hall area near the room entrance. The aim wonders really currently hotel design problems and whether the local cultural elements work in region hotel, details of which are described below.

Table 5.1 visited hotels

Global brand hotels	• Inter-Continental Hotel Group (IHG): The Crowne Plaza Nanjing Hotel; Nanjing Holiday Inn • the French hotel brand: Sofitel
Local hotels	• Jingling hotel • Lakeview Xuanwu Hotel • The International Conference Hotel • Mandarin Garden Hotel

5.5.2 Preliminary Data Collected and Analysis

Collected part of photos from the travel survey, and then placed the same type of design together. Comments were obtained through an informal interview and visit. Simple analysis of some pictures was carried out, with more detailed analysis.

1. Jinling Hotel (accessed on 1st May, 2011)

It is one example of a local international standard 5 star hotel. Standing in the heart of Nanjing city, Jinling Hotel Nanjing receives guests from all over the world. Acclaimed for its graciousness, oriental authenticity and Golden Touch of hospitality it is truly the first choice for impeccable business meetings, events and discriminating guests. Jinling Hotel Nanjing has become the established symbol of Nanjing since its opening in 1983, for blending Oriental with Western culture successfully.

Figure 5.2 Jinling Hotel (photos taken in site survey)

In addition, the cross cultural design style found in Jinling hotel in Nanjing, makes use of a cross cultural idea which is Oriental hand drawn art linked with Western oil painting design. This application of traditional culture is developed as a new way to introduce Chinese calligraphy. Figure 4.2 shows a decorative painting in a hotel corridor. It uses Western oil painting techniques to show Chinese calligraphy and incorporates Chinese pottery. Chinese calligraphy is normally written on rice paper, but here, the board represents paper, the oil painting instead of ink. This decoration is a smart way to display Oriental art mixed with that of the West. The design can take inspiration from different regions, countries, cultures and times, and mix these elements

together. This method is changing the materials to achieve the aim of mixed Western and Oriental cultures.

Natural symbols are of most use in hotel design because they are from nature and give a person a feeling of freshness. Plum is the city flower emblem of Nanjing, and therefore, many local hotels have adopted the plum pattern or motif to be used in hotel design.

Figure 5.3 Carpet pattern in Jinling Hotel

A guest room in Jinling hotel (Figure 4.4) uses geometry in interior design to decorate the area of bed head background. The whole wall divided into five smaller spaces of dynamic rectangles.

Figure 5.4 A Guest Room in Jinling Hotel (photos taken in site survey)

Further analysis the background is in Figure 4.5 Dividing the background with diagonal and intersection can found except the main five vertical rectangles, still have many other dynamic rectangles. Furthermore, these small spaces of rectangles generate a variety of geometric forms. Angles, spaces, design and measurements all are a part of geometry. These geometric elements play a role in the design.

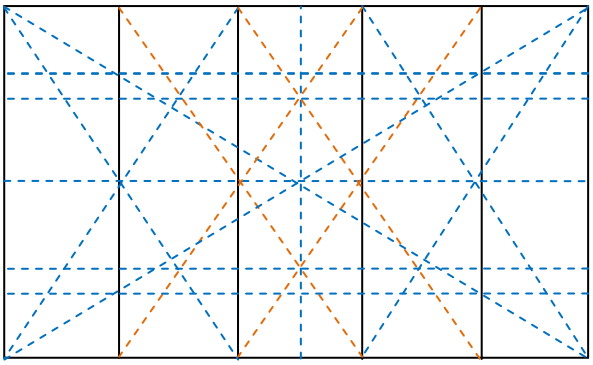


Figure 5.5 Analysing the Background

Geometric composition includes a proportioning system such as the golden section and root rectangles, as well as ratios and proportion, interrelationships of form and regulating lines. However, the suitability of geometric design for hotels will be discussed in chapter 6.

According to the three fundamental assessment criteria, the overall strengths and weaknesses of this hotel as follows:

Strengths:

- Successful implementation of the local cultural element in hotel design standards.
- Easily identifiable geometric design strategies based on the Chinese traditional grid design approach to stimulate application of mathematics in design.

Weaknesses:

- Due to lack of vivid visual information in the exhibits, as the decoration, the cross cultural exhibition environment does not effectively enhance a sense of presence.
- Natural element image should be its normal size when over-enlaged or reduced in size. It does not make visual scese.

2. Lakeview Xuanwu Hotel (accessed on 4th May, 2011)

Lakeview Xuanwu Hotel is a luxurious five-star hotel, and joine the World Hotels accreditation in 2006. It is a member of the prestigious World Hotels accreditation in Nanjing. The hotel occupied a wonderful location in the city centre which is adjacent to the beautiful Xuanwu Lake.

The Xuan Wu hotel design style is more luxurious and Western. There are strongly Western cultural features in this guest room with just one traditional piece of Chinese lacquer furniture in the corner (Figure 4.6). This designer might be thinking simply to put Chinese furniture together with Western design style means cross cultural style. However, this combination of Chinese and Western forms makes for an uncomfortable feeling because the guest room design style, such as chairs, lighting and ceiling, is predominantly Western, which is suddenly shocked by the Chinese lacquer at the corner, out of context and without any natural design sense. In addition, all room accepted the bright colour, this lacquer furniture colour is too heavy (dark) to balance the stiffness.

Figure 5.6 The Guest Room in Xuan Wu Hotel (photos taken in site survey)

Figure 5.7Xuan Wu Hotel (photos taken in site survey)

Xuan Wu Hotel also uses water symbols for the decoration of the lobby ceiling. It is clear to see from Figure 5.7 water and lotus patterns on the ceiling. These real patterns are examples of intuitive expression design method. It also is easy and direct to make the guest imagine the design language and understand the meaning from these patterns.

As is well known, red is a traditional Chinese colour that means luck and happiness. Even some domesticl hotels preferred to choose this colour in design. But in Europe, red means danger, blood. When Europeans came to China, they could not accept red. The different cultural background means

that people from different countries may not understand each other's culture. Designers have to look for new ways to introduce the Chinese traditional colour in hotel design. In Xuan Wu hotel's tea room (Figure 4.8) other colours from Chinese heritage are used. These are also traditional colour, the designer took inspiration from the colour of Chinese antique ornaments.

Figure 5.8 Tea room in Xuan Wu Hotel (photos taken in site survey)

This ornament was typical of the Tang dynasty 1300years ago. It is made of pottery and the main colours are yellow, a green and white, called Sancai which means three colours. In this tea room, the Tang ornament is placed on the table and the ceiling colour is also taken from the Tang ornament, this matches one to the other. The whole space is given a calm feeling, with balanced use of warm colours: brown and yellow matched with cold colours: blue, grey and green. Also the classic Western furniture incorporates Chinese traditional direction.

In addition, furniture and ceiling colours also match with heritage colours. The ceiling just use a small part of the colour for decoration, it plays the role of embellishment function. The brown Oriental style chair blends with the blue Western chair also showing the mixed cultural design. It is an excellent design. Therefore, the designer should be careful with colour. Try to choose neutral colours, avoiding special colours (red) due to different cultural backgrounds of guests who might not understand the significance or local meaning of colour.

According to the three fundamental assessment criteria, the overall strengths and weaknesses of this hotel as follows:

Strengths:

- Clear real cultural symbols with structure of sculpture exhibit components which encourages visitors to appreciate the evolution of aesthetic concepts of the Chinese local culture.
- Easily identifiable local cultural information strategy based on the heritage's colour, approach to stimulate designers' learning process.

Weaknesses:

- These designs have little or no consideration of how to make a perfect combination of styles.

3. The International Conference Hotel of Nanjing (accessed on 12th May, 2011)

The International Conference Hotel of Nanjing is a five star hotel. It is located in the famous Zhongshan Mausoleum scenic area. Many famous attractions are also in close proximity, such as Xiaoling Tomb, Linggu Temple. The International Conference Hotel is ideal for travelers who want accommodations in a scenic environment.

Figure 5.9 ceiling

In the past, local people weave net by hand for firishing, as there we can see that the ceiling design creates an image from a weaving motif.

According to the three fundamental assessment criteria, the overall strengths and weaknesses of this hotel as follows:

Strengths:

- Consider the local handwork elements in design.

Weaknesses:

- Too complex design style for practical purpose.
- The poor quality of cultural information fails to contribute to an immersive exhibition/ design environment.

4. Mandarin Garden Hotel (accessed on 21st May, 2011)

Mandarin Garden Hotel is a Five-star hotel with distinctive national features. The hotel has 500 guest rooms, and various Chinese and Western restaurants. It presents the “classical, oriental demeanour and stylish airs of the Chinese Mandarins” to all visitors. The hotel is located beside the famous Confucius Temple in the Qinhuai Scenic District. The environment in this area has strong national characteristics. Hence, in order to comply with this traditional environment, the Mandarin Garden hotel design accepted classical and oriental style.

Figure 5.10 mian hall in Mandarin Garden Hotel

The Mandarin Garden Hotel borrows the landscape of garden and places it in the interior. As Figure 5.10 shows stone, plant and fishes in the water.

According to the three fundamental assessment criteria, the overall strengths and weaknesses of this hotel as follows:

Strengths:

- Successful exploits the Chinese garden elements, and moved these into interior.

Weaknesses:

- Lack of high quality visual information which results in failure to contribute to a sense of presence with a feeling of actually viewing the constructed exhibits themselves in hotel design.
- Not easy to clean, and not practical.

5. Holiday Inn ((accessed on 21st May,2011)

Holiday Inn is an original hotel brand from the UK which came to Nanjing in 2000. Figure 5.11 shows the lobby area design using the water element, which is based on the five traditional elements in China.

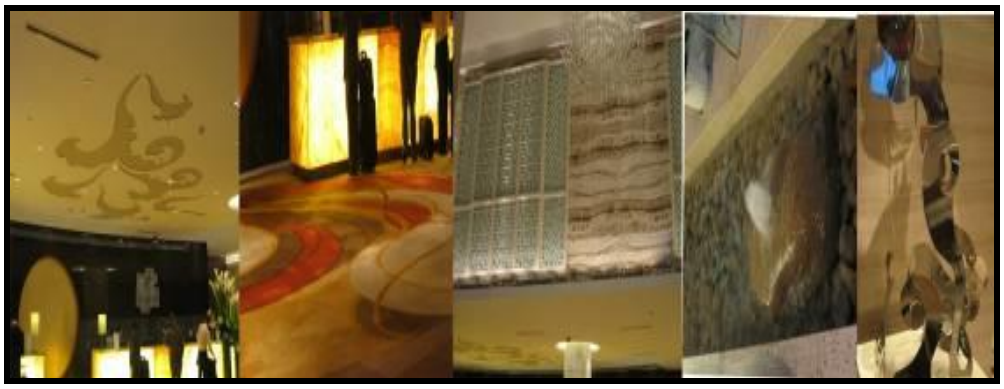


Figure 5.11 Holiday Inn in Nanjing (photos taken in site survey)

The water element is important in Earth; living things cannot survive without water. Water is the material beginning of all things. It was admitting the existence of an intelligence or mind, which is a principal force for the beings formed by the water. It is dynamic; its liquidity metaphor is used more and more in hotel design. When used for interior design it can make a person feel at ease with nature and its sound also can make bring about relaxation and calmness. Hence, in this example, the water symbol is used on the ceiling, carpet and ornament. This is the success point to demonstrate the application of the Five Elements in hotel design.

According to the three fundamental assessment criteria, the overall strengths and weaknesses of this hotel as follows:

Strengths:

- Provides ample informational resources in the Chinese five elements (water, fire, wood, earth, golden)

Weaknesses:

- Lack of clear cultural symbols, these watery shapes express subjective emotions through abstract shapes and colours which also cannot make sense to foreign guests.

6. Sofitel Hotels in Nanjing (accessed on 24th May, 2011)

Sofitel hotel is the other global hotel visited at this time, and two Sofitel hotel branches are in Nanjing. These are Sofitel Galaxy Nanjing and Zhongshan Golf Resort --- Nanjing.

Sofitel hotel group is owned by the ACCOR Company whose head office is in France. It has several main brands: Hotel F1, Etap'Hôtel, Suitehotel, Ibis, Mercure, Novotel, Sofitel, Motel6/Studio6, Red Roof Inns, Accor Thalassa, Pullman, All Seasons. ACCOR is a European leader in hotels and tourism, and a global leader in corporate services, operating in nearly 100 countries with two major international activities: Accor Hospitality and Accor Services.

Symmetrical design form is used in traditional Chinese building plans. Symmetrical balance makes people feel comfortable and secure. It is the role of design elements to create design harmony. Symmetry also was achieved through harmony. Symmetry in nature underlies the connotations of balance and order. As Figure 5.12 shows, two decoration objects (vases) were placed on plinths table each side which created a symmetrically balanced look.

Figure 5.12 Sofitel Hotel in Nanjing (photos taken in site survey)

Symmetry involves a close correspondence between opposite halves of an image on the facing sides of an axis. It appears equivalent and the

image achieves symmetrical balance. It is a balance achieved by similarity which types like psychological qualities. The image may feel peaceful, calm, stable, and harmonious. Such designs might be reminiscent of the geometry and aesthetics of Renaissance classicism. Images with symmetrical balance tend to create feelings of order, tradition, classicism, formality (Suler, 2012).

According to the three fundamental assessment criteria, the overall strengths and weaknesses of this hotel as follows:

Strengths:

- Easily identifiable Chinese cultural target through structure of exhibition content.

Weaknesses:

- Lack of in-depth interpretive content.

5.5.3 The overall best and worst current hotel design in Nanjing

The results of critical review indicated key features and problems for identification of the overall best and worst current hotel design in Nanjing.

The overall best current hotel design in Nanjing: Jinling Hotel

The key features in this hotel design include the following:

- Successful use of local cultural information to improve hotel design cultural interactivity (i.e. cross cultural combination, natural plants metaphors and grid design.
- Effective use of the cultural representational symbol: natural plans, traditional art, Chinese grid design. A series of cultural symbol is conveyed through design exhibition.

- Clear cultural design strategies are based on “constructivism” approach suited for the target global hotel in local cities.
- Various methods used (i.e. decoration exhibition, visual display, indirect show) effectively enhance the different exhibition types of local cultural symbols.
- Successful application of local cultural information in hotel design.

The overall worst current hotel design in Nanjing: The International Conference Hotel

The key problems in the hotel design style include the following:

- Lack of cultural information and cultural content.
- Lack of integration of local cultural information and global hotel design styles, therefore provides limited design experiences to hotel designers.
- Lack of any clear cultural design elements to help hotel designers.

Overall, a number of important research findings and design elements have been identified, regarded as helpful to the proposition of a new design method for the development of global hotel design in local cities.

5.7 Summary

The critical review conducted in this chapter presented a range of hotels design which employs local cultural elements. Each hotel design style was assessed against the three fundamental components. The use of local cultural symbol in improving access for visitors to a hotel was commented on. The hotel design accepts local cultural information strategies and the use of representational schemes in each hotel design style was analysed and interpreted.

There are several key research findings and a design element regarded as important to the proposed design method for the development of a hotel design, including 1) the relationship between local cultural symbols and global hotel design style, 2) the ability to application cultural symbols for hotel viewing the detailed spatial information, 3) clearly defined local cultural design target with appropriate design approaches for the effective presentation of cultural design content, 4) design content using rich multimedia formats and methods to introduce the different local culture to visitors, and help them got more local information and experience, 5)uses the multi-method which is based on the combination of complementary empirical research methods to compensate for weaknesses inherent in individual methods. In addition, part of the observational study is to confirm, as objectively as possible, some of the more subjective findings from this critical review.

It provides benefits in terms of more robust conclusion and increased understanding of research results (Wood, 1999). However, after analysing and comparing design style, it was found that some design solutions were not successful due to excessive use deeply the cultural symbols and ignored the different cultural background. Hence, the design suggestion is as follow:

- Chinese traditional cultural symbols should link with design elements and create a new style to be used in hotel design; there appears to be a process with incorporating traditional cultural symbols with in a modern design fair work that does not work. Because complex traditional cultural symbols have hidden meanings these metaphors are not understood by foreigners. For example, the Five Elements --- water, earth, fire, wood, golden (metal), each element from nature. People have to drink water every day and live on earth; using fire for cooking; but when these elements are used in design, the meaning for their identity has changed, such that water represents the fluid, flowing,

and emotion feeling with adaptability, flexibility, suppleness. Fire represents energy and forcefulness and in the emotional realm represents passion. These deeper meanings are not easily understood by foreign guests, even Chinese can also have different understandings. Hence, through this field study it is suggested that the Chinese five elements are difficult to integrate effectively within interior solutions in a local Chinese city. Because of cultural background differences, many foreign guests would not understood the meaning of real Chinese traditional cultural elements and this would make them feel uncomfortable and strange.

- Some natural elements such as special plants --- bamboo, plum flower also are cultural elements. For example, bamboo plays an important role in traditional Chinese cultures. It is green all year round and represents tenacity, uprightness. These features are also regarded as desirable human characteristics --- uprightness, perseverance. These natural elements are easily accepted and do not appear in any cultural controversy. The characteristic of the plants are easy for people to understand.

- The colour of choice should apply colour as preferred by most people. Due to different cultural background, the same colour has different meanings in different countries. For example, red in China means luck and happiness, but in some countries means danger and bleeding. Hence, controversial colours should be avoided in hotel design.

- Symbolic pattern or decorating size

  Identification of the local elements and local design style are emphasized. Identify pattern structural with simple lines, cannot be separated without destroying, such as use original bamboo shape and original water style, try to keep original pattern scale in design. Design

should be following types of patterns which are natural and realistic, keeping its natural form; if abuse applies abstract elements which depart from nature, inspiration for the design is not recognizable.

- Geometric design is using geometric concepts to describe the physical and mathematical shapes in design. It has provided structure and a visual language to designers and makers for centuries. Geometrical design shape is of importance in modern design, such as ceramics, glass and textiles. The Bauhaus school also focuses on geometry in design. Nowadays, many designers used geometry to extend their ideas and to link their work to the wider worlds of architecture and science (Bell, 2012).

  Today, try use geometric design principles again. Decoration is made up of geometric shapes or stripes which are an interesting point coming into hotel design. In ancient China, people also used geometry and mathematics in the study of architecture. Geometry is linking together with hotel design and this also is another way to display cultural characters.

- Symmetry is a traditional idea, it is a precise sense of harmony and balance, and it reflects beauty and perfection. The second meaning is a well-defined concept of balance or patterned self-similarity that can be demonstrated or proved according to the rules of a formal system: by geometry, through physics or otherwise. The forms of symmetry have reflection symmetry, rotational symmetry and so on. Symmetry is covered in architecture and art (Mainzer, 2005).

  There are two types of symmetry---- horizontal and vertical. A horizontally symmetrical image emphasizes the horizontal dimension. A vertically symmetrical image emphasizes the vertical dimension.

However, in both cases there is an invisible axis that marks the boundary between the two halves (Suler, 2012).

Moreover, the results of critical review indicated that the Jinlin hotel was effective in presenting local cultural symbols exhibit content based on the intended hotel design approaches in local city for global hotel design and interpretive needs of the target audiences. This design style will be used to further conduct observational studies in the next chapter (Chapter Five) to determine a potential relationship between visitors' behaviours and their associated learning activities within the examined hotel based on the pedagogic approaches used in global hotel design.

Chapter 6 Creation of the Guidelines, Development and Evaluation

6.1 Introduction

The last chapter revealed some potential adoption requirements of the proposed integration of cultural symbol elements, in the study of the proposed application domain: the hotel bedhead wall. This chapter is concerned with building the application. Relating likely uses and field visits to an actual hotel, the chapter will start by formulating a more detailed set of requirements, and the advantage of field visits will be presented. The proposed design guideline will be elucidated from the design guideline selection and testing, and then guideline of the choice of guest room. The advantage of using guideline in 3D model simulation will be made clear during the guideline development process. An initial testing of the proposed guideline will then be presented as part of the refinement of the production, before mass evaluation with a sample audience in the final section.

This chapter is concerned with the evaluation of the proposed integrated application, developed from both an end-user perspective and from the perspective of the expert audience. The evaluation will use end-user testing (quantitative method) and expert interview (qualitative method). The chapter starts by discussing the evaluation criteria and then each test. More importantly, the evaluation has an additional intention, to not only find evidence to support the generated hypotheses, but also elicit more potential uses of the developed testing. The adopted guideline layout with interactive design will be tested, which is the final process (see Chapter 3, Figure 3.4) of the adopted Multimedia Design Model in developing the hotel design guideline, and the process will be interpreted. An overall discussion section will be given summarizing the results.

6.2 Creation of the Guideline of Guest Room

The results obtained from interview feedback is that designer experts agree with glocalisation ideas; they also agree with the golden section theory, but they do not use this theory, because they feel golden section is too complex to use.

Hence, this section focuses on the golden section applied to the design of the bedhead wall and the creation of a guideline to help designers' in their future guest room projects.

