

## The Impact of Visual Image on Brand Communication: A Multi-Dimensional Interaction Model Analysis

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**Abstract.** In today's competitive business landscape, the brand's visual image plays a pivotal role in distinguishing enterprises from their competitors. Customizing and promoting a compelling visual image is essential for enterprises to establish their brand identity effectively. To enhance brand communication and achieve higher levels of success, this study delves into the impact mechanism of visual image on brand communication under the multi-dimensional interaction model. Employing the K-means clustering algorithm, we mine the multi-dimensional interaction index of visual image and brand communication. Subsequently, it constructs a comprehensive multi-dimensional interaction model that comprising eight key factors: communicator's attitude and ability, visual image content, communication means and channels, brand awareness, enterprise employee interaction quality, employee-customer interaction quality, enterprise-customer interaction quality, and customer satisfaction. To validate the model, it empirically analyze 10 enterprises as research subjects. The results of the empirical analysis demonstrate that when enterprises, employees, and customers establish a strong and positive interaction relationship, the communication effect of the brand becomes more favorable. High-quality visual images, effective communication methods, and strategic media usage effectively improve brand awareness. By unraveling the intricate interplay between visual image and brand communication, this study provides valuable insights for enterprises seeking to optimize their brand strategies. Understanding the critical factors and mechanisms driving successful brand communication empowers businesses to strengthen customer engagement, foster brand loyalty, and elevate their competitive standing in the marketplace.

**Keywords:** Multidimensional interaction model; Visual image; Brand communication; Influence mechanism; Communication mode and channel; Brand awareness

## 1. Introduction

The influence mechanism of brand communication refers to the internal mechanism of interaction, restriction and interaction between the influencing factors that affect the effect of brand image communication (Chen et al., 2021). These influencing factors form an organic whole to achieve the healthy communication of brand image. Visual image is the most important factor affecting consumer consumption, and also an important embodiment of corporate brand image. How to use visual image to improve consumers' purchasing power and promote enterprises to obtain more economic benefits is a question worth pondering (Teng et al., 2021). A good visual image can realize the efficient spread of brands and make consumers more intuitive about enterprises and products, which is of great significance for improving the value of product marketing. Enterprises need to combine the market environment (Mao et al., 2021), through real-time research on the market and consumers, create a unique corporate visual image, improve consumers' purchasing power (Cristiane et al., 2021), and then integrate consumers and product marketing value.

Visual image plays an important role in brand communication. The level of brand communication can measure whether a company's visual image is good and whether it has popularity in the market. As a very intuitive and powerful way of communication, visual image can convey the core values, personality and vision of the brand through visual elements such as images, colors and design elements, thus arousing the emotional resonance and memory of the audience. It can also help build brand recognition and awareness, attract the attention of the target audience, and create a positive brand impression. Visual image is also the concrete embodiment of corporate cultural value, which plays an important role in improving consumer purchasing power and corporate profitability. The visual image in the eyes of consumers is the embodiment of high quality, high quality and high reputation (Yin et al., 2022). The better the brand image of the enterprise, the more it can meet the consumer demand, the higher its popularity. This shows that the importance of visual image in brand communication can not be ignored. The main means to improve the good brand image of enterprises is to vigorously promote the enterprise brand, such as the use of multimedia and the Internet to launch enterprise products, so that more consumers know the brand (Lin et al., 2022), and then increase the purchasing power of its products. To a certain extent, the visual image of an enterprise depends on the advertising situation, and of course, it also depends on the consumer habits and characteristics, which provides the possibility to enhance the brand awareness of the enterprise and open up the consumer market. Taking the visual experience as the key element of brand image building, the enterprise needs to pay attention to the connotation and function that the vision needs to convey in the long-term development in combination with the market environment, Integrate brand image (Yao & Li et al., 2022). When designing the visual image of an enterprise, the enterprise needs to accurately position its own style, re-examine the market direction in combination with product quality and price, and use visual effects to convey brand culture, brand intent, and brand value. It is also necessary to analyze the audience of the brand according to the characteristics of the product (Sung et al., 2021), design the visual image in combination with the corporate official website, brand logo, brochures, etc., and build the soft power of the enterprise. The visual image of an enterprise can achieve the purpose of information expression by means of self arrangement, painting, graphic design, illustration, etc. (Roy et al., 2021), use color to create spatial image content, and innovate basic composition (Pan, 2022). The design scheme composed of three elements of color, design concept and composition can not only optimize the visual image of the enterprise, integrate and unify it with the enterprise culture, but also reduce the contradiction between the visual image and the enterprise (Chen et al., 2022), and enhance the sense of balance and art of the overall design.

