Research Article

Brand Identity and Technological Innovation: Evolution from Traditional to Variable Visual Identity Design

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ARTICLE INFO	ABSTRACT
	In today's digital era, brand visual identity design is undergoing unprecedented changes. With the rapid development of the Internet, mobile technology and social media, the traditional static visual identity system gradually reveals its limitations and is difficult to adapt to the diversified and fragmented modern communication environment. Brands are faced with many challenges such as how to stand out in the age of information explosion and how to establish a deeper emotional connection with increasingly discerning consumers. Against this background, variable visual identity design has emerged as a new trend in brand visual communication. This study aims to explore the evolution of brand visual identity design from traditional static mode to variable design, and analyze the technological drivers and socio-cultural factors behind this shift. By comparing the characteristics, advantages and disadvantages of traditional and variable visual identity design, this study reveals the impact of this evolution on brand image building and communication effectiveness, as well as the implications for the design industry. Using a literature review and case study approach, the study examines three typical cases, namely LA28 Olympic Games, Eurovision Song Contest 2020 and Schwanensee, to illustrate the advantages and potentials of variable visual identity design in concrete practice. The findings show that variable visual identity design, with its flexibility, diversity and interactivity, can better adapt to modern communication environments and enhance the interactivity and engagement between brands and their audiences. Technological innovation is a key factor driving this evolution, with emerging technologies such as artificial intelligence, big data, and virtual reality providing unprecedented innovation possibilities for visual design. Variable design not only enhances brand recognition and emotional connection, but also provides brands with broader creative space and expression. The theoretical contribution of this study is to reveal the evolving trends in brand visual identity design, providing brand managers and design practitioners with insights into the future direction of visual design, as well as practical guidance on how to effectively shape and communicate brand images in the digital age. The study points out that the future of brand visual identity will be more dynamic, interactive and personalized, and designers will need to acquire interdisciplinary knowledge and skills to create variable visual identity solutions that are truly user-centric. This study provides a theoretical foundation and practical reference for the innovative development of brand visual communication in the digital era. **Keywords:** brand identity; technological innovation; visual identity; design evolution

1 INTRODUCTION

In today's digital era, brand visual identity design is undergoing unprecedented changes. With the rapid development of the Internet, mobile technology and social media, the traditional static visual identity system is gradually showing its limitations, making it difficult to adapt to the diversified and fragmented modern communication environment. Brands are faced with many challenges such as how to stand out in the age of information explosion and how to establish a deeper emotional connection with increasingly discerning consumers. Against this background, variable visual identity design has emerged as a new trend in brand visual communication.

This study aims to explore the evolution of brand visual identity design from traditional static mode to variable design, and analyze the technological drivers and socio-cultural factors behind this shift. By comparing the characteristics, advantages and disadvantages of traditional and variable visual identity design, this study attempts to reveal the impact of this evolution on brand image building and communication effects, as well as the implications for the design industry.

The study hypothesizes that variable visual identity design can be better adapted to modern communication environments, enhance brand interaction and engagement with audiences, and thus enhance brand recognition and emotional connection. At the same time, this study hypothesizes that the implementation of variable design will face technical, creative, and brand consistency challenges.

Based on the above background and assumptions, this study asks three core questions:

(1) What are the main drivers of the evolution of traditional visual identity design to variable design?

(2) How does variable visual identity design affect the relationship between a brand and its audience?

(3) What are the key factors that brands and designers need to consider when implementing a variable visual identity design?

By exploring these issues, this study aims to provide brand managers and design practitioners with insights into the future trends of visual identity design, as well as practical guidance on how to effectively shape and communicate brand images in the digital age.

The study and organization of literature found that brand visual identity design, as a key element of brand image building, has been the focus of attention in academia and industry. First of all, with the rapid development of digital technology and changes in consumer needs, brand visual identity design is experiencing a shift from traditional static mode to variable design.The study of Cuong and Khoi (2019)[1] shows that brand image has a significant impact on consumer satisfaction and loyalty.Rossolatos (2014)[2] , on the other hand, explores brand image in advertising films from a semiotic perspective rhetorical structure of brand image in commercials, which provides new perspectives for understanding brand visual communication. These studies emphasize the importance of visual identity in brand image building and lay the foundation for this paper to explore the evolution of visual identity design.

Second, the historical evolution of visual identity design has also been the focus of scholars.Gorman (2017)[3] examines the role of trademark law in the history of visual identity design in the United States, revealing the impact of legal factors on design practice.Anguera (2018)[6] demonstrates the longterm evolution of design styles and philosophies by examining the 60-year history of graphic design in Catalonia. These studies provide valuable perspectives for understanding the historical lineage of visual identity design.

