Research on the Application of Internet based Interactive Model in Packaging Design

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Abstract

In this paper, the application of Internet based interactive model in packaging design is researched. This paper integrates the interactive technology of new media into the packaging. This paper studies the application of new technologies such as two-dimensional code, video and 3D printing on packaging, and integrates information and technology and aesthetics on packaging with enabling consumers to interact with producers, users and commodities, in order to drive consumers' emotional resonance. In addition, the theme, pictures and words of the packaging are designed by consumers to complete the custom package. The thinking of the Internet is centered on users. New packaging design must enhance the interaction and experience of consumers with new media technology and creative design methods. The new packaging design should meet the deep needs of the users by interactive design, and explain the new concept of life which is the trend of future design and development.

Key words: Application, Internet based interactive model, Packaging design

1. Introduction

Packaging design is the beautification and decoration design of container structure and packaging for packaging commodities, which are suitable packaging materials and ingenious technological means. The three elements of packaging design can be seen from it.

Packaging is a comprehensive reflection of brand concept, product characteristics and consumer psychology, which directly affects consumers’ desire for purchase. We are convinced that packaging is a powerful means to establish the affinity between products and consumers. Today, the economic globalization, packaging and goods have become integrated. Packaging, as a means to achieve commodity value and use value, plays an extremely important role in the fields of production, circulation, sale and consumption. It is an important topic that businesses and designers must pay close attention to. The function of packaging is to protect goods, convey information of goods, facilitate use, facilitate transportation, promote sales and increase the added value of products. As a comprehensive subject, packaging has the dual nature of combination of goods and art. Beijing Chuangyi only and creative stand in the height of the brand on packaging, we use brand innovation strategy, consumer experience insight, providing creative packaging solutions. We should focus on the identification framework planning of the whole product series packaging, so as to systematize the packaging and improve the terminal performance of the product (Hao, 2016; Mohan, 2016).

Shape elements

The shape element is the shape of the commodity packaging surface, including the size, size and shape of the display surface. There are 3 kinds of forms we see in daily life, namely, natural form, artificial form and occasional form. But when we are studying the form and composition of products, we must find a suitable form for any nature, namely, extract common and regular things, and call them abstract form.

We know that form is the element of shape, or this is the element of form, which is a variety of forms made up of a certain method and law. Form is made up of points, lines, surfaces and bodies. Packaging forms: cylindrical, rectangular, and various shapes and cone shape and different combination of cutting a various forms of packaging form the novelty of consumer visual guidance plays a very important role, visual form peculiar to impress consumers. The packaging designer must be familiar with the features of the form elements themselves and their expressions, and this is the material for the beauty of the form.

When we consider the elements of the packaging design, we must also understand it from the perspective of the formal beauty rule. According to the formal beauty rule of packaging design and the characteristics of product's own function, we combine all kinds of factors organically and naturally to get the perfect and unified design image (Tumwesigye, 2016).

Composition elements

Composition is a complete picture of the trademark, graphics, text and combination of the display surface of the commodity packaging. The combination of these four aspects constitutes the overall effect of packaging decoration. The use of trademarks, graphics, characters and colors of commodity design composition is correct, appropriate and beautiful, which can be called excellent design works.

2. Overview
Graphic design of the packaging and decoration of the graphics mainly refers to the image of the product and other auxiliary decoration image. Graphics as a design language is to express the internal and external factors of the image, and convey information to consumers in the form of visual image. In order to achieve this purpose, the positioning accuracy of graphic design is very critical. The process of positioning is to know all the contents of products, including factors such as the nature of commodities, the meaning of trademarks, the names of commodities, and the status quo of similar products. Graphics can be divided into physical and decorative patterns on their forms.

**Physical figure**

It includes the use of painting techniques, photo and so on to show. Painting is the main form of packaging design, according to the overall concept of packaging needs to draw a picture, for the service of goods. Compared with a photographic portrait, it has the characteristics of choosing, refining and summarizing freedom. It is a means to propagate, beautify and sell goods. However, the commercialized nature of commodity packaging determines that the design should highlight the real image of goods and give consumers the intuitive image. Therefore, using the Huaqing design works in photography industry to express real and intuitive visual images is the best way of expression for packaging decoration design (Hensler, 2015; Lee, 2016).

