Research on Visual Design Methods in Computer Web Page Development

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Abstract. This article reviews the relevant literature in the field of visual design methods in computer web page development, aiming to explore the current status, development trends, and challenges of visual design methods in computer web page development. By systematically collecting and organizing academic papers, monographs, and conference reports published in recent years, this article analyzes the application and influence of computer web page development in color selection, layout design, font selection, use of images and icons, interactive page design, and responsive design. Research has found that different design methods bring different experiences to users, and the happiness of users is crucial for the creation of web creators. However, there are still some web page designs that are not reasonable, such as screen incompatibility, unclear color matching, chaotic font selection, and lack of user interaction, which bring users a bad experience and affect the development and progress of computer web page development. This review provides a theoretical basis and practical guidance for the further development and improvement of visual design methods in computer web page development. It also provides prospects for future research and proposes suggestions for dynamic and diverse visual design of web pages, including adding animation effects, increasing interactive design, increasing the use of image icons, and focusing on continuous optimization and updating of web pages.

Keywords: Visual design, Interaction design, Responsive design.

1   Introduction

With the development of the times and the improvement of quality of life, the pursuit of beauty by the public is becoming more and more significant, and the demand for the visual experience of surfing the internet is also increasing. At the same time, with the development of electronic technology, responsive design has become an important design method for web pages to have good display effects on screens of different mobile devices. At the same time, it is important to pay more attention to the user interaction experience on the webpage and increase user engagement. The selection of color combinations, page layout design, font size and size selection, and the use of image icons are also important visual methods for webpage design. By using these design methods well, users can improve their satisfaction and user experience with the

website, enhance their sense of happiness in life, achieve anytime and anywhere retrieval of desired articles, increase their interest in using the website and their desire to acquire unknown knowledge, to some extent, break down information barriers, and cultivate more talents. In the new environment of network development, network information presents diversified forms of expression, providing more possibilities for web design. Web design demonstrates advantages and also provides a good development platform for web design. At this point, web developers are required to fully utilize digital information media technology to optimize visual elements in order to better design web pages, present effects, make the layout structure of web pages more reasonable, professional, and trustworthy, continuously improve the efficiency of users in obtaining information, and enhance their ability to retrieve information. However, from the current reality, there are lots of shortcomings in web design. Most web designs have not yet achieved an organic combination of technology and art. Some web designs lack aesthetic appeal, and the value of artistic web design is gradually weakening. The transmission of information is weak, resulting in many users being unable to extract information clearly and intuitively, and easily becoming a stack of functional windows, causing users to lose interest in retrieving information [1]. In this regard, by optimizing the visual elements in computer web development, keep up with the changes in public aesthetic needs in the new media era, and use interface interaction, responsive design, and other visual arts to enrich the presentation and content of visual design elements, providing users with a high-quality visual experience [2]. This article investigates the current development status of computer networks and ways to optimize visual elements in web design.

2   The Importance of Web Design

A good web design can attract users and improve user retention. Meanwhile, good webpage design can also enhance the brand image and credibility of a website. User experience optimization: An excellent web design can provide users with a smooth, intuitive, and attractive browsing experience. Clear and concise navigation design and beautiful page layout can improve user satisfaction and retention rate. Responsive design enables websites to display and operate well on different devices and screen sizes, further enhancing user experience [3].

For commercial websites, webpage design and conversion rates are crucial and directly affect the website's profitability. Web design facilitates users by influencing and optimizing page layout, increasing the visibility of purchase buttons, and providing clear product information. It guides users to complete target behaviors such as account registration, downloading, or purchasing, thereby improving conversion rates [4]. In terms of brand image shaping, web design is an important way for brands to convey their uniqueness and values. By designing visual elements such as colors, fonts, images, and layouts, websites can showcase the brand's personality, style, and philosophy, thereby deepening user awareness and memory of the brand. Finally, web design is also an important tool for communicating and conveying information to users. Through clear, accurate, and attractive page content, websites can convey brand

stories, product features, service advantages, and other information to users, thereby establishing trust and connection between users and brands.