Accepting that geometric design provides an energetic feeling of balance and harmony, and using the golden ratio formula in modern hotel design is a way to blend culture with design and energize the conventional and typical rectangular design. The reason is that the golden ratio formula and the geometric shapes have come directly from nature that these shapes are features of the Earth's construction, which also produces a harmonic energy frequency and balance. Hence, the golden ratio formula can be used to assist designers obtain the characteristic benefits of golden ratio in their hotel design.

One of the strongest advocates for the application of the Golden Ratio to art and architecture was the famous Swiss-French architect and painter Le Corbusier.

Le Corbusier's interest was in the application of geometry to structure and mathematics. His book Towards a New Architecture (1931), recorded the needs of regulating lines to create order and beauty in architecture. Le Corbusier argued that the regulating lines could be used to rationalize the placement of features in buildings. In each case, he attempted to show how the lines augment the fine proportions and add a rational sense of coherence to the buildings. In this way, the order, the function, and the volume of the

space are drawn into one architectural moment. Le Corbusier argues that this method aids in formalizing the intuitive sense of aesthetics and integrating human proportions as well (Herz, 1984; Abraham, 1924, Corbusier, 1931).

A new proportional system called the “Modulor” was developed by Le Corbusier. He explicitly used the golden ratio in his Modulor system. The purpose of the Modulor was to "maintain the human scale everywhere" and it would give harmonious proportions to everything. The Modulor chronicled Le Corbusier’s proportioning system is on the mathematics of the golden section and the proportion of the human body (Corbusier, 1942; Elam, 2001).

Le Corbusier’s Modulor is using the golden section theory to diving basic on square shape. However, this research refers to Le Corbusier’s Modulor concept of segmentation method and ergonomics proportion of modulor elements apply into hotel bedroom bedhead wall area which is a rectangle shape, and combined with the human body height to analyse the eye touch area.

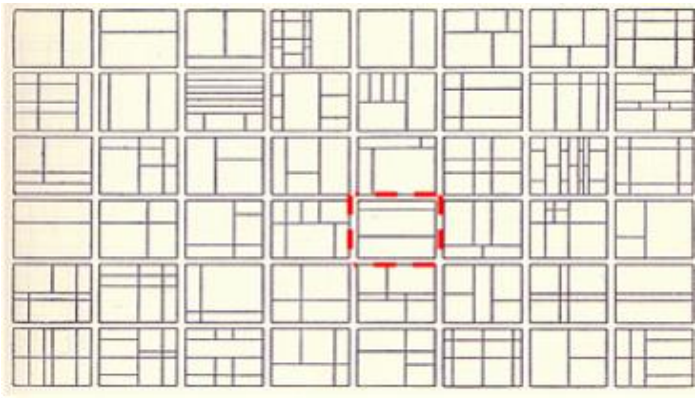


Figure 6.1 Modulor’s Model

Le Corbusier (1963) had drawn many different modulor model combinations as ‘the panel exercise’. He takes one square and divides it up with in accordance with the measurement of the modulor. This exercise tries

to decide which of the combinations are the most satisfactory or the most beautiful.

6.2.1 Analysis of guest room bed background design

As Figure 6.2 displays a part of Modulor exercise that is based on the golden ratio. This research takes one model example which is in the blue area for analysis.

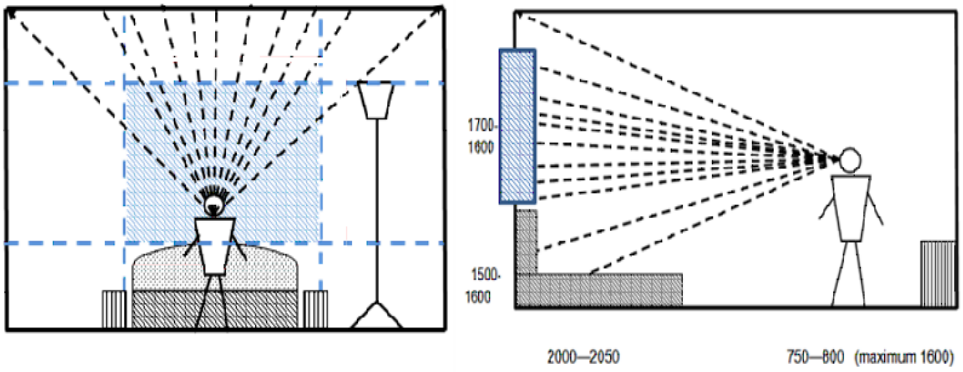


Figure 6.2 Sketch Map of BedHead Wall

Hotel rooms have various sizes. The sizes of the rooms are based on the equipment and furnishings included. To improve our understanding of these commercial establishments, this study focuses on the average Chinese hotel room size, the parameters of which are described below.

According to the Chinese hotel design policy, a hotel guest room should have a ceiling height of 2600mm, the length is not necessary to know in this analysis (because the room width and length depends on the hotel luxury rating). The bed's (double, single) length is 2000---2050mm, one headboard height is 900---1000mm from the floor and 500---600mm above the bed. The bedside cupboard length is typically 400—450mm, and the scope of customers' activity is between 750---800mm but the maximum is not over 1600mm. In this maximum area, a person's eye can deal with and appreciate elements (Le Corbusier, pp76, pp5).

The average person’s eye level is between 1500—1600 mm which results in the front of bed and the top on the bed being the intensive region of view (Figure 6.2).

It was described at begin of section (6.2.1); this center of interest in visual proportion is around the radio which is 1: 1.618. The central area of visual interest as shown in Figure 6.1 is based on the Modulor proportioning system.

In summary, this design guideline pays attention to the golden section design system, guiding designers in how to better apply the golden section concept within hotel design, accurately catching the typical persons eye contact level and area, and mobilize them subconscious golden section concept to help them further understand the golden section. It is aim is to enable a deeper understanding of the concept of the golden section.

6.2.2 Prototype design guidelines

Based on the Modulor system, this section sets out the subdivision of a rectangular wall, in the process as follow:

1. Based on the golden section theory extend a square to a golden rectangle: draw a diagonal from the midpoint (A/2) of one of the sides to an opposite corner. This diagonal becomes the radius of an arc that extends beyond the square to the horizontal. The smaller rectangle and the square together become a golden section rectangle.

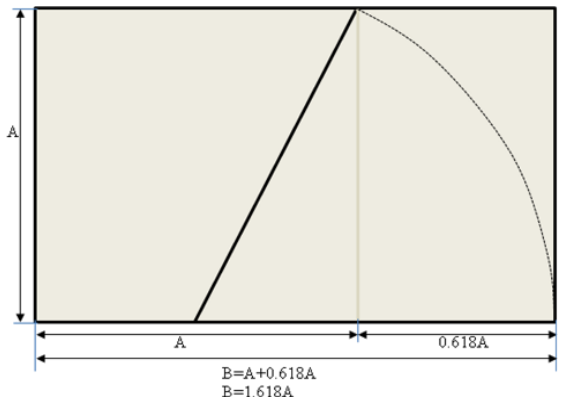


Figure 6.3 Process of Drawing the Golden Rectangle

2. The same method can be derived from another direction according to Pythagoras' Theorem. Pythagoras' theorem is a relation in Euclidean geometry between the lengths of three sides of a right angle triangle. So, it is easy to show that this red diagonal length is A (√5/2).

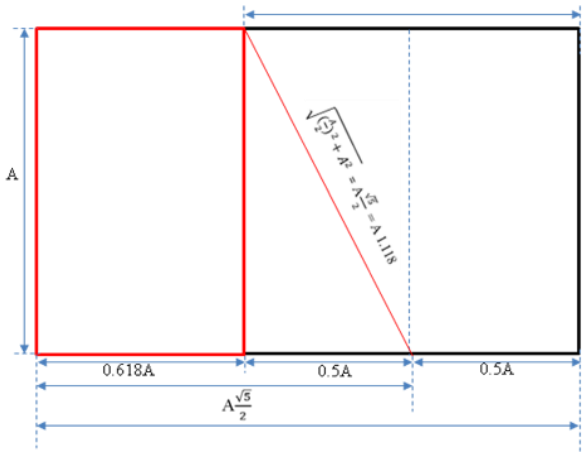


Figure 6.4 Detail Analysis of the Golden Section

3. Now, draw two diagonals.

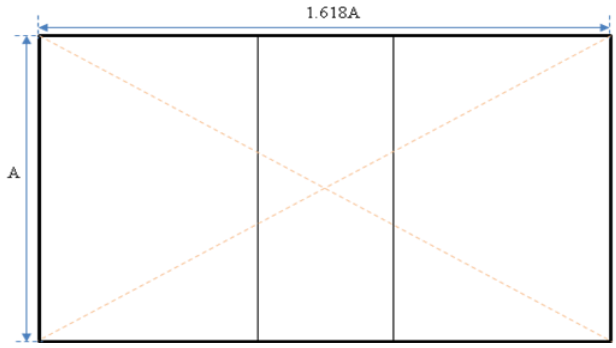


Figure 6.5 Dividing the Golden Section by Diagonal

4. Then, draw horizontal lines through the intersection points. Now, the rectangle produces smaller proportional areas.

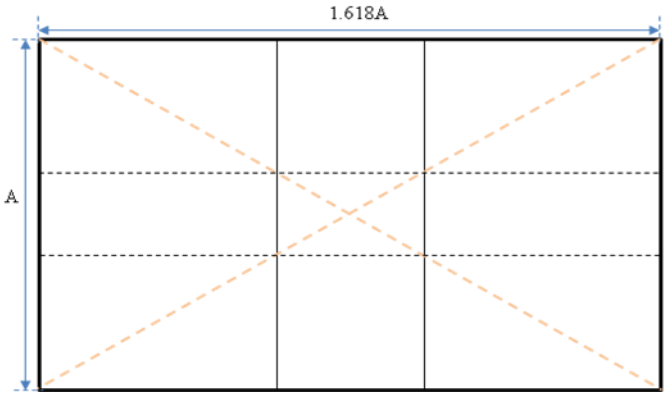


Figure 6.6 Subdivided the Golden Section

5.A subdivided rectangle inside it again. When subdivided the rectangle produces a smaller proportional golden section rectangle which is the reciprocal. Draw a diagonal from this smaller rectangle which crosses with the other diagonal, produce an intersection and draw a horizontal line. Now, this is the same as Modulor's model. The next step will be explained in detail.

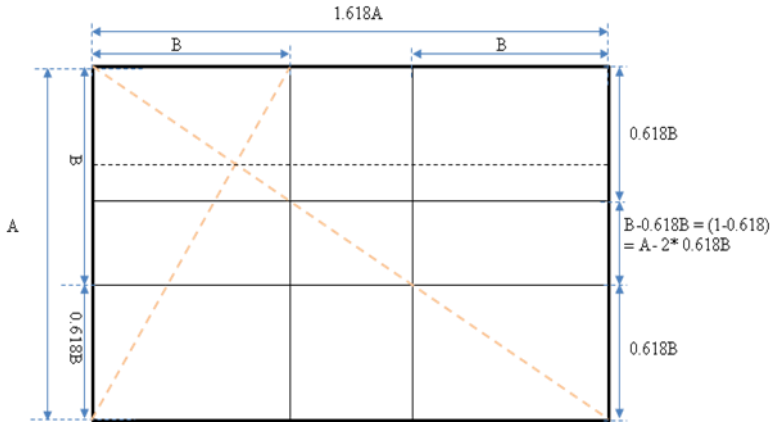


Figure 6.7 Subdivided Inner Golden Rectangle

6.Now, the same model as one of the Modulor was produced.

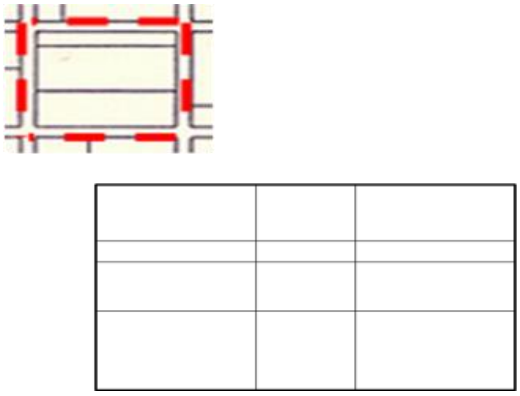


Figure 6.8 The Model of Modulor

7.The previous steps have generated many smaller rectangles in inside, and it is easy to find the same relations between smaller rectangles' length. The result is shown in Figure 6.9: three of side B which are equal 0.618A; three same sides are 0.618B; two sides are A-B which are A-2*0.618B.

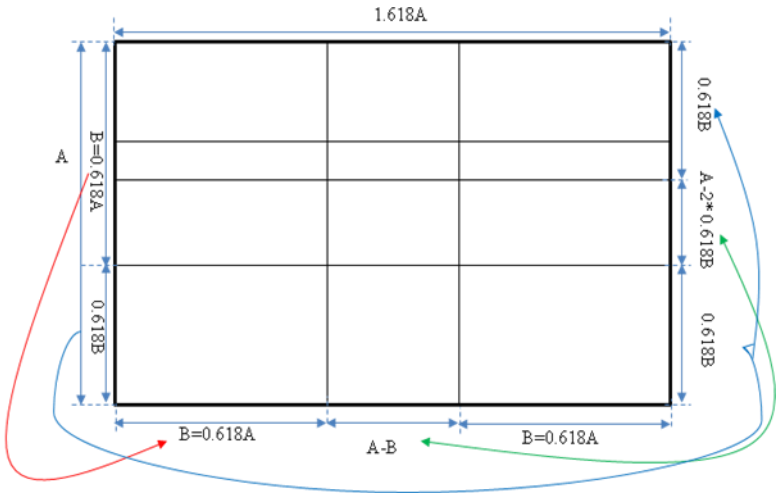


Figure 6.9 Analyses the Distance of Subdivided Golden Rectangle

8. Based on cross point, draw the straight dotted line.

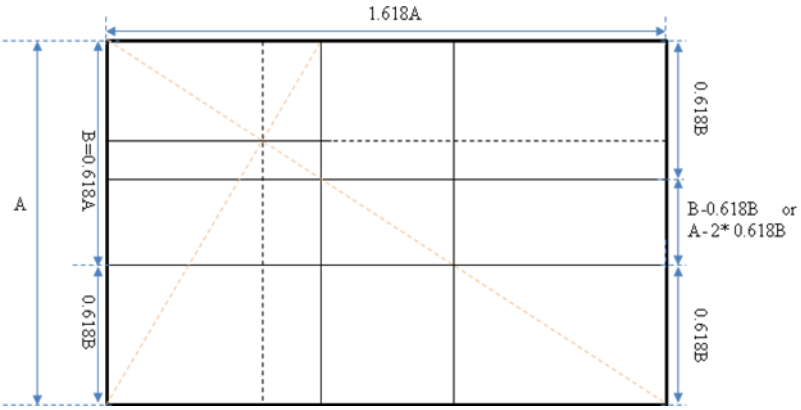


Figure 6.10 Draw a Straight Dotted Line

9.Then, based on this dotted line draw a small square.

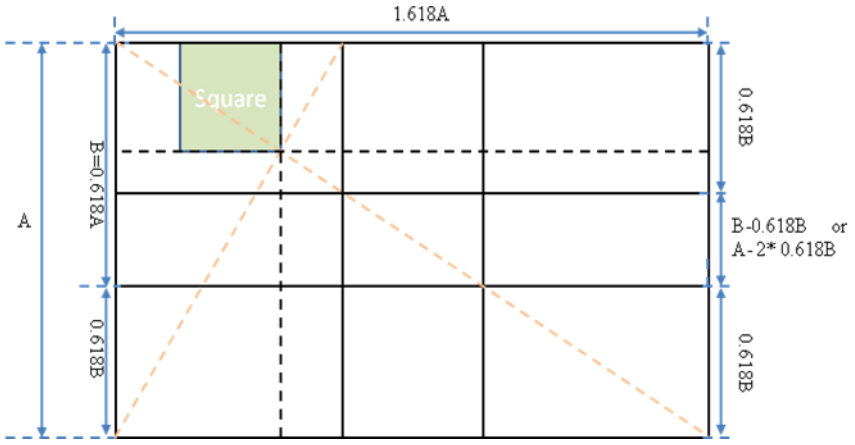


Figure 6.11 Draw a Small Square

10.Extension of the side-line from the square.

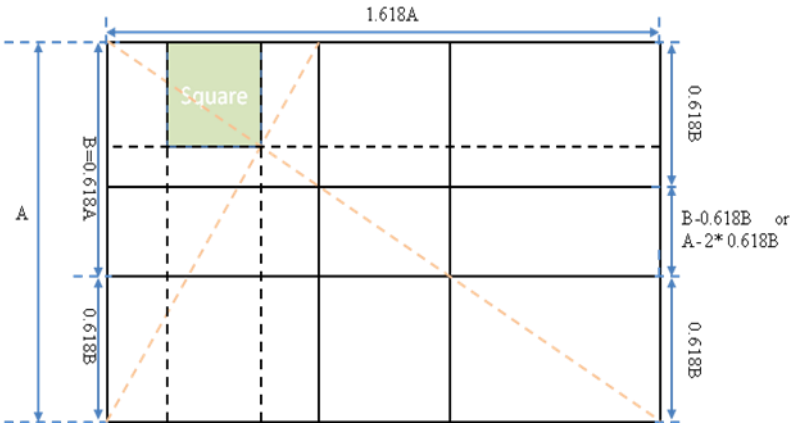


Figure 6.12 Draw Side line

11. Now, a blue rectangle on the top of left takes it as example. Draw one straight line from the intersection points and transform into a Green Square in this blue rectangle area.

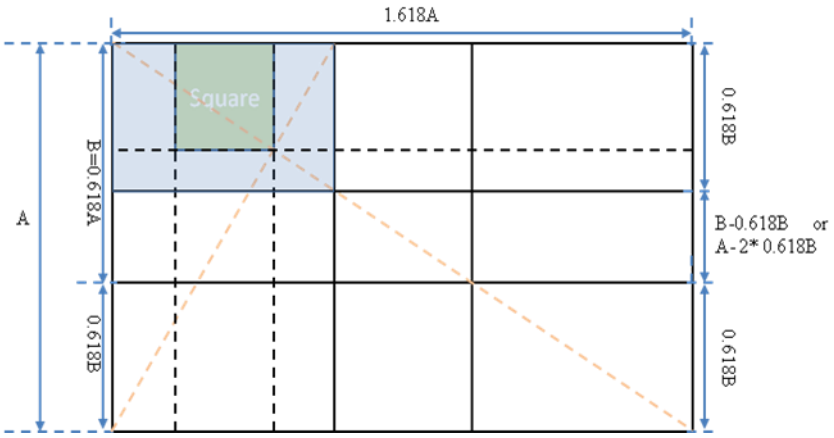


Figure 6.13 Details of Subdivided Golden Rectangles

12. However, the blue rectangle length C is a part from square B. The relationship between B and C is the golden section, so that easy can infer the blue rectangle width is C which equals 0.618B. The other orange rectangle has a width of B-0.618B. So, C which is the blue rectangle width plus (B-0.618B) which is the orange rectangle width, equal the square B side. C + (B-0.618B) =B.

This is the analysis of the relationship between line segments of golden ratio.

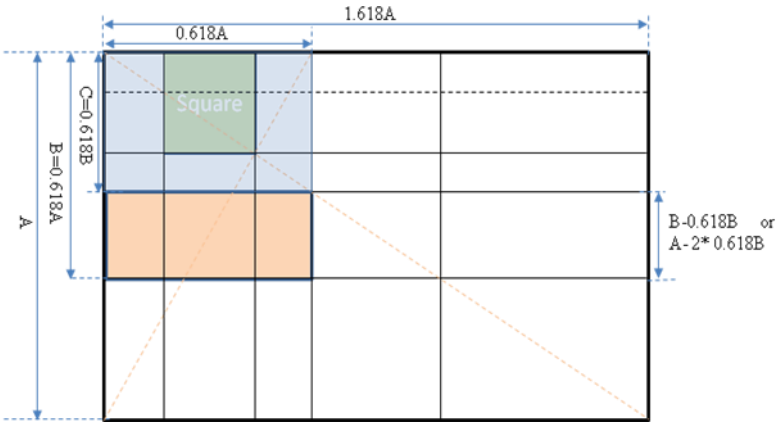


Figure 6.14 Process of Subdivided Golden Rectangle

13. Zoom in this blue rectangle which shows the relationship between squares and the golden rectangles, and use the capital words instant for these distances. Then, make all shape distance capable words represent with A (brown box).