**Decorative graphics**

It is divided into two forms of representational and abstract expression. The figurative figure, landscape, animal or plant pattern can be used to represent the contents and attributes of the package as a symbolic figure of the packaging. Abstract techniques are mostly used for freehand brushwork. They are made up of abstract dots, lines, surfaces, geometric patterns, color blocks or texture effects. They are concise, striking, and have a sense of form. They are also the main means of packaging and decorating. Usually, the concrete form and the abstract expression technique are not isolated in the packaging and decoration design, but are combined with each other.

The content and form of the dialectical unity of universal law in graphic design, in the design process, according to the need of graphic content, select the corresponding graphical representation technique, the unification of the graphic design to create content and form, reflecting the spirit of the times, the national style is suitable, economical and beautiful design and decoration works is the packaging designer basic requirements.

**Color design editor**

Color design occupies an important position in packaging design. Color is an important factor in beautifying and protruding products. The application of packaging color is closely related to the design of the whole picture and the composition of the whole picture. Packaging color requirements flat, even, this is to summarize the color filter and refine the. It is based on people's Association and the habit of color, and the high exaggeration and discoloration are a means of packaging art. At the same time, the color of the packaging must also be made and restricted by the process, material, use and sales area.

The color of the packaging design requires striking, strong contrast, strong attraction and competitive power to arouse the consumers' desire for purchase and promote the sale. For example, the food and the bright colors, with warm color, fresh taste, nutrition and outstanding food; medicine and pure cold and warm tone; cosmetics commonly used soft middle tones; hardware, machine tools and other kinds of blue and black color to show calm, solid, precision and durability; a variety of color contrast color and well-being of children's toys used to strong dazzlingly beautiful, consistent with the child's psychological and hobby; sports with distinctive loud colors, in order to increase the active and the feeling of movement. Different commodities have different characteristics and attributes. Designers should study the habits and interests of consumers, and the trend of international and domestic color change, so as to continuously enhance the consciousness of color sociology and consumer psychology.

**Text design**

Words are symbols that convey ideas, communicate feelings and information, and express the content of a subject. The essential contents of the packaging are reflected by the brands, names, characters, words, advertisements, manufacturers, companies or distribution units on the packaging. It is necessary to consider these words as part of the overall design of the packaging design.

The packaging design of the main points of the design is: text concise, authentic, vivid, readable and easy to remember; font design should reflect the characteristics of products, nature, character, and have good recognition and aesthetic functions; text layout and packaging of the overall design style should be harmonious.

Packaging design methods often used in deformation, extrusion, stacking, reorganization, decoration and other additional specific techniques to reflect its cultural connotation, characteristics of the specific image can be reflected in all aspects of packaging style, style, color, graphics, text and material.

The packaging design styles are various, and the design forms are varied. From the original primitive folklore nationality to the avant-garde modern packaging, from the traditional frugal packaging to the gorgeous style, even the luxurious packaging. Even the liquor bottle packing the same, can also be designed with rough or
delicate soft polarized style. All kinds of packaging can have different designs of size, length and width, so that people can freely choose from them, which leads to uncertainty and uncertainty in the trend of packaging.

In the shape of the packaging, the traditional packaging methods and concepts have also been challenged, just look at the liquor packaging, from the appearance, or is all inclusive, or transparent, or ambiguous, or complicated, or simple, or extensive, or narrow, or layers, irregular or disorderly.... It is full of strong personalization and diversity (Jiang, 2015; Hron, 2015).

And in the packaging structure, from the comprehensive, clear to the decomposition, fuzzy. To build a distinctive structure design method of deconstruction into the traditional three-dimensional graphic and three-dimensional shape, will combine to various parts of the structure reconstruction of packaging, which is free, loose, fuzzy, mutation, motion and structure design of anti-conventional features, thus forming a new visual effect.

The color of the packaging (including the combination and change of graphics and fonts) overlaps with the low purity natural soft color and the high purity of the brightly colored irritation color. Some of the whimsical mutually exclusive colors show the lively and dramatic packaging of the packaging. In addition, through cascading, combination, transparent, texture design used in the material, the color gradient shading orderly and disorderly changes, add infinite charm for packaging.

On the packaging materials, there are obvious diversity and richness characteristics. This is mainly reflected in the raw material types, morphological structure, texture and texture, and the comparison between them. Some designers also creatively use deformation, hollowing and combination to enrich the appearance of materials, give new images to materials, and emphasize the aesthetic value of material design.