Many researchers have studied the brand communication of enterprises. Lyeonov et al. (2021) studied the key components and parameters of the enterprise's green brand to develop an effective promotion plan. The research used Mark Fetcher model, content analysis and Fishbourne method to

evaluate the green brand of enterprises. The research results verified that the main factor affecting the green brand is the transparency of the company in financial and non-financial results. The non-financial reports regularly released by the company led to increased trust among the stakeholders of leading companies, attract additional financial resources for the company's green development, and improve the brand's communication performance. However, this method requires a large amount of data support, and when faced with a small amount of data, there is a problem of incomplete consideration of key factors, which has limitations; Gregorio et al. (2021) conducted research on the impact of false reviews on corporate brand communication, discussed the theoretical implications of model inconsistency and optimal stimulus level, and determined how to improve the management level of enterprises from the management of online false reviews when user generated content is increasingly important and popular. However, this method faces a certain degree of subjectivity and bias, without considering the interaction and correlation between different factors, resulting in poor reliability of the evaluation results; Hafzullah and Tuncer (2021) used the data interaction of social media users, and used 10 parameters such as diameter, density, reciprocity, centrality and modularity to comprehensively characterize the interaction behavior of Twitter users. Use these parameters to visualize the data and form a new dataset. Use the convolutional neural network model of deep learning to classify user profiles, and formulate relevant strategies to improve the communication level of enterprises through the results of user segmentation. However, this method relies on reliable and representative datasets, which may be affected by factors such as data availability and privacy issues, leading to deviation and uncertainty in the dataset. Poor selection of indicators for brand communication impact can lead to low accuracy of evaluation results and affect the level of enterprise strategy formulation. Based on the above research, in order to solve the problem of selecting indicator factors and analyzing their effectiveness, and further improve the level of brand communication of enterprises, the impact mechanism of visual image on brand communication under a multidimensional interaction model is studied. The multidimensional interaction model can comprehensively consider multiple key factors and systematically analyze and evaluate the impact of multiple factors on brand communication. And through a multidimensional interaction model, it is possible to conduct in-depth research on the interaction and correlation between different factors, which can better optimize the visual image design and strategy in brand communication. It can also quantify and measure the impact of various factors on brand communication, thereby obtaining accurate results and indicators, which helps decision-makers better understand the advantages and disadvantages of brand communication strategies in terms of visual image. Therefore, a multidimensional interactive model is adopted to study the impact mechanism of visual image on brand communication, in order to improve the effectiveness and efficiency of brand communication and provide a basis for enterprise brand communication.

## **2. Impact mechanism of visual image on brand communication**

### **2.1. An overview of the brand's visual image**

Although the word "brand" was first born in the United States, and has been widely used in the global marketing field, each professional word will be defined by scholars at home and abroad. From the consumer's point of view, the brand may be just a noun, a nickname, a logo, a reputation, or even just a symbol used to distinguish other products and so on. Brand is an identification system designed and registered to display product personality and audience information. The implementation of brand strategy by enterprises reflects the core competitiveness of enterprises (Le & Ha, 2021). The competition between enterprises and industries is particularly fierce in this era of high-speed market economy. The competition between them may be said to be a brand competition. In order to obtain a wider audience market, various industries make the difference between commodities smaller and smaller, which makes it more difficult for enterprises to obtain stable consumer groups in the complex market. As a result, the brand communication ability of enterprises is extremely important, and becomes the key factor to win the market. This also enables strong brands to firmly grasp consumers, which can

make potential consumers become loyal consumers. In the current market, who can grasp consumers' eyes and psychology, who can last forever.

A successful brand contains many key elements, through the clever combination of these factors, so that the product brand can be perfectly reflected. However, people often mistakenly think that the visual image of a brand is just a simple combination of logo design and packaging (Lee & Hosanagar, 2021), which is actually a mistake in the cognitive direction. In fact, the visual image of the brand is a comprehensive concept, through a series of marketing activities, to build a collection of associations in the consumer psychology, with a unique style. Therefore, brand image is not just an outer layer, but a chain with various interrelated elements. Today, enterprises attract consumers by changing their visual image and catchy slogans (Ameen et al., 2021). However, visual image is the first way to attract consumers and make the brand stand in the minds of consumers. With the rapid development of social economy, people's cognition and choice of products and enterprises are gradually influenced by spiritual needs. IBM's precision, Apple's powerful and creative mobile phone, KFC's high-quality, standardized and humanized brands all stimulate people's purchase desire. The visual image of Pepsi Cola combines the sea blue color of fresh ice, passion, warm red and clean white. It is young, dynamic and popular, which is very attractive. Its brand proposition: breakthrough desire, encourage young people to have dreams, pursue and seek breakthroughs. Its image deeply touches and affects a large number of young people. Through this visual effect, it firmly catches some young people, as well as people who are eager and brave to challenge and love life.

The core of a brand is its relationship with consumers, who decide the brand value of a product. A good brand visual image is an extremely important determinant that moves consumers to purchase. The visual image of a brand is the first impression in the communication between the brand and consumers. The brand visual image with unique way, color matching, visual impact and certain affinity will often attract more consumers' attention, which is also convenient for consumers to have an identification, initial impression and understanding of the brand. "Brand visual image" is the concentrated embodiment of "brand image" visual communication, and the most important and direct means of transmitting brand information. Brands can use visual effects to provide some beautiful pictures intuitively and vividly, which will make the audience have an aesthetic imagination effect. In the process of creating a brand, it is particularly important to shape the brand image (Zhang et al., 2022). The "visual image" in the brand image can convey the taste and characteristics of the brand to consumers most intuitively. The way and means of expression of products in the cognitive process of consumers are embodied through the visual realization of color, shape and language. Any successful brand will have distinctive recognition in visual performance. It highlights the overall image of brand vision with standardized and personalized colors, symbols, fonts, etc., and will convey a sense of beauty, that is, the beauty of the product in the hearts of consumers. Every well-known brand has its own unique image symbols, such as the blue packaging of Pepsi Cola, the LV logo of Louis Vuitton, and Chanel's Double C to improve the brand communication effect through visual image. The visual image mainly includes image factors, as shown in Figure 1.

