

Visual Communication Design Based on Low Carbon Ecological Environment

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ABSTRACT

Low-carbon design is ecological, environmentally friendly, scientific, and reasonable design. It is developed from green design, but it is different from green design. Nowadays, low carbon has been inseparable from all aspects of people's production and life. The concept of low carbon has become the guiding ideology of all walks of life. Under the guidance of the low-carbon concept, the design concept of visual communication design has changed from a people-oriented service that serves people to a natural-oriented approach. Since then, low carbon has become the development policy of the times. This study starts from the origin of low-carbon design and the elaboration of the concept of low-carbon design and discusses the multiple characteristics of low-carbon design. The low-carbon design method is explored, and the five aspects of design concept, design language, design form, design material, and production process are described. From the practice of low-carbon packaging design, low-carbon book design and low-carbon graphic design, the low-carbon design in visual communication design is analyzed and studied. This article starts from the perspective of visual communication design, runs low-carbon design throughout, and integrates ecological concepts, design methods, specific practices, and other relevant knowledge into the research in an organized manner to provide help to promote the low-carbon sustainable development of visual design.

KEYWORDS

Low carbon design, low carbon concept, visual communication design

ABSTRACT

With the rapid development of the economy, the problem of environmental degradation has become more and more serious, which contrasts with people's high requirements for the quality of life and the pursuit of happiness. Low-carbon design is one of the most effective soft methods to achieve healthy ecological development. Low-carbon design was first produced in the field of architectural design [1-2], and then gradually applied in product design packaging design, interior design and other design contents [3-4]. Yang jing analyzed the characteristics of low-carbon design in product design and summarized its advantages based on specific design examples, showing the important role of low-carbon design on behavior and providing a theoretical basis for the low-carbon development of product design [5-8]. Lu Dailing summarized the concept of low-carbon design and discussed its development status, expounding how low-carbon design is produced under the influence of low-carbon economy [9-10]. Xue Qing discussed the relationship between the nature-based low-carbon concept and the people-oriented modern design in essence [11]. Wang Yong systematically introduced green design methods, design materials and production processes in visual communication [12]. Li Yimang expounded the ecologically simple design idea of MUJI, and systematically introduced the related content of MUJI from brand concept to packaging design, and then to management [13-16]. Qin Suiyue and He Mengnan explored graphics processing methods, emotional color matching techniques, and text typesetting methods that include font size, font, and text color. They also discussed the important relationship between the three. Appropriate application of low-carbon

concepts to web design not only achieves low-carbon ecology but also satisfies the functionality and aesthetics of the design [17]. The low-carbon design of visual communication is developing in the process of people's acceptance, such as the flat style of web interface [18]. The web interface of Windows Phone is the beginning of flat design. It started the flat interface design style in 2010. Then in 2011, Android system fully used the flat style in the interface design. It was until 2013 that people really accepted and began to appreciate the flat design. Concise and lively graphics, comfortable and harmonious colors, and smart text layout are the outstanding features of flat design. These features make the information expression precise and vivid [19]. The current popular "micro-gradient" style is developed based on flattening with slight color changes. Therefore, low-carbon design is not only trying to reduce carbon emissions, but also spreading ecological concepts and assuming social responsibility [20].

After analyzing the above literature, the author found that: First, the research content of the literature is mostly about the research of low-carbon packaging design in visual communication, not systematic research on visual communication design. Secondly, most of the literature research is about green design concepts. Third, the literature research focuses on the interpretation of low-carbon design concepts and lacks specific systematic practical method research.

FEATURES OF LOW-CARBON DESIGN

(1) Standardized design.

Standardization is one of the important influencing factors of product quality. The product quality can reach the highest level when the degree of standardization is the best. China also has clear economic policies and regulations for product production, requiring generalization and standardization in the production of parts and components, and serialization in the development of new products. Therefore, the guiding role of standardization should be emphasized in the design.

(2) Sophisticated design.

Sophisticated design is a low-carbon design, which extends the life of the product from two aspects. The first aspect: When dealing with well-designed items, people have the behavior of cherishing and protecting them because of their appreciation and love, thereby prolonging the service life of the items; the second aspect: sophisticated design is reflected in product design, development, and production. High-standard design requirements in all links of manufacturing, sales, use, and recycling have virtually extended the life cycle of the product and avoided over-renewal due to poor manufacturing.

(3) Appropriate design.