Third, in the context of globalization, the influence of cultural factors on visual identity design has also attracted the attention of scholars.Hu (2020)[4] explores the application of traditional Chinese symbols in contemporary tea packaging design, reflecting the importance of traditional cultural elements in modern design.Runtić and Pejić (2017)[5] , on the other hand, through the analysis of the logo controversy of the Washington Redskins, explore the relationship between visual sovereignty and the the complex relationship between cultural identity. These studies highlight the important role of cultural factors in visual identity design and provide a reference for understanding design strategies in different cultural contexts.

Fourth, with the development of digital technology, the media and forms of visual identity design are also expanding. Zhang and Hong (2022)[8] studied the design and production of visual images for print advertisements based on mobile media, reflecting the impact of the new media environment on visual design. Liu (2022)[10] , on the other hand, explored the method of animation special effect production and artistic color research based on visual communication design, revealing the potential of dynamic visual elements in brand communication. These studies provide important references for understanding the new trends of visual identity design in the digital era.

Finally, the impact of visual design on consumer perception and behavior is also one of the current directions of academic research.Torrico (2022)[9] examined the impact of wine label design and origin information on consumers' visual, sensory, and emotional responses, emphasizing the important role of visual design in product marketing.Sellars (2015)[7] , on the other hand, explored visual images from an optical and anatomical perspective construction, providing new perspectives for understanding visual perception.

A comprehensive analysis reveals that existing literature has explored various aspects of visual identity design from a variety of perspectives, including brand image, design history, cultural factors, technological development and consumer perception. However, there are still fewer systematic studies on the evolution of visual identity design from traditional static mode to variable design. Based on the existing literature, this study will delve into this evolutionary process, analyze its drivers and influences, and provide new insights for understanding brand visual identity design in the digital era.

2 THE BASIC CONCEPT OF BRAND VISUAL IDENTITY DESIGN

Brand visual identity design refers to the design process of using visual elements to convey brand concepts and shape brand image. It is an important part of the brand's overall image strategy, and plays a key role in establishing brand recognition and enhancing brand awareness and loyalty. This type of visual system can be divided into five core elements:

(1) Logo: As the visual symbol of the brand, Logo is the core of the visual identity system, which presents the unique personality of the brand in a simple and eye-catching graphical way.

(2) Color scheme: The brand's exclusive color scheme can trigger emotional resonance and convey the brand's atmosphere and tone. Uniform and recognizable use of color can strengthen the consistency of the brand image.

(3) Typography: Exclusive fonts or specifications for the use of fonts are another important component of the visual identity system. The choice of font style needs to complement the brand temperament and maintain a high degree of unity in various application scenarios.

(4) Graphic elements: auxiliary graphics in addition to the Logo, used to enrich the visual performance and strengthen the recognition. The design of graphic elements needs to be harmonized with the Logo and the overall visual style.

(5) Application specification: Guidelines for the application of visual identity on various types of carriers, so as to ensure the correct and consistent use of brand visual assets in different scenarios and media.
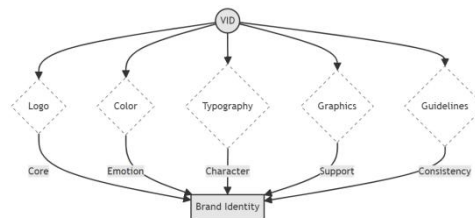

Figure 1 Five core elements of brand visual design

Scientific and systematic brand visual identity design can shape a distinctive brand personality, establish an emotional connection between the brand and the audience, and maintain a highly consistent brand image in diversified communication channels, thus deepening brand equity and enhancing brand value. At present, brand visual identity design is in the stage of continuous evolution. Emerging communication channels such as the Internet, mobile, and social media have put forward new requirements for visual design, and dynamization, interactivity, and personalization have gradually become the new trend of visual design. Against the background of this trend, this study hopes to review and analyze the main features of traditional visual identity design and its limitations, and clarify the difference between it and modern variable visual design. On this basis, the fundamental evolution process is explored in depth to provide theoretical and practical references for future design.

3 CHARACTERISTICS AND LIMITATIONS OF TRADITIONAL VISUAL IDENTITY DESIGN

3.1 Traditional Visual Identity Design Core - Fixed Logo

In traditional brand visual identity design, Logo as the core visual symbol carries the expression of brand personality and values. By virtue of its consistency and continuity, fixed logo design plays a key role in shaping brand image and establishing brand awareness, and belongs to the important core of traditional design concept. The greatest advantage of this type of logo design is its high degree of recognizability and memorability. The streamlined and unique graphic can stand out among many visual messages, giving the audience a deep and lasting impression. The repeated appearance of the logo can also deepen the audience's memory and establish a close link between the brand and the logo. After a long time of precipitation and dissemination, the logo itself becomes a symbol of the brand, carrying the brand's connotation and value.
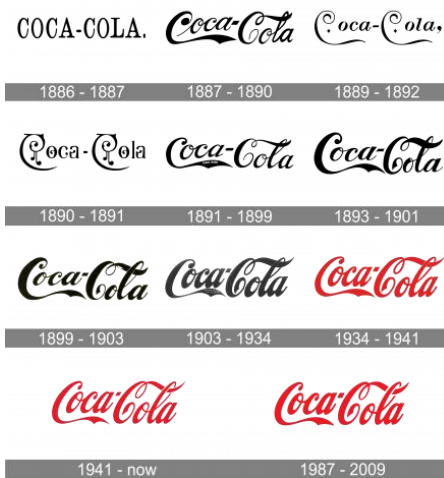
Figure 2 History of classic Coca-Cola logo changes