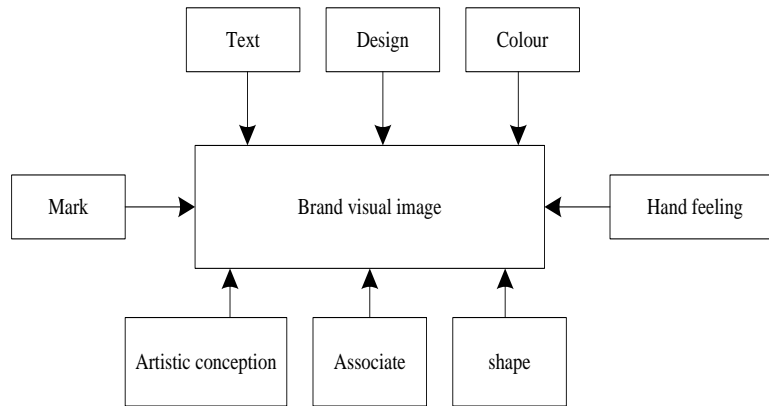


Fig. 1: Brand visual image factor map

It can be seen from Figure 1 that when brand visual image plays the role of brand communication, the information conveyed by visual image to consumers can be roughly divided into the following factors: color, pattern, text, logo, shape, texture, artistic conception, and association.

## 2.2. Role of visual image in brand communication

The visual image of an important role in brand communication, which is mainly reflected in the following aspects: On the one hand, it helps to maintain the brand image of an enterprise. A good corporate visual image is an important support to maintain the corporate image, but also one of the key signs to attract consumers to consume. In the highly competitive brand market, enterprises need to build diversified brands that adapt to diversified market competition. The brand visual image of an enterprise is affected by the corporate culture and values, and a good brand visual image can bring more profits to the enterprise and enhance the status of the enterprise in the eyes of consumers. In addition, the visual image of an enterprise can be divided into external image and internal image, in which the external image is the primary link to guide consumers to consume (Xiong & Pan, 2021), while the internal image is one of the links that affect consumers' shopping intentions. The quality of corporate visual image directly affects customers' consumption behavior, and is also the driving factor of customers' consumption psychology. Enterprises should pay more attention to the maintenance of corporate visual image. Only a good corporate visual image can attract more consumers, gain the trust of consumers, and ultimately enhance the overall brand image of enterprises and increase the added value of products. On the other hand, it drives product sales.

Good corporate visual image is an important factor to drive product sales. The characteristics and performance of the enterprise itself can drive the sales of products, which can promote the promotion of product marketing value. The marketing value of the product needs to combine the characteristics of the product itself and consumer demand to promote consumers' higher awareness of the corporate visual image and products. If an enterprise wants to sell more products, it needs to design a sales plan. The design of the sales plan mainly depends on the quality of the product itself. If the quality of the product itself improves, enterprises can design more flexible sales plans according to the market environment to drive consumer consumption (Huang et al., 2022). If the product quality does not meet the consumer demand or the quality is poor, the enterprise should start from improving the product quality to design products that are more in line with customer demand. The designers of the corporate visual image are important organizations that bring business value to the enterprise (Smith & Johnson, 2022), and are also the main force to enhance the corporate visual image and drive product sales. Use aesthetics to change the appearance and design of products, increase the economic benefits of enterprises on the basis of obtaining consumers' trust in enterprises, and lay the foundation for improving the visual image and product value of enterprises in the future.

### 2.3. Multi-dimensional interactive index mining on the influence of visual image on brand communication

The K-means clustering algorithm is selected to mine multidimensional interaction indicators of visual image and brand communication. Cluster analysis is the process of dividing samples into different categories according to the similarity between sample characteristics in the data set, and requires samples of the same category to have as much similarity as possible, and samples of different categories to have as much difference as possible. When clustering, appropriate sample features and clustering algorithms should be selected according to the actual interaction between visual image and brand communication to achieve better clustering results.

The K-means algorithm is one of the most widely used algorithms in clustering analysis. Its basic idea is: The  $k$  points are the initial cluster centers for clustering, and the objects closest to them are classified and divided. Through the iterative method, the values of each cluster center are updated gradually until the best clustering result is obtained. Assume to divide the sample set of visual image and brand communication into  $c$  categories, the algorithm is described as follows:

Firstly, appropriate select  $k$  value as the initial cluster center;

Then, in the  $N$  iteration, for any sample data, calculate its distance to  $k$  centers, and classify the sample to the class of the center with the shortest distance;

Secondly, update the central value of visual image and brand communication by means of mean value and other methods;

Finally, for all of the  $k$  cluster centers, if the value remains unchanged or the set termination conditions are met after updating by the iteration method of step (2) and step (3), the iteration will be ended, otherwise, the iteration will continue.

The advantage of K-means algorithm is fast and simple  $k$  value needs to be set in advance. The premise for this is that the number of categories contained in the dataset to be clustered is known, but in most cases, the distribution of data in the dataset is not clear. How to effectively determine  $k$  values are extremely important. The algorithm initially selects the cluster center randomly, which may produce unstable clustering results, or even lead to wrong division. Moreover, the algorithm is also sensitive to noise and outlier data. Therefore, it is very important to determine the optimal clustering number and clustering center of K-means algorithm.