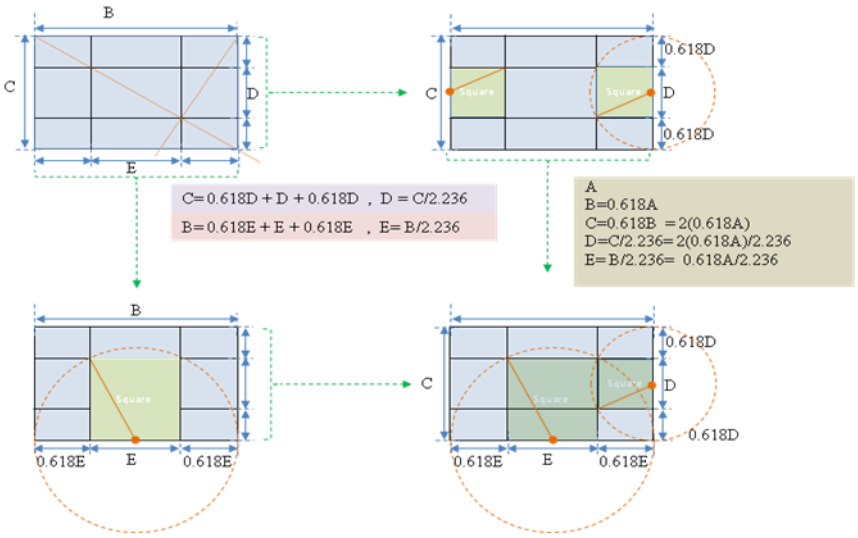


Figure 6.15 Detailed Analysis about the Middle Area

14.In the end, that is easy to know this orange length which is (B-0.618B) +0.618D, then conversion to relationship by A.

0.618A * (1-0.618) + 0.618 [2*(0.618A)/ 2.236]

= A [(0.618*(1-0.618) +2*0.618/2.236]

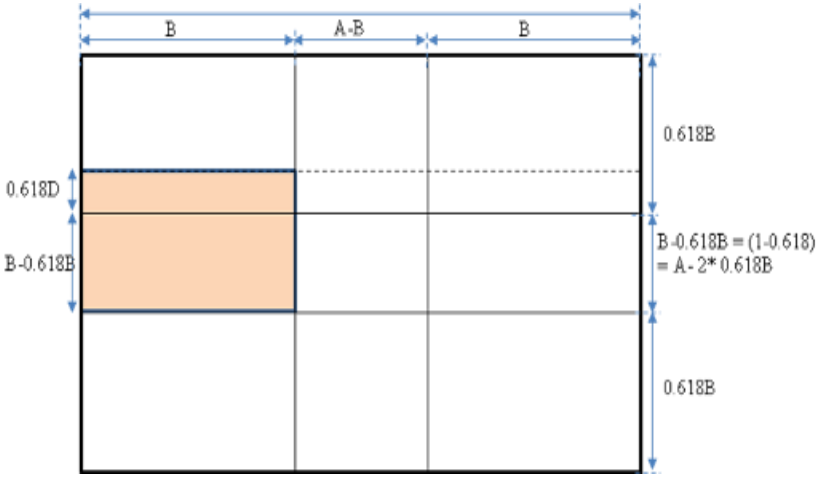
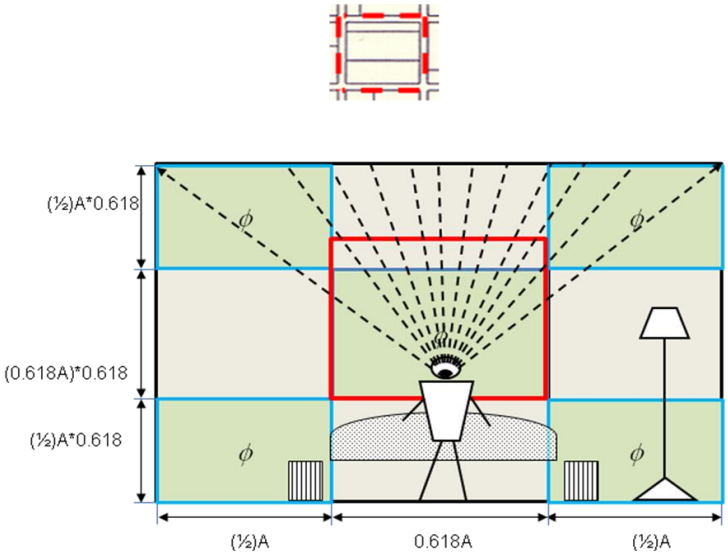
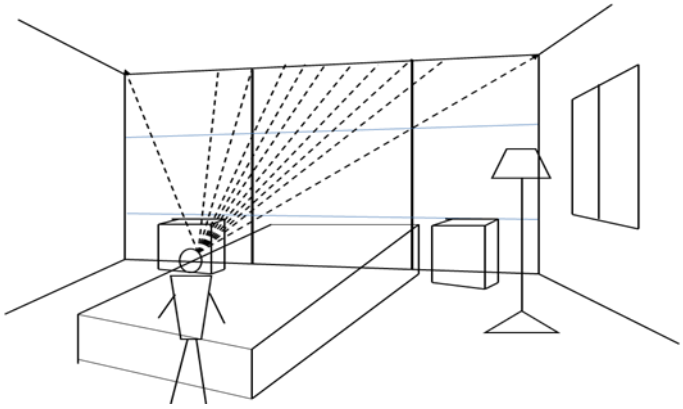


Figure 6.16 Further More Detail of Subdivided Golden Rectangle

15. This distance is recommended in the Modulor. This research gives the detail of calculation of the numerical proportions.



2D



3D

Figure 6.17 Detail for Person Eye Contact Area (2D, 3D)

Returning to the large golden rectangle many smaller rectangles can be found within it which have been previously analysed. The bottom two smaller rectangles ratio areas can accommodate furniture, which can occupy the diagonals line points.

This result is that the only wall size suitable for the head board is between Ø and bigger than root 3. This means if the wall length to width ratio approximates around the Ø≥√3, this is close to the golden ratio.

6.2.3 Testing Guideline in a bed head

Some options emerge from the previous steps analysis (Chapter 4), with 3 options depending on the room size.

- Option 1

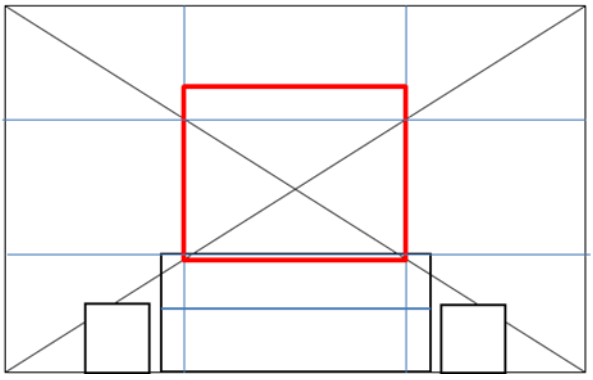
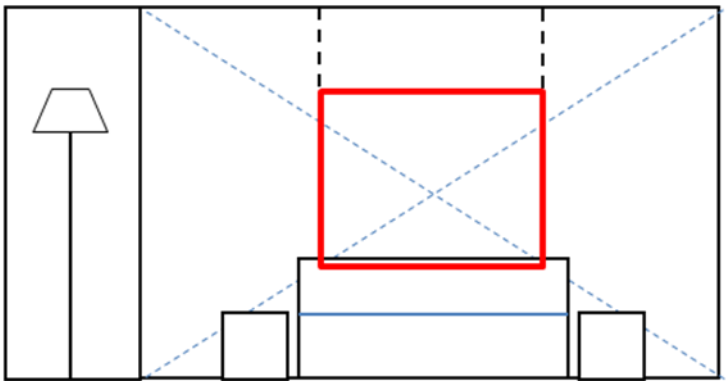


Figure 6.18 Option 1

Option 1 is when the bedhead wall ratio equals or approximates the golden section or is less than root 3.

- Option 2

Option 2a



Option 2 is when the bed head wall size is bigger than Ø and less than √4. In this case, the wall can be subdivided into two parts. Option 2a is to take the golden section wall out to one side and other side stands alone.

Option 2b

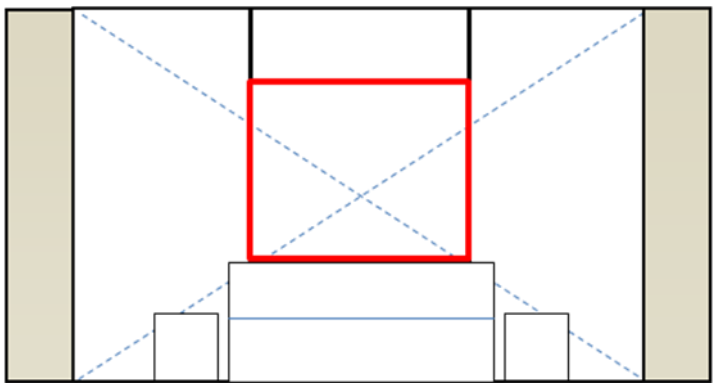
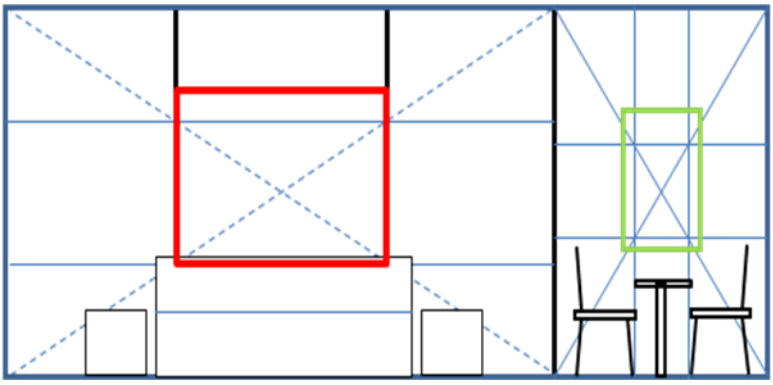


Figure 6.19 Option 2

Option 2b is to put the golden section wall in the middle and the position surplus areas on both sides.

- Option 3

Option 3a



Option 3b

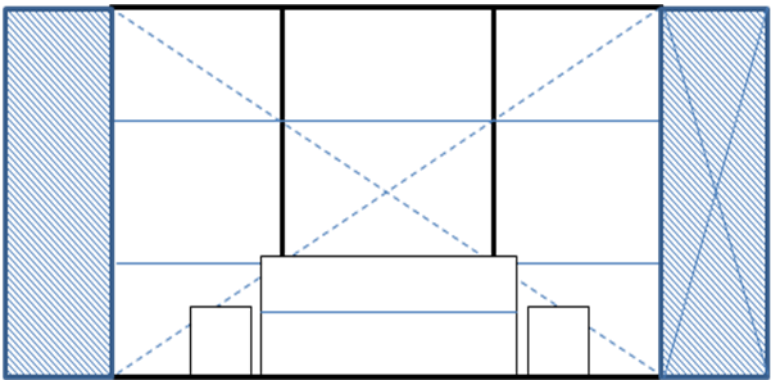


Figure 6.20 Option 3

Option 3 is when the bed head wall is bigger than the golden section and less than root 5.

In this case, the principle is the same as in option 2 a/b having the golden ratio area in the middle, with the surplus area divided on two sides

equally or located to one side. It is suggested to choose option 3a because keeping this area to one side results in more leisure space.

6.2.3.1 Repair Existing Design Errors in the Numerical of Ø

Here all principles suggested so far for the hypothetical guest room will be used and tested with an actual room design and improved upon.

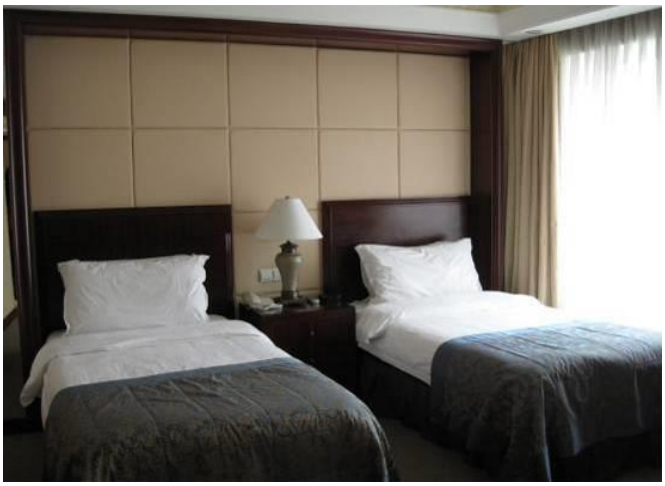


Figure 6.21 Photo from the Xuanwu Lakerview Hotel, Nanjing

Referring to Figure 6.21, this room belongs in the category with golden ratio and root 3. Figure 6.64 shows the two single beds occupy all of the space; there is not any extra space left. This situation belongs to option1 that is easy to judge room size.

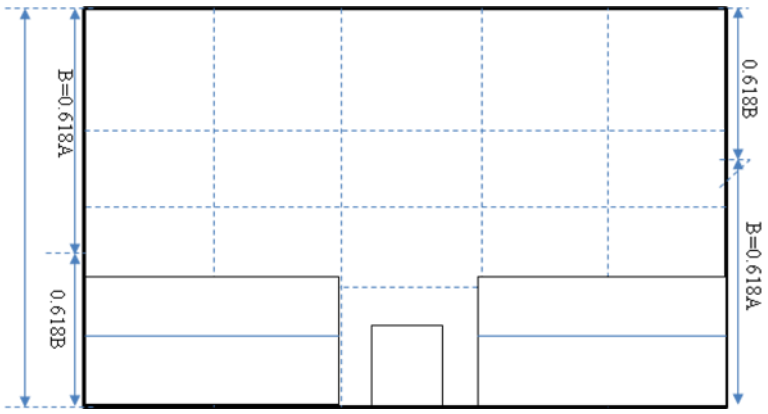


Figure 6.22 2D Dimensional Analysis

However, in this design, the bed wall was equaled divided into five spaces and the bed head is higher, it is the recommended 900-1000 (page 138). The lamp with a sloping shape to the two sides was symmetrically placed in the middle. However, the design problem is that the bedhead wall did not follow the golden ratio theory and has lost the opportunity to include some cultural elements.

Using the golden ratio divided the bedhead wall (figure 6.23), the wall should be divided by the golden ratio and the picture inserted to decorate at the eye level.

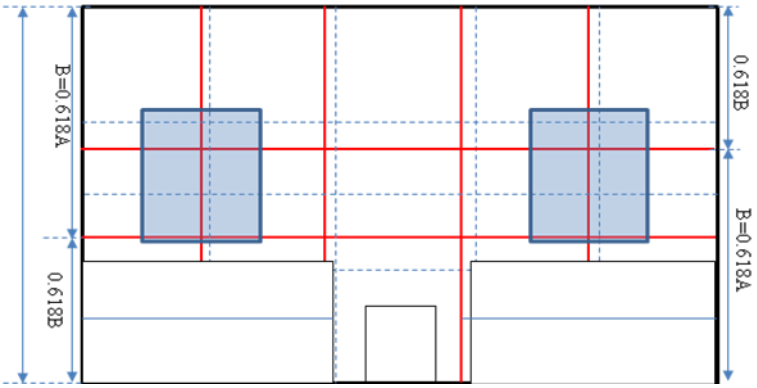


Figure 6.23 Model of Single Bed Head Wall

Following the dividing steps, after re-designing the room, it should become more comfortable and have cultural elements incorporated (Figure 6.24).

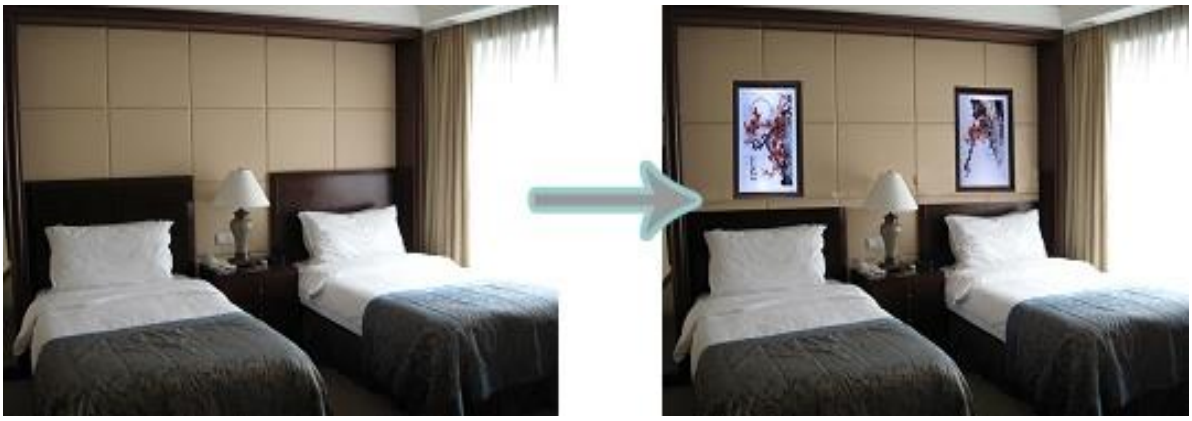
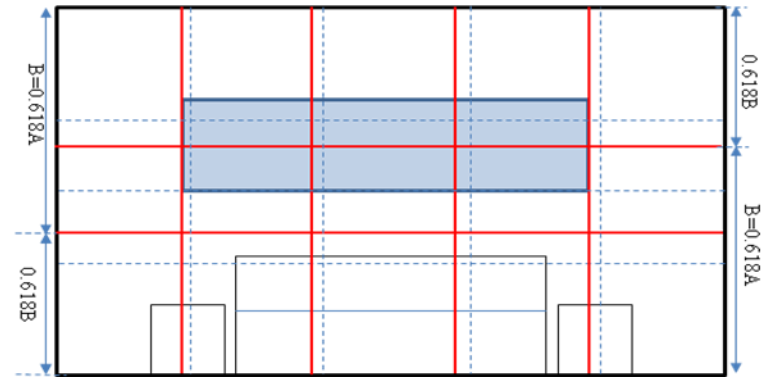
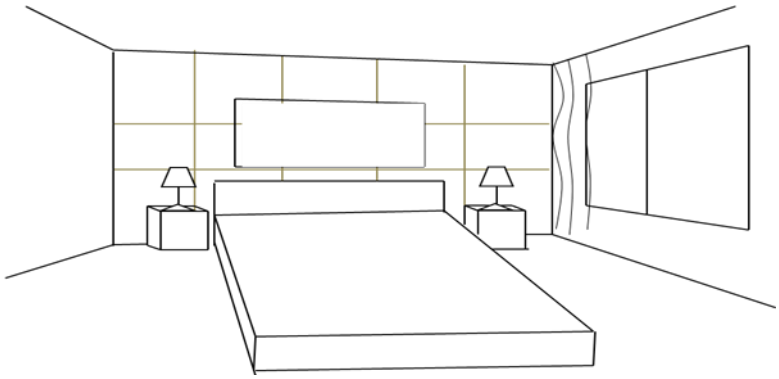


Figure 6.24 Comparing the Original Design and Re-designed Guest Room

A design problem of the original room's bed head wall was the fact that it was divided equally; the bedheads were too high and there was no placement of cultural decorative paintings. The design guideline was used to re-design the guest room by accepting the golden section theory to divide the bedhead wall. The height of the bedheads was reduced and two cultural decorative pictures were placed symmetrically. The symmetrical form used paintings to decorate the walls, but the pattern within the paintings is asymmetrical. Here, this study wants to emphasise that designers can accept a symmetrical main style, but part of the space can adopt asymmetry to increase atmospheric interest (Figure 6.25).



A



B

Figure 6.25 The Model of Bed Head Wall in Double Bed (A, B)

6.2.3.2 Repair Existing Design Errors in the Numerical Between Ø and √4

Figure 6.26 Photo from the Mandarin Garden Hotel

The original is taken from the Mandarin Garden Hotel. This room has a root 4 ratio. Firstly, make a simple model as Figure 6.27. Separate the wall into two parts. The main area is the golden ratio. Divide this golden rectangle with diagonals, then the decoration picture should be positioned between these lines, and the floor lamp can be located in the smaller area. Secondly, according to the Modulor model then determine an eye appropriate contact area and decide on the location of the decorative painting over the double bed.