Appropriate design requires accurate positioning according to the target population, and the design is simple, clear, and easy to operate, which can not only meet design requirements but also reduce carbon emissions. Appropriate design is just the degree that suits the requirements in terms of materials, functions, and packaging, as opposed to over-design.

(4) Dematerialization design.

The relationship between "non-material" and "material" here is not opposite. Non-material design must depend on material design, and material design contains non-material design. The two are closely related and mutually reinforcing.

VISUAL COMMUNICATION OF LOW-CARBON DESIGN METHODS

Visual communication design is developed from graphic design, but with the progress of the times and the rapid development of science and technology, the content of visual communication design has also undergone major changes. There are many categories of visual communication design, including all the content designed by graphic design, as well as oriented design related to environmental design art. The category of visual communication design in the low-carbon era can be divided into three parts according to different media communication methods: 1) from the perspective of printing communication methods, it includes packaging design, book binding design, logo design, album design, advertising design, etc. 2) the way of communication includes TV, movie-related design and photography-related design. 3) the way of digital media communication includes Internet-related design and multimedia and new media-related design. In short, the visual communication design category has become more extensive and more specific with the progress of the times, involving all aspects of people's production and life.

(1) Design concept one "Nature-oriented".

Low-carbon design in visual communication design can be understood from two levels: one is the dissemination of low-carbon concepts in the design content and the appeal for environmental protection of the atmosphere, through low-carbon themed posters and TV advertisements; the other is to use the "nature-based" low-carbon concept as a guide for design and production, from the beginning of the conception, design, and processing, to the end of the life of product use, recycling and design products, to achieve harmony between man and nature, and to implement the concept of nature-oriented.

(2) Design language-simplifying the complex.

The design language is reduced to simplicity, avoiding the cumbersome form, getting rid of the surface disguise, and making the design content reach the soul. The simple design is in line with the environmental protection concept of low-carbon design. On the one hand, low-carbon design requires that the design should avoid damage to the environment, and the design should be carried out under the premise of saving resources, and the processing of materials should be minimized to reduce carbon emissions under the premise of ensuring product quality; on the other hand, people should integrate science and technology into low-carbon design, improve the added value of products with innovative thinking, make the design simple and not simple, instead of blindly decorating the surface, so as to satisfy people's continuous improvement in material and spiritual needs.

The conciseness of the design language in visual communication design should first be concise in terms of expression, but it is full and rich in the content of the information conveyed. The simplicity of language is secondly manifested in the rational use of design elements such as font arrangement, color matching, and graphic design, rather than losing the beauty for simplicity. Reasonable and appropriate decoration is like a finishing touch, which will bring highlights to the design. In the end, the simplicity of the design language conveys a new concept of low-carbon and environmental protection, which can not only serve as a product selling point to attract consumers, but also play a good role in promoting low-carbon concepts and low-carbon life.

(3) Design forms-finding the beauty of fit.

Design is inseparable from the support of shape and state, which is the skeleton that conveys the characteristics of objects. Low-carbon design advocates scientific and reasonable form design rather than one-sided pursuit of visual enjoyment built with

materials. Segmentation and combination are one of the main ways to express the beauty of form in design, which contains the aesthetic thought of "fit", and is the most used form design method in packaging design. The design form seeks the beauty of fit, the pursuit of segmentation and combination between the various parts is full of change, smart and immobile, and at the same time viewing from the overall view is unified, reflecting the beauty of harmony.

(4) Design materials-ecologically recyclable.

The ecological recyclability of design materials is embodied in two aspects. On the one hand, at the beginning of the design, we tend to choose environmentally friendly and recyclable materials to avoid relatively scarce resources; on the other hand, it refers to the comprehensive consideration of multiple factors such as production, transportation, service life and recycling in the design process.

(5) Production process- everything is used to the best.

Common process types in visual communication design include die cutting, bronzing, embossing, laminating, etc. The process type should be selected according to specific needs in the design to avoid high costs and high consumption caused by excessive use of processes. In terms of styling design, we fully respect the original properties and true appearance of materials, and do not deliberately change materials through complicated procedures. For example, to deal with some beautiful natural materials, we just make slight changes based on the original shape, so that the works have original ecological characteristics and low carbon energy saving. In terms of color design, the original color of the material is retained and used to convey the natural temperature. In terms of decoration design, we should make a simple and elegant design based on low-carbon design principles to avoid complicated appearance decoration.

