

# Study on the Application of Dunhuang Grotto Color in Contemporary Product Design

## --Taking Xiaomi Mobile MIX 2S Dunhuang Art Edition as an Example

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### Abstract

Mobile phones are an important tool for communication and communication in modern society. The trend of economic globalization has brought fierce market competition to the Chinese mobile phone market. Domestic mobile phone brands such as Huawei, OPPO and VIVO have also stepped out of the domestic market. Under the background of rapid development of science and technology, how to integrate Chinese traditional culture into contemporary product design and form a national design culture with Chinese characteristics is an important mission of Chinese contemporary designers. "Dunhuang Grottoes" is a unique Chinese traditional cultural database. The color system contained in murals and statues is an important link in Chinese traditional color system. Combining it with modern design is a new way to inherit and carry forward traditional culture. . This article focuses on the case of Xiaomi mobile phone MIX 2S Dunhuang Art Edition. From the perspective of mobile phone design, this paper discusses the significance of Dunhuang color in brand design and innovation in contemporary design, especially for the development of Chinese traditional culture. Design innovative ideas have important reference value.

### Keywords

Chinese traditional culture; Dunhuang cave color; design; millet phone MIX 2S.

## 1. Introduction

### 1.1. Research Background

With the development of human society and the extensive exchanges of politics, economy, culture and art on a global scale, people's pursuit of aesthetics is getting stronger and stronger. What is especially striking is that the attention of the Chinese people to color has never been higher. Today in the 21st century, China's economic growth and comprehensive national strength have also introduced new lifestyles to the people. People's pursuit of life is no longer satisfied with simple functional consumption. For most people, they are more willing. Choose designs that are pleasing in both color and appearance. The combination of well-designed colors and colors helps to adjust mood and beautify the visual environment. Therefore, color design in China has gradually become an indispensable part of modern design. On the other hand, for the contemporary people who are gradually entering the "global village", the convergence of culture becomes more and more obvious, and the anxiety of the designers and consumers is deeply rooted in the pursuit of "cultural personality". Throughout the development process of Chinese design, the phenomenon of imitating or even copying the Western design pattern still exists, but we can easily find that some of the designers in China have gradually tried to develop design styles with their own national characteristics, which may not constitute relative A mature and complete system, but there are also some successful

representative works. We believe that the development of Chinese color design requires not only the use of external vision as a reference, but also the establishment of its own characteristics, and this should undoubtedly be sought from the origin of the cultural phenomenon, that is, the local resources of Chinese culture. Dunhuang art, which has been in existence for 1,600 years, should be an important resource for color design research.

## **1.2. The Purpose and Significance of the Topic Research**

From the perspective of Dunhuang color, this paper analyzes the case of Xiaomi MIX2S and considers the significance of folk color in modern product design. If we don't integrate traditional cultural elements now, we can't open the distance between them and European and American cultures. It is difficult to say that we can achieve real cultural self-confidence in the face of the pressure of foreign cultural output. Through this kind of research, we can find a design path. How to integrate traditional culture into the design is very helpful for modern product design and learning.

## **2. The Significance of Dunhuang Grotto Art**

### **2.1. The Artistic Value of Dunhuang Grottoes**

As an important part of Dunhuang culture, Dunhuang art includes architecture, sculpture, murals, calligraphy, literary music, dance, costumes, Bai Opera and other various art types, as well as a large number of paintings discovered in the Jingjing Cave. Prints, etc., even include related art and cultural content in various secular societies that appeared in the same period as Dunhuang Art, and the above-mentioned various art forms constitute the complete content of Dunhuang art. When talking about the artistic achievements of Dunhuang Grottoes, we can first understand them intuitively from some statistical data. Only in the southern part of the Mogao Grottoes, there are 492 Buddhist caves, nearly 45,000 square meters of murals, more than 3,000 colorful plastic sculptures, 5 cave buildings, etc.: If you add other grottoes that belong to the same vein, a total of 870 caves, The total area of murals is more than 50,000 square meters, which forms the Buddhist grotto art group with the longest continuation period, the relatively best preservation, the richest content, the most remains of architecture, murals and colored sculptures, and the most concentrated among all the existing ancient grottoes in the world. Dunhuang mural art can be used as a Chinese religious painting room, Chinese religious architecture history, Chinese religious sculpture and Chinese religious music and dance culture history, and can be regarded as a complete history of Chinese religious art. In view of the huge capacity of Dunhuang mural art, it is not limited to Buddhist culture. It can also be used as a carrier of mural art as a carrier of Chinese art and culture history. From this perspective, Dunhuang mural art has quite important artistic value and strong vitality.