Taking the classic Coca-Cola logo shown in Figure 2 as an example, the evolution of its logo fully reflects the advantages of fixed logo design. From 1886 to the present, although the logo has gone through many adjustments, its core element - the unique floral font - has always remained unchanged, and this consistency has effectively enhanced the brand's recognition and memorability. In the early black-and-white design phase (1886-1903), the Coca-Cola Logo had already established its distinctive font style, laying the foundation for future development. Over time, the evolution of the Coca-Cola logo demonstrated the flexibility and adaptability of the fixed design, with the introduction of the distinctive red color in 1934, which not only enhanced the visual impact, but also became the brand's signature color. This change demonstrates how a fixed logo can adapt to new design trends and market needs while keeping the core elements intact.

From an application perspective, fixed logos have excellent cross-media applicability. Whether in print, on outdoor billboards, on digital screens, or in mobile app interfaces, fixed logos maintain their design integrity and ensure a high degree of consistency in the brand's visual identity. This consistency is essential for building unified brand awareness and fostering brand loyalty. Moreover, a classic fixed logo design can stand the test of time and become a visual testament to a brand's history. By ensuring the continuity of a famous brand's logo, the brand is able to maintain brand equity and build brand reputation over a long period of time. Even when a brand's image is being renewed, retaining the core elements of the logo can serve to pass on the brand's legacy and continue the brand's personality.

3.2 Design Components of Traditional Visual Identity - Static Element Planning

In the traditional brand visual identity system, other visual elements other than Logo, such as exclusive colors, fonts, graphics, etc., are also widely used in all kinds of brand carriers in a static manner. From print materials, outdoor advertising to product packaging and store displays, the consistent application of these static visual elements plays an important role in establishing a unified brand visual image and enhancing brand recognition.

Figure 3 Nike's static element design

Taking the visual identity system of Nike in Figure 3 as an example, its iconic "Swoosh" graphic logo and brand name "NIKE" adopt simple and powerful white design, which contrasts with the black background, and this high-contrast color scheme effectively strengthens the brand's visual impact and memorability, and shows how to strengthen the brand identity through the reasonable use of colors. Moreover, Nike's brand slogan "JUST DO IT" also adopts a simple and powerful font design. The choice of fonts is highly consistent with the brand's positive and dynamic image, which realizes the goal of conveying the brand's personality and values through the font style. The standardized use of fonts also ensures the consistency of the brand's message across various media, effectively maintaining the brand's tone.

On this basis, Nike has further extended a number of graphic elements, such as the simplified version of the "Swoosh" and the "Jumpman" (the silhouette of a basketball player) shown at the bottom of Figure 3. These elements not only increase the diversity of the brand's visual expression, but also can be flexibly utilized according to different product lines or marketing activities, demonstrating the flexibility of static elements in adapting to different application scenarios. It can be found that Nike's visual design shows how to build a unified and distinctive brand visual identity system through the systematic planning of static elements such as logos, colors, fonts and auxiliary graphics. This design approach ensures the consistency of the brand image in various application scenarios, and at the same time provides enough space for the brand's visual expression.

With this extension, it can be clear that a unified and standardized application of visual elements can ensure that the brand achieves visual consistency across different touchpoints, thus strengthening brand identity and deepening audience impression. For example, the repeated use of the brand's exclusive color can establish a link between the color and the brand, and enhance the brand's emotional appeal. For brand visual fonts, they can also be used as the focus of communication adjustments, so that the font style is consistent with the brand's application function, achieving the effect of maintaining the brand tone and conveying the brand's personality. The application of graphic elements other than colors and fonts can enrich the visual language of the brand and enhance the diversity and hierarchy of visual communication.

However, in a time of information explosion and media fragmentation, static visual elements are also facing the challenge of insufficient attraction and declining impact. Single, repetitive visual forms are difficult to stand out in a complex information environment and are not conducive to building an interactive relationship between the brand and its audience. These limitations have prompted brand visual identity design to develop in the direction of dynamization, diversification and interaction, in order to better adapt to the digital communication environment and enhance the effectiveness of brand visual communication.

3.3 Modernization Challenges to Traditional Visual Identity Design Systems

After entering the digital era, the traditional visual identity system has gradually exposed its limitations, and it is difficult to fully adapt to the ever-changing communication environment and audience needs. In the face of a series of challenges such as media fragmentation, information overload and aesthetic change, the static and single visual identification method cannot effectively maintain its communication effectiveness, and is in urgent need of change and innovation.