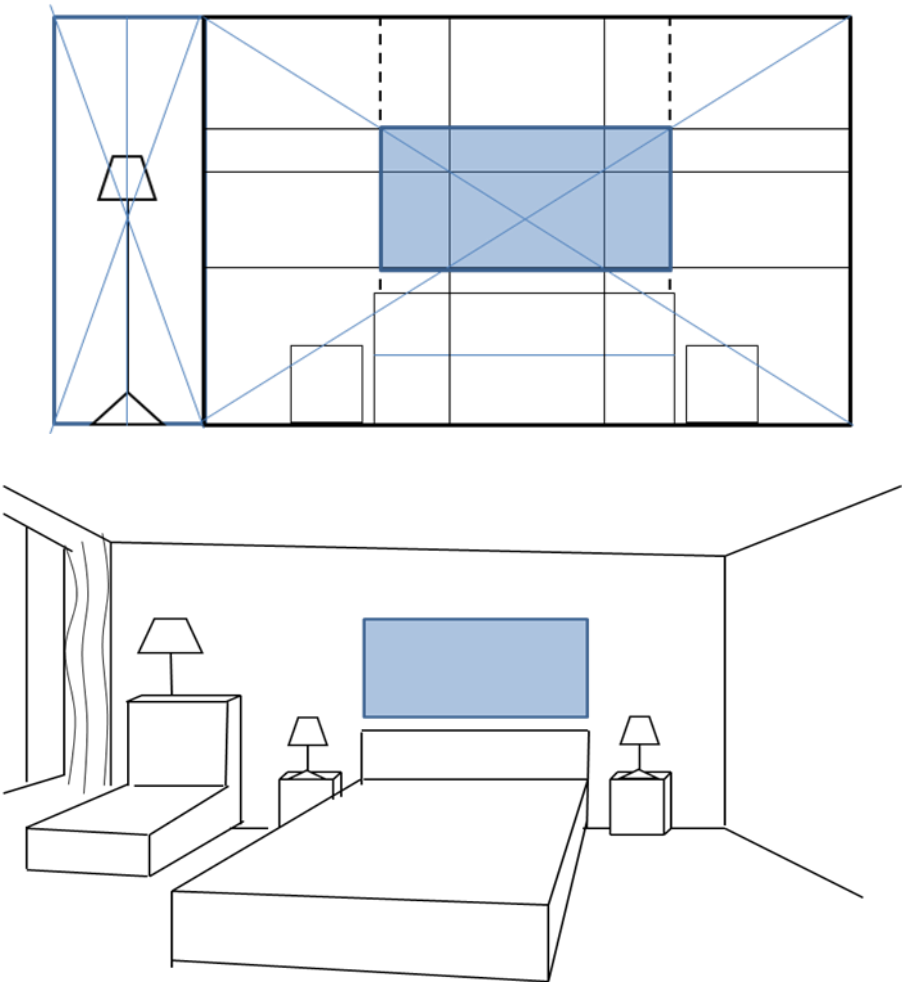


Figure 6.27 Simple Model of Root 4 Bed Head Wall

6.2.4 Testing in Hotel Other Areas

This guideline can work with many hotel areas, such as reception, hotel bar or hotel rest area. This section is simple an example to show how can

guideline work in reception. For example, this is reception of Jinlin hotel (Figure 6.28), after use guideline rule to analyse background of reception, as we can see (Figure 6.31) the decorative region is too long and too thin.

Figure 6.28 Reception of Jinglin Hotel

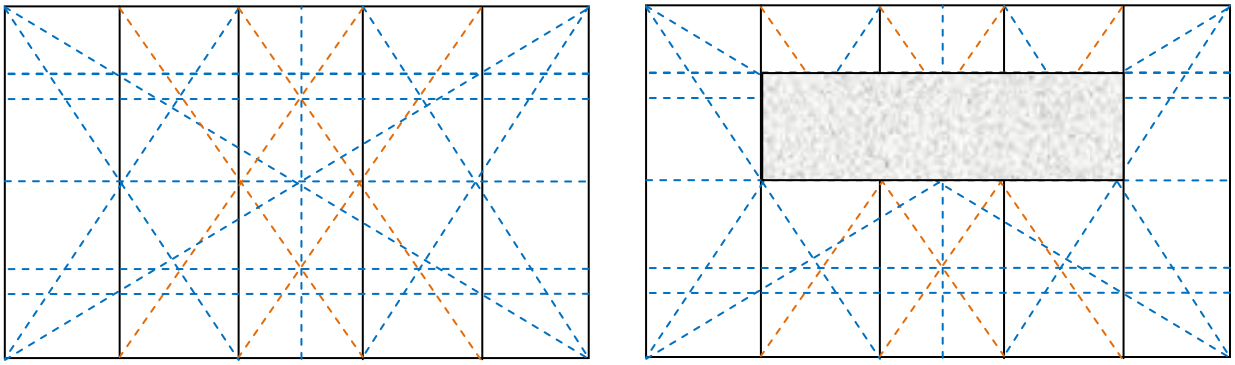


Figure 6.29 analyse processes

This is only simple example to show how hotel guideline of this research can work with many kind of hotel area.

6.3 Evaluation of the Guideline and Results Analysis

The evaluation of the proposed theoretical model includes two evaluation activities: user testing (observations combined with performance tasks and questionnaires) and expert evaluation (semi-structured interview).

The end-user testing and expert interview are designed mainly to determine the performance of the integrated application on the requirement of the created production, which is called application's performance of the design guideline later on. In addition, the end-user testing also included evaluating the design method, tested in 3D model environment, an open comment section was provide during the end-user testing for production refinement and to obtain more potential applications of the created the guideline. Topics of the expert interview events were designed to elicit additional applications in the specific domain and to the interface design. Based on the study of literature (see Chapter 5) and practical viewpoints of the application domain from hotel, the design guideline directly relates to cultural symbols', e.g. grid design, and symmetry. This information content in the prototype guideline was checked by a hotel designer before the prototype evaluation to confirm that no error had been made in contextual interpretation.

6.4 End-User Testing - Quantitative Method

6.4.1 Participant Profile

All thirty designer participants had experience of staying in hotels and 80% of the participants had stayed in hotels overseas. In addition, 41% visit hotels once or twice per month. When asked about their opinions of the design guideline for guest rooms, those participants who had design experience regarded the guideline as easy to use (23), useful (11) and attractive (8).

The designers' participants' experience provided valuable input to this study, they fell that this design guideline could make visitors feel comfortable. Furthermore, this design model creates a harmonious atmosphere and the room space is fully used.

This viewpoint was maintained throughout the whole research in order to investigate and discuss that how the golden section theory can be applied in hotel design. Therefore, the experience of the interviewees provided practical input to the study, enabling the body of research to be evaluated and valuable suggestions presented for future study.

6.4.2 Survey Questionnaire Design

The questionnaire (see App 6A) related to the technology's performance, and table 6.1 lists the questions related to the application's performance. The questions to determine the technology's performance were acquired from the experiments in the phase of testing the proposed methods of developing and improving the guideline (see Chapter 4). Participants undertaking the user testing were asked to grade their assessments of each question on a 5 level Liket scale, where 5 denoted strongly agree and 1 denoted strongly disagree. The rating method was recommended on Chapter 3 - 3.5.1 and used in evaluating research aims.

Table 6.1 The aims of determining the application of the design guideline

Sequence	Questions	Aim (determining)
Q1	Understanding the guideline	Manipulating the movement of the view was easy
Q2	Mathematics formula is easy for application	It was easy to find the object
Q3	Is the guideline helpful	The overall design of this application was good

Q4	Other suggestions	It is easy to recognize my position

6.4.3 Results and Comments

The application's design guideline clearly has high statistical and practical ranking within the group. Knowledge delivery enriched understanding of the golden ratio is rated very close to "strongly agree" (Q1), and the awareness of using math's formula achieved a high level of ranking and agreement (Q2). In addition, the helpfulness of using this guideline received almost the same rank of strong agreement (Q3). the suggestions will be discussed in the following section (Q4).

From a practical standpoint, the perspective obtained looked natural to a level very close to "strongly agree" and an extremely high level of rating and agreement (4 out of 5) for the quality is obtained. This was a good result.

6.4.3.1 Comments of the Subjects

Over 70% of the participants showed their strong willingness to comment on this guideline creation. The comments were varied, and included praising the production in terms of creative design, in communicating the design information. Moreover, several suggestions were on potential applications and future development. Some specific suggestions for improving and updating the production are also mentioned in the comment section. For easy understanding and analysis, of the comments (see Table 6.2).

Table 6.2 Suggestions of future applications and investigations

No.	Rate	Comments	Recommendation
Q1	85%	1.This project is good for people who have no knowledge or experience	Application

		2.I would like to try using it in guest room design 3. To make the experience more immersive it would be good to steps to display	
Q2	70%	I was thinking the math's formula interface can be designed fitted to variety application easily.	Investigation
Q3	75%	1. Advantage on improving the guest room design. 2. This guideline can be used to offer other kind of atmosphere e.g. hotel shopping area, main hall. 3. I was really impressed with the guideline. I think it can help the designers.	Applications and Investigations
Q4	10%	1.This guideline also can have a good impact even on other areas such as hotel lobby. 2. Suggest adopting in interior design.	Application

6.4.4 Discussion

The results and comments give significant evidence to the bedhead wall guideline and requirements from end-users' points of view. The evidence comes from the very high and consistent ranking of the system on application related questions.

So far, the guidelines options have only been applied to the bedhead wall in guest rooms, other areas were do not researched in this study, and the bedhead wall area is between golden ratio and root 5. If the bed head wall ratio is bigger than root 5 it is not in this study range. However, the method of creating a math's formula for the bedhead wall design led to being given much praise. These comments provide the evidence of improvement.

The suggestion of further applications and investigations from the end users will be elucidated alongside suggestions from participants of the expert interviews in the concluding chapter.

6.5 Expert Interview - Qualitative Methods

Interviewing experts who are working in the application domain has a number of advantages. Not only in ensuring the credibility of content and therefore making findings stronger, but also allowing both parties to fully explore the applications and use of the created design guideline (see Chapter 3 for discussion of this method).

There were professional people selected for the interview survey (Table 6.3). These comprised five UK experts and five China experts. The reason is this hotel design guide line is intended for application to the global hotel brands with reference to Western and Eastern styles. Hence, both UK and China experts were found for this questionnaire survey.

Table 6.3 List of Professional People Selected for the Interview Survey

UK Professionals	China Professionals
Robert Chen (Industrial Design)	Yang Wu (Interior Design)
Nick Higgett (Multimedia Design)	Lihua Zhang (Art Design)
David Hartwell (Interior Design)	Xiaoliang Liu (Web Design)
Stuart Wright (Interior Design)	Rong Shen (Interior Design)
Matthew (Architect)	Lei Zhan(Interior Design)

All expert subjects have a combined average of fifteen years' experience and at least seven years practice in architecture or interior design disciplines. The reason these professionals were chosen from interior or architectural fields was because the research, from the beginning, was center on an interior architectural design perspective.

6.5.1 Topics and Progress

The whole project was focused on an interior design incorporating geometric and cultural elements and aimed at discovering some improved methods to be used for determining hotel guest room bedhead wall design.

The interview progressed in two parts, after giving an initial introduction to the purposes and process of the interview to each interviewee. The first part involved giving a presentation of the technology being operated and then letting the interviewee draw, and experiences the production. The second part started with general questions, later becoming more specific to the main purpose of determining the requirement performance for the application of the bedhead wall guideline. The interviews ended with eliciting more potential applications of the created technology. Table 6.4 shows the aims of the topics.

Table 6.4 The purposes of the interview topics

Topic	Purposes
1	Understanding the issues of adopting the project
2	Realizing thoughts of how to communicate the golden ratio and math
3	Realizing how to provide easy design formula when using the project
4	Knowing the benefits of adopting the project as part of hotel design
5	Extending more applications of the created technology in the domain

Each interview was conducted in 20-30 minutes and recorded by digital recorder for analysis purposes. Table 6.5 shows the interview process, with the intentions of each topic.

Table 6.5 The interview process and the contents

Topic	Interview process	Probe or prompt
1. Did you consider use the golden ratio in design before?	General questions ↓	What are the issues? Time, knowledge or something else?
2. Did you know how can you apply the golden ratio in design?	Thoughts on the design guideline of the bedhead wall ↓	What potential do you think the golden ratio has in the hotel role?
3. Are these design guide line rules easy in helping you design bedhead wall?		layout, interactive design, and related design information presentation
4.Will you use it in the future?	Comments on future development	What is good about having this guideline? What is not good? Advantages and disadvantages
5. Do you have any suggestions?		1. Can this guideline help in the other interpretation applications in the hotel? 2. Any recommendations for other applications related to hotel and for the design, content etc.

6.5.2 Results

The responses of the interviewees are sorted by each topic and can be seen in the tables below. The topics one to five, have posited a positive (P) or negative (N) mark to represent the opinion (see Table 6.6). Topic is mainly for starting the interviews gently and acquiring the opinions of the bedhead wall guideline.

Table 6.6 The interviewees response

Topic	Response	Performance mark
1	1. Looks very useful for the organization 2. Lots of information 3. Very interactive, very nice and user-friendly	P
2	1. potentially very useful 2. Gives the impression of actually being there and gives control over what you do 3. Very easy to use, very interactive	P
3	1.Very interactive 2. The layout and interactive design looks good intuitive, natural understand to move around 3. Intuitive/natural operation	P
4	1. I like it very much, really good idea 3. Interactivity is good 4. I think it's very interesting 5. I like the way you can find out more information 6. Like a game – makes you want to keep exploring	P
5	1. It is a very interesting idea 2. Nice information presentation and being able to see the other area of hotel is an interesting feature	P
		Result: Full positive

This interview (See App.6B) aims to establish which design method is used by hotel designers the bedhead wall then introduce the golden section. Showing designers a guest room plan and 3-dimensional view with simple furniture and decorative painting, and asking them to arrange these items. After that, the author introduces the bedhead wall guide line, and asked the designer to try the design rules to compare which way is better for them.

This 2D questionnaire's (see App. 6B) prototype was derived from the last six testing drawings, choosing four different drawing styles. The Author used Auto CAD software to combine all hand drawings into one manifestation which is easy to display and compare. Altogether, it comprises 4 groups with two pictures, the upper picture is from the subjects' original free hand drawing; the lower picture is based on the golden section theory after introducing the guide lines from this study. The subjects' task was to select the best one from two pictures in each group.

Table 6.7 Compare the results

Group		Results	
		2D	3D
1	A	0	0
	B	5	4
2	A	0	0
	B	4	5
3	A	1	2
	B	5	5
4	A	2	0
	B	5	5

From the pilot questionnaire survey results it was found that 80% of the experts preferred the golden section theory application in the hotel bedhead background design. Only one expert preferred group 3 of A picture style, one of experts like the vertical shape of the picture, he also said two vertical pictures should be placed on the wall because one picture had insufficient visual impact; in Group 4, one expert selected A, but he suggested that it may

be is better if this picture occupied the whole bedhead ground; another felt that the vertical style is more contemporary. All of the Chinese experts agree with B style in each group.

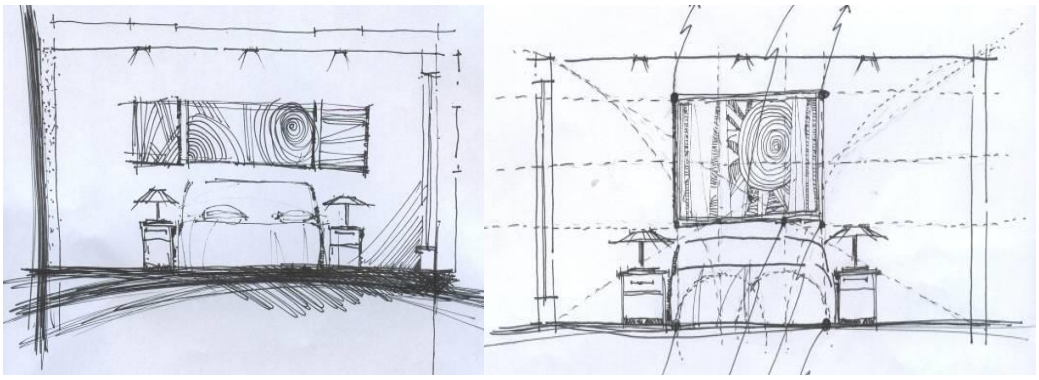
According to expert suggestion a 3D model questionnaire may illicit further accurate results. Hence, 3D questionnaire (see App 6B) was designed which simulate 2D elevations style. This final questionnaire was also send together with the 2D graphic questionnaire (see App. 6B.1) so that subjects compare each different elevation pictures and provide more accurate results.

The result shows (Table 6.8) that designers preferred derations using the golden section theory to decorate the bedhead wall.

Table 6.8 Questionnaires' result

2D					3D				
A	B	C	D	E	A	B	C	D	E
0%	2.7%	7.9%	5.2%	84.2%	0%	2.7%	5.2%	0%	92.1%

Information gathered from design experts during interview (See App. 6C). about when they design the bed wall area; they consider lighting, the bed mantle, or an emphasis on the bed on both sides of the decorative. They felt it is difficult to design the bed wall area.

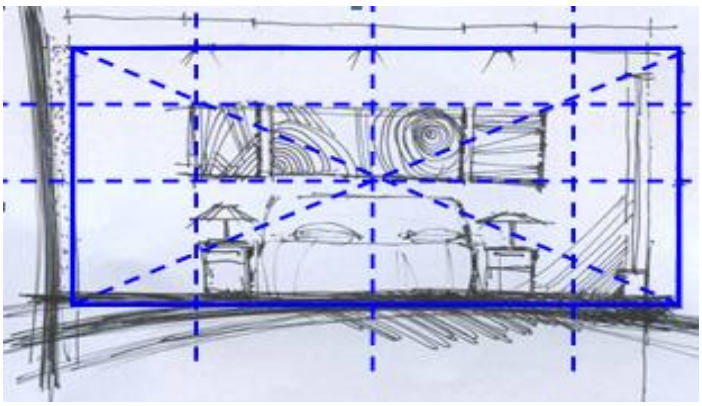


(1) Before (2) After

Figure 6.30 Examples from Wu

Wu said that normally he depends on feeling and is very random when he designs bedhead wall. He did not consider how to divide the wall and arrange items (Figure 6.32. After introducing the guideline from this research, he used the rules to design again, as shown Figure 6.30 (2), he felt this rule was better and more scientific and rational.

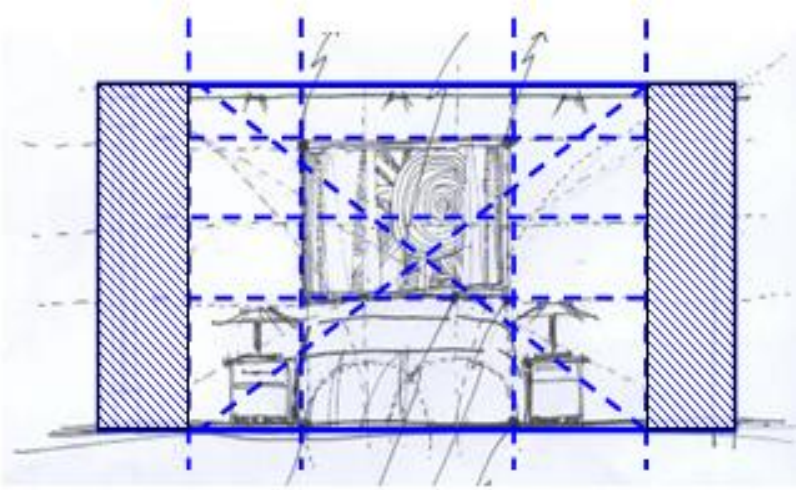
This bedhead wall area of guest room is ¢ ≤ √4. Initially, Wu did not think about the golden ratio, just drew a draft based on his feelings, as Figure 6.38,shows using auxiliary lines that heground items in the center.



(1) First Drawing

After introducing the guideline, he draws the elevation again. Firstly, he measured the proportion of the bedhead wall, and found this area close to

option 2 (¢ ≤√4), then he calculated the area of the golden section from the middle, with two sides as other excess areas. Finally, he tried divided the golden section area and put decorative painting and furniture.



(2) Following the Design Guide line Drawing

Comparing these two drawings, the first is not scientific, just depending on a feeling to design. There are too many uncertain design factors; the second is better, it demonstrates rational scientific, and methodical, process.

However, carefully subdividing the premier first image some shapes are close to the golden section as Figure 6.31.

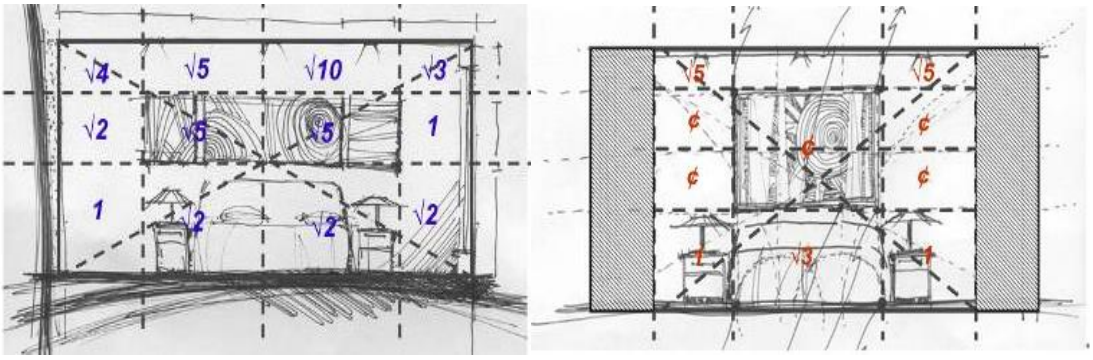
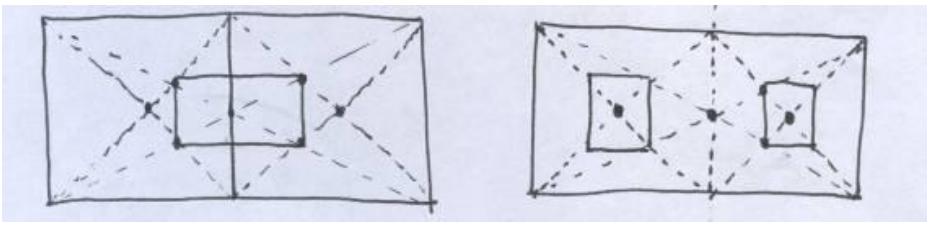


Figure 6.31 Analysis of Wu's Drawing

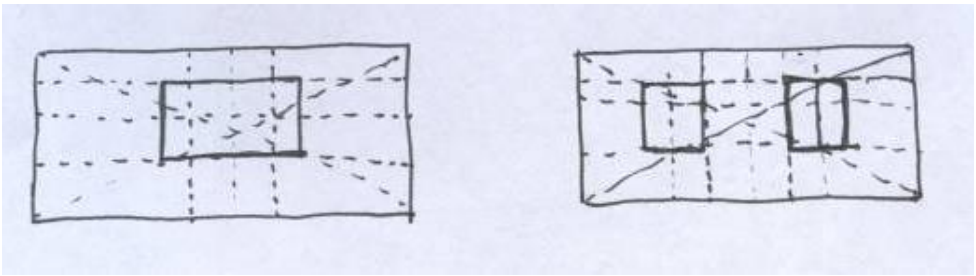
These shapes (1) are from a subject randomly drawing, and the outlines and proportions are close to the golden section. The subject does not realize that they have used the golden section theory in design subconsciously in their work.