3. The internet model and algorithm

In order to meet the needs of large-scale occupation of the market, the traditional packaging design adopts unified packaging to create the brand effect of packaging standardization and scale, such as Coca-Cola, cleaning and McDonald's. In the Internet era, with the great wealth of material and spirit, consumer interest in packaging has expanded from simple demand to packaging products emotional interaction, the connotation of commodity emotional communication, mentality reaction, culture, era awareness deeper needs more vigorous, it can convey inherent and indirect interaction design the intangible information, enhance the cultural value of brand packaging.

The era of the Internet economy has transformed into an era of experience economy. In the era of experience economy, design more and more pursuit of an aimless and unpredictable lyrical value, consumers to select goods according to perception and intention, according to Maslow’s hierarchy theory, consumption pattern will experience the traditional consumption mode of consumers’ physiological and safety needs attention to expand the low level of the self-esteem and self-realization of consumers the value of high spiritual needs. With the development of information technology and new media, the popularity of mobile phone terminals, WeChat timely communication, Internet viral propagation speed, the cloud resource sharing and networking as well as expand the interactive intelligent market, the Internet has changed people’s mode of thinking and way of life, but also to the people to provide more opportunities for interaction, to the public a new experience.

In the multivariate information of the moment, people are tired of the traditional forms of immutable and frozen packaging design, packaging design, interactive experience design will be a disruptive and innovative, cultural, emotional interaction and entertainment attribute type packaging design and interactive experience these shows, more easy to be accepted by the public, people bring profound impression.

\[ S_{HM} \text{ solution vectors are randomly generated according to the variable range for each variable. Namely} \]

\[
HMV = \begin{bmatrix}
x_1^1 & f(x_1^1) \\
x_2^2 & f(x_2^2) \\
\vdots & \vdots \\
x_n^N & f(x_n^N)
\end{bmatrix} = \begin{bmatrix}
x_1^2 & x_2^2 & \ldots & x_n^2 & f(x_1^2) \\
x_1^3 & x_2^3 & \ldots & x_n^3 & f(x_1^3) \\
\vdots & \vdots & \ddots & \vdots & \vdots \\
x_1^N & x_2^N & \ldots & x_n^N & f(x_1^N)
\end{bmatrix}
\]

Hence, we have equation (2):

\[
x_i^{new} = \begin{cases} x_i^j, & j \in \{1, 2,..., S_{HM} \}, \text{if} \ rand < HMCR \\
x_i \in X_i, & otherwise
\end{cases}
\]

As for \( x_i^{new} \) from harmony memory, we have equation (3):
The worst harmony is replaced with the new harmony, i.e.,
\[ x_{\text{new}} = x_{\text{new}}, \]  
if \( f(x_{\text{new}}) < f(x_{\text{worst}}) \)  
(4)

According to the analysis and description of routing problem in express delivery, the constraints can be expressed as:
\[ \sum_{k=1}^{n} d(k-1,k) + d(n,0) \leq MD \]  
(5)

The mathematical model of route programming can be defined as:
\[ L = \min \left( \sum_{k=1}^{n} d(k-1,k) + d(n,0) \right) \]  
(6)

Based on the gradient descent method, node center and base width parameter are:
\[ w_j(k) = w_j(k-1) + \eta (y(k) - y_m(k))b_j \]
\[ + \alpha (w_j(k-1) - w_j(k-2)) \]  
(7)

\[ \Delta b_j = (y(k) - y_m(k))w_j \left( \frac{\|x - C\|_2}{b_j} \right) \]  
(8)

\[ b_j(k) = b_j(k-1) + \eta \Delta b_j \]
\[ + \alpha (b_j(k-1) - b_j(k-2)) \]  
(9)

\[ \Delta c_{ij} = (y(k) - y_m(k))w_j \frac{x_j - c_{ij}}{b_j} \]  
(10)

4. The design case

The traditional packaging is one way information transmission; the public can only understand the basic information of the product from the flat print of the package. From the perspective of consumer psychology, consumers are eager to know all the information of products before buying because they lack experience or knowledge of products, so that they can identify their trust and popularity and make purchase decisions. All aspects of information display mode of the development of new media technology in the age of the Internet for packaging design brings new possibilities, such as two-dimensional code on the packaging for consumers to understand the product, by sweeping a two-dimensional code on the packaging so that consumers understand the products and production process, material price, etc., to allow consumers to easily participate in and understand the commodity economic activities. The two dimensional code on the Coca-Cola package is shown in the Figure 1.

Figure 2. Sweep the Two-dimensional code on Coca-Cola packaging, immediately issue a musical sound
dimensional code on Coca-Cola's packaging, and immediately send out a pleasant musical sound, as shown in Figure 2. It makes interactive technology no longer a cold technology, but something that can bring more interesting and pleasant surprises to life (Kotrowski, 2016; Conte, 2015).

