Color Design Research Analysis of Hotel Public Space For User Interaction Experience

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Abstract - In today's increasingly developed tourism industry and people's increasing aesthetic needs, the demand for hotel environment is also increasing. The color in the hotel space is combined with the human experience. In the design of hotel space, "experience" can make people truly feel the space, and people can interact with the space in all directions. This interaction is not only reflected in the facilities in the hotel, but also in the environmental elements of the hotel. Excellent color matching will attract users' attention more easily. In addition, good color matching can make the design get a better user experience. Engage users and spaces emotionally through the physical environment. In interaction design, color is the most direct and influential factor. Taking a hotel in Seoul as an example, this paper investigates the elements of color design in the interaction design of hotel public spaces. The colors in the interaction design are divided into main colors, which are used to determine the atmosphere of the space, complement the colors, enhance and highlight the main colors as space decoration. Firstly, through the literature survey, the hotel space color and user experience are sorted out and analyzed. And through the scene analysis of the role of color in the design of the hotel public space service environment. According to research, these elements need to complement each other to form a good color interaction design of hotel space. The survey shows that the color matching of modern hotel spaces is more harmonious and unified, but it lacks diversity and interest. Managers need to improve in this regard, on the one hand is the special design, on the other hand is to improve the hotel color environment to attract customers.

Keywords: Hotel, Public Space, Color, Interaction

1. Introduction

With the development of people's lives and the development of the hotel industry, there are demands not only for hotel services but also for hotel environment when moving into a hotel. And as people's aesthetics develop and new materials develop, the traditional hotel's single space design method cannot meet modern people's demands for space experience. Therefore, hotel space design must find a new development direction. The form of modern hotel public space design is becoming more and more diversified, and it is merging with people's aesthetic needs. The 'experience' of hotel public space design is to make people feel the real space. Among these experiences, color is the element that can stimulate the human senses most directly and give the most direct spatial experience. Hotel public space color is an important part of interaction design as it can affect people on a visual, psychological and other level. In view of the above, this study intends to empirically analyze the color factors and characteristics of hotels based on the relationship between users and spaces through case studies and user analysis by analyzing and researching the physical public space environment of hotels mainly through literature review.

In this study, one hotel located in Seoul is selected as the research object, the level of application of color design in the hotel's common space is evaluated and the direction of the hotel's physical environment is suggested. The research method of this study is as follows. First, prior research related to the design of hotel common spaces and color experience elements is reviewed, and the main concepts are cleared up. Second, the hotel interaction analysis index was derived according to the characteristic elements of color experience in the public space through literature comparison. Third, one hotel is selected as a research subject, and the color of the hotel's indoor public space is analyzed and observational research is conducted to evaluate the applicability of color interaction design through persona scenarios.

2. Theoretical Considerations
2.1. Classification of hotel indoor public spaces

The concept of public space is an area of social life, and it can be seen as a common area of use in which a large number of people can freely enter and use the hotel during normal times. The function and area composition of the public space of a hotel are different depending on the size. The public space of the hotel can be broadly divided into the entrance and the lobby, the passage, the restaurant and the rest area in the facilities provided. Therefore, it is desirable to understand the characteristics of the hotel space and the composition of the public space suitable for it. In order to understand the composition of the hotel's public space and to derive the spatial classification, 5 studies were selected and the comparison of the hotel's public space classification is summarized in Table 1.

Table 1: Comparison of hotel common space classification in previous studies.

Researcher	Hotel's public space
Kang Hyun-hye (2018)	Lobby, aisle/elevator, restaurant, indoor swimming pool, spa, health club, golf driving range, meeting room, lounge
Noh Hyun-kyung (2021)	Entrance, Front, Lobby, Lounge, Restaurant/Bar, Banquet Room, Business Center, Swimming Pool, Fitness Center, Elevator, Toilet, aisle, Bar
Jang Inju (2019)	Lobby, lounge, entrance hall, ELEV hall, escalator, lift lobby, aisle, stairs, windbreak room, high-pass toilet, restroom for the disabled
Gang Bongyu (2014)	Front desk, lobby, lounge, business genter, gallery, food and beverage space, Banquet space, health club, screen golf, indoor swimming pool, sauna, laundry, massage, gallery
Jeon Yoo-kyung (2021)	ELEV. Hall, elevator lobby, aisle, stairs, windbreak room, ruby, lounge, escalator, toilet

Based on the spatial classification derived from previous studies in Table 1, it was analyzed in Table 2. As a result of analysis by frequency, six spaces were derived: 'Lobby', 'Corridor', 'Elev. Hall', and 'Restaurant'. The detailed items are as follows Table 2.