For example, in the digital context, information dissemination is characterized by media fragmentation. The rise of the mobile Internet and social platforms has made the reach of brand information more diversified, but it has also led to more dispersed audience attention. In the fast-paced communication environment of short videos and information streams, it is difficult for static and single visual identity elements to quickly catch the audience's eyes, and their communication effect is greatly reduced. How to use the new media to enhance the attractiveness and infectiousness of brand visual content has become an urgent problem to be solved.

Moreover, information overload poses new challenges to brand visual communication. In the era of information explosion, audiences receive huge amount of information every day, and brand visual identity faces unprecedented competitive pressure. Fixed and unchanging visual forms are difficult to stand out in the complex information environment, and it is difficult to establish effective interaction with the audience. Brands need more flexible and versatile visual expressions to enhance the recognition and memorability of brand messages.

In addition, the aesthetic tendency of the audience in the Internet era has also changed significantly. Digital natives prefer more personalized and interactive visual experiences, and have higher demands for freshness and participation in visual content. It is difficult to satisfy this demand with uniform brand visual images, and brands need to create more diversified and flexible visual identity assets to meet the aesthetic expectations of the new generation of audiences.

In the face of various challenges, technology-driven visual design innovation has become the key to break through the bottleneck. The iterative upgrading of digital technology has brought new possibilities for brand visual identity, and dynamic, data-driven and intelligent design concepts have emerged. With the power of technology, brands are expected to break through the limitations of traditional visual identity and create a new situation of more flexible, diversified and attractive visual communication. With the support of new technologies, variable visual design stands out among many design concepts and has become the first choice for modernized brand image and technological innovation.

4 THE RISE AND DEVELOPMENT OF VARIABLE VISUAL IDENTITY DESIGN

4.1 Technology-driven changes in visual design

In the wave of the digital era, technological innovation has brought new development opportunities and change momentum to the field of visual design. The rapid development of digital technology not only changes the way of information dissemination, but also provides visual design with new creative tools and forms of expression. The integration of technology and design has given birth to a series of new ideas and methods, promoting visual design from static to dynamic, from single to multiple.

The fragmentation, real-time, and interactivity of online platforms and social media have prompted designers to explore more flexible, dynamic, and attractive forms of visual expression to adapt to the communication needs in the digital media environment. At the same time, data analysis, artificial intelligence and other technologies are beginning to be widely used in the field of visual design. Big data analysis technology can provide insight into user behavior and preferences, provide data support for design decisions, and help brands create a more personalized and precise visual experience. The breakthroughs of artificial intelligence technology in image recognition and automatic generation have also opened up a new creation path for visual design, improving design efficiency and diversity.

Driven by technological innovation, emerging design concepts such as parametric design and algorithmic generative art are beginning to receive widespread attention in the industry. Designers can utilize programming technology to create variable and generative visual works by setting parameters, rules and algorithms. This novel creation mode breaks through the fixed thinking of traditional visual design, gives visual images more prominent flexibility and adaptability, and provides new solutions for brand visual identity. In the mingling of technology and design, variable visual identity design is born. It is able to create a changeable and diversified visual identity system based on data-driven, algorithmic generation and other technical means, bringing unprecedented flexibility and adaptability to brand visual communication.
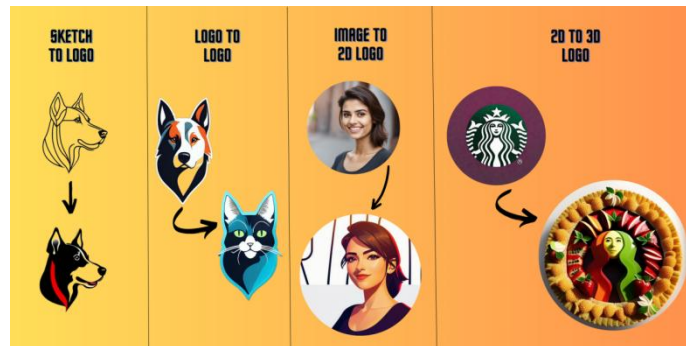

Figure 4 Typical example of algorithm generation - using Logo Diffusion to complete the various processes of Logo design

As shown in Figure 4, designers can use Logo Diffusion to quickly complete the basic process of logo design. For example, first use Sketch to Logo to transform a simple hand-drawn sketch into a sophisticated logo design. Then use the "Logo to Logo" conversion to quickly transform the original logo into another form, maintaining the original design style. This flexibility allows brands to quickly adapt their visual identity to different market needs or product lines without the need for a complete redesign.

It can be found that technology has given new vitality and possibilities to the traditional visual design system, enabling the brand visual identity system to adapt more flexibly to the digital and personalized communication environment, and establishing a dynamic and diversified visual image for the brand. This technology-driven design change is reshaping the visual communication between brands and audiences, creating a new era of visual design.