However, drawing (2) is based on the result from this research and includes many golden sections. This drawing content is very rich, and makes the background tidy. Also the drawing results on extra space in the background which could make customers feel that the guest room is bigger and more comfortable.

Further positive feedback from Shen (Figure 6.32), is that previously he knew that he need to for the eye contact point and put the picture on the intersection point, but the point was not always correct because it was not based on any theory. After seeing the guideline, he felt this rule is more scientific and reasonable. He founf that the eye contact point is higher than in his design, and he will use this rule in future design work.



(1)



(2)

Figure 6.32 Examples from Shen

Expert designers also said that they placed great importance on the selected spatial areas, this being the bedhead wall space. Because the place where guests spend the most time is in their room, choosing the bedhead wall design as a theme is a great idea. All of the designers would like to give guests a softly designed fantasy, including some fantasy elements, such as hiding the ratio relationship in design, its devised to make customers feel more comfortable and relaxed. Therefore, the professionals thought this was good research: to provide formulae for a variety of sizes of bedhead walls.

The pilot questionnaire was successful in proving the application of golden section theory in hotel design. Due to different cultural backgrounds, the guideline of application of the golden ratio is more successful in Oriental designs. From the questionnaire, there were suggestions from subjects, such as applying the golden section to the whole bed head ground, and trying the use of vertical pictures. These suggestions might or might not work with the golden section guidelines, which will be a subject for further research.

There are many responses regarding the recommendations and the future work related to the future works of the research, and these will be discussed and interpreted together with suggestions from end-users, in detail in Chapter 7.

6.5.3 Discussion

The interviews fully achieved the purpose and expectation of not only providing evidence to confirm with experts' opinions, but also extending the future studies in the proposed application domain.

During the event, the interviewees expressed a lot of interest about developing bedhead wall. Expert interviews not only give evidence that the guideline meets the intended requirements, but they also reveal other potential design information for future study (see Chapter 3). This confirms

that it is important and necessary to have expert interviews in the evaluation stage.

6.6 Summary of Results

Table 6.9 shows the combination of the requirement performance determination results of the production, for the two sets of evaluation methods, indicating that both are in very high agreement.

Table 6.9: Performance in communicating knowledge and application

	Knowledge delivery	Application
End-User Testing	Highly agree (table 6.2,rate)	Highly agree (table 6.2)
Expert Interview	Strongly agree (Table 6.6)	Strongly agree(Table6.6)
Result	Very high agreement	Very high agreement

Comments and responses from end-users and interviewees give many recommendations for further and future investigations on the application. Table 6.10 shows the areas for obtaining the feedback in the two sets of evaluation methods. The feedback will be categorized in the concluding chapter.

Table 6.10: The areas of obtaining further investigations on the two sets of evaluation method

	User Testing	Expert Interview
Recommendation and future works	Comments (Table 6.2, page159)	Response (Table 6.6, page 163)

The creation of the design guideline is proved from both the end-users and the experts. Table 6.11 shows the combination of the two sets of evaluation methods on the bedhead wall interface and shows that the design received very strong agreement that it is well designed.

Table 6.11 the guideline is very well designed, as agreed by both end-users and experts

	Guideline is useful
End-User Testing	Highly agree to “It was easy to find the object” (table 6.2)
Expert Interview	Strongly agree (Table 6.6)
Result	Both types of participant / tester agree

6.7 Conclusion

This chapter has been concerned with the statistical results on guideline the application of the guideline. In addition, undertaking along with end-user testing of the final production evaluation has been confirmed.

The two sets of evaluation methods respond to the purpose of this production evaluation, and can be concluded as follows:

Firstly, both user testing and expert evaluations showed that they can imagine more clearly the linear space based on the 2D image and 3D model exhibits. This reveals the research has successfully approached a practical guest room space. Many comments and opinions on this can be seen in sections 6.4.3.1 and 6.5.3.

Secondly, experts’ informed feedback has been taken and used to improve the guide line to become on easier and more detailed system of design program. This reveals the research has successfully identified new methods. This finding of the guideline helps the designer to use the golden section system in hotel more easily, designing rooms in which the customer may feel more relaxed and comfortable.

Finally, the results of the evaluation indicate the two mixed sets of evaluation methods have great advantages of not only obtaining wider and deeper understanding of the production to the requirements, but also suggesting that this guideline can be extended to other areas of the hotel extend (6.4.4 and 6.5.1). This reveals the importance and necessity of adopting end-users testing and expert interviews in the proposed production evaluation.

The results of the evaluation also indicate that the idea to blend local cultural elements into global hotel design is not only effective, but also that the guidelines are successful in helping the designer to apply the theory. This reveals affirmative evidence that the design guidelines for the bedhead wall can deal with the current problem in global hotel design: the design is too global and needs golcalisation.

The next chapter summarises the overall studies of the research, including the aims, achievements and contributions to knowledge. In addition, the recommendations and future works will be provided.

Chapter 7 Conclusion and Future Work

7.1 Introduction

In this final chapter, the main research findings and the guidelines are discussed. As planned, the aim of this research was to propose a theoretical design reference guideline model for the global hotels in Nanjing city. From the positive results of the evaluation (Chapter 6) of the theoretical design reference model, the aim of this study seems to have been achieved.

The main research question of this study was defined by the literature review: does the global hotel brand need local cultural element with their design? Is the Chinese Five Elements philosophy the best choice of addition into the global hotel design in local city of Nanjing? This research question was addressed by the three primary research studies (questionnaires, observation studies and interviews) and the evaluation of the guideline based on the questionnaires testing.

In the following sections, the achievements and contributions to knowledge as well as a number of limitations emerging in this research are summarised. Moreover, recommendations are made to improve the guideline design reference model at the end of this final chapter.

7.2 Implementation and Outcomes of the Research

7.2.1 Research Implementation

The outcomes of this research relate to its aims and objectives which were set up in the beginning (Section 1.4). The study started with a wide literature review of hotel development and hotel design evolution (Chapter 2) and characterised the issues in detail identifying some limitations of previous work. It was noticed that many former researchers faced practical problems when dealing with these issues, such as cultural bias, distrusted data

collection, and cultural symbols that were too localised to be understand by international audiences(see chapter 3).

A modified method for developing and applying the global hotel design style in local cities was proposed. This was Twin Cycle; adopting a 3D design model in simulation method, to test the proposed design method, and expert interview together with end user testing, looking into the process of developing global hotel design style and applications. Section 3.2 detailed the adopted methodology of the research, and section 3.3 outlined the five phases of the framework based on the process of the Twin Cycle of the research. The phases were designed to deal with the aims of the research in a logical order from testing first, then through to the application.

Table 7.1 categorises the phases of the research framework, linking the chapters of thesis and objectives of research (Chapter 1, 1.4) to the aims of the research, to enable clear interpretation of the process of the study, and the key outcomes.

Table 7.1 Chapter detailing research outcomes related to research objectives

Chapter No.	The research objectives
Chapter 2	• Proportion as a common cultural element between Western and Eastern will be used in global hotel design in Chinese local cities.
Chapter 4	• Compare the common points of design systems from Western and Eastern cultures, and apply these to the global hotel located in China. The internationalization of the design can be highlighted, but also reflect local characteristics: Glocalisation.
Chapter 5	• To prove the golden section, colour, symmetry is still popular

	style
Chapter 6	• To better enable local hotel designers to incorporate traditional cultural elements within international global hotels at a local level in a way that correctly promotes local cultural values and also is understood by international visitors.
Chapter 6	• Re-introduce / reflect the value of cultural elements in the design. Utilising appropriate cultural symbolism within the interior environments of hotels in a way that genuinely reflects local culture, but also can be understood and appreciated by international visitors.
Chapter 6	• Explore the use of geometrical shapes based on the golden section, within design of Hotel guest rooms.

Based on the research framework laid out in the earlier stage of the research (see Section 3.4), a literature review (Chapter 2) was initially conducted, covering development of hotel design regarding the definition and types related to global hotels. Hotel design includes the role of conveying local cultural information. Literature research indicates that although the number of global hotel continues to increase in China, the design style is the same in different cities. Therefore, the inclusion of local cultural character is good way to introduce variety instead of promoting sameness and standardization. Accordingly, the methods implemented within this thesis offer interviews and questionnaires into the perceptions of customers and provide us with information concerning their requirements.

Primary research studies (Visits to hotels and observation studies in Chapter 4, questionnaires in Chapter 5 and interviews in Chapter 6) were also carried out. The geometry of design (Chapter 6) as developed in this research work, could be used as a decision support tool for global hotel design development, which would assist the designer in hotel design projects and achieve higher customer satisfaction. The geometric design has been

developed as an interesting topic to support comfort and suitable design factors with due regard to design expectations, use and acceptability. This research helps the designer to much improve previous hotel design style as it is based on the geometric design frame and local cultural symbols.

The visits to hotels and observation studies undertaken, examined ways to work with local elements in global hotel design. Current problems and the effectiveness and usability of cultural symbol information were identified from within the examined global hotel.

The observations were undertaken to investigate the relationship between globalisation and localisation, what the current main problem is in global hotel design, and how Chinese traditional symbols can link with design. This was followed by interviews, questionnaires and to test the research hypotheses generated from the observations.

Hypothesis: 1 that states that the exhibit which features rich cultural symbols provides attraction for hotel guests.

2 the guests can understand some of the meaning of the traditional Chinese cultural symbols.

3 the designer can apply the traditional cultural elements in global hotel design.

A theoretical design reference model (Chapter 6) based on the Modulor's model was then proposed which consists of three phases for creating the design guideline: An analysis phase, testing and an assessment phase. A guideline was created based on the analysis and design phase of the theoretical model. Finally, the guideline was tested using an evaluation based on the assessment phase. From the positive results of the guideline evaluation, the theoretical model's formula seems to be considered a valid

design method for creating effective guest room bedhead wall to accommodate the associated guest room size and ultimately help designers.

7.2.2 Research Outcomes

The research question was defined by the literature review (Chapter 2): does the global hotel brand need local cultural element with their design? Is the Chinese Five Elements philosophy the best choice of addition into the global hotel design in local city of Nanjing? The research question was addressed by the three stages of primary research studies and the evaluation of the guideline based on proportion and geometry.

From the conclusions of the case study and observations (Chapter 4), came analysis of local hotel band design, 2 global hotels and 5 local hotels in Nanjing. The most effective and successful hotel design was identified as where local cultural content is presented in hotel design. These hotels were used to consider the local cultural elements in hotel design. For example, the design was focused on the Chinese Five Elements, but whether these cultural elements can understood by international guests was not known. The future chapters give further evaluation.

From the results of the questionnaires (Chapter 5), it proves the initial experts test of the golden ratio, colour, and symmetry. The results are similar as them. And these factors were selected in future testing.

The interview and testing results (Chapter 6) also revealed that the design of guideline formula can help designers to apply the golden ratio concept in design. The research method reveals the geometry, symmetry and local cultural symbols which are explored throughout the dissertation. The new conceptual framework highlights cultural design. The possibility this guideline may improve visitors' experience and raise interest in the local culture is important.

In addition, the results of the observation studies and interviews indicated Investment in global hotels in Chinese provincial cities undoubtedly provides architects and designers with opportunities to display talent, and to introduce the latest and best design concepts. Following from this is to bring new and ideal ways for guests' to enjoy the cultural and material aspects of these designs. Designers use their wisdom, creativity, and imagination to produce designs which represent today's most advanced new thinking, new ideas, new design style and cultural features which new design elements will generate.

7.3 Achievements and Contributions to Knowledge

Modern hotel design often fails to insert cultural symbols, and one contribution from this study will be to fill that gap. However, the methodologies of design guideline were generally successful and had the potential to provide those within the field of hotel design tools to help designers understand cultural symbols. Hence, it was important that the results of the research were reported back to the subjects, as this may serve to encourage their future involvement. This study contributes to the field of knowledge by exposing a new perspective on the following steps:

- This study relates to the three subjects of proportion, colour and symmetry together. The human being main aesthetic point of view is the same regardless of cultural background, for example, people preferred the golden ratio, cold colour and symmetry style in design.
- To demonstrate an understanding of Corbusier's Modulor System through detailed analysis. Basic to the Modulor's principles, applied to an interior design problem, and developed simplified proportional design guidelines.

- To establish that the Chinese Five Elements are not easily integrated meaningfully into the design of interior environments and that even local Chinese people do not necessarily understand the visual references and certainly most Westerners cannot. Hence, it is recommended to use natural symbols. The reason is that people can easily recognise them, providing the scale is realistic and they are not over- abstracted.

- In different cultural backgrounds colour holds different meanings and there are different favourite colours. However, the cold colours such as green and blue tend to be favourite colours in different countries.

- Proportion / visual elements should be based on the golden section theory, which is a well-known ratio throughout in the world. It is also close to the Chinese ratio - the rule of thirds. This is a good way to combine the cultures.

- Symmetry / asymmetry is a different way to show decorative paintings. The results of the questionnaire show that symmetry still is highly rated in decorative paintings, which is the traditional way.

- Easy and convenient to use geometric formula to help hotel designers apply geometric principles to design.

- The geometric shape is based on the golden section which is universally the most preferred shape. When this geometric shape is applied to the design of a bedhead wall in a guest room, it creates a harmonious and comfortable environment.

- How to incorporate local cultural symbols in hotel design which can be better designed by adapting some of the design tools from the global hotel brands.

- The Five Elements is a Chinese traditional element; however, not everybody understands its meaning. So this research pays attention to the common cultural symbols with the Western and Eastern cultures which can avoid mis-understanding due to cultural differences.
- The three options of hotel guest room guideline will help the designer consider the geometric way to design the rooms.

However, it should be conceded that, in relation to the design of hotel spaces, there is still much to learn, to review, and to experiment with in order to discover the most effective and desirable ways to involve customers. Nonetheless, it is clear that there is a definite requirement for more research in order to provide a greater understanding of customers' perceptions of space and that this would, potentially, lead to the provision of more satisfactory environments for them to stay in and enjoy.

7.4 Limitations of Current Work

As with all research, there are a number of limitations to this research:

1. Questionnaire survey (Chapter 4) only proved the golden ratio, symmetry and colour. Other cultural elements were not part of this research.
2. In observation studies (Chapter 5) that was only restricted to Nanjing City.
3. The guideline testing (Chapter 6) was only tried in guest rooms.

7.5 Recommendations for future research

The recommendations for future work were mainly directly suggested by participants in the end-user testing and interviewees in the expert

interviews (Chapter 6). These are distributed into two sections including studies on creating the guideline, and on improvements to the guideline.

7.5.1 Creating the Design Guideline Model

Based on the design guideline evaluation, two issues concerned with its application and how easily a designer can understand it, need to be considered to improve the design of the guideline model (table 7. 2)

Table 7.2 Recommendations for Hotel Guideline

No.	Content	Recommender
1	Adding a quick access menu to find information for people who just want to get the information and do not want to wait or spend time finding it.	Interviewee
2	Different sizes of guest room in the same list. Same set up but maybe three different size guest rooms which would be really useful.	Interviewee
3	Three main sizes of detail in the guest room: √2, √4 and √5	Interviewee
4	The guideline needs to be clearer, not similar to the background, and the design should fit to the contents of the display information.	Interviewee

7.5.2 Improvements to the Guideline Design

The guideline exhibition is based on user-testing and expert evaluations. Based on the results of the evaluation, there were two weaknesses of the guideline: more steps are needed and details about the use of mathematical formulas. The guideline model could be improved in these two ways:

1. The addition of more steps to explain how to use it easily. For example, introductions to the processes to give more interaction and to provide more information when designer needs to select it.

2. A clearer definition of the application of the guideline. Target audience(s) needs to be given advice in order to organise appropriate information content to fulfil for their needs and expectations. For example, using X, Y, and Z instead of length, height, width to use the mathematical formulas.

7.6 Final Summary

This final chapter describes overall conclusions of the research and the main results of the research findings. The implementation and outcomes of the research related to research objectives are discussed. The research question of this study was addressed by the three primary research studies (questionnaires, observation studies and interviews) and the evaluation of the design of guideline.

Although the research undertaken has some limitations, the research findings indicated that the design of guideline model is a valid design method based on the evaluation and testing. The research has accomplished the intended aims of creating an optimal hotel design guideline which is easy to use in global hotel design. Recommendations have been made to improve the guideline through the testing, and this was provided opportunities for further research.

The volume of recommendations received from the participants of the product evaluation and the very positive responses to the work overall have been an inspiration to the author to complete further study in the field. The cross-disciplinary collaboration between design and culture has been

established, and there are expected to be more contributions in this area in the future.

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Appendices

4A Questionnaire

My name is Yansen Che and I am a PhD student at De Montfort University. My research concerns how Chinese cultural design elements can be incorporated into International Hotels in China. This questionnaire will collect relevant information which will be held in strict confidence. The questionnaire should only take a few minutes. I would be most grateful for your help.

Conducted by:

Yansen Che (Yan.che@email.dmu.ac.uk)

Fundamentals:

1. How much would you expect to pay for stay in a 4 star rated hotel, per night (excluding meals):

£35-£55	☐	£56-£75	☐	£76-£95	☐
£96-£150	☐	£156-£250	☐	Over £250	☐

2. For what reason you will stay in a 4 star rated hotel per year?

Business	☐	Tourist	☐	Visits	☐

If other, please specify position …….....

3. How often do you live in hotel per year?

1-2	☐	3-5	☐	over5	☐

4. Which area would you spend more time? (5 is strongly---1 is weakly)

Entrance area	☐	Guest	☐	**Guest shower room**	☐

room ☐ ☐

lift ☐ Passage ☐

If other, please specify position ….....

5. which design elements do you think important in hotel design?

(5 is strongly---1 is weakly)

Colour scheme ☐ Decoration ☐ Lighting ☐

Furniture ☐ Flooring ☐

If other, please specify position ….....

6. Please rate the importance of the design elements in the different area that are mentioned below? (5-extreme important; 1-not that important)

- Entrance area

Colour	
Decoration	
Lighting	
Furniture/equipment	
Flooring	

If other, please specify position ……

- Guest room

Colour	
Decoration	
Lighting	
Furniture/equipment	
Flooring	

If other, please specify position ……

- Guest shower room
- Lift

Colour	
Decoration	
Lighting	

Furniture/equipment	
Flooring	

If other, please specify position …..

- Passage

Colour	
Decoration	
Lighting	
Furniture/equipment	
Flooring	

If other, please specify position…..

Colour	
Decoration	
Lighting	
Furniture/equipment	
Flooring	

If other, please specify position …..

Testing:

- A

Which elements do you prefer in guest room A?

Elements	strongly agree	agree	general	disagree	strongly disagree
Flooring					
Decoration					
Ceiling					
Planting					
Furniture					
Background d					

- B

Which elements do you prefer in guest room B?

Elements	strongly agree	agree	general	disagree	strongly disagree
Flooring					
Decoration					
Ceiling					
Planting					
Furniture					
Background c					

- C

Which elements do you prefer in guest room C?

Elements	strongly agree	agree	general	disagree	strongly disagree
Flooring					
Decoration					
Ceiling					
Planting					
Furniture					
Background c					

7. Which style of room would you prefer?

A ☐ B ☐ C ☐

8.Would you prefer to select a room with cultural feature in a hotel if the prices are the same? (Please circle the number that applies)

Strongly disagree 1 2 3 4 5 Strongly agree

9.Do you think modern hotels should contain traditional elements?

Strongly disagree 1 2 3 4 5 Strongly agree

10.Are you interested in staying a hotel with both traditional and modern elements in the future?

Strongly disagree 1 2 3 4 5 Strongly agree

Please leave your basic profile, after our experiment, a short report to summarise the result will be you by E-mail. Thank you for your help.