Table 2: Common spaces derived from prior research.

Researcher (Year)	Lobby	Aaisle	Elev. Hall	Restaurant	Terrace	Room Gallery
Kang Hyun-hye (2018)	■	■		■		
Noh Hyun-kyung (2021)	■	■				
Jang Inju (2019)	■	■	■			
Gang Bongyu (2014)	■			■		■
Jeon Yoo-kyung (2021)		■	■		■	
Number	4	4	2	2	1	1

2.2. Interactive experience

From a general perspective, experience is the knowledge about objects, events, and technologies acquired through contact with or accompanying objects or events. As a result, experience has been studied in various ways in various fields. In addition, user experience is an important factor in interaction, and it is being used as an extended concept to include interaction through interface operation and human interaction as well as communication with human. User experience design is not only to meet the direct needs of users, but also to provide users with unexpected satisfaction.

Interaction is the sensory communication between people and space in the hotel space. Experience is a complex mental process that includes people's present and future emotions. The color in the space is an element in the design, and it is also a direct way to convey the emotion of the space. This paper aims to study the interaction between people and space by analyzing how the public spaces of hotels affect people's senses through color.

2.3. Elements of visual experience of color in space

Color is an element that stimulates human emotion, and considering that most information depends on vision, it can be said to be the most important formative element. To use these colors accurately and effectively, objective systematization is required. This is called the color system, and among them, the representative Munsell color system is a three-dimensional space coordinate system that corresponds to three color properties: hue (H), brightness (V), and saturation (C). It is a system for forming and measuring color solids by structuring them in directions. The color area refers to the large number of color planes or the proportion between the large and small.

The color area of a space creates an atmosphere and affects the overall image, and visual and psychological effects can be seen through the relative contrast with other colors. To summarize, the following Table 3 is as follows.

Table 3: Classification according to color area of space.

Element	Area of space color	Effect
Main color	More than 70% of the total	• An image of the entire space • Harmony with surroundings • A sense of space, a sense of temperature, a sense of weight • Consideration of publicity
Secondary color	25% of the total	• Harmony with the main color (similar contrast) • Consider diversity
Accent color	5% of the total	• Decorative effect • Consider symbolism

3. Analysis of User Color Experience for Hotel Public Spaces

3.1 spatial extent

In order to analyze the color design characteristics in the hotel public space, one of the popular hotels built in Seoul after 2015 was selected as a case study by the user experience design analysis method targeting the densely populated urban area of Seoul. Sonar was conducted.

3.2 Persona setting through user observation

As a research process in this study, observational surveys were conducted from 10 am to 4 pm in the hotel public space. During the behavior investigation, it can be confirmed that various behaviors such as moving, resting, talking, and eating are being carried out. According to the observation result, users were classified according to the sensitivity to color, and three users were installed. A persona was created with one person who is sensitive to color, one person who is usually interested in color, and one person who is indifferent to color. One young woman in her twenties, an artist with aesthetics, one young male in his mid-20s who experienced the dining environment in Seoul on weekends, and an office worker with economic conditions, during vacation, visiting friends in Seoul for culture and exercise It was set as a persona who behaves in a hotel due to daily life, rest, etc., and is an office worker in his 40s who is indifferent to the color of the environment, stays in a hotel on a business trip to Seoul, and behaves in the hotel's common space. The scenario was written.

Table 4: General characteristics and behaviors of Posona.