4.2 Development and refinement of dynamic concepts

In the development process of variable visual identity design, the emergence of the concept of dynamization marks a stage change in the visual image of the brand. Compared with the traditional static scheme, the element design under the concept of dynamization can give the brand richer expressiveness and stronger attraction through animation, interaction and other technical means, prompting the design content to become a new carrier of communication between the brand and the audience.

Taking dynamic logos as an example, the core concept of its design is to break the limitations of traditional static logos and inject more vitality and personality into the brand. Through skillful animation design and creative expression, the dynamic logo can tell the brand story, convey the brand emotion, and narrow the distance between the audience. And break away from the static visual form to present the brand concept in a more vivid and intuitive way, stimulating the audience cognitive resonance. As shown in Figure 5 and Figure 6, the 2021 Google New Year logo design adopts the birdhouse clock to show the flexible and free new year logo changes, and the twisted lights on the logo echo the birdhouse and the new year, which strengthens the user's emotional identity, and at the same time, enhances the uniqueness of the logo, and allows Google to further spread its brand image. The logo also enhances the uniqueness of the logo, further spreading Google's brand image.

Figure 5 Google 2021 logo dynamic visual design (before changes)

Figure 6 Google 2021 logo dynamic visual design (after changes)

Unlike static design concepts, dynamic design needs to take into account both brand recognizability and changeability dimensions. On the one hand, dynamic content must ensure the consistency of the brand's visual elements to ensure the continuity and recognizability of the brand image. Dynamic performance also needs to be built on the core visual elements of the brand to maintain the integrity of the brand's visual assets. On the other hand, dynamic content needs to show enough flexibility and diversity to adapt to different communication scenarios and media forms. Through dynamic changes, brand image design can present different states and styles according to different usage environments and communication purposes, enhancing the richness and adaptability of brand expression.

5 EMPIRICAL EVIDENCE ON THE DYNAMIC EVOLUTION OF TRADITIONAL DESIGN USING TECHNOLOGICAL INNOVATION --THE CASE OF THREE MAJOR BRAND IMAGES

5.1 Case 1: LA28 Olympic Games Dynamic Visual Design System

The LA28 Olympic Games dynamic visual identity system is an exemplary case of the evolution of traditional visual identity to variable visual identity, reflecting the trend of brand visual identity innovation in the digital era. The most obvious feature of this visual system is that the core elements of the brand are adjusted from a fixed mode to a flexible mode, which realizes the technical and conceptual innovation on top of the traditional system.

Figure 7 LA28 Olympic Games Visual Poster

Traditional Olympic logos usually adopt static design, which remains unchanged for a long time once it is finalized. However, LA28 breaks through by designing the core letter "LA" and the number "28" as variable elements, and each character can present rich and diversified visual effects, which breaks away from the static identification mode of the traditional Olympic Games, as shown in Figure 7. Moreover, the design also adopts the technology of algorithmic generation to create almost unlimited logo variants by setting diversified parameters, which effectively breaks through the limitations of traditional static design and realizes the intelligent generation and management of visual assets, as shown in Figure 8. Variable logos supported by generative technology also reflect new changes in the relationship between brands and audiences, providing personalized visual experiences for different scenarios and audiences, and reflecting a more open and interactive relationship between brands and audiences. It can be considered that it empowers the audience to participate in the visual presentation of the brand, so that the brand image is no longer a top-down unidirectional communication, but a novel co-creation result.

Fig. 8 Algorithmic generation of variants

In addition, LA28 has managed to find a precise balance when analyzing the visual system from the point of view of adaptability and consistency. Although the logo can present countless variations, the core letter and number composition always remains the same. This design approach not only ensures the stability of the brand identity, but also provides flexible and varied visual solutions for different application scenarios, revealing the advantages of the evolution of the brand's visual design from static to dynamic and from single to multiple. From the feedback of the masses obtained by the system, variable design not only adapts to the current diversified communication environment, but also reserves space for the future development of the brand. It can be constantly updated and expanded with the advancement of technology and changes in the communication environment, showing strong foresight and sustainability.

The case proves that in future design practice, designers need to continue to explore the potential of variable visual identity, find a balance between technological innovation and humanistic care, and create a brand visual experience that is both highly recognizable and deeply resonant with the audience. In this way, the technical and application advantages of variable visual design can be fully utilized to make up for the shortcomings of the traditional visual identity system and to strengthen the communication power in the context of modern society.