Name: Gender: F M Occupation:

Age:

19-25 ☐ 26-35 ☐ 36-45 ☐

46-55 ☐ 56-65 ☐ Over 65 ☐

E-mail:

4B Shapes' question

Questionnaire

Gender F ☐ M ☐

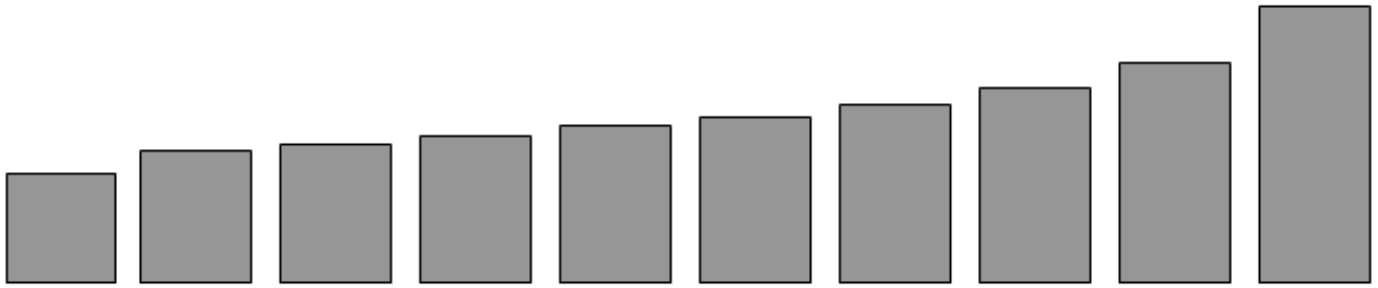
Age 18-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ over 60 ☐

Nationality UK ☐ International ☐

Please indicate which **three** of these shapes you find the **most pleasing**, by placing a **tick** √ in the chosen shapes

Please indicate which **three** of these shapes you find the **least pleasing**, by placing a **cross** x in the chosen shapes

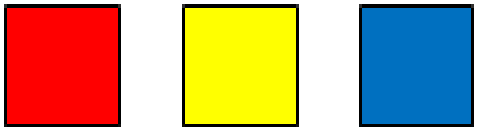
Finally, of **three** shapes you ticked as the **most pleasing** – please indicate which **one** of these shapes you **most prefer**, by adding an extra **tick** √√ in that shape



4C Colours' Questionnaire

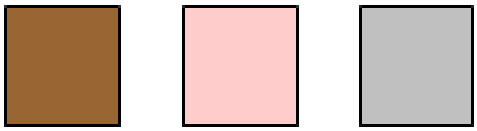
Questionnaire

1. Please indicate which one of these three colours you prefer, by ticking √ the colours of your choice.

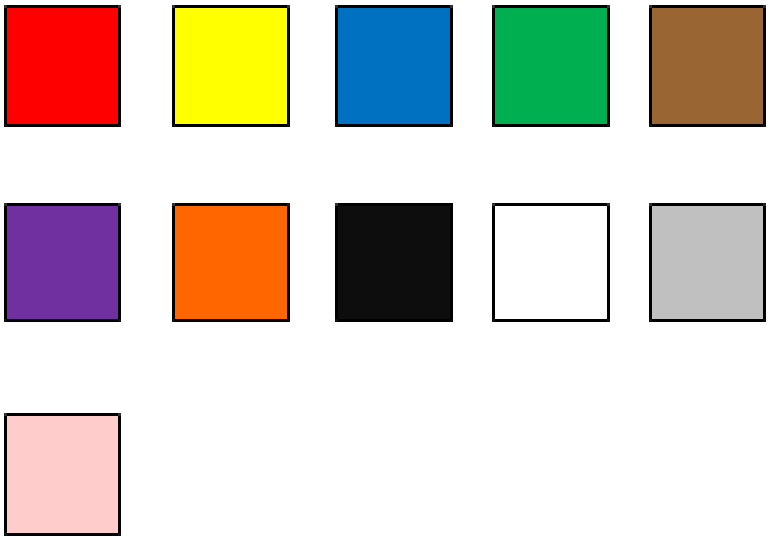


2. Please indicate which one of these five colours you prefer, by ticking √ the colours of your choice.

3. Please indicate which one of these three colours you prefer, by ticking √ the colours of your choice.

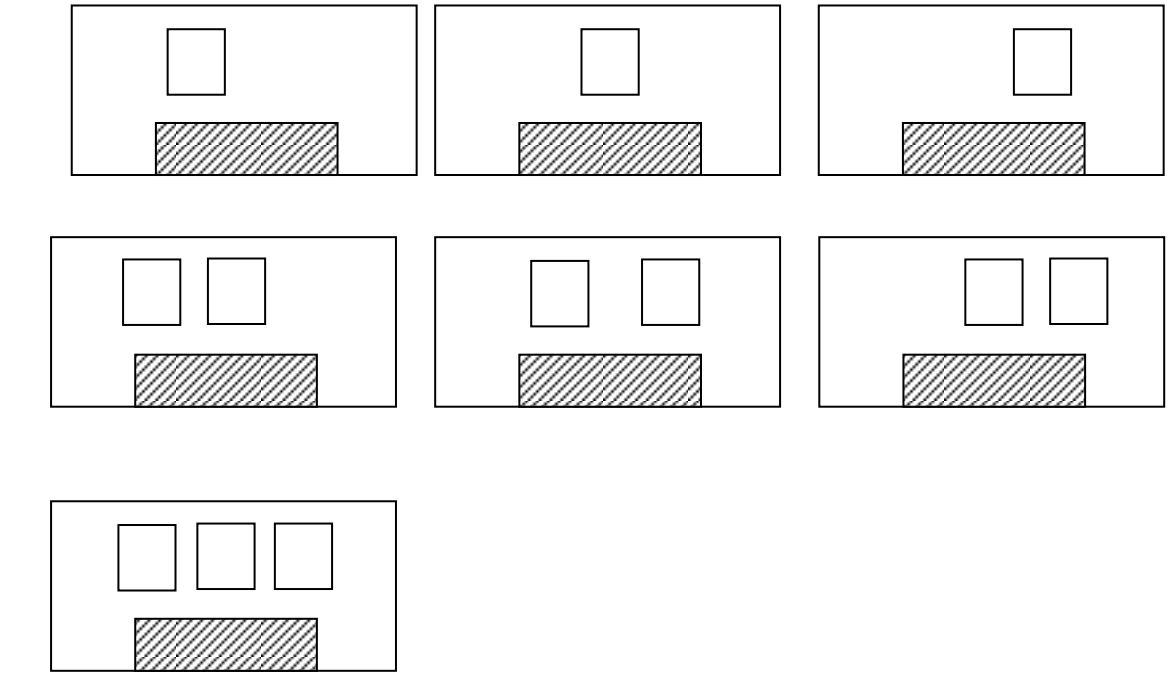


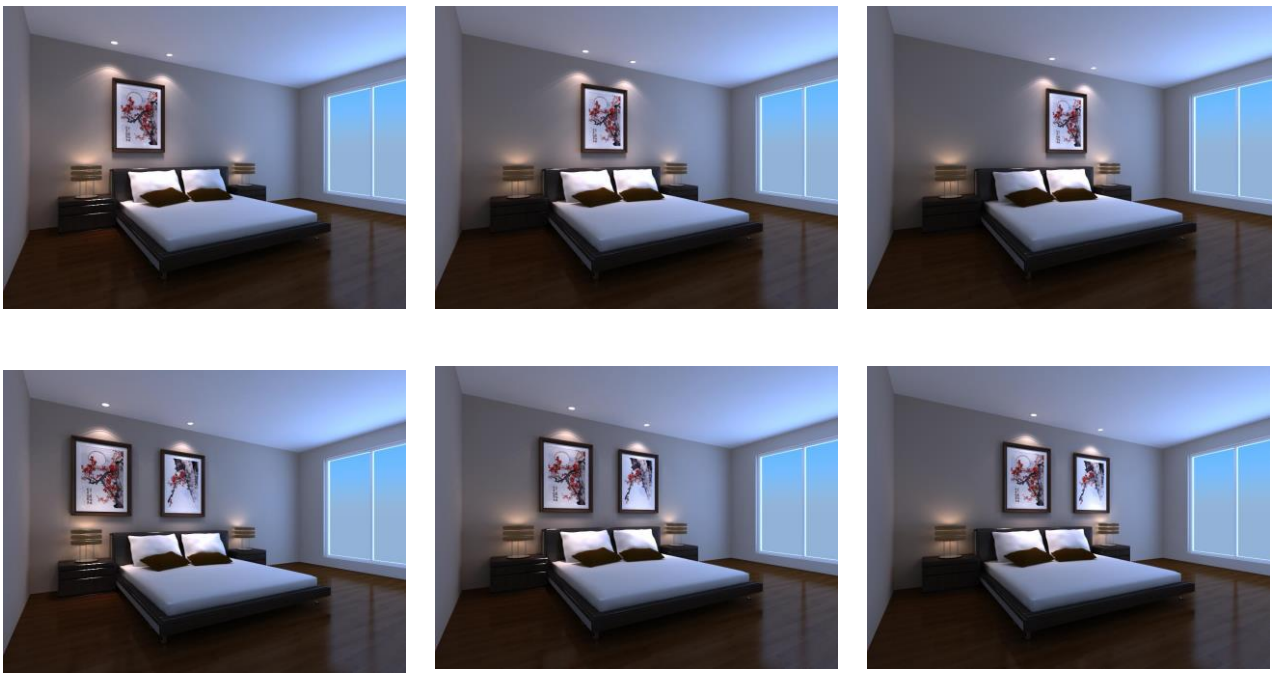
4. Please tick √ one of these 11 colours which is you most prefer.



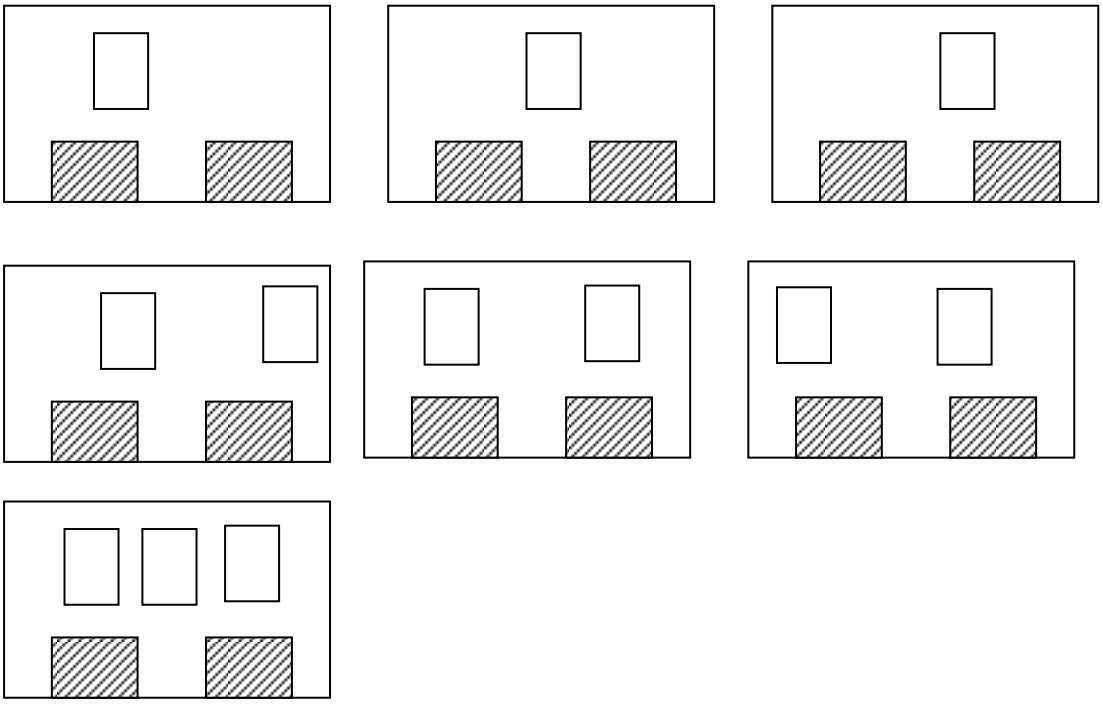
4D.Symmetry Questionnaires

Double bed





Single bed



4E interviews' questions

First I would like to explain the aim of this interview:

As the results from my primary study have concludes, the aim of the interview survey is to get opinions from guests, hotel managers and hotel designers to evaluate the research findings and methodologies used.

There are 2 sections in this interview.

First, could you please fill the details of your work experience in section A for me please.

Section A: Personal Detail

Can you please briefly describe your work experience (history& current) including: year, employer, position and field of work:

Year	Employer	Position	Field of work

Section B: Opinion on research Methods Used

In section B, I am going to introduce my research purpose and then ask your opinion.

First, I am going to briefly introduce the global hotels in Nanjing of China. After China have "open door" (1979) policy, many global business, tourism and hotel brands are coming to China. However, many guest feedback are about hotel design style was the same when they lived in different countries. They wish understand

local culture from characteristically hotel design. This research is focus on global hotel brands design in Nanjing. The reason is this city is my hometown; I know much information than others. And Nanjing was the capital of China for 600years. It has rich cultural deposits. Also it is 3rd big city and developing fast city in China.

The area of hotel lobby and guest room is important sections in this research. Because lobby is the path of diameter for guests and they send much time in room. So I take these two areas.

Before explaining the methods used in this research, I would like to ask you some questions:

Q1. Do you think global hotel design in local city is keep global design style or add local cultural elements?

Q2. Do you agree with reproduction of the Chinese traditional cultural values in global hotel design in local city? If yes, would give any comments? If no, which area do you think is important in hotel and why?

Q3. About this methodology, in your opinion, are there any advantages and disadvantages? And do you have any other comments?

Second, room model survey

3 styles room model have been designed which style was found from visit hotels. There are the same areas, different design type. I want to know from subjects which room design style is prefer and why.

Q4. About this methodology, in your opinion, are there any advantages and disadvantages? And do you have any other comments?

Q5. About this methodology, in your opinion, are there any advantages and disadvantages? And do you have any other comments?

Q6. About this methodology, in your opinion, are there any advantages and disadvantages? And do you have any other comments?

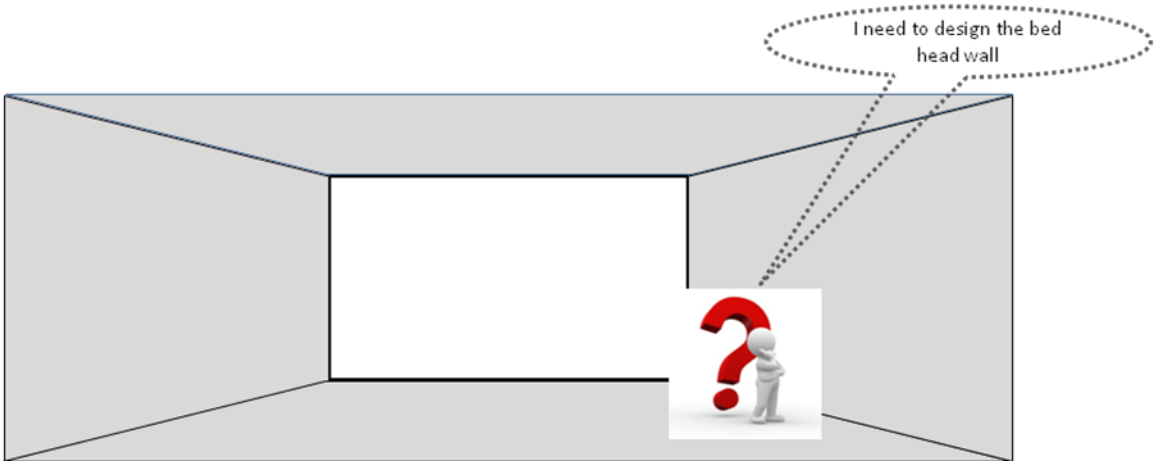
Interviewee	Job title/ experiences	Duration (years)	Q1	Q2	Q3	Q4	Q5	Q6
Pan	Designer	35	Design trend is suitable for the world. This design is popular and many people can accept it.	The main deign style should be modern add some special local feature elements.	Yes, it is better way to introduce the Chinese traditional cultural to guests.	I preferred C. This room design is including the cultural elements with modern design style.	Flooring 4 Decoration5 Ceiling 3 Bed background5 Furniture 3	Yes, common cultural symbol is easy to understanding.
Liu	Designer	8	Global design is a part of modern design. It is main design style in currently design period.	Yes, add some local cultural symbols in modern design.	Yes. Many foreigner guests are interesting for Chinese traditional culture.	C. this design style is bright and has lots of local cultural feature.	Flooring 3 Decoration5 Ceiling 2 Bed background4 Furniture 3	Try some special symbol. Maybe that is interesting.
Shen	Designer	15	The global design is currently design main trend. It is very popular	Design should keep local feature.	Yes. Chinese culture has design value. Many designs are trying adding them in currently design.	A It looks more Chinese.	Flooring 3 Decoration2 Ceiling 3 Bed background4 Furniture 3	Common symbol is simple and easy.

Guan	Designer	14	Global design is suitable for whole design trend.	Following main design developing trend.	In china, design style should have Chinese characteristic.	C. Modern & local elements	Flooring 3 Decoration2 Ceiling 3 Bed background4 Furniture 3	Common symbol is main symbol and put some special symbols.
Jin	Hotel manger	22	Main design style in the world.	Global hotel design should follow the head hotel office law.	Yes, after follow the head hotel request add local feature.	C Modern and have Chinese elements	Flooring 2 Decoration5 Ceiling 2 Bed background4 Furniture 4	A common symbol is easy to understanding.
Lin	Hotel manger	28	Popular design in the world.	Following the head hotel request.	Prominent the local culture.	C	Flooring 3 Decoration2 Ceiling 2 Bed background4 Furniture 4	A main symbol is common, but adds some interesting local symbol.
Tom	Technical Director	30	Popular design style.	Yes, I would like to see some local culture in hotel design.	Yes, Chinese cultures are interesting.	A More Chinese	Flooring 4 Decoration3 Ceiling 1 Bed background4 Furniture 3	I like to see some special symbols which are more Chinese.

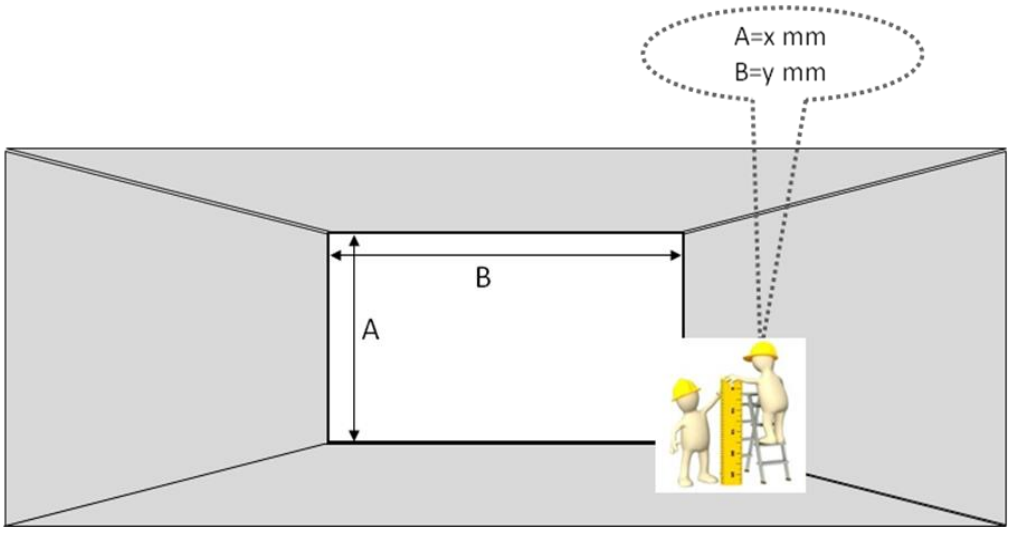
6A. User Testing Data for Evaluation of design guideline

This questionnaire wants to know does is design guideline can help designer or not. It's step by step simple to introduce guideline. Then, tell your idea later.

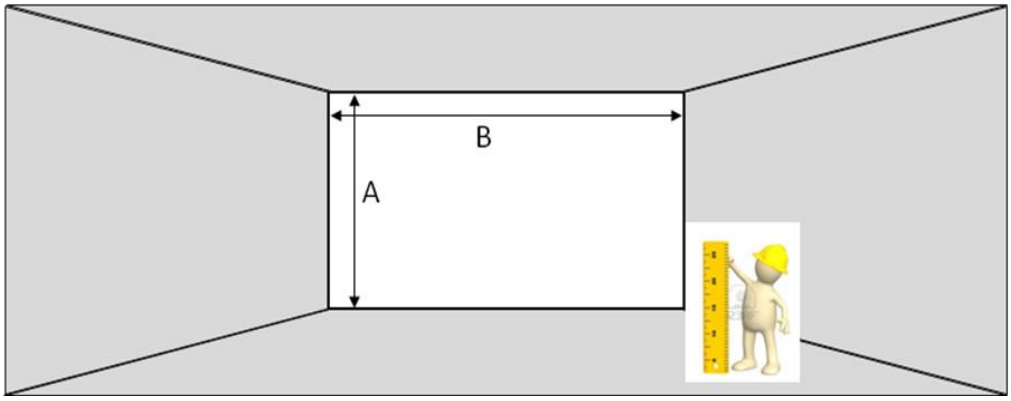
1. When designer entry the hotel guest room, they will be thinking how design can bed head wall.