Element	Detail
	User1 (sensitive interested in color)
Name	• Lee Ji-young
Age	• 23
Gender	• Femal
Residence	• Gangdong-gu, Seoul
Occupation	• Artist
Height	• 163cm
Character	• With a good personality and the environment is more demanding in terms of beauty. • She is sensitive to the colors of the environment.
Background	• Looking for a quality life, choose a hotel with perfect facilities and a good environment. • Traveled a lot, has a lot of hotel experience. • In terms of eating, likes to eat while enjoying the surrounding scenery. likes to observe her surroundings, so she spends a lot of time in public spaces.
Purpose	• Go to a hotel for a meal. • Experience a special hotel environment.
	User2 (Moderately interested in color)
Name	• Lee Seo-Jun
Age	• 25
Gender	• Male
Residence	• Ansan-si, Gyeonggi-do
Occupation	• Office worker
Height	• 176cm
Character	• Enjoy living a cultural life. • Has good aesthetics and the surrounding environment is more demanding in terms of beauty. • Interest in the colors of the environment is moderate.
Background	• Looking for a quality life, will choose a hotel with perfect facilities and good environment. • Traveled a lot, have a lot of hotel experience. • In terms of eating, he likes to eat while enjoying the surrounding scenery. • He likes to observe my surroundings, so I spend a lot of time in public spaces.
Purpose	• Visit a friend who lived in Seoeul. • Stay in a comfortable hotel. • Even living in a hotel requires exercise and cultural life.
	User3 (indifferent to color)
Name	• Kang Dong-ah
Age	• 46
Gender	• Male
Residence	• Busan
Occupation	• Office worker

Height	• 175cm
Character	• Emphasis is placed on real-world physical experiences. • He is not interested in sports and cultural life. • He is indifferent to the colors of his environment.
Background	• The middle class of society. • When choosing a hotel, pay attention to the comfort of body. • Necessary to use facilities.
Purpose	• Went to Seoul on a business trip. • Stay in a comfortable hotel.

3.3. Hotel public space color experience scenario

According to the user classification, the color experience scenario of the hotel public space is created and the user's emotions are displayed. (▲ User1, ● User2, ■ User3).

Table 5: Color experience scenario of Anterum Hotel.

Anterum Hotel							
Overview	Location	153 Dosan Boulevard, Shinsa-dong, Gangnam-gu, Seoul, South Korea	In 2020, we opened ANTERROOM NAHA in Okinawa and ANTEROOM SEOUL in Seoul, South Korea, to create a space that connects arts and culture, neighborhoods and regions, and even Asia.				
	Opening Year	2020					
	Scale	Floor 19					
Space	Emotion	①gallery	②lobby	③Elev.hall	④ariel	⑤restaurant	⑥terrace, bar
	Satisfaction	●				▲	●
	↑		▲●		■●	●■	
	Common	▲		▲●■			
	↓		■				
	Discontent						
Persona Scenario	Behavior						
	User1	①	• Visited the hotel for a gallery viewing. The gallery is located on the 2nd floor of the Constitution. • The color of the floor, walls, ceiling of the gallery space is all white. • Spent 30 minutes visiting the museum and photographing my favorite works.				
		②	• After visiting the gallery, went through the lobby on the first basement floor and planned to eat at the restaurant on the first floor. • The color of the ceiling and walls of the lobby is white, and the color of the space is rich in color combined with the artistic decoration and painting of the space. • Was fascinated by the colors of the paintings in the lobby and stopped for a moment to take pictures of the interesting works.				
		③	• Waited for the elevator in the hall. • For information about this hotel, go to Elev. I read the hotel brochure in the hall. • The color of Elev.hall felt a bit monotonous.				