5.2 Case 2: Eurovision Song Contest 2020 Data-Driven Visual Recognition

The Eurovision Song Contest 2020 data-driven visual identity system is another typical example of the evolution of design systems. The most obvious feature of this visual identity system is its data-driven design concept, which enables the designer to generate dynamic visual elements based on the data of previous years' competitions, including participating countries, scores, audience votes, etc. The data visualization is cleverly combined with the brand's visual identity to create an informative and aesthetically-pleasing visual presentation, as shown in Figure 9:
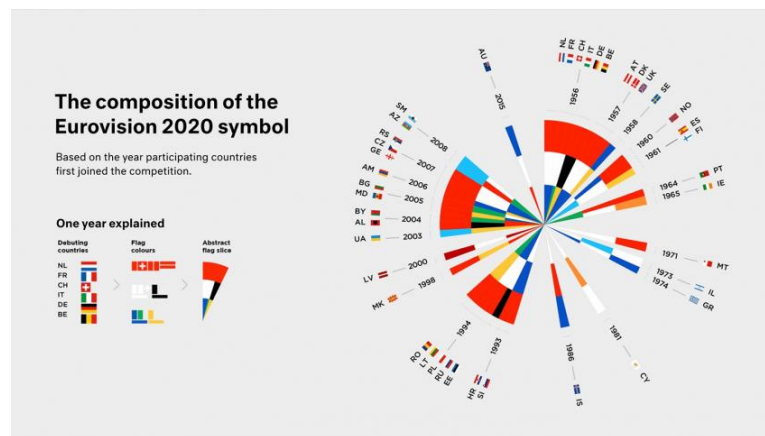

Figure 9 Eurovision Song Contest 2020 Visual Design Deconstruction

Eurovision's visual system is also highly dynamic and interactive, with visual elements changing in response to real-time data changes, creating fluid, life-like visuals. Utilizing this type of dynamic design, the visual system not only enhances visual appeal, but also reflects the progress and results of the competition in real time, increasing viewer participation and engagement. By visualizing data from previous years' competitions, the visual system also vividly displays information about the traditions of the competition, the participation of each country, and the audience's voting trends, making the brand story richer and more tangible.

The Eurovision visual system also demonstrates the power of combining technology and creativity, using a combination of data analysis, visualization technology and creative design to create a visual effect that is both technological and artistic. Using

the basic carrier of real-time audience interaction data, the visual system makes the audience a part of the visual creation, blurring the boundaries between creator and audience, making the brand visual jump out of the limitations of the traditional system into a new, co-creative result based on modern information technology. Traditional brand visual identity lacks sufficient user participation, and the audience can only be limited to passive viewers, unable to become active participants. With the help of data-driven technology, the visual system not only enhances the emotional connection between the brand and the audience, but also makes the brand visualization closer to the user, fully reflecting the user's needs and preferences, which is more suitable for the communication standards of the modern information society.

In addition to this, Eurovision's visual system demonstrates excellent cross-media adaptability. Whether it is live media or peripheral objects, the visual elements of the system can be flexibly adapted to maintain a consistent visual effect and message. On top of these diversified carriers, its visual art information can also realize consistent hierarchical presentation, which can quickly convey the brand image through the overall visual effect, and also display specific data information through detailed elements, as shown in Figure 10. This hierarchical design allows the visual identity system to achieve a concise, clear and informative effect, which attracts a modern audience of fast browsers and meets the needs of in-depth exploration users.
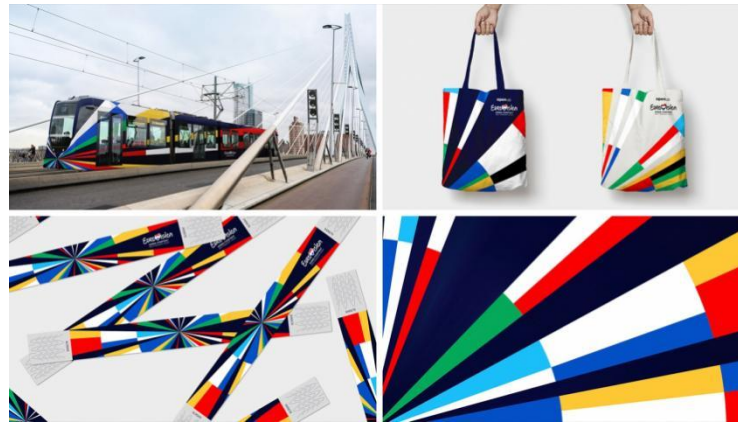

Figure 10 Diversified Carrier Expansion

A look at this case shows that Eurovision Song Contest 2020's data-driven visual identity system demonstrates the new possibilities of brand visual identity in the digital age. It not only integrates data, technology and creativity, but also realizes the deep interaction between brand and audience. The future of brand visual identity will be more dynamic, interactive and information-rich, it is not only a symbol of the brand, but also a platform for brand-audience dialog. In design practice, the design subject needs to continuously explore how to utilize new technology and new thinking to create a visual experience that not only conveys the core value of the brand, but also resonates deeply with the audience. Attention should also be paid to maintaining the consistency and recognizability of the brand in innovation, and reflecting the core spirit of the brand in change.