### **2.2. Characteristics of the Color System of Dunhuang Murals in the Tang Dynasty**

#### **2.2.1. Oriental Color Philosophy in Dunhuang Murals**

When talking about the oriental philosophy in color, the first thing to mention is the "ink-colored multi-colored". "Ink-colored multi-colored" is actually related to the "five elements" in the traditional Chinese cosmology, and the relevant bibliography can be found and The five elements correspond to the "five parties", "five seasons", "five sounds", "five colors", "five flavors", "grain", "five sexes", "five ambitions" and so on. Among them, "five colors" include cyan, yellow, red, white, and black, that is, the three primary colors in the chromatic science are combined with the achromatic two poles, and the three primary colors are combined with each other to produce red, orange, yellow, recorded, Seven basic colors, such as green, blue and purple, are combined in various proportions on this basis, and visitors get a variety of complex colors. China's five-color concept, that is, the concept of three primary colors plus two-pole

color, contains the basic elements of color composition and the initial state (three primary colors), including the concept of the ultimate state of color and colorlessness and color composition, including extreme and no. The dialectical understanding of the extreme has laid the scientific foundation that black and white can replace all colors. It is the basic theory of Chinese ink painting system. It embodies the completeness and profoundness of the Chinese painting color program. It also reflects the uniqueness of Chinese art in grasping the color law. accurate.

From another point of view, Dunhuang art is re-imagining and artistic processing based on religious imagination, and integrating real life into such artistic imagination, not only expresses religious thought, but also conveys a different worldly feelings. Therefore, in the process of admiring murals, we can appreciate the subtle relationship between religion and secularism, so we can find a balance between the objective nature, the subjective religion, and the integration of the three. A special connection is established between reality and religion. Although it is close to but maintains a distance, it is necessary to use the imagination space of people to perfect the artistic expression and philosophical enlightenment outside the picture.

### **2.2.2. Development and Color Characteristics of Dunhuang Murals in the Tang Dynasty**

The paintings of Dunhuang Grottoes in the Tang Dynasty were particularly rich and varied, and the scenes were truly interesting. They showed the flourishing appearance of China at that time. The picture was relatively compact and extremely complete. It was the most prosperous period of the development of Dunhuang Grottoes. Most of the works are competing for later generations and widely circulated. In terms of mural color matching, the bold combination of blue, red, yellow, white and black fully emphasizes the complementarity between each single color. The color combination is rich and beautiful, exquisite and vivid, and the characteristics are distinct and unique.

### **2.2.3. Color Matching Style in Murals**

Most of the Dunhuang Grottoes murals use four background colors, which are red bottom, foundation, mud bottom and blue bottom. Different color schemes are used on different background colors, which are attributed to the following five types of color matching styles: dazzling and luxurious styles of red, green and blue combinations; fresh and elegant styles of blue and green; black, interspersed light-colored ink white style; The shining style. It is these flexible and varied color configuration styles of various purity and brightness that have made the visual experience of Dunhuang Grottoes murals colorful and beautiful.

## **2.3. The Guiding Role of the Color System of Dunhuang Grottoes in Contemporary Design**

Color is one of the key factors in modern art design. Excellent design works are inseparable from the rational allocation of color elements. However, the color configuration applied in excellent design works not only meets the requirements of visual effects, but more importantly, it can convey the spiritual feeling and cultural charm outside the visual. Therefore, it is a crucial step to find the source of color configuration in the design process. . Generally, the color source of foreign designers is excavated from art works, for example, from the traditional art forms such as oil painting, watercolor, mural painting, etc., the color distribution law of color proportion distribution, mutual contrast relationship, color tone control and so on. In recent years, China's modern art design field has made great progress in the inheritance and innovation of Chinese traditional art. The color of Dunhuang Grottoes mural art is a classic of color application in the treasure house of Chinese traditional art, especially the algae well in Dunhuang Grotto art. The pattern of color arrangement of patterns is an important research object. Researching and exploring the color of murals in Dunhuang Grottoes art, on the one hand, providing an excellent model of traditional color design for modern art design, using