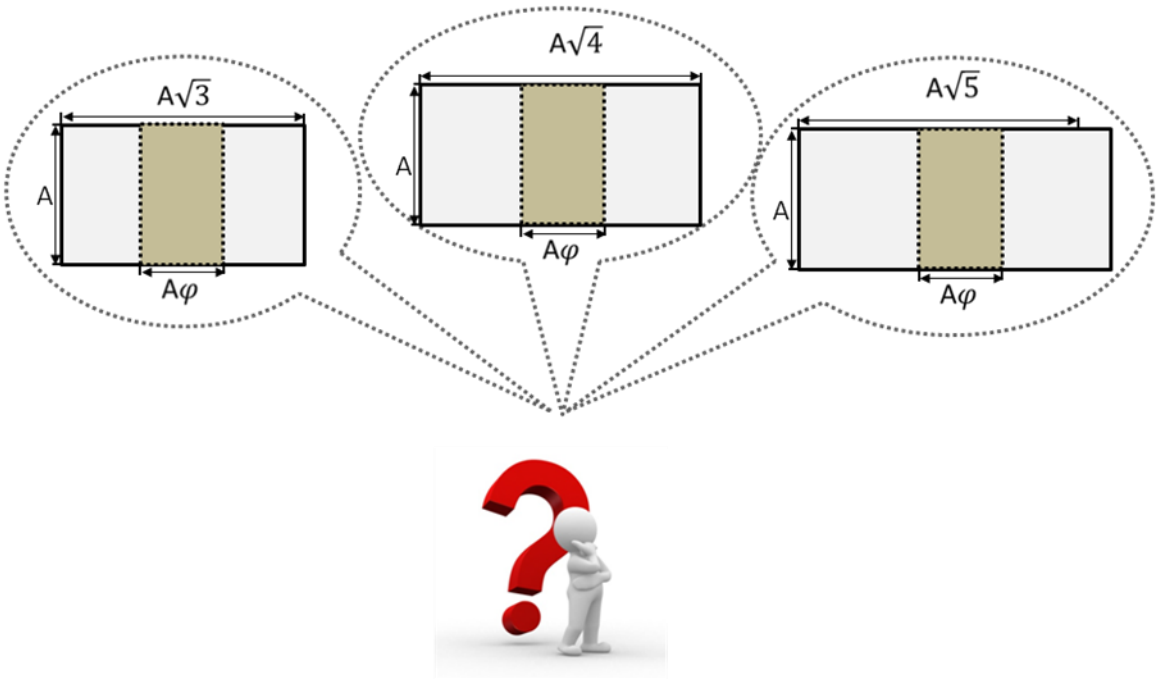
2. They have to use tools (ruler) to measure the wall's high (A), length (B).



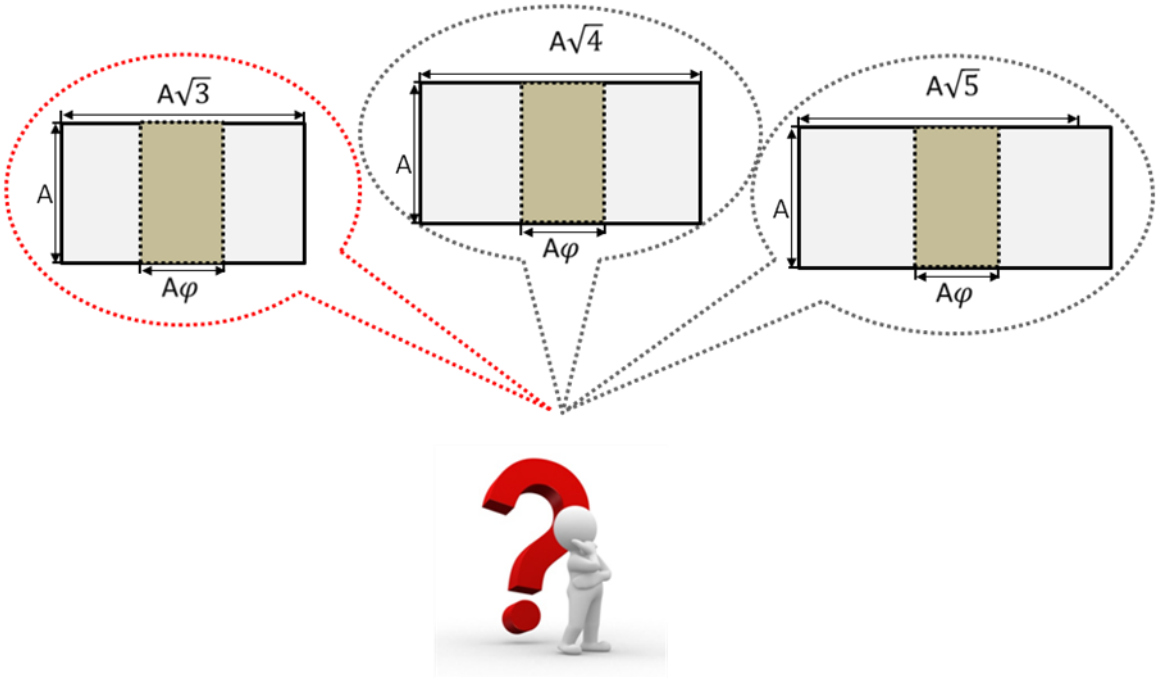
3. After they got wall's high and length, and record it down. Then, use B÷A (length ÷ high)



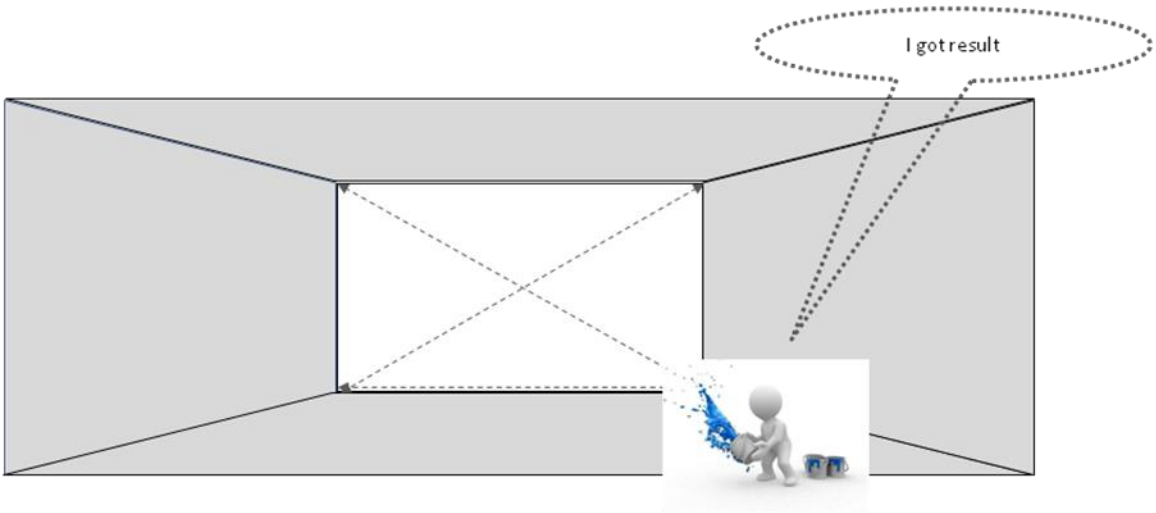
4. Then, they can get numerical, and have to think about this numerical close to which design guideline.



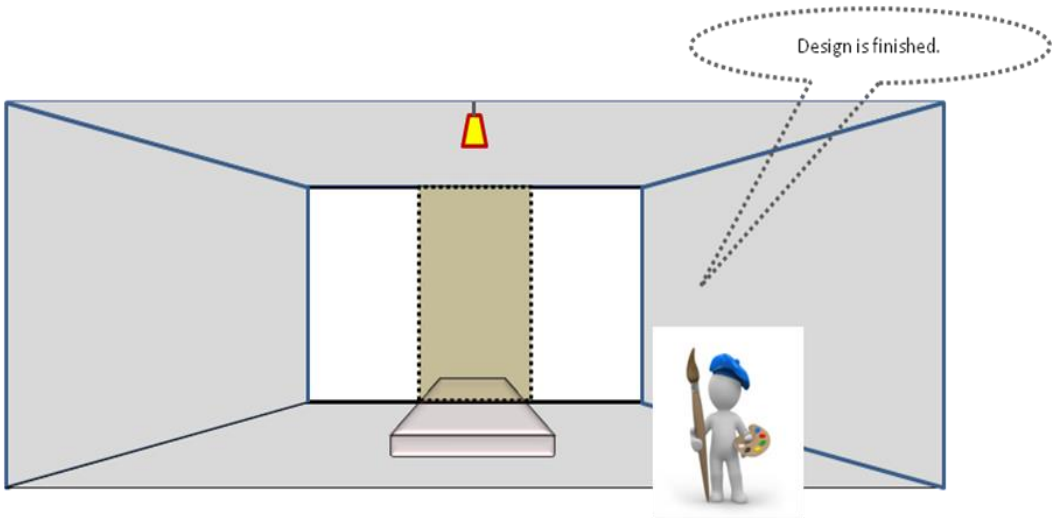
5. If the numerical is between 1.414 (√2) and 1.732 (√3), or 1.732 (√3) and 2 (√4), or 2(√4) and 2.236 (√5).



6. After they found the correct ratio, they start to use the guideline to design bed head wall. Draw the diagonal to find the centre area.



7. Then divide this centre area, which is guest eye touch area. In the end, it easy to use design the bed head wall.



Then, did you understand this guideline? Do you feel it useful? Does it easy can help you use Mathematics?

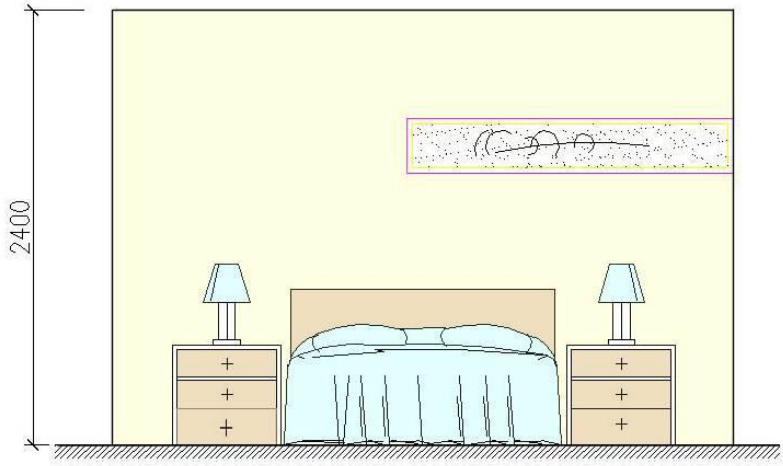
Please Rate the task using the following rating code:

5=strongly agree, 4=agree, 3=neither agree nor disagree, 2= disagree, 1= strongly disagree

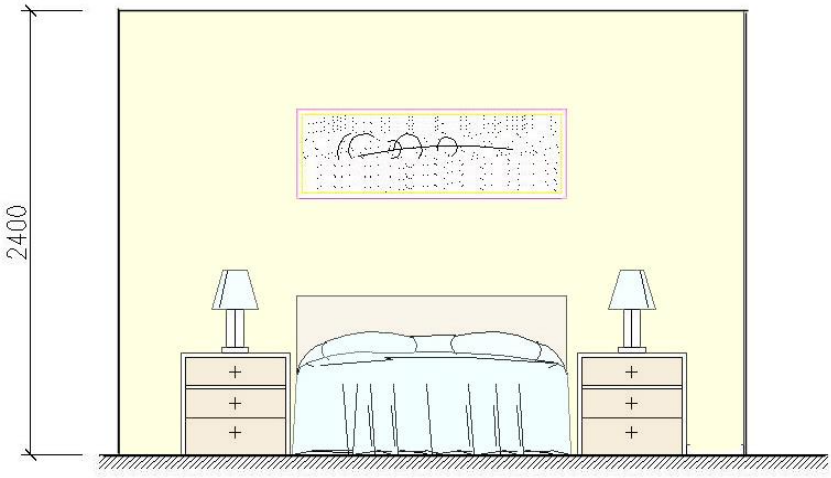
Understand	Mathematics	Helpful	Others suggestions

6B. Expert Interview Questions

Group 1



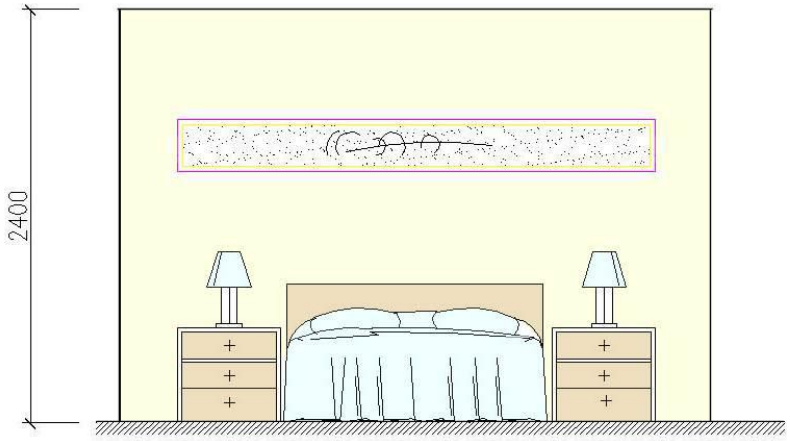
A



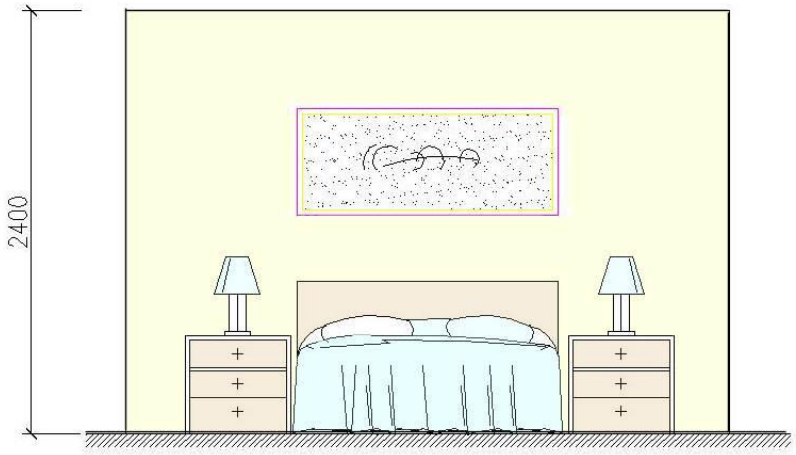
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 2



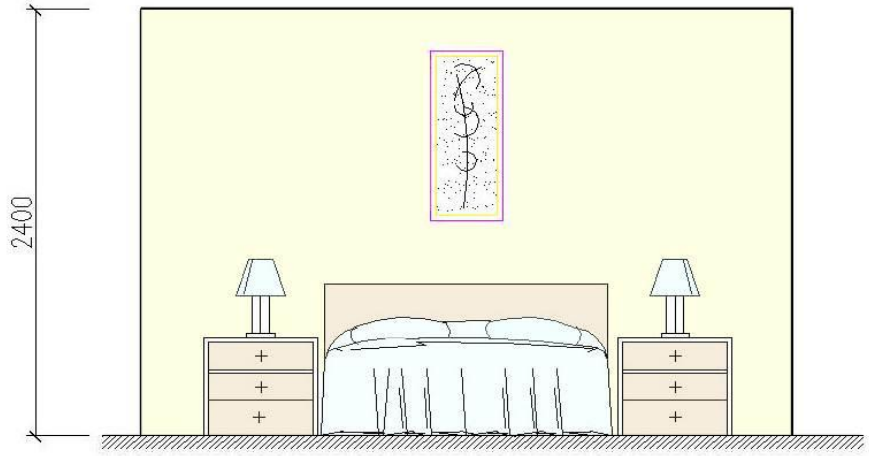
A



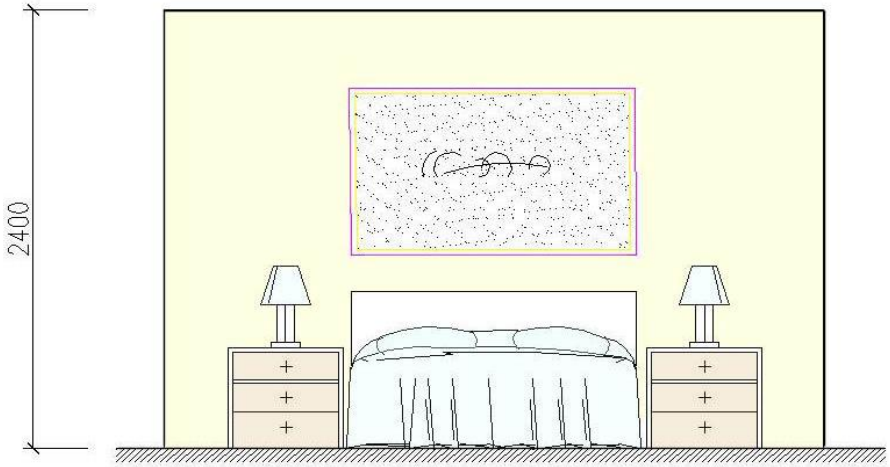
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 3



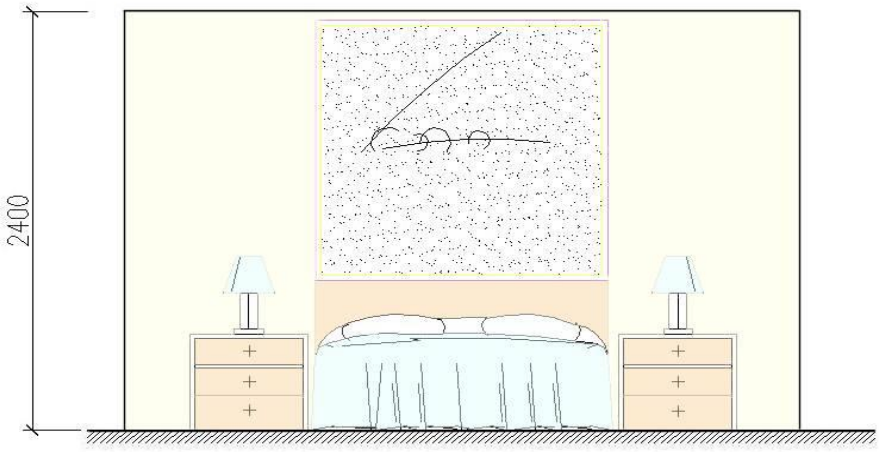
A



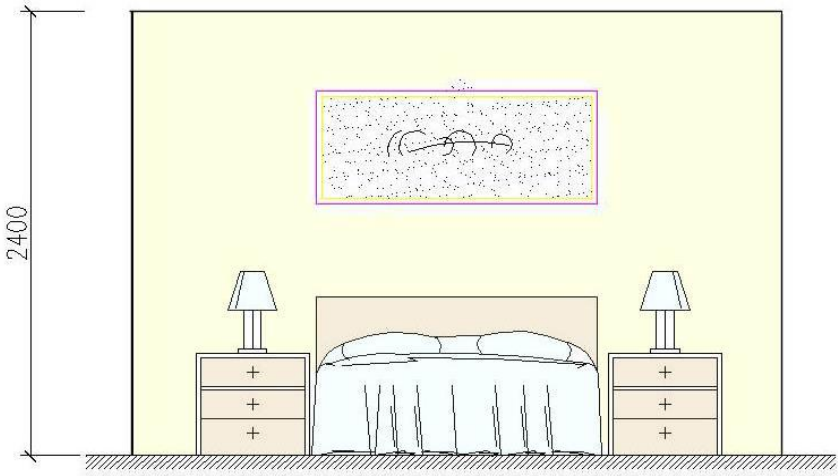
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 4