CASE STUDY

(1) Low-carbon packaging design.

Low-carbon packaging design is based on the premise of low-carbon and environmental protection. From the design concept, design implementation, to commodity production, storage and transportation, and finally to commodity use and waste recycling, every link in the life cycle follows the principle of low carbon and high efficiency. In packaging design, low-carbon packaging design means to be concise and moderate while meeting consumer aesthetic requirements, thereby reducing carbon emissions caused by packaging. Low-carbon packaging design can not only improve production efficiency, reduce the consumption of raw materials and energy, but also reduce pollution, protect the ecological environment, and improve people's quality of life in many ways.

The product packaging of MUJI is a typical representative of low-carbon packaging design. The packaging of more than 5,000 products embodies the principle of simplicity and moderation, which is a demonstration of eco-friendly low-carbon design and conveys natural simplicity to consumers.

1) Simple packaging.

Low-carbon packaging design requires not only stylish and beautiful appearance, reasonable and ingenious structure, but also concise and appropriate design principles to convey low-carbon and energy-saving design concepts. The packaging form of MUJI is simple, and generally adopts classic packaging shapes. According to the needs of the product, the suitable packaging structure and precise packaging ratio are designed to avoid complicated useless decoration and structural modeling, saving resources and energy.

Figure 1 shows the packaging design of the MUJI skin care product series. The shape follows the classic cylindrical shape. According to different products, the bottle body has different heights and thicknesses. In terms of structure, according to different uses, different design methods are adopted for the bottle mouth: water-like products adopt spray bottle mouth because of low concentration and easy to evaporate. The water-like products with slightly higher concentration adopt a small round mouth design method, which can be poured out smoothly without spilling. The emulsion-like products are squeezed for easy use and creams are designed with a short bottle and a large mouth due to the high concentration and poor fluidity, which is convenient to take the product by hand. Many bottles are made of transparent or semi-transparent frosted material, which can clearly see the product itself. The use of high-brightness and saturated colors gives people a clear, bright, comfortable, and natural visual experience.



FIGURE 1
MUJI cosmetic packaging bottle.

2) Environmentally friendly packaging materials.

In terms of packaging materials, MUJI selects environmentally friendly materials that are not harmful to consumers and the environment in accordance with the design principles of green and environmental protection and has made specific rules and regulations for packaging materials. In the design of packaging and packaging bags, MUJI chose to use recycled paper (Figure 2). The recycled paper is made of natural fibers with non-hazardous chemical additives, which are easily degraded and recycled after being discarded. The process without bleaching reduces the damage to the environment during the production process. The natural brown color also gives consumers a warm and cordial feeling, which is an environmentally friendly packaging material. Secondly, recycled paper has low weight and high toughness, which can meet different packaging design requirements.

In packaging design, cotton packaging materials must be green and ecological organic cotton materials (Figure 3), rather than synthetic chemical materials. Organic cotton is firstly safe and non-flammable. Secondly, organic cotton products are soft and smooth to the touch, not stiff, and the color is gentle and natural. Finally, it is comfortable to use, does not harm the skin, and can be ventilated. The MUJI gift packaging bag design shown in Figure 4 is a whole piece of beige cotton cloth, which is tied with a dark green rope according to the size of the product. When packaging products are no longer needed, the fabric can also be used elsewhere, extending the life of the packaging. The tying and dismantling of the packaging are different from the mechanical feel of the previous hard materials, which improves consumer participation and brings consumers a fresh experience.



(a)



(b)



(c)

FIGURE 2

MUJI recycled paper packaging



FIGURE 3

Organic cotton, raw material of MUJI products.



FIGURE 4

MUJI gift packaging bags.

3) Concise font design.

Font design is an important part of packaging design. The text in the packaging has the function of conveying product information, and the simple and beautiful font design can become the finishing touch in the packaging design. In packaging design, it is necessary to avoid that the font is too complex and changeable, and the decorative effect is too strong, which affects the role of introducing the product. The packaging font design of MUJI is concise and clear, without unnecessary font distortion and special effects, and the overall visual experience is unified, which can effectively introduce product information and play a good brand publicity effect. The MUJI tea packaging bag design shown in Figure 5 uses bold fonts, with high clarity and legibility, and the content is read without the burden of recognition, making the packaging look simple and generous. The size, thickness, word spacing, and position of the text are all changed according to the needs of the primary and secondary content, avoiding the packaging from appearing monotonous. The layout design of the entire text looks neat and orderly, and the clever placement of the text also adds a decorative effect to the packaging, which is practical and beautiful.