5.3 Case 3: Schwanensee (Swan Lake) dynamic visual identity system

The Schwanensee visual identity system is another important example of the evolution of traditional visual design to variable visual design. The system centers on the visual design of the ballet "Swan Lake", which is a perfect fusion of classical ballet art and modern digital technology. The design body captures the movement data of the dancers and transforms it into smooth and dynamic visual elements, creating a visual effect that is both artistically beautiful and full of technology, as shown in Figure 11:
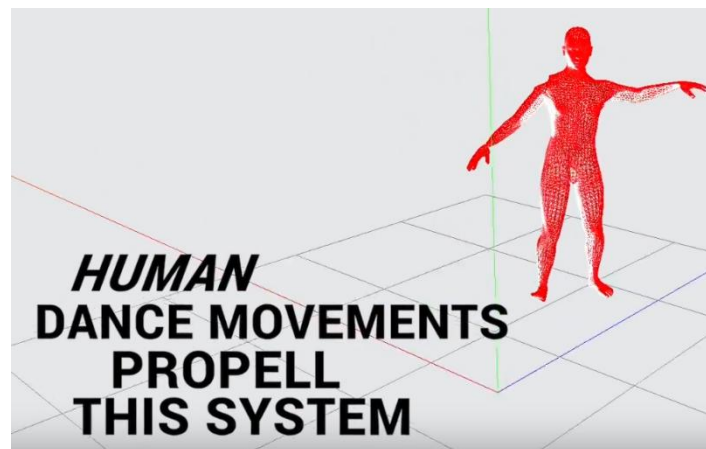

Figure 11 Dancer movement data conversion

Schwanensee's visual system vividly expresses the elegance and fluidity of ballet through dynamic elements that change with the rhythm of the music and dance, creating a visual effect that is as dynamic as the dancers. This dynamic design enhances the visual appeal and is able to visually communicate the artistic qualities of ballet. Moreover, the system is not just a passive display, but also has a clear interactive design. The audience can interact with the visual system through a specific interface and influence

the changes of the visual elements, as if becoming virtual dancers, effectively enhancing the audience's sense of participation and immersion.

Supported by this core concept, Schwanensee's visual system demonstrates good scalability and application flexibility. It can be used not only for promotional materials for dance productions, but also for stage design, interactive installations and many other scenarios, as shown in Figure 12. The basic elements of the system can be flexibly adjusted and combined according to different application requirements, creating a new digital experience for the promotion of ballet, a traditional art. Moreover, thanks to the new dynamic visual system, the Schwanensee program also successfully realizes cross-cultural and cross-generational communication. It interprets classical ballet in a modern visual language, preserving the essence of the art while adding contemporary expression, thus appealing to audiences of different cultural backgrounds and age groups.

Figure 12 Visual System Material Expansion

This case proves that the future of brand visual identity will be more dynamic, interactive and diverse. Unlike traditional static visual systems, the Schwanensee system is not only a visual symbol of the brand, but also an experience platform that connects the brand with the audience. In design practice, designers need to continue to explore how to utilize new technologies and new thinking to create visual experiences that not only convey the core values of the brand, but also resonate deeply with the audience. At the same time, attention should also be paid to maintaining respect for tradition and essence in innovation, and highlighting the core spirit of the brand in change. By integrating and innovating the traditional brand image program, the design subject can create a brand visual identity system that is both contemporary and enduring in the context of the new era.

6 FUTURE TRENDS IN VARIABLE VISUAL IDENTITY DESIGN

Looking into the future, variable visual identity design has become an unstoppable trend to replace traditional static visual identity design. With its flexibility, diversity, interactivity and other characteristics, variable design has opened up a new development path for brand visual identity, and become a new language for brand and audience communication. In the future, artificial intelligence, big data, virtual reality and other cutting-edge technologies will further promote the development of variable visual identity design.

Advances in artificial intelligence technology will give visual recognition systems stronger generative and adaptive capabilities, enabling them to generate personalized and intelligent visual output in real time based on massive amounts of data. Big data analysis will help brands gain a more accurate insight into audience needs, providing richer creative inspiration and decision-making basis for variable design. The application of immersive technologies such as virtual reality and augmented reality will create a more immersive and interactive experience for variable visual identity.

In the future, variable visual identity design should further break through the traditional model of "one size fits all", and provide customized visual content and interaction methods according to the characteristics and preferences of different users. Through variable design, the brand image can establish a deeper and more personalized emotional connection with each user, enhancing brand affinity and loyalty. With the help of interactive technology and immersive media, brand visual identity can be transformed from passive information delivery to active user participation and interactive experience. Users will no longer be passive recipients of visual information, but active creators and participants of visual experience. Through interaction and participation, a closer and deeper emotional bond will be formed between the brand and the user.