classic traditional color arrangement as the color of modern product design, display design, graphic design, environment and art design. The source is to improve the artistic position and artistic value of modern art design works; on the other hand, in the course of the development of modern art design, Chinese design must truly establish its own position on the international stage, and it is necessary to create a typical Chinese characteristic. Excellent design works, the color achievement in Dunhuang Grotto art is the peak of Chinese traditional art, and it is the most valuable historical data of color design in modern art design in China.

### **3. Overview of Domestic Mobile Phone Design Market and Analysis of Existing Problems**

#### **3.1. Contemporary Consumers' Purchasing Propensity and Consumption Characteristics**

##### **3.1.1. Consumer Buying Tendency**

Closely related to the diversity of consumer demand is the individualized characteristics of consumer consumption in contemporary society. In modern society, the choice of goods is broadened, the society is more open and inclusive, and people generally have greater freedom and equality. They are no longer as strong as before and they are equal and average. People's pursuit of self-expression and individuality are not only manifested in the cultural field, but also hope to gain the right to speak in the cultural field, and in the field of consumption, people also hope to establish their consumption through their own unique consumption methods. The right to speak in the field to express their understanding of fashion trends. Individuals with different economic strengths and cultural capitals can choose their own habits and preferences, their own consumption patterns, and their own self-consumption. Consumption has become a mainstream means for individuals to gain identity and self-expression. People pursue the singularity and uniqueness of consumption, pursuing elegance, hierarchy, personality, taste, style and status and identity in the process. Through the maintenance and display of this kind of individual consumption, people realize the satisfaction of consumer goods to achieve their desired status and status. At the same time, people express their perception of the meaning of life by choosing the way of life and consumption that suits their own personality. And understanding. We can even differently divide different people by observing the consumption patterns of different classes and groups. In short, on the one hand, the society has formed a consistent and homogenous convergence trend of consumption development, on the other hand, it also allows for the existence of personalized consumption methods. Among them, some people have become the leading peaks in the fashion field and become the model for people to choose their consumption patterns. Although this exemplary role in the sensitive capture of business and the mass marketing of the mass media will quickly become the object of popularization of the masses. Once popularized, this consumption pattern and consumer behavior will generate new mass consumer demand and become new. This wave of consumption is a very important phenomenon in the field of consumer culture in China.

##### **3.1.2. Consumer Consumption Characteristics**

In the second half of the 20th century, the rapid development of the national economy has greatly improved the people's living standards, and has made the consumer goods more abundant than in the past, so that people's consumption patterns and consumption objects are enriched. Today's consumer culture in China has presented different new features. The material base is becoming more and more abundant, the consumption space has been greatly expanded, and Xiaofei's ability has been significantly improved. Consumer demand is increasingly diversified, communication consumption is increasing, and the tertiary industry is developing rapidly. Consumers have also become personalized and aestheticized, which is already a very



important phenomenon in the field of consumer culture in China. In the process of consumption, people pay more attention not only to the use value of consumer goods, but also to their symbolic value and symbolic meaning. Nowadays, people don't want to buy mobile phones. Everyone has mobile phones. Compared with mobile phones, people are pursuing the brand culture behind them.

### 3.2. Overview of the Domestic Mobile Phone Market

#### 3.2.1. Discussion on the Price/Performance Ratio of Major Brands

It is reported that the price-performance list is in addition to the average configuration of the mobile phone and the current price. The list is still divided into thousands of yuan, 1000-1999 yuan, 2000-3000 yuan and more than 3,000 yuan, each price is selected in the top ten. According to the list, Xiaomi's new mobile phone has the highest price/performance ratio and occupies the first two seats in the list. Xiaomi has always been known for its excellent quality and benefits among the broad masses of the people. Xiaomi also has a group of supporters called "rice noodles".

