Application Analysis of Computer Information Science and Technology in Logo Design of Digital Era

Xiaojie Min¹ and Bei Gong‡*¹

¹Gongqing College of Nanchang University, Jiangxi, China
²Gongqing College of Nanchang University, Jiangxi, China

*Corresponding author e-mail: 623044261@ncu.edu.cn

Abstract. With the development of society and the progress of human civilization, the application of science and technology in people's daily production and life is becoming more and more extensive. The application of computer information science and technology in logo design of digital era has gradually become a development trend in the future. Signs generally have long-term use value, once established, they will not change easily. However, with the rapid development of this era, the design of modern signs needs to follow the development of the digital era to design. In order to better help the logo design of the digital era in the current era, this paper puts forward the method of applying computer information science and technology to the logo design in the digital era. Through in-depth study of the current status of logo design in the digital era, the process of logo design in the digital era is simulated, so as to formulate a set of logo design most suitable for the digital era in this era Methods of calculation. Through the analysis, the method proposed in this paper successfully provides a new development idea for the application of computer information science and technology in the digital era logo design.

Keywords: Science and Technology; Computer Information Science and Technology; Digital Age; Logo Design

1. Introduction
With the continuous change of world economic structure, people's demand for information is also increasing. Computer science and technology [1-3] has been widely used in various fields of society, widely used in industrial production, military defense, medical care and family life. The development and popularization of computer science and technology is closely related to people's living standards and the development of science and technology. With the continuous development of China's economic construction, the application of computer technology in the field of industrial and commercial finance has been greatly improved. Especially in industrial production, the application of advanced computer system in automatic production not only promotes the rapid improvement of China's economic level, but also speeds up the development process of China's computer science and technology. Intelligent robot [4, 5] has been successfully applied in the production of high-tech products.
In the traditional logo design [6, 7], limited by technical conditions, most of its forms of expression are monochromatic and planar graphic combination, which is a two-dimensional space art. After the digital era, the rapid development of computer technology has brought new creative methods for art design, which makes logo design no longer limited by traditional methods, and gradually breaks through the shackles of plane and develops, in a three-dimensional direction. Through this three-dimensional pursuit, logo design becomes more visual impact, reflecting the aesthetic pursuit of modern art design.

This paper mainly studies the application method of computer information science and technology in logo design in the digital era. With the development of current social economy, logo design in the digital era [8-10] is facing great challenges brought by the times. In order to better help the logo design of the digital era in the current era, this paper puts forward the method of applying computer information science and technology to the logo design in the digital era. Through in-depth study of the current status of logo design in the digital era, the process of logo design in the digital era is simulated, so as to formulate a set of logo design most suitable for the digital era in this era Methods of calculation. Through the analysis, the method proposed in this paper successfully provides a new development idea for the application of computer information science and technology in the digital era logo design.

2. Application Analysis Method of Computer Information Science and Technology in Logo Design of Digital Era

2.1. Characteristics of Computer Science and Technology
The appearance of computer has changed the way of data calculation. A large number of complex calculation processes can be completed by computer. It can achieve trillions of calculations per second and improve people's work efficiency. Especially in the field of national defense and scientific research, the advantages of computer science and technology have been brought into full play. Under the influence of computer science and technology, the problem can be solved in a few minutes. High speed computing speeds up the process of social development.

2.2. Dynamic Logo Design in Digital Era
Logo design is no longer limited to its inherent concept, that is, to use it in any case, we should try our best to keep all the characteristics, and not to change its so-called "design principles" easily. In the digital age, designers began to try to break the limitations of single, static, fixed shape and color logo. They pay more attention to the rhythm and dynamic balance of the internal structure of logo to show the essence of visual image. According to the corresponding visual principles, designers give flexibility and flexibility to the external form of works, which makes the logo produce interesting dynamic visual changes. It shows the visual image and infinite vitality, and makes the deep meaning contained in it get accurate and effective recognition in the visual space-time extension.