In addition, seamless visual experience across media and platforms will also become the focus of variable design. With the diversification and fragmentation of communication channels, brand visual identity needs to be seamlessly integrated and consistent across different media and platforms. Variable design will ensure that the brand visual image remains synchronized and unified in various digital and physical environments through intelligent adaptation and dynamic generation, providing users with a coherent and consistent brand experience. On this basis, the visual system design can also integrate new visual carriers such as digital body and virtual image, so as to interact with users in a more intuitive and humanized way through the vivid and distinctive digital body. As in the case shown in Figure 13, using the SD (Stable Diffusion) model in conjunction with the Lora (Low-Rank Adaptation) stylization plug-in, anchors on online platforms can quickly generate a self-image that meets the

audience's impression needs. In this way, these anchors can make the virtual image become the embodiment of the brand's personality and values, and through emotional expression and interaction, they can bring the emotional distance with the users closer and enhance the brand's sense of identity and goodwill, which fully demonstrates the future development trend of variable visual identity design.

Fig. 13 Online anchor image design based on AI image generation model and digital body Lora implementation

For the design body, the evolution of traditional visual identity design to variable design will also begin to force designers to focus on improving their own capabilities. Designers not only need to have solid visual design skills, but also need to master programming, data analysis, interactive design and other diversified skills, interdisciplinary, cross-field knowledge integration will become a necessary quality of designers. At the same time, design thinking also needs to change from the traditional "designer-led" to "user-led", pay more attention to user needs and experience, through data insight and user participation, to create a truly user-centered variable visual identity program.

It can be considered that variable visual identity design represents the future development direction of brand visual communication. It combines cutting-edge technology, innovative thinking and user-centered design concepts, injecting new vitality and imagination into brand visual identity. With the continuous progress of technology and innovation of design concepts, variable visual identity design will usher in a broader development space, building a more dynamic, more personalized and more in-depth emotional ties between brands and consumers, and opening up a new era of brand visual communication.

7 CONCLUSION

Through an in-depth exploration of the evolution of brand visual identity design from traditional static mode to variable design, this study finds that technology-driven and socio-cultural changes are the core factors driving this evolution. Digital technology, especially the application of emerging technologies such as artificial intelligence, big data and virtual reality, has provided strong support for variable visual identity design. At the same time, changes in audience aesthetics and the pursuit of personalized experiences have also led to the development of brand visual identity design in a more flexible and diversified direction. The study of comprehensive design cases found that variable visual identity design has obvious advantages over traditional static design, which can better adapt to the fragmented communication environment, provide a richer and more dynamic visual experience, and enhance the interactivity and participation between the brand and the audience. In the future, brand visual identity design will pay more attention to personalization, interactivity and cross-media experience, and intelligent, personalized visual design and immersive brand experience will become an important development direction.

The findings have important practical implications for brand management and design practice. For brand managers, the study provides practical guidance on how to effectively shape and communicate brand identity in the digital age. For design practitioners, the study points to the interdisciplinary knowledge and skills needed in the future, providing a clear direction for career development. Therefore, this study not only deepens the theoretical understanding of the evolution of brand visual identity design, but also provides practical guidance to brand managers and design practitioners on how to innovate brand visual communication strategies in the digital age. Future research can further explore the application effects of variable design in different industries and cultural contexts, and how to find a balance between technological innovation and brand tradition, providing more insights into the sustainable development of brand visual identity design.

REFERENCES

[1]Cuong D T , Khoi B .The Effect of Brand Image and Perceived Value on Satisfaction and Loyalty at Convenience Stores in Vietnam[J].Transylvanian Review , 2019, 11:1446-1454.

[2]Rossolatos G .Exploring the rhetorical semiotic brand image structure of ad films with multivariate mapping techniques.Semiotica Vol.200 2014. 335-358[J].Semiotica, 2014, 200(1):335-358.

[3]Gorman C .The Role of Trademark Law in the History of US Visual Identity Design, c.1860-1960[J].Journal of design history, 2017, 30(4):371-388.

[4]Hu B .Exploring Contemporary Visualizations of Traditional Chinese Symbols: a Case of Tea Packaging Design[J].The Design Journal, 2020, 23:309 - 320.

[5]Runti? S , Peji? L .NO LOGO! Visual sovereignty and the Washington Redsk*ns debate[J].Neohelicon, 2017, 44(1):99-113.

[6]Anguera M .Enric Huguet: 60 Years of the History of Catalan Graphic Design[J].Design Issues, 2018, 34(3):103-104.

[7]Sellars N .The Optics of Anatomy and Light: a Studio-based Investigation of the Construction of Anatomical Images[J].Leonardo, 2015, 48(5):495- 495.

[8]Zhang Y , Hong K .Design and Production of Visual Image of Print Advertisement Based on Mobile Media[J].Mobile information systems, 2022, 2022(Pt.18):4125623.1-4125623.10.

[9]Torrico D D .Influence of Label Design and Country of Origin Information in Wines on Consumers' Visual, Sensory, and Emotional Responses[J].Sensors , 2022, 22.

[10]Liu X .Animation Special Effects Production Method and Art Color Research Based on Visual Communication Design[J].Scientific Programming, 2022.