		⑤	• Came to the restaurant on the first floor to have a meal, it felt good to see the green plants spread out in the restaurant. • The color of the restaurant space is richer and more harmonious. The large floor-to-ceiling windows enhance the brightness of the restaurant, adding to the attractiveness of the restaurant's colors. • After ordering, ate at the window seat and rested after eating.
	User2	①	• After arriving at the hotel, visited the gallery on the second lower floor. • Received an artistic first impression of the hotel.
		②	• The lobby area on the lower first floor of was combined with the exhibition hall and checked in at the front desk. • After checking in, saw some exhibits. took pictures of the exhibits he was interested in.
		③	• From the lobby to the Elev. Hall, read the information on each floor of the hotel and entered the guest room floor. • While waiting for the elevator, read the hotel brochure in the Elev. Hall and took it with him.
		④	• Entered the room through the hallway inside the hotel. • Heard noises from other rooms in the hallway and was a little worried.
		⑤	• Visited the restaurant on the 1st floor to have a spring break in the guest room. • After arriving at the restaurant, we ordered a meal, sat at a table, and ate while enjoying the view through the floor-to-ceiling window. • After eating, we rested at the restaurant and went to our room.
		④	• Went back through the corridor to the windproof room on the 17th floor of the hotel.
		⑥	• There is a bar in the windproof room on the 19th floor, so after ordering 1 cup of coffee, sat on the balcony and visited the urban landscape of Bab Namsan. • Through the active introduction of nature through urban outlook, it was possible to feel psychologically stable and occupy for a long time.
	User3	①	• Came to the hotel for a stay. • Checked in at the front desk and the lobby felt very bright but it was a bit empty. • The color of the front desk was also in a crooked color, which was the same as the casting color of the space, which made it a little difficult to recognize.
		③	• Was tired of a business trip so wanted to quickly get into the room and rest. • Waiting for the elevator in the ELEV.hall, he quickly got into the elevator and arrived on the floor of his room.
		④	• Pass through the ariel and follow the signs in the aisle to enter the room. • The signs in the ariel were clean and clear, so he quickly found the room and walked in.
		⑤	• After a short break in his room, he came to restaurant for dinner. • The bright atmosphere of restaurant makes him feel relaxed. After ordering a meal, randomly found a spot and ate it. After a quick meal in restaurant, returned to the room.
		⑥	• After staying, went to the lobby, checked out at the front desk and left the hotel.
Problems needs			• The colors in most of the spaces, except for the restaurant, are so monotonous that they look neat but lack the charm. • The colors of the restaurant are relatively rich and meticulously planned, but the single color of the different spaces will give the user a psychological gap. • Elevator hall, corridor and art gallery space. Different colors are not separated depending on the function, making the space more uniform.

Improvements	• By diversifying the color of the hallway and gallery space, various functions can be distinguished, and at the same time it is convenient for customers to use, while at the same time giving charm to the space.

3.4. Analysis

(1) User 1

User 1 is a person who is sensitive to color, and User 1 uses common spaces such as galleries, halls, and elevators. Hall, restaurant. Since the hotel's restaurant has a variety of colors, the main colors are the gray of the walls and the wood of the furniture, which are combined with many indoor green plants, so the color matching is harmonious and the most attractive. The gallery space and elevator hall are almost entirely white, and the colors are harmonious but a bit monotonous. The walls, floor, and ceiling of the lobby space are all white in a relatively monotonous color, but the combination of chromatic paint and artwork will add interest.

(2) User 2

User 2 is a person who is usually interested in color. The hotel's gallery space is well-received for its simple color and clean space. The color of the windproof room floor combines the wood-colored wooden floor with white table and chair furniture to give people a warm and stable atmosphere, but the color of the hallway is single and lacks a bright spot.

(3) User 3

User 3 is not interested in color. The lobby of the Anterum Hotel, Elev. The hall and hallway spaces are all white, giving a bright and clear feeling. It has good reviews. And the color displayed on the hotel is black, which contrasts sharply with the white on the wall for easy identification.

4. Conclusion

The color of the hotel's indoor public space is the representative face of the hotel and an important part of the hotel interaction design, which determines the first impression and has a visual impact on customers. The results of color experience analysis of hotel indoor public spaces are summarized as follows. First, the entrance space (restaurant, lobby) of the hotel was designed in various colors. Anterum Hotel uses many plants in the restaurant space, using wooden dining tables, furniture, gray walls and floors, and combining the black window frames with the accent color, the color of the space is harmonious and natural. The lobby space uses white as the main color to design the walls and ceiling, and to make the space artistic by combining painting and art as decoration. Second, the color of the facilities in the hotel space matches the color of the common space. The hotel uses black markings for elevator halls and passages, and uses white as the main color for easy identification. Third, there is a disadvantage in matching the color of the hotel space with the purpose of use. In the lobby area of the Anteroom Hotel, the front desk and the display shelves in the wall, ceiling, ceiling and interior environment adopt the same color. Due to the low degree of identification, it is difficult to achieve the purpose of checking in the space. Fourth, the main and auxiliary colors of the hotel are different. The main color of the Anteroom Hotel is a wide range of white, and the secondary color is a small range of black. Using white as the main color can increase the brightness of the hotel. The combination of black makes the space look clean and lively.

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