(a)

(b)

(c)

FIGURE 5
MUJI tea packaging.

(2) Low-carbon book design.

The importance of integrating low-carbon concepts into book design can be divided into three parts. From the perspective of atmospheric environmental protection, it will reduce carbon emissions, promote low-carbon development, and establish a new corporate image of low-carbon and environmental protection. In terms of resource conservation, the rational use of resources and energy has been realized, saving time and cost for production. From the perspective of product sales, it reduces the liability risk coefficient arising from product production and sales, and caters to consumers' increasing low-carbon awareness, increasing market competitiveness in many ways. The integration of low-carbon concept into book

design conforms to the requirements of the development of the times and has injected new vitality into book design.

1) Appropriate design.

In book design, reading comfort should be the only goal, and appropriate design should be made without sensationalism. We should integrate low-carbon design concepts into book design, effectively convey the cultural knowledge in books, provide readers with a good visual experience with a moderately beautiful design, and spread the concept of low-carbon sustainable development. As shown in Figure 6, the book design works have a unified overall design style, and the content layout is dense, prioritized, concise and clear as needed, and it is easy and smooth to read. Aiming at the reader's comfortable and smooth reading, it provides readers with a simple and beautiful visual design to meet the dual needs of spirit and vision.

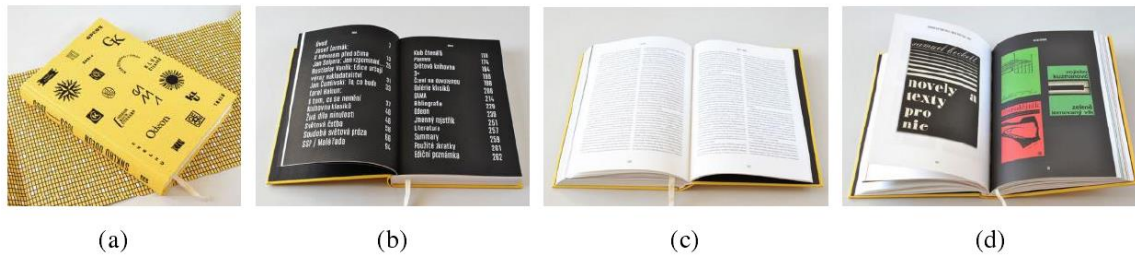


FIGURE 6
Book design.

2) Reasonable use of binding materials.

In book design, natural and simple beauty should be promoted, meaningless ornate decoration should be avoided, and the selection of binding materials should be consistent with book culture, which can convey low-carbon ecological design ideas. We need to promote research attempts on environmentally friendly materials and strive to reduce the waste of non-renewable resources in order to reduce the negative impact of book binding on the environment. For example, in the design of the book "Memory of China" by Lu Jingren in Figure 7, the envelope uses environmentally friendly cardboard, and the unbleached brown conveys the long history of the Middle Ages. The clasps and decorative pendants are made of simple cloth and jade materials without complicated processing procedures. The color is unified as a whole, the font layout is tight, and the materials are energy-saving and environmentally friendly, giving people a simple and atmospheric feeling.

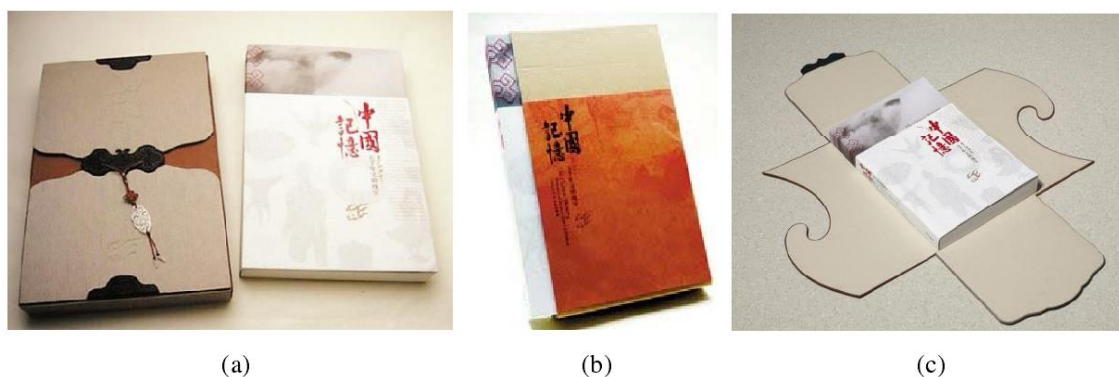


FIGURE 7

Book design of Lv Jingren's "Memory of China".