In the cluster tree generated from the visual image and brand communication sample dataset  $H_k$  contain  $c$  clusters  $\{G_1, G_2, \dots, G_c\}$ , and each cluster contains  $n_i$  sample data  $i = 1, 2, \dots, c$ , then define the  $i$  cluster evaluation index of class samples  $CS(i)$  is the intra class compact density of this type of sample data  $cd(i)$  and interclass dispersion  $sd(i)$ . The expression is:

$$CS(i) = cd(i) / sd(i) \tag{1}$$

The  $CS$  index reflects the clustering effectiveness of a certain type of samples in the visual image and brand communication data set. The smaller the value of  $CS$ , the better the clustering effect of this type of sample data. For the visual image and brand communication data set  $CS$  the average value of the index value is used to analyze the clustering effect of the data set. The smaller the corresponding average value is, the better the clustering effect of the data set is. That is to say, the number of clusters corresponding to the smallest validity index value is the best number of clusters required. In the following formula  $avgCS(k)$  division of representative visual image and brand communication data set and when there are  $k$  clusters, the corresponding  $CS$  average value of indicators,  $k_{opt}$  represents the optimal number of clusters.

$$avgCS(k) = \sum_{i=1}^k CS(i) / k \tag{2}$$

$$k_{opt} = \arg \min(avgCS(k)), 2 \leq k \leq n \tag{3}$$

When determining the optimal number of clusters in the visual image and brand communication

dataset, it is necessary to determine an effective search range for the number of clusters  $[k_{\min}, k_{\max}]$ . Usually, the minimum number of clusters is 2, that is to take  $k_{\min}$  as 2; For the maximum number of clusters  $k_{\max}$ , according to many research results, there are rules  $k_{\max} \leq \sqrt{n}$ , where  $n$  is the number of samples in the dataset. Based on this, select  $\sqrt{n}$  as the upper bound of the search, consider it as value of  $k_{\max}$ .

The selection of the initial cluster center plays an important role in the clustering process. Different initial cluster centers will lead to different clustering effects. If the initial cluster center is randomly determined, the clustering results will be unstable. The maximum minimum distance algorithm is used to select a better initial cluster center. The maximum minimum distance algorithm is essentially a heuristic algorithm. Its basic idea is to select a new cluster center according to the maximum distance principle, that is, take the data objects as far away as possible as the cluster center, and classify the sample data according to the minimum distance principle to avoid the situation that the initial cluster center is too close when selecting the initial value. The algorithm not only determines the number of initial cluster centers, but also improves the efficiency of sample data division. Assume that the visual image and brand communication data set to be classified is  $D_n$ ,  $D_n = \{x_1, x_2, \dots, x_n\}$ , the selected scale factor is  $\theta$ . The specific steps of the maximum and minimum distance algorithm are as follows:

Firstly, spreading data sets from visual image and brand  $D_n$  select any sample data from as the first cluster center  $c_1$ ;

Then, spreading data sets from visual image and brand  $D_n$ , looking for the sample data with the largest distance value from  $c_1$  take the sample data as the second cluster center  $c_2$ ;

Secondly, calculate the distance of  $d_{ij}$  of other sample data to the cluster center  $c_1$ 、 $c_2$ , find out the minimum value  $d_i$ , where

$$d_{ij} = \|x_i c_j\|, j = 1, 2 \tag{4}$$

$$d_i = \min(d_{i1}, d_{i2}), i = 1, 2, \dots, n \tag{5}$$

Then, when  $d_i = \max(d_i) > \theta \|c_1 - c_2\|$ , sample data  $x_i$  was select as the third cluster center  $c_3$ ;

Next, if already exists  $k$  cluster centers, calculate the sample data that has not been used as cluster centers  $x_i$  distance from each cluster center  $d_{ij}$ , and find  $d_r = \max(\min(d_{i1}, d_{i2}, \dots, d_{ik}))$ , if  $d_r > \theta \|c_1 - c_2\|$ , then the corresponding sample data  $x_r$  as No  $(k + 1)$  cluster centers  $c_{k+1}$ ;

Then repeat the above steps until no new cluster center matching the conditions can be found;

Finally, distribute the sample data of each visual image and brand communication to each cluster according to the principle of minimum distance.

The initial cluster centers selected according to the maximum and minimum distance algorithm will not be too close to each other, so it is easier to obtain good clustering results when clustering. However, the algorithm does not know the number of clusters in advance, so it needs to determine the proportion coefficient  $\theta$  the number of clusters can be obtained by taking the value of as the limiting condition. Set the number of clusters to be known, and do not use the scale coefficient as a constraint. The method to determine the initial cluster center of multidimensional interaction index mining of visual image and brand communication is as follows:

Firstly, according to the sample characteristics of the dataset to be classified, select the sample closest to the average value of all samples as the first initial cluster center  $c_1$ ;

Then, when the number of clusters is 2, select the distance from the sample data to be classified  $c_1$  the farthest sample data serves as the second initial cluster center  $c_2$ . At this time, two initial cluster centers are output;

Secondly, when the number of clusters is 3, calculate the sample data that has not been selected as the cluster center and the two initial cluster centers that have been determined  $c_1$ 、 $c_2$  and find the minimum value between them  $d_i$ , according to  $d_i = \max(d_i)$ , select the  $t$  sample data as the third initial

cluster center  $c_3$ . At this time, three initial cluster centers are output;

Firstly, when the number of clusters is  $k$  and  $k \leq k_{\max}$ , for the confirmed  $k - 1$  initial cluster centers, calculate the distance from each sample data not used as the cluster center to each initial cluster center  $d_{ij}$ , calculated  $d_r = \max(\min(d_{i1}, d_{i2}, \dots, d_{i(k-1)}))$ , select the  $r$  sample data as the  $k$  initial cluster centers, output  $k$  initial cluster centers at this time.