2019年2月手机性价比排行榜					
微信公众号: 商业排行榜(askplan)		官方网站: <a href="http://top.askcs.com">http://top.askcs.com</a>			
排名	手机类型	性价比			
0-999元:			1000-1999元:		
1	红米Note 7 3GB+32GB	143.6	1	魅族X8 4GB+64GB	130
2	联想K5 Pro 4GB+64GB	120.5	2	小米6X 4GB+32GB	122.4
3	魅族Note 8 4GB+32GB	115.5	3	联想Z5s 4GB+64GB	120.6
4	红米6A 2GB+16GB	111.1	4	华为nova 2s 4GB+64GB	116.4
5	荣耀畅玩8c 4GB+32GB	104.4	5	努比亚Z18mini 6GB+64GB	111.7
6	荣耀畅玩8A 3GB+32GB	101.7	6	小米8 SE 4GB+64GB	111.0
7	红米6 3GB+32GB	101.1	7	vivo Z1 4GB+64GB	110.9
8	联想S5 4GB+64GB	97.7	8	荣耀Play 6GB+64GB	109.3
9	魅族V8 4GB+64GB	97.6	9	vivo Z3 4GB+64GB	106.3
10	联想K5 Note 4GB+64GB	90.3	10	联想Z5 6GB+64GB	105.7
2000-3000元:			3000元以上:		
1	小米8 6GB+64GB	128.7	1	小米黑鲨游戏手机 8GB+256GB	94.3
2	小米9 6GB+128GB	123.5	2	魅族16th Plus 8GB+128GB	94
3	魅族16th 6GB+64GB	121.9	3	小米黑鲨游戏手机 Helo 8GB+128GB	93
4	红魔MarsERR 6GB+64GB	118.5	4	小米MI x3 6GB+128GB	89.4
5	努比亚Z18 6GB+64GB	117.5	5	努比亚X 8GB+128GB	87
6	小米MIX 2S 6GB+128GB	109.4	6	一加手机6T 8GB+128GB	82.6
7	小米8 5B透明版 8GB+128GB	102.3	7	一加手机6 8GB+256GB	81.9
8	荣耀V20 6GB+128GB	102.3	8	荣耀Magic2 6GB+128GB	79.2
9	小米8 5M 58GB+128GB	102.2	9	华为Mate 20 6GB+64GB	76
10	红魔Mars电竞手机 6GB+64GB	102.1	10	vivo NEX旗舰版 8GB+128GB	67.7

Fig 1. Related types of mobile phone price rankings

### 3.3. Problems in the Development of Domestic Mobile Phones

#### 3.3.1. Application of Materials for Mobile Phone Design

Metal material is the dominant and multi-material application. Other material. The use of plastic materials: plastic material has the longest history in the body of the mobile phone. The plastic material can effectively control the process cost, the coloring property is good, the coloring is relatively free, and the coloring agent can be added into various molding processes. Color body shell.

The use of glass materials, the use of leather materials. Ceramic materials, especially those developed by science and technology, have the characteristics of hard texture, fine structure, high heat resistance, electrical insulation, warm color, good artistic expression and strong

plasticity. Depending on the application, ceramic materials used in mobile phone exterior accessories are mainly microcrystalline zirconium ceramics at this stage. Microcrystalline zirconium is a new type of ceramic material with many excellent properties such as wear resistance, corrosion resistance, impact resistance, high strength, high initiality and good thermal stability. With the improvement of the preparation process, microcrystalline zirconium materials have been applied to jewelry, watches and mobile phones launched by many well-known brands. Compared with the plastic and metal materials commonly used in mobile phone casings, microcrystalline zirconium ceramics have the advantages of high hardness, high thermal conductivity and smaller electromagnetic shielding, good biocompatibility and good visual effect. These features have a very good auxiliary effect on the development of smart phones, especially high-end smart phones. They have relative advantages in realizing certain functions or producing specific visual effects, which makes the application prospects of ceramic materials in future smart devices more broad. For example, the Xiaomi 4 series and the Xiaomi MIX series introduced by Xiaomi Company use austenite 304 and ceramic as materials respectively.