3) Appropriate use of special processes.

With the rapid development of e-books and new media, the pressure on the publishing industry has increased. In order to improve competitiveness and attract consumers, some book designs use a large number of special techniques, adding pressure on the natural environment. Special crafts should be used appropriately and ingeniously in book design to minimize the overlap of craftsmanship and reduce environmental pressure. Appropriate use of special processes such as anodized aluminum hot stamping in book design can achieve beautiful and practical effects, and minimize damage to the environment, in line with the low-carbon environmental protection concept.

(3) Flat style low-carbon web interface design.

Simple technology in web interface design can no longer meet people's visual needs. Incorporating aesthetic elements into web interface design is a requirement of the times and has become one of the main contents of visual communication design. Compared with the traditional web interface design, the flat style is concise and clear, does not require extra decoration, and can convey information accurately and quickly. The popular micro-gradient web interface design style (Figure 8) is also developed with a slight change based on the flat style. Therefore, the flat style is a classic web interface design style and is a product of the development of the low-carbon era. The outstanding feature of the flat style web interface design is the centralized information division area and simplified information hierarchy, which enhances the functionality of use. Flat style is a minimalist design type in visual communication design. Graphics and fonts avoid complex presentation effects. Key texts do not need to be emphasized by strokes and shadows. Pictures are not processed by feathering and transparent gradients.



(a)



(b)

FIGURE 8

Micro gradient style web interface design.

1) Graphics processing.

Graphics are an important element in visual design, especially in the advertising web interface, which needs to be combined with text information to show the true appearance of the product. The graphics used in the flat interface are all concise graphics that have been refined and summarized. The graphic elements serve for the transmission of information, which can guide users to read and help the understanding of textual information, rather than decorative elements to increase visual effects.

2) Color matching.

The use of color is an important content of web interface design. In flat interface design, quasi-materialized graphic elements are less used, and highly refined color blocks are used to serve hierarchical information. This requires color matching not only to be consistent

with the information content, but also needs to be advanced and beautiful to meet the user's visual experience needs.

3) Typesetting.

Words can play a role in the composition of points, lines, and planes in the design. The ingenious text layout design is not only the need of the information content of the webpage, but also increases the design sense. Through the rational use of text color, font, font size, etc., it adds a sense of agility and space to the flat web interface. The text in the flat web interface will not use excessive decorative effects. The font color can be flexibly adjusted according to the overall tone of the interface. The main information such as the primary and secondary headings often use blue or black as the font color. Do not do too much artistic processing and processing. In terms of font selection, fonts with simple strokes and regular structure are often used and are consistent with the overall flat interface design style.

CONCLUSION

(1) The development of visual communication design is closely related to people's production and life, and it continues to progress with the development of science and technology and the improvement of people's living standards. Specifically, first, the rapid development of science and technology has added expressions to visual communication design, making the design language of print publishing media and new online media rich and diverse. Secondly, with the improvement of people's material living standards and cultural quality, the content of visual communication design is globalized and socialized.

(2) Low-carbon design has the characteristics of standardized design, sophisticated design, moderate design, and non-material design. Low-carbon design can be achieved through the "nature-oriented" design concept, simplified design language, a beautiful design form, ecologically recyclable design materials, and the best use of materials. The research in this paper conforms to the requirements of the era of low-carbon and environmental protection, and explores new ideas for low-carbon design of visual communication art. It not only analyzes and studies the low-carbonization of concepts and materials, but also explores ways of low-carbon design from the simplicity of design language.

(3) Design is different from art, which serves people and contains the nature of interest. But design and art have something in common. It is closely connected with people and closely related to nature. It is a mirror of the development of the times. Nowadays, natural environmental problems are becoming more and more serious, such as air pollution, forest destruction, endangered rare animals, and decreasing plant species. In the face of severe environmental problems, visual communication design should play its social responsibility and make efforts for the harmonious development of man and nature through its own low-carbon behavior.

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