The initial cluster center obtained through the above steps has a certain stability and effectiveness, so that unstable clustering results can be avoided in the subsequent clustering process. Therefore, on the premise of knowing the number of clusters, it is easier to obtain better clustering results by using the maximum and minimum distance algorithm to calculate the initial cluster center.

#### **2.4. Construction of multidimensional interaction model of visual image and brand communication influence mechanism**

Using multidimensional interaction model to study the impact mechanism of visual image on brand communication, it is necessary to build a model of the role of visual image on the influencing factors of brand communication effect, put forward the research hypothesis of influencing factors, test the hypothesis of each influencing factor, and determine the impact mechanism of visual image on brand communication.

By using K-means clustering algorithm, the multi-dimensional interaction index of visual image and brand communication is mined, and the multi-dimensional interaction model of the impact mechanism of visual image and brand communication is constructed. The components of a multidimensional interaction model usually include the following elements: brand touch points, consumer engagement, interaction influencing factors, feedback and response, and interaction effects. The components in this model are closely related to visual branding and work together to influence the interaction between consumers and brands. Among them, visual brands communicate brand image and values through brand touch points, and well-designed brand visual elements (such as logo, color, typography, etc.) can resonate with consumers, making them more willing to interact with the brand and participate in the brand's activities. Interactive influencing factors play an important role in influencing consumers' interactive behaviors towards brands. A unique and attractive brand visual system helps to shape the brand's identity and personality, thus causing consumers' positive interaction and interaction effect, so as to provide effective information for enterprise strategy formulation. Based on this, brands can continuously optimize and adjust their visual brand strategy by interpreting and responding to consumer feedback. The interaction between the visual brand and consumers directly reflects the effect of the interaction between the visual brand and consumers, which will further affect the brand's reputation and market position, forming a virtuous circle. To sum up, having a strong and consistent visual brand experience can enhance consumer engagement, shape a good brand image, and bring about positive interactive effects. Therefore, when building and managing a visual brand, it is necessary to consider the various components of the multi-dimensional interaction model to ensure that the interaction between the brand and the consumer can achieve the best results. The interactive influencing factors play a key role, which can help the brand to establish effective and sustained interaction with consumers, and enhance the brand's influence and market competitiveness. Therefore, based on the multi-dimensional interactive indicators mined above, the multi-dimensional interactive model is constructed. Among them, the multidimensional interaction indicators include eight public factors: communicator attitude and ability, visual image content, communication mode channels, brand awareness, enterprise-employee interaction quality, employee-customer interaction quality, enterprise-customer interaction quality, and customer satisfaction. Public factors affect the brand communication effect through joint action, but each factor has different influence, influence degree and influence way, and the interaction between factors is also different. It is precisely because of these differences that it is necessary to adopt a multidimensional interactive model to complete the research on the influence



mechanism of visual image and brand communication, so as to effectively solve the problems of the selection of indicator factors and the effectiveness of analysis, so as to improve the effect and benefit of brand communication and provide a basis for the brand communication of enterprises.

Communication means and channels include two influencing factors, namely, "communication means" and "communication media", which are embodied in the ways and channels of enterprises to disseminate information. The methods and channels of spreading visual image will not only affect the effective embodiment of the content information, but also affect the establishment of the corporate visual image, thus affecting the maintenance of the long-term relationship between consumers and enterprises. The choice of communication mode and channel will affect the content of visual image communication and the maintenance of corporate visual image and organizational relationship.

The attitude and ability of communicators include three influencing factors: corporate culture, motivation and professionalism of communicators. They mainly refer to the values formed by the enterprise in the long-term operation process, the intensity of the purpose of information dissemination and the professional level displayed in the dissemination of product information. The value concept formed in the long-term operation of an enterprise will affect the visual image and organizational relationship of the enterprise, while the professionalism and purpose of the communicator will affect the effectiveness of the communication content and the selection of suitable communication channels. The attitude and ability of the communicator will have an impact on the communication channel, the communication content of the corporate visual image and the maintenance of organizational relations.

The content of corporate visual image communication refers to the level of effective information communication and the overall image formed in the contact with the outside world. The specific content of the visual image information communicated by the enterprise directly affects the brand image of the enterprise. The establishment of the visual image of the enterprise is the overall image of the enterprise in contact with the outside world, which will affect the relationship between the enterprise and consumers.