3. Experimental Background and Design

3.1. Experimental Background
Digital art design will continue to develop towards multimedia and network. Multimedia technology is to edit and process images, sounds, text, animation, sound and other media forms in one file, which will greatly enrich the constituent language of art design and improve the appeal of works. In the digital art space of multimedia, design is a process of comprehensive control of multiple media. With the development of information superhighway, the network will also become the hot spot of digital art development, so that the creation and appreciation of art are no longer limited to regions. It is a new existence way of digital art. With strong cooperation and communication skills, it has broad prospects for development.
3.2. Experimental Design
The development of digital technology has enriched our thinking and homework to a great extent, making it easy and possible to do things that are difficult or even impossible with traditional methods, and many things that need to spend a lot of time and energy become convenient, fast and even easy. The change from computer to design not only affects the practice of humanized design, but also changes the traditional design program and design method for a long time, which fundamentally challenges the traditional design concept of humanized design. The new modeling language and expression method brought by computer have changed the image of design field thoroughly, and the design will have profound and vivid changes. The advantages of digital design are investigated. The results are shown in Table 1:

| Data collection | Before | Now |
|-----------------|--------|-----|
| Design definition | Consult a large number of books, and the records are mainly descriptive and manual records | Consult the electronic literature, carry on the information retrieval, the record mainly to download, copy and paste |
| Design concept | Comprehensive comparison, analysis of various opinions, the final definition | Using professional software and expert system, the definition can be summed up objectively |
| Design refinement | Using a lot of different drawing tools, a lot of time is spent on presentation skills | Using the expert system of professional software, we can conclude the definition objectively |
| Design refinement | While designing, while making models to observe the effect of the entity, there are some details difficult to find | With 3D modeling rendering, you can evaluate and analyze from various angles, and change materials |

4. Discussion

4.1. Application of Computer Information Science and Technology in Logo Design in Digital Era
Logo design is to convey information to the audience in the form of beauty through graphics or words. It is based on the needs of the enterprise and is the interpretation of the design concept by designers. The creative process of logo design is the comprehensive embodiment of concept, artistic conception, consciousness, meaning, concept and wisdom. It shows people with images, conveys the corresponding information content of the enterprise or commodity to the audience, and publicizes the culture, idea, essence, proposition and spirit of the enterprise or commodity. In logo design, external image and internal meaning are harmonious and complementary. Especially in the digital age, the audience has changed from passive acceptance of visual information to active choice. In order to save the time and cost of receiving information, every time the logo appears, it should not only ensure that the visual impact is eye-catching, but also make the audience clearly receive the information, and realize the communication between the audience and the enterprise through digital equipment. According to the survey on the standards of digital logo design of Chinese enterprises, the results are shown in Figure 1:
As shown in Figure 1, when digital art is applied to logo design, the creativity and expression of graphics must meet the standards of appropriateness, conciseness, unforgettability and concentration. Appropriate means that the shape or extension of the trademark should be related to the customer or other industries. For example, the logo of the sports industry should be eye-catching and energetic. A successful brand image should be able to contact with relevant enterprises or institutions at the first sight of the audience. Conciseness means that the trademark must be simple, direct, clear and concentrated in conveying enterprise information to the audience, and the form of expression should be clear at a glance. In the past, signs will be used on the exterior walls of buildings or newspaper advertisements, but in today's society, signs are more used in mobile devices, emerging media or dynamic pictures. Therefore, in order to maintain the effect in different media and maintain uniform visibility at different scales, the logo must be concise.

The development of modern logo design is also affected by the integration of multi cultures. If the modern logo design overemphasizes the national style, it is easy to lead to visual fatigue and similarity. Modern logo design logo should absorb and integrate different regional and national art forms, excellent artistic expression skills and advanced technology, and master the essence of cultural logo design. We should excavate and sort out the rich cultural connotation, strengthen cultural exchange, overcome the obstacles of different cultural backgrounds, and reach the consensus of Ideological and emotional resonance. The proportion of design concept of urban signs in China is investigated and the results are shown in Figure 2:
Figure 2. Proportion of design concept of urban signs in China

As shown in Figure 1, the proportion of design concepts of urban signs in China is 50%, exchange accounts for 25%, reunion accounts for 15%, cooperation accounts for 10%. The design concept of urban signs in China should fully reflect the concept of understanding, exchange, reunion and cooperation. In the context of rapid development of communication and Internet and the formation of strong information exchange, the development of various cultures is facing different cultures the degree of opportunity and challenge requires the cultural renewal and transformation. At the same time, under the complex social structure, different needs lead to different cultures serving the whole society. Therefore, the design of a city logo should fully reflect this information.

4.2. Application and Development Prospect of Computer Information Science and Technology in Logo Design in Digital Era

After the arrival of the digital age, in addition to the innovation of graphics and text, color also ushered in new changes, logo design has entered a new color era. It is embodied in two aspects. A lot of new colors are created. Computers turn colors into ribbons. As a designer, he can choose the color he likes. So many colors have never appeared in life and painting. For example, in the logo design of some electronic technology products, they like to use this rare color. These colors often have "four different" characteristics, such as purple, red, brown and black, to highlight the freshness and mystery. Second, gradient and transparent colors are widely used. For example, transparent colors are used in the logo design of Microsoft product MSN. Butterflies are made up of blue, green, red and yellow. Among the four colors, the transparent color design is adopted in the four colors, which makes the overlapping part of the pattern realize the color overlap, that is, the overlapping of blue and green, and the rewriting of red and yellow, which brings a new color effect.