The Internet is a business model based on large data, which can be used to analyze the needs of different consumer groups in detail. Therefore, the product engineer and packaging designers can to subdivide the user needs, preferences and perceptions to distinguish and design strategy, design and develop for the core criteria, in product development and packaging design should pay more attention to the user as the center, focus on the consumer pain points and emotional needs, which requires the products and packaging design process in the whole, to the user's participation, the planning process of product design, and to allow consumers to evaluate. For example, millet phone is based on user experience as the core of the brand to build a sense of participation, open product, service, brand and sales process, so that users can participate in building a brand that can be touched, owned, and users grow together. The 3 tactics of millet are the open participation node, the design of interaction and the spread of word of mouth.

Through the Internet to attract a lot of fans, so that consumers in product development and packaging design on full participation, so that consumers understand the concept and connotation of product information, in the interaction, and then according to the needs of consumers and loved to customize products and packaging, so that consumers feel that this is designed specifically for their products. Let users participate in the whole process of design and production of millet phone, see Figure 3, through its good interaction, it has won the fans' love and trust, and has also enhanced the brand reputation. It has become a dark horse in the mobile phone industry. With the development of the Internet and the changes of the times, the 85 and the post-90s have mastered the discourse right of consumption.

Packaging design with obsolete and image aging will soon be eliminated. How to use packaging innovation to attract young consumers is a problem that every brand should seriously consider. Donald, a famous American designer of design psychology, points out that if a design wants to get the user's approval and love, it must enhance the feeling of the consumer's heart and let the user choose. Humanistic care for user intervention and packaging design users is the packaging design innovation, as the hundred years brand Coca-Cola will introduce the concept of interactive packaging design, in order to stimulate consumers' curiosity and fun, the sense of participation and consumer packaging to effectively contact and communication, to young consumers more fun, won the user's sympathy from behavior, psychological and emotional, to capture the hearts of young people. For example, one of Coca-Cola's interactive creative packaging: new universities who are not aware of, is boring, so Coca-Cola in order to allow students to interact with them, developed a special packing bottle, only when the two together, the reverse rotation of Coke Cola to open. The interactive packaging bottle design shown in Figure 4 for Coca-Cola, this interesting packaging design allows consumers to get emotional appeal and aesthetic feeling interactive experience, so that consumers and products to establish one-on-one interaction, share the passion, share happiness, this interesting package through social media spread quickly in the market, so that more people love and praise the brand.
Traditional packaging design mostly focuses on the beauty of design, rather than the characteristics of real-time interaction, often considering less interoperability, and good interaction design is the soul of design. On the one hand, the packaging design to make consumers feel warm and human, on the other hand, let the consumer packaging design has become the platform for the exchange between the audience and let package works in two aspects of technology and art of information and emotional communication, consumers can put their ideas and feelings in the packaging design, let the concept of emotion and spread rapidly, interactive design this emphasis on communication and exchange a humane, embody the spirit of people-oriented, whether packaging graphic or color reflects the human nature respect and care, packaging becomes the carrier of public emotion, more like an emotional speaker, such as Chongqing famous brand River white wine has abandoned the traditional product style, for young people to create stylish wine, White River fashion packaging humor personalized innovative quotations. In view of the college graduation season, White River launched a special graduation message custom packaging bottle, students can put the most moving pictures and want to say to the classmates custom packaging, packaging bottle type, color, images are available on the web by the students to participate in the design finalized. Jiang Xiaobai's custom wrapper bottle is shown in Figure 5. It emphasizes the participation, imagination and interoperability of the audience, and can stimulate the emotional and psychological resonance of the audience. The integration and interactive packaging design of emotion and scenery, has become a new form of packaging, the graphical user participation of affection, love, fun, lyrical interactive design is the design of a teaser mood, can let consumers.

5. The conclusion
With the development of economy and Internet, consumption behavior and consumption mode have also changed a lot. In the era of experience economy, packaging design thinking must be innovated. The packaging design under the thinking of the Internet is centered on the user, and it is interesting and multidimensional to the packaging. Fresh blood, such as interaction, participation, experience, and so on is the key point. The integration of interactive genes enables packaging designers to actively exchange actions, thoughts and emotions with consumers, and create an organic seamless connection between packaging and consumers, bringing new emotional experience. In the future, science and humanization will be the best way for modern packaging design.

References