The interaction between visual image and brand communication is a three-dimensional concept, including employee customer interaction, enterprise customer interaction and enterprise employee interaction. Employee customer interaction and enterprise customer interaction belong to external interaction, and enterprise employee interaction belongs to internal interaction. For the relationship between enterprise employee interaction and employee customer interaction, the internal service level of an enterprise affects employee satisfaction and loyalty, and then affects the external service level of an enterprise through employee performance. Since both employees and customers are "customers" of the enterprise, the two interaction signals are sent by the enterprise. They have the same signal source and have logical consistency. Based on the interactive dimension of visual image and brand communication, the following assumptions are proposed:

H1: The quality of enterprise employee interaction has a positive impact on the quality of employee customer interaction.

H2: The quality of enterprise customer interaction is positively related to the quality of enterprise employee interaction.

Brand awareness and brand visual image are the main driving factors of corporate brand communication. Brand awareness is the primary and basic factor. Customers' recognition and recall of brands affect their willingness to repurchase and play an important role in customers' purchase decisions. The brand visual image brought by strong and unique brand association is an important prerequisite for building and measuring brand communication effect. Customer loyalty is an important factor that determines the profits of enterprises. The purpose of enterprises to take various measures to improve the effect of brand communication is to obtain customer loyalty.

Brand loyalty is a high-level core driving factor of service brand equity. From the perspective of

external service quality, some scholars believe that external service quality directly affects brand loyalty, while most scholars believe that external service quality only affects brand loyalty through customer value and customer satisfaction. From the perspective of internal service quality, the theory of service profit chain believes that internal service quality affects employee satisfaction and loyalty, then affects external service quality, and then affects customer satisfaction and value and brand loyalty through the external embodiment of quality. External interaction quality is a direct impact, internal interaction quality is an indirect impact, service quality is the main influencing factor of customer satisfaction, and there is a strong positive correlation between service quality and customer satisfaction. Customers will be satisfied only when they think the service quality provided by the enterprise is high and exceeds their expectations. Therefore, the following assumptions are proposed:

H3: The quality of employee customer interaction has a positive impact on customer satisfaction.

H4: The quality of enterprise customer interaction has a positive impact on customer satisfaction.

The higher the attitude and ability of communicators to spread the corporate visual image, the better the brand awareness. This paper proposes the following assumptions:

H5: Corporate culture has a positive impact on brand awareness.

H6: The motivation and attitude of communicators have a positive impact on brand awareness.

H7: The professionalism of communicators has a positive impact on brand awareness.

In the enterprise profit chain model, it is clearly pointed out that customer satisfaction is an important influencing factor of brand loyalty and has a direct impact on brand communication effect. Therefore, this paper proposes the following assumptions:

H8: Customer satisfaction has a positive impact on brand communication.

The content of visual image is the brand association in customer memory, reflecting the intuition of a brand, including reputation and uniqueness. The reputation of brand association is related to whether customers believe that the brand can meet their needs, whether customers are satisfied with the uniqueness of brand association is related to brand positioning, and whether customers gain value. The visual image of a brand is the overall perception and perception of the brand by customers resulting from the brand's long-term contact with customers. The service brand image in customers' minds is derived from the quality of their contact and interaction with service enterprises and service personnel. Selecting customer value and customer satisfaction as the embodiment factors of multidimensional interaction quality among enterprises, employees and customers has an impact on the content of visual image. Therefore, the following assumptions are proposed:

H9: The content of visual image has a direct impact on customer satisfaction.

H10: The content of visual image has a direct impact on customer value.

Brand awareness refers to the number of contact experiences with a brand accumulated in customer memory. High brand awareness means that customers have high cognitive sensitivity and strong positive "prejudice" towards the brand, which is activated when customers recall various brands to seek specific attributes and benefits compared with competitive brands. These specific attributes and benefits that satisfy customers are affected by the communication channels of the brand's visual image. This paper believes that there is a correlation between communication modes and channels and brand awareness. Therefore, this paper proposes the following assumptions:

H11: Communication mode is directly related to brand awareness.

H12: Media is directly related to brand awareness.

### **3. Empirical analysis results**

#### **3.1. Sample and data collection**

On the basis of the above model, multiple key factors can be comprehensively considered and the

advantages of interaction and correlation among different factors can be deeply studied. Various variable indicators obtained can be analyzed, and then information about brand communication and visual image can be collected through questionnaire survey, interview, observation and other methods. To get information about brand communication and visual identity. Then, appropriate data analysis methods are used to analyze the collected data, so as to systematically analyze and evaluate the influence of multiple factors on brand communication, and put forward the above 12 hypotheses about the influence of visual image on brand communication. Then, to illustrate the validity of the proposed method, the hypothesis is tested. Select 10 enterprises in different industries, including tourism, hotel catering, financial services and mobile communications. The sample is collected in a city with relatively developed service industry. In order to make the sample drawn universal, based on the criteria of selection representativeness and availability, one enterprise was selected from each survey industry, such as Guangzhilv in tourism, McDonald's in catering and hotel industry, Bank of China in financial services industry, and China Mobile in mobile communication industry. The service enterprises selected by various industries also have certain brand influence, ensuring the representativeness of the sample and the reliability of the survey results.