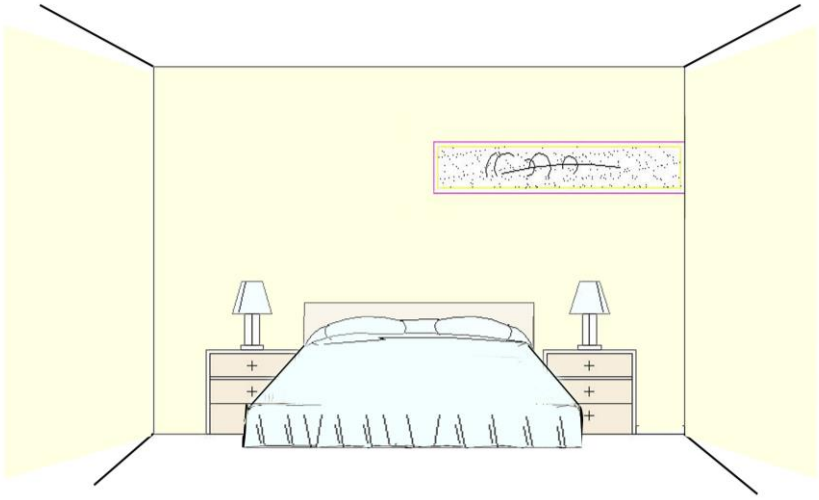
A



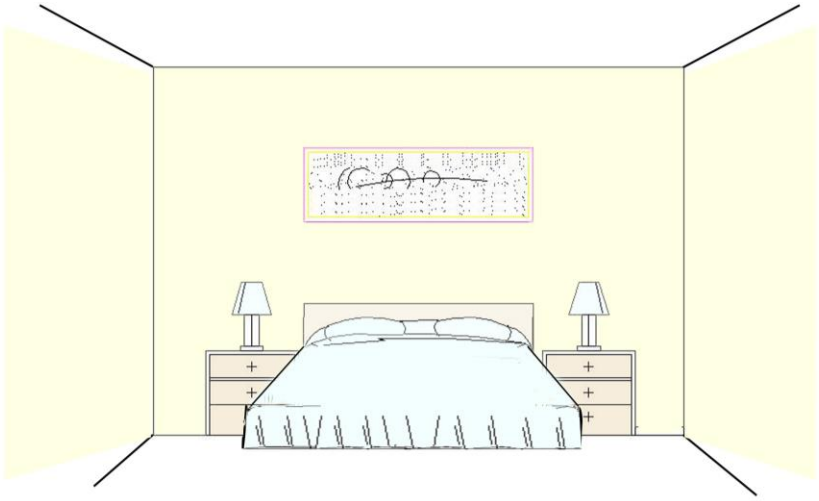
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 1



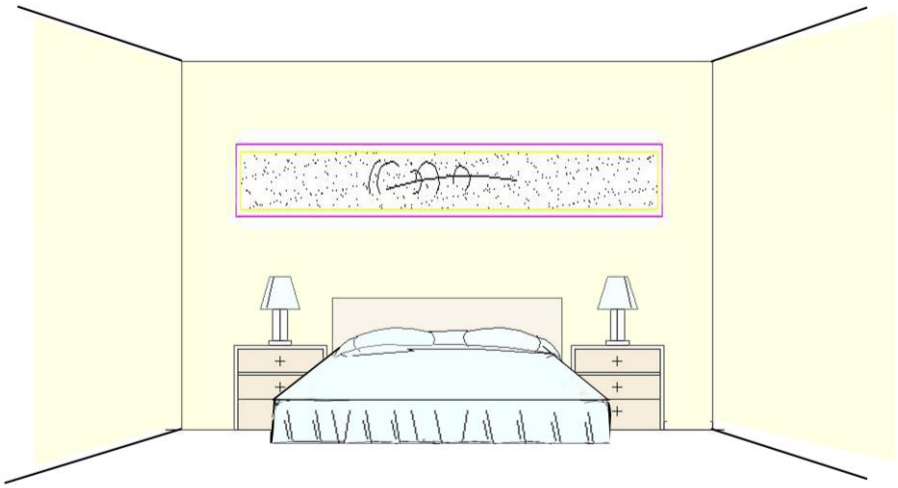
A



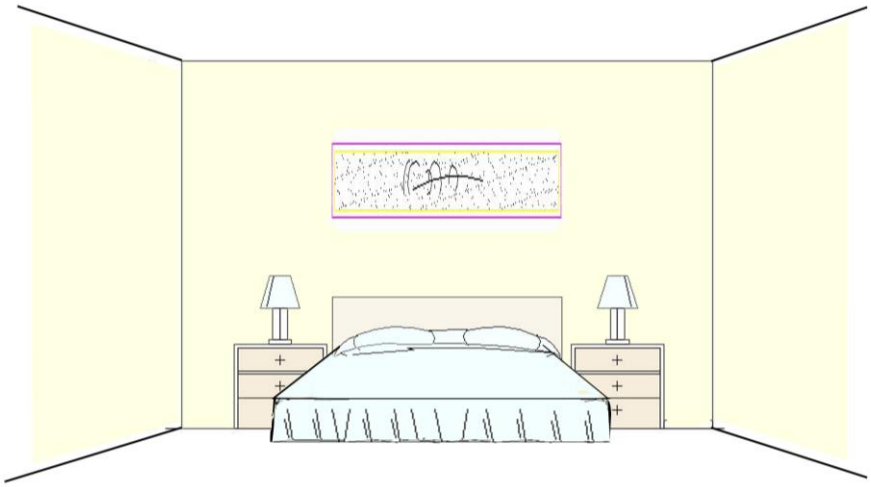
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 2



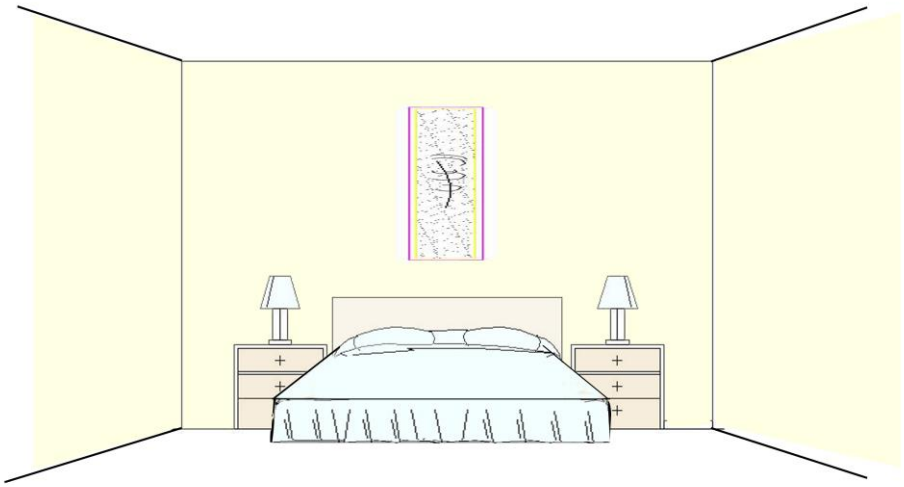
A



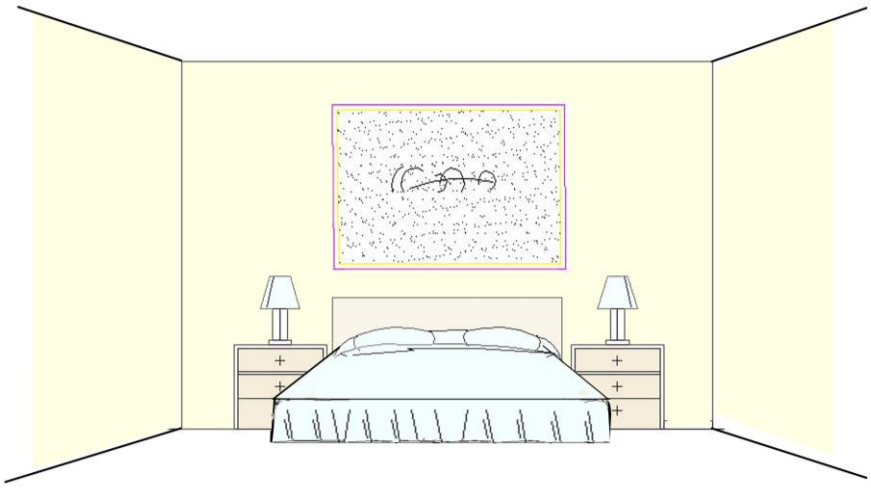
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 3



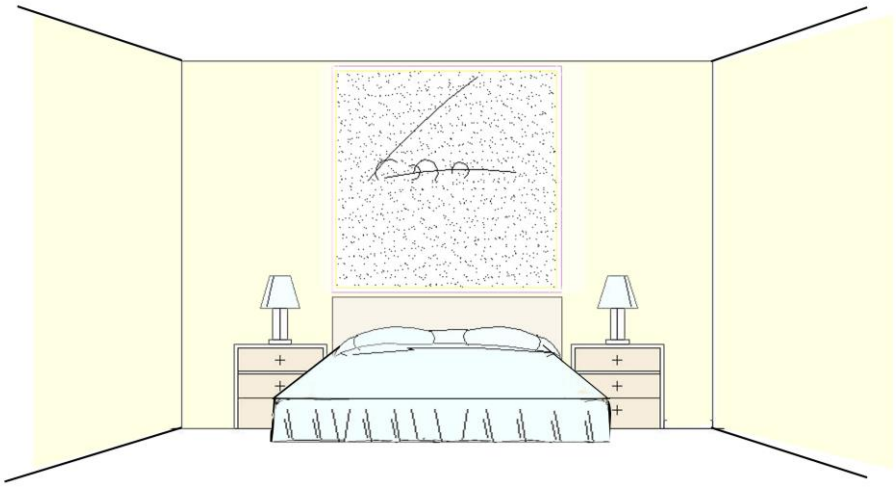
A



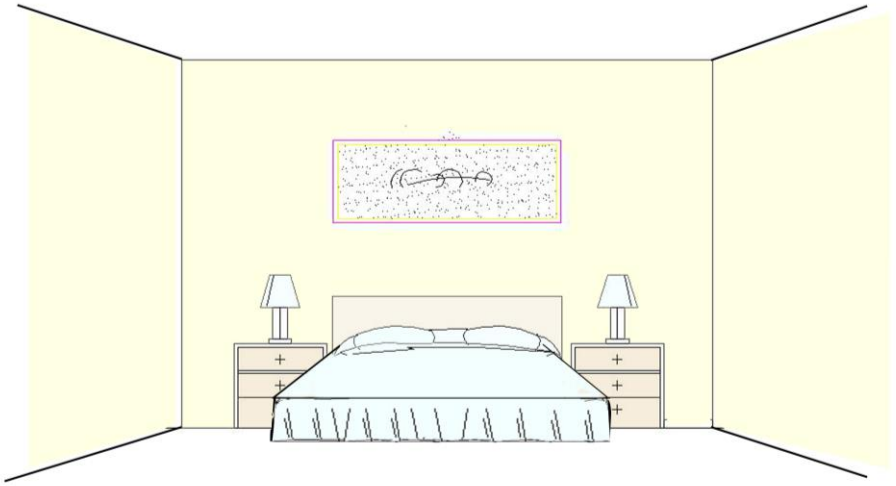
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

Group 4



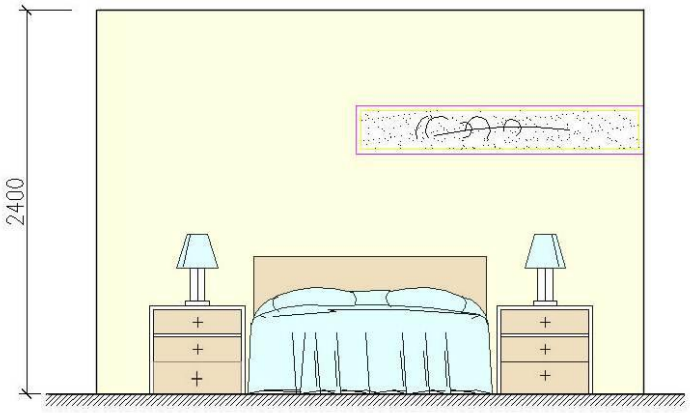
A



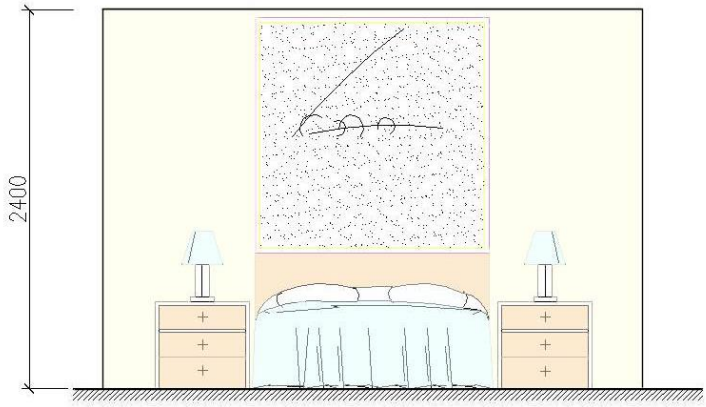
B

Which elevation do you prefer please, other A or B (√)		Please explain your preference
A	B	

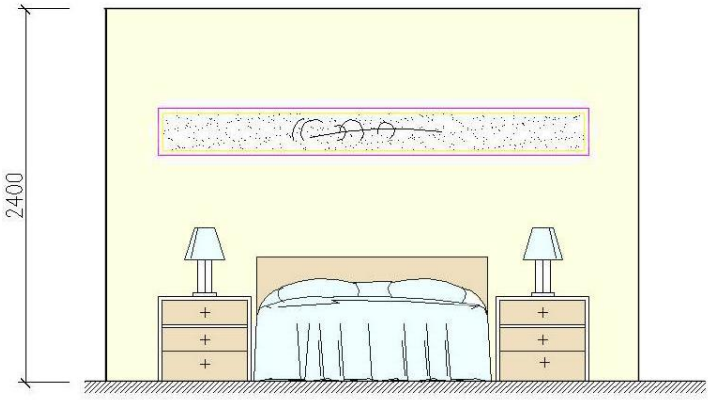
6B.1 Which 2D elevations is your prefect? (strongly dislike 1 - 5 strongly like)



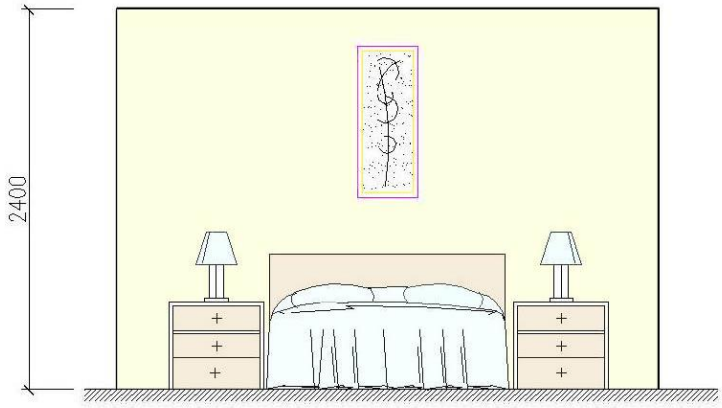
A



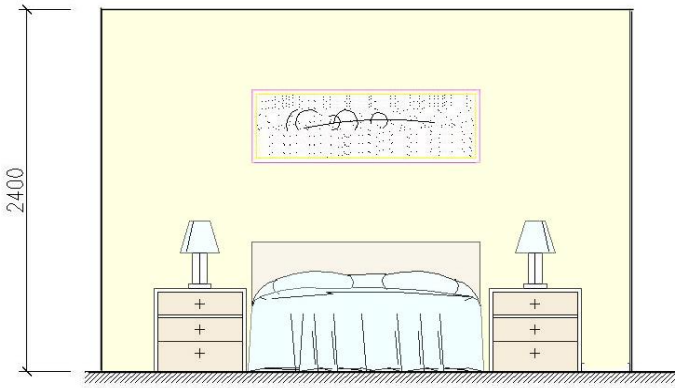
B



C



D



E

(strongly dislike 1 - 5 strongly like)

A	B	C	D	E

This 5 different 3D shapes about decorative painting on bed head wall for hotel guest room, please select (√) which the layout you preferred and ignore the other furniture style.

A

B

C

D

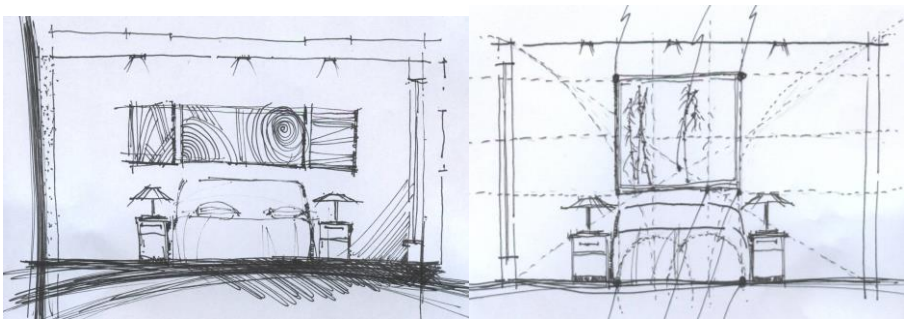
E

(strongly dislike 1 - 5 strongly like)

A	B	C	D	E

6C. Sketch drawings by designers

1. Sketch drawings by Wu

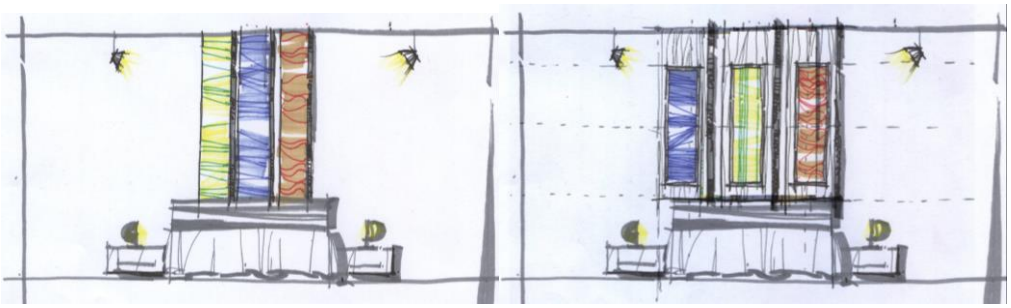


A (before) B (after)

2. Sketch drawings by Shi

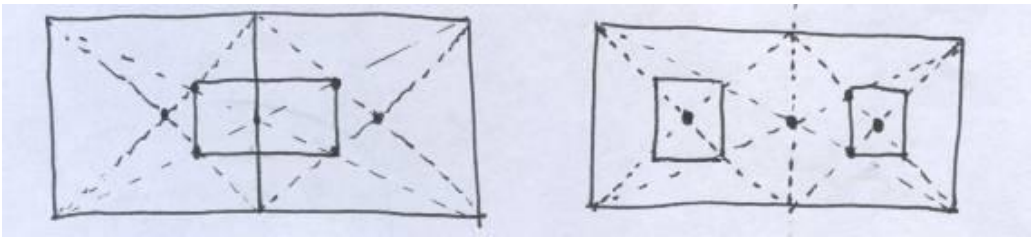
A (before) B (after)

3. Sketch drawings by Guan

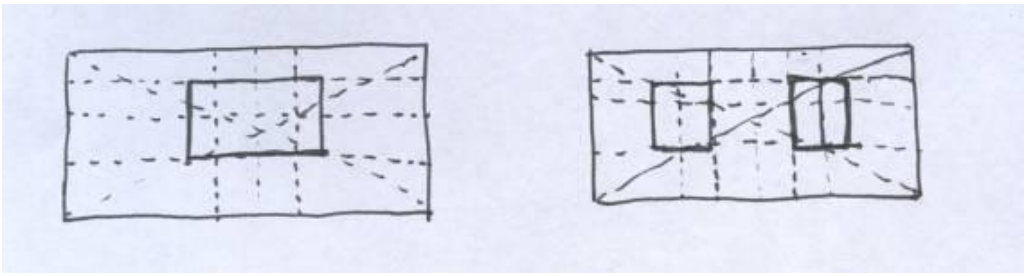


A (before) B (after)

4. Sketch drawings by Shen



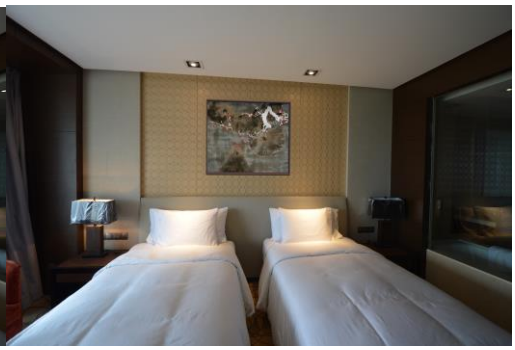
A (before)



B (after)

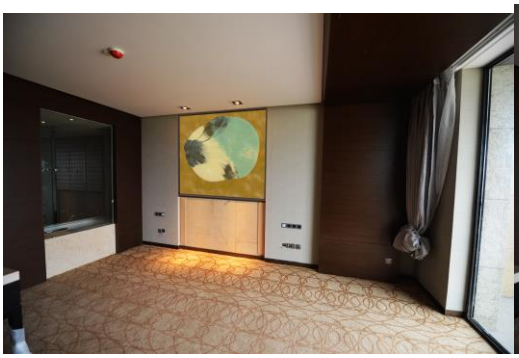
5. Sketch drawings by Baihui Decoration Company

A (before)



B (after)

6. Sketch drawings by Tianzuo Decoration Company



A (before)

B (after)