### **3.3.2. Insufficient Brand Culture Characteristics of Mobile Phones**

The weakening of the appearance of smartphones has led to factors affecting consumers' choice of smartphones in terms of performance, brand preference and price. Under the current situation that major manufacturers are vying for the market share of smart phones, it is difficult to win in the fierce competition by simply improving performance and lowering prices, because the product update will be saturated in a certain period of time. After the function is roughly digested, it will enter a new stage, and continuously lowering the price of the product will reduce the profit of the enterprise, so the price reduction cannot become the main means for the enterprise to occupy the market. Consumers' preference for a brand is based on the brand image that the brand conveys to consumers, although the product brand image is swayed in a variety of ways, such as relying on the media or accumulating through time. Word of mouth, etc., but the most direct and effective way is to interpret the corporate brand image and differentiate it from competitors through the visual image of the product itself. Many brands involved in the smart phone market have blurred the brand image because of the lack of product personality, which also reduces the loyalty of consumers to these brands. Therefore, the establishment of a smart phone visual image that conforms to its own brand characteristics will become a competition from this competition. The important factor for winning, the personalized smartphone design will become the "new weapon" for major brands to compete for the market share of smartphones.

### **3.3.3. The Awareness of the Innovative Design of the Exterior needs to be Strengthened in Combination with the Characteristics of Chinese Culture**

Considering the color matching of mobile phones, the future smart phones must be colorful, because color is the most exciting element in product design to stimulate emotion, reflect personality and stimulate the senses, and it is also the most cost-effective way to manufacture product differences. The future of smart phones is not necessarily colorful, designers can make different color choices according to different crowd positioning. For example, the basic color of navy and gray is used to reflect the style of intellectual male industrialists; the color and color of the same color are used to interpret the elegance and beauty of women; and so on. Designers can also choose colors by communicating their understanding and feelings about the product. For example, through the warm colors of bright colors to convey a gorgeous, happy impression; through the different levels of cool color to match the color to show a refreshing, simple effect; and so on. Designers can also study the next season's color trends, adding fashion elements to smartphones with upcoming colors.

## 4. Application of Chinese Traditional Colors in Contemporary Mobile Phone Designs

### 4.1. Appearance Color Characteristics of Xiaomi Mobile Phone MIX 2S Dunhuang Art Version

The Xiaomi MIX 2S is a high-profile machine with a 5.99-inch screen and an 845 processor. In the design, the design of the ceramic back shell + metal frame is used. Different from the design of this Dunhuang emerald color, although it also uses the ceramic back shell, it breaks through the production process to create this unique emerald color..

The design of the Xiaomi MIX 2S Emerald & Jade Art Gift Box is inspired by the Dunhuang Feitian mural, which uses a full emerald ceramic material on the back of the phone. The color technology on the Dunhuang murals has a certain relationship. In cooperation with the Dunhuang Academy, the "Lucky Color of the Millennium" was launched, and a circle of gold and a green back shell were used in the place of fingerprint sensing and camera.