This questionnaire survey lasted for 12 months, and a total of 1000 effective interaction samples were collected (500 samples of front-line employees and 500 samples of customers of service enterprises, and the interactive contact between employees and customers corresponded one by one, forming an interactive matching unit). All items in the questionnaire are positive descriptions. Except for the demographic characteristics, the questionnaire is evaluated using the Likert 7-point scale. The higher the score, the stronger the degree of agreement. "1" means completely disagree, and "7" means completely agree. The questionnaire is completely filled in by the interviewee, and the investigators answer the questions raised by the interviewee in this process to ensure the authenticity and integrity of the collected data. The distribution of the total number of samples in each industry and the number of samples in each subject in the questionnaire survey is basically average.

Before the verification, SPSS 22.0 statistical analysis software was first used to analyze the multidimensional interactive indicators of visual image and brand communication by K-means clustering algorithm, so as to illustrate its effectiveness and ensure the accuracy of subsequent verification results. Secondly, the collected questionnaire survey data is analyzed through reliability and validity test to explain the validity of the collected data and ensure the reliability of the subsequent verification results. Finally, based on the above analysis results, the AMOS structural equation model method in SPSS statistical analysis software is used to test the 12 hypotheses proposed above, and the impact of visual image on brand communication under the multi-dimensional interactive model is analyzed and studied.

### 3.2. Descriptive statistical results

This paper uses SPSS 22.0 statistical analysis software to conduct descriptive statistical analysis on the variables of the impact mechanism of visual image on brand communication under the multi-dimensional interaction model. The analysis results are shown in Table 1.

Table 1: Results of descriptive statistical analysis of variables

Variable sequence number	Variable name	Item quantity	Mean value	Standard deviation
1	Quality of enterprise-employee interaction	3	2.654	0.254

2	Quality of employee-customer interaction	5	2.548	0.354
3	Quality of enterprise-customer interaction	7	2.575	0.185
4	Brand awareness	6	2.648	0.165
5	Brand visual image	5	2.584	0.345
6	Customer satisfaction	7	2.615	0.285
7	Corporate culture	6	2.515	0.145
8	Communicator motivation and attitude	5	2.514	0.125
9	Communicator professionalism	4	2.558	0.164
10	Customer value	5	2.648	0.384
11	Visual image content	6	2.665	0.285
12	Mode of transmission	7	2.745	0.132
13	Media	6	2.594	0.254

The questionnaire used a 5-point scale with an average of 2.5 points. It can be seen from the descriptive statistical analysis of variables in Table 1 that the average values of each variable index factor are all higher than 2.5 points, among which the average values of the communicator's motivation and attitude and corporate culture are 2.514 and 2.515 respectively, which are relatively low. It shows that people think the level of communicators' motivation, attitude and corporate culture needs to be improved. The average value of the other indicators is high, which indicates that the public thinks the ability level of brand awareness and customer satisfaction is at the medium level. It can be shown that the multi-dimensional interactive indicators excavated are effective and can provide reliable support for the multi-dimensional interactive model to realize the impact analysis of visual image on brand communication.

### 3.3. Reliability and validity test

The reliability and validity test is a statistical method to test whether the sample data is reasonable and effective. It is a necessary step before the empirical analysis of the questionnaire. Only if the reliability and validity test results of the questionnaire data are qualified, can the questionnaire survey be effective and reliable and can be used for empirical analysis.

The Alpha coefficient method in SPSS software is used to test the reliability of the questionnaire, that is, to calculate the Cronbach's Alpha value of the questionnaire. The test results are shown in Table 2.

Table 2: Reliability test results

Variable name	Cronbach's Alpha value
Quality of enterprise-employee interaction	0.824
Quality of employee-customer interaction	0.864

Quality of enterprise-customer interaction	0.854
Brand awareness	0.924
Brand visual image	0.915
Customer satisfaction	0.845
Corporate culture	0.864
Communicator motivation and attitude	0.874
Communicator professionalism	0.905
Customer value	0.846
Visual image content	0.835
Mode of transmission	0.847
Media	0.846
Total	0.864

According to the experimental results in Table 2, under the multi-dimensional interaction model, the Cronbach's Alpha value of each research variable in the analysis of the impact mechanism of visual image and brand communication is higher than 0.7, and the total Cronbach's Alpha value of the variable is 0.864, which passes the reliability test, indicating that the survey data is true and effective. It is suitable for analyzing the impact mechanism of visual image and brand communication under the multi-dimensional interaction model.

The KMO value and Bartlett's sphericity are used to test the validity of the questionnaire for the analysis of the impact mechanism of visual image and brand communication under the multi-dimensional interaction model. The test results are shown in Table 3.

Table 3: Validity test results

Index		Numerical value
KMO metric		0.975
Approximate chi-square		3054.85
Sphericity test	Degree of freedom	175
Significance probability		0.000

It can be seen from the validity test results in Table 3 that the KMO value of the test results is equal to 0.975, greater than 0.9, which meets the test requirements, and the significance probability of Bartlett sphericity test is 0.000. Table 3 shows that the questionnaire questions set for this study are reasonable

and effective, and can meet the research needs of this survey. In summary, the analysis results show that the collected data has a high application type and can be effectively used to analyze the influence mechanism of visual image and brand communication under the multidimensional interactive model, providing reliable data and information support for its analysis to ensure the reliability of the analysis results.

**3.4. Hypothesis test results**

Using the AMOS structural equation model method in SPSS statistical analysis software, the 12 hypotheses proposed above are tested. This paper uses the maximum likelihood method of AMOS structural equation model to analyze the correlation between variables. The hypothesis test results are shown in Table 4.