3   Web Page Development and Design Methods

3.1   Color Selection

Choose a color scheme that is suitable for the webpage theme and target audience. Color can convey emotions and brand image, while also considering the contrast and readability of colors. The impact of color design on users cannot be ignored. Good color application and matching can leave a deep impression on users, which will affect their judgment of the professionalism of the webpage and ultimately affect their choices. In terms of color application and matching, attention should be paid to the selection of the main color tone, which should not be too abrupt. Determine a main color tone to make the webpage more coordinated and beautiful. Learn to use auxiliary colors to highlight the key points of a webpage and catch the user's attention. In the selection of text color, the text color should be clear and easy to read, forming a contrast with the background color. As shown in Fig.1, Canva is a versatile design website that offers excellent color combinations and offers a variety of color options. It allows users to directly find the most suitable color design based on theme and style limitations, which is both beautiful and practical, creating an attractive visual effect. Every login can bring surprises and freshness.
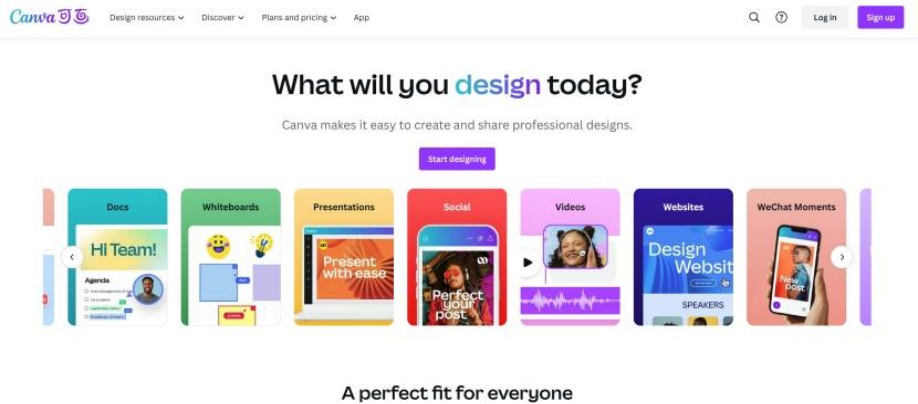

Fig. 1. Examples of good color combinations [5].

3.2   Layout Design

Design the layout structure of a webpage, including the position, size, and spacing of page elements. A reasonable layout can improve user browsing efficiency and comfort and increase user retention rate. The most used layout methods currently include table layout, software design layout, card layout, split screen layout, and

personalized recommendation style webpage layout. Table layout presents the information to be displayed on a webpage in the form of a table, which facilitates page content positioning and alignment, and facilitates user browsing and selection. However, it is relatively slow in efficiency and prone to formatting errors [6]. Personalized recommendation of web layout is achieved by using computer deep learning technology to predict and recommend content that users are interested in by reading user preference data, thereby increasing user retention rate.

3.3   Font Selection

Choose a font that is suitable for the content and style of the webpage. The size, style, and color of the font should be coordinated with the overall style of the web-page and ensure readability. The selection and use of fonts should follow the three principles of systematization, repetition, and rhythm. Systematization means that before designing a web-page, there is a rough plan for the web-page structure design, distinguishing priorities, selecting fonts reasonably, and enhancing the coordination of the web-page. Font style, font color, font size, etc. should follow the principle of repetition and not change too many styles and forms to cause confusion. Rhythm refers to the ability to choose font sizes with larger contrasts when needed to create a subtle sense of rhythm between sizes.

3.4   Image and Icon Usage

Use appropriate images and icons to enhance the visual appeal and information transmission effect of the webpage. The images and icons should be consistent with the webpage theme, and attention should be paid to their quality and loading speed. The visual consistency of icons is very important. The visual symbols of icons should be related to the functions they refer to, and users can imagine them themselves to improve the efficiency of using icons [7].

3.5   Interface Interaction Design

Design interface elements for users to interact with web pages, such as buttons, navigation bars, etc. The style and animation effects of interface elements can enhance the user experience. Compared with traditional web pages, interactive technology has greatly improved the user experience. Nowadays, users have transformed from simple visual stimulation experience needs to perceptual experience needs [8].

User Input. Users can interact with web pages and obtain information by tapping the keyboard, dragging the mouse, and other input devices. There are also other methods such as dragging elements, clicking buttons, and scrolling up and down.

Page response. The webpage can respond to user input, such as displaying new content or redirecting to other pages when the user touches the content with the

cursor. As shown in Fig.2, La Shop Studio is a website with creative audio design, with a simple staff design on the page. When the mouse touches the staff, the lines fluctuate and produce music, which is interactive design and provides users with a good experience.

Data transmission. Web page interaction also involves data transmission. The data input by the user needs to be transmitted to the server through the network for processing, and the data returned by the server also needs to be transmitted back to the user's browser for display [9].

Dynamic effects. Web page interaction can be achieved using front-end technologies such as JavaScript to achieve dynamic effects in network visual design, such as real-time optimization and updating of web pages, asynchronous loading of content, display of animation effects, etc. As shown in Fig.3, Manuel Rueda is a website with excellent dynamic effects, using visual scrolling to attract users' interest in watching. Users can move their mouse to display different animations.

Fig. 2. Examples of Interface Interaction Design [10].

3.6   Responsive design

Consider the display effects on different devices to ensure that web pages can be displayed and operated well on different screen sizes. Responsive design is based on programming tools such as HTML5 and CSS3, making the designed web pages cross platform and adaptive.