Under the background of new media, the innovation of new technology and printing technology has made great changes in the design means and application field of logo. Logo design is gradually
breaking through the traditional static design mode. By introducing dynamic mechanism, the intention is to pursue a new form of visual expression with more visual impact effect and aesthetic experience. Nowadays, illustration, hand-painted, retro and other specific styles are also introduced into logo design after refining. In addition, the market environment which pays more attention to user experience also gives logo a new mission: to meet the changeable and higher aesthetic needs of the public. Therefore, mobilizing more people’s perception system and enhancing the interaction between logo and audience has become another main purpose of logo in the new era.

Logo is a typical visual symbol. It expresses specific meaning to people in a simple form, and transmits some information to the outside world by creating a typical symbol feature. Modern logo design, including aesthetics, advertising, symbols, sociology, psychology, semantics and other related knowledge, is a comprehensive design art classification. In modern society, how to present a unique visual image in the rich and colorful complex information, and make this unique visual image more accurate and faster to the majority of the audience, has become an important topic of logo design. In logo design, the use of dynamic graphics is an important means of expression. Now many foreign logo design works are trying this kind of dynamic graphics, which can be reflected in the actual communication.

Logo design in the digital age has gradually broken the meaning of traditional logo design from the concept and form. There are great differences in design concept, visual language and application development. Modern logo design is a kind of comprehensive logo which contains various forms, methods and connotations. In the past, one-dimensional independent graphic recognition has been unable to meet the needs of future market competition and multimedia communication. At the same time, the pursuit of individuality, focus on the diversification of forms and application effect has gradually become a new trend of logo image, and logo design tends to be diversified.

5. Conclusions
This paper mainly studies the application method of computer information science and technology in the digital era logo design. In this era of rapid development, the design of digital era logo has encountered unprecedented challenges. In order to better help the design of digital era logo in the current era, this paper puts forward the application of Computer Information Science and technology in logo design of digital era. Through in-depth study of the current status of logo design in the digital era, the process of logo design in the digital era is simulated, so as to develop a set of logo design methods that are most suitable for the digital era in this era. Through the analysis, the method proposed in this paper successfully provides a new development idea for the application of computer information science and technology in the digital era logo design.

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References
[1] Li K., Wu H., Li Z. Big data cloud and the frontier of computer science and technology[J]. Concurrency & Computation Practice & Experience, 2016, 27(18):5719-5721.
[2] Nissim, K., Bembenek, A., Wood, A., Bun, M., Gaboardi, M., & Gasser, U., et al. (2018). Bridging the gap between computer science and legal approaches to privacy. Harvard Journal of Law and Technology, 31(2), 687-780.
[3] Amjad, T., & Ali, A. (2019). Uncovering diffusion trends in computer science and physics publications. Library Hi Tech, 37(4), 794-810.
[4] Roumeliotis S I, Bekey G A. Distributed multirobot localization [J]. IEEE Transactions on Robotics and Automation, 2015, 18(5):781-795.
[5] Michmizos K P, Rossi S, Castelli E, et al. Robot-Aided Neurorehabilitation: A Pediatric Robot for Ankle Rehabilitation[J]. IEEE Transactions on Neural Systems & Rehabilitation
Engineering, 2015, 23(6):1056-1067.

[6] Bresciani S, Ponte P D. New brand logo design: customers' preference for brand name and icon[J]. Social ence Electronic Publishing, 2017, 24(2):1-16.

[7] Seraphin H, Ambaye M, Gowreesunkar V, et al. A marketing research tool for destination marketing organizations' logo design[J]. Journal of Business Research, 2016, 69(11):5022-5027.

[8] J.M. Peña Aguilar, F. Flores Agüero, C.P. Bermudez P. THE IMPACT OF THE DIGITAL AGE IN MEXICO[J]. International Journal of Infectious Diseases, 2015, 14(12):e1076-e1081.

[9] Reamer, Frederic G. Social Work in a Digital Age: Ethical and Risk Management Challenges[J]. Social Work, 2015, 58(2):120-132.

[10] Barrett M, Davidson E, Prabhu J, et al. Service Innovation in the Digital Age: Key Contributions and Future Directions[J]. Mis Quarterly, 2015, 39(1):135-154.