Table 4: Test results of hypothesis relationships

Hypothesis	Hypothetical path	Non-standardized path coefficient	Standardized path coefficient	CR	Conclusion
H1	The quality of enterprise-employee interaction has a positive impact on the quality of employee-customer interaction.	0.382	0.415	5.945 ***	Support
H2	The quality of enterprise-customer interaction is positively correlated with the quality of enterprise-employee interaction.	0.485	0.512	3.524 ***	Support
H3	The quality of employee-customer interaction has a positive impact on customer satisfaction.	0.615	0.594	2.845 **	Support
H4	The quality of enterprise-customer interaction has a positive impact on customer satisfaction.	0.898	0.453	1.982 ***	Support
H5	Corporate culture has a positive impact on brand awareness.	0.564	0.557	2.648 ***	Support
H6	The motivational attitude of communicators has a positive impact on brand awareness.	0.648	0.665	3.854 ***	Support
H7	The professionalism of communicators has a positive impact on brand awareness.	0.518	0.498	2.648 ***	Support
H8	Customer satisfaction has a positive impact on brand communication.	0.845	0.424	1.992 ***	Support
H9	Visual image content has a direct impact on customer satisfaction.	0.584	0.615	4.854 **	Support

H10	Visual image content has a direct impact on customer value.	0.845	0.815	6.844 ***	Support
H11	There is a direct correlation between communication mode and brand awareness.	0.754	0.805	7.514 **	Support
H12	There is a direct correlation between media and brand awareness.	0.861	0.845	2.845 ***	Support

As can be seen from the test results in Table 4, all the 12 hypotheses proposed in this paper have been confirmed, and the CR value of each hypothesis is higher than 1.96, indicating that the hypotheses are significant and important. When studying the impact mechanism of visual image on brand communication, among the multidimensional interaction relationships, when the quality of enterprise employee, employee customer and enterprise employee interaction is high, enterprises, employees and customers have high satisfaction. Therefore, the quality of enterprise employee interaction has a positive impact on the quality of employee customer interaction. The quality of enterprise customer interaction is positively related to the quality of enterprise employee interaction. When the quality of employee customer interaction and enterprise customer interaction is high, there is a positive impact on customer satisfaction. Corporate culture, communicator's motivation and attitude, and communicator's professionalism are important expressions of communicator's attitude and ability. When communicators communicate visual images, with good attitude and high ability, enterprises can obtain ideal brand communication effects. The higher the customer satisfaction, the better the brand communication effect of the enterprise. The content of an enterprise's visual image directly affects customer satisfaction and customer value. The higher the quality of the visual image, the higher the customer satisfaction and customer value. The communication channels of visual image have a high correlation with the brand awareness of enterprises. When enterprises adopt effective communication methods and media, they will enhance the brand awareness of enterprises and obtain ideal communication effects. Through comprehensive analysis of the above hypothesis verification results, when enterprises, employees and customers have a good interaction relationship, the brand's communication effect is relatively ideal through high-quality visual image, effective communication methods and media, and effectively enhance the brand's popularity. Multidimensional interactive quality is an important driving factor of brand communication. Multidimensional interactive quality has a significant positive impact on brand awareness through customer value and customer satisfaction. Enterprises should influence the level of brand communication by effectively fulfilling their brand commitments. Service enterprises should have a high-quality visual image, select effective communication methods and media, and facilitate customers to receive information and respond, so as to form a successful interaction.

In general, the results obtained by the proposed method have high reliability, which has important guiding significance for enterprises to formulate brand communication strategies and enhance brand awareness. By establishing a good interactive relationship, paying attention to the quality of visual image, and choosing suitable communication methods and media, enterprises can improve the brand communication effect and customer satisfaction, and enhance the competitiveness of the brand in the market.

#### **4. Conclusion**

The brand image of an enterprise plays a pivotal role in defining its distinct style and identity. The visual

image of the enterprise serves as a powerful vehicle not only for conveying information but also for establishing a strong brand identity in the hearts of consumers, thus creating significant brand value. Through the lens of the multi-dimensional interaction model, this study has constructed an insightful framework to analyze the impact mechanism of visual image on brand communication, offering valuable insights to related enterprises.

The visual image of an enterprise, coupled with the dynamic interactions among the enterprise, employees, and customers, significantly influences the marketing value of the enterprise, product sales volume, and brand positioning. Therefore, enterprises must prioritize the promotion of a compelling visual image and conduct thorough market research to identify a brand image that resonates with their target audience. This strategic approach not only facilitates entry into the international market but also elevates the value of product marketing.

By analyzing the impact of visual branding on brand communication and recognizing the importance of visual image, enterprises should invest in recruiting talented designers to create visually appealing performances to meet the needs of consumers. By fostering effective multi-dimensional interactions, businesses can use their visual image as a powerful tool for brand communication. This is a necessary condition for success in the fierce market competition and ultimately to maximize economic benefits. In conclusion, this study highlights the paramount significance of visual image and multi-dimensional interaction in shaping an enterprise's success. By understanding the profound impact of visual branding and harnessing it as a medium for brand communication, enterprises can thrive in the dynamic market landscape, ultimately leading to enhanced economic prosperity.

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