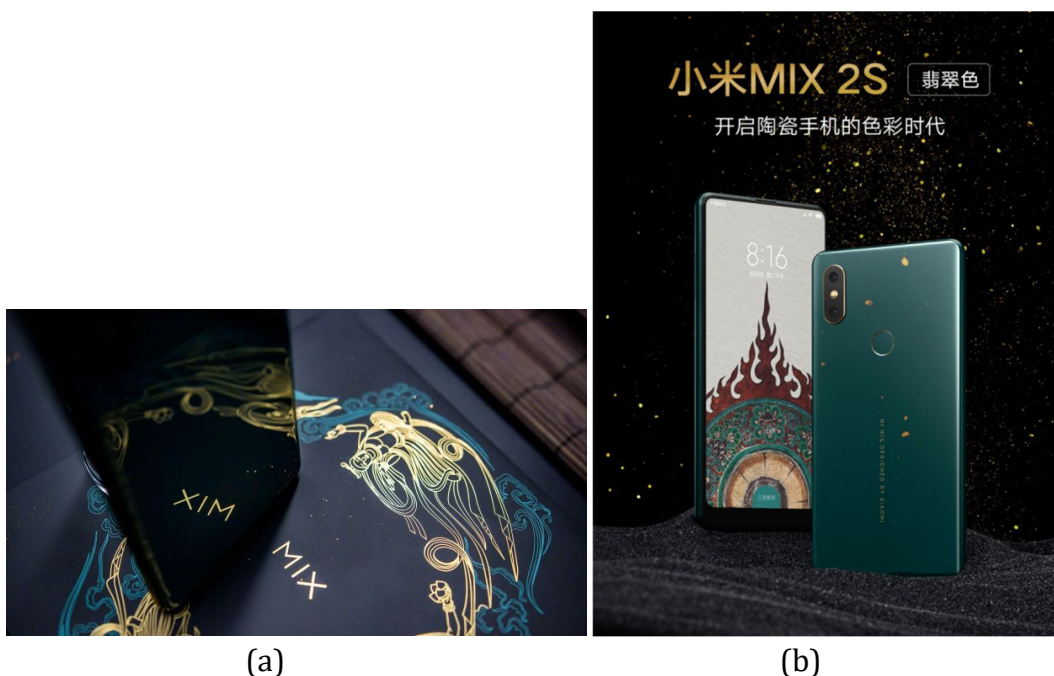


Fig 2. The Xiaomi MIX 2S's ceramic back shell + metal frame

### 4.2. Application of Traditional Color Elements in Xiaomi Mobile Phone MIX 2S Dunhuang Art Version

The green color of Dunhuang murals is mineral pigments, and the painting world is commonly referred to as stone green, while the modern scientific name is chlorite. These pigments are made of green ore, and their colors range from warm to cold, and are divided into green, green, and green by particle thickness and color depth. Also known as sand green, patina, malachite and so on. Sand green, according to the ancients, should be the thicker of the early Dunhuang mural paint particles, the color is warm, deep and calm and elegant; the patina is the lighter and blueish green in Dunhuang murals, also known as copper green; The color of malachite, such as the green color of peacock feathers, has a calm, bright luster, and the ore is blocky. According to literature records and modern chemical analysis, it is proved that stone green is from a place with copper ore. Due to the different origins, its molecular structure, color, warmth and depth are also different. Some of the stone greens in the Dunhuang murals have a green hue, while the green has some green hue.

#### 4.3. Millet Mobile Phone MIX 2S Dunhuang Art Edition for the Innovation of Domestic Mobile Phone Design Innovation

During the long process of development of Dunhuang art, the accumulated artistic creation experience and exquisite art masterpieces have provided rich and unique national resources for the design of modern art in China. The application of Xiaomi to the element of Dunhuang color is simply to attach the pattern and color to the product, and there is a shortage of integration and excavation with its own product design. In addition, there are some designs that use Dunhuang elements, but most of them still use mechanically to misappropriate original works, or simply imitate or piece together, failing to truly understand the essence of Dunhuang art, let alone Dunhuang art. Dissolve into the traditional elements of the East into the modern design. The rhythm of oriental art and the heavy history have changed over the past thousand years. It is not simple to stop here. The use of Dunhuang elements by Xiaomi is in response to the theme of the era of returning to tradition and retrospecting the origin. It is very good. Cultural heritage, but still to be improved. Therefore, designers need to better explore the essence of excellent traditional art in the treasure house of Dunhuang art and apply it to modern product design.



Fig 3. The Xiaomi MIX 2S Jade Art Edition Gift Box

## 5. Conclusion

This article has a comprehensive exposition of Dunhuang Grotto art from the important position of Dunhuang Grotto art in the course of Chinese traditional art, artistic achievements, and the oriental philosophy and national culture it represents. The article has carried out the current color philosophy of Dunhuang Grottoes murals. Explain, from the discovery of the advantages and disadvantages of design using traditional colors, in addition to the problems of the design works itself, the fundamental question is whether the designer's design concept is correct. The reference and study of excellent traditional art is not a formal copying and application, but a designer to clearly understand the tradition, inherit and innovate. As Mr. Lu Xun said, tradition fosters the future and may also bind the future. Therefore, while trying to explore the rules of ancient traditional color arrangement, designers should constantly update



the design concept and create excellent modern design works with Chinese nationality between Chinese art treasures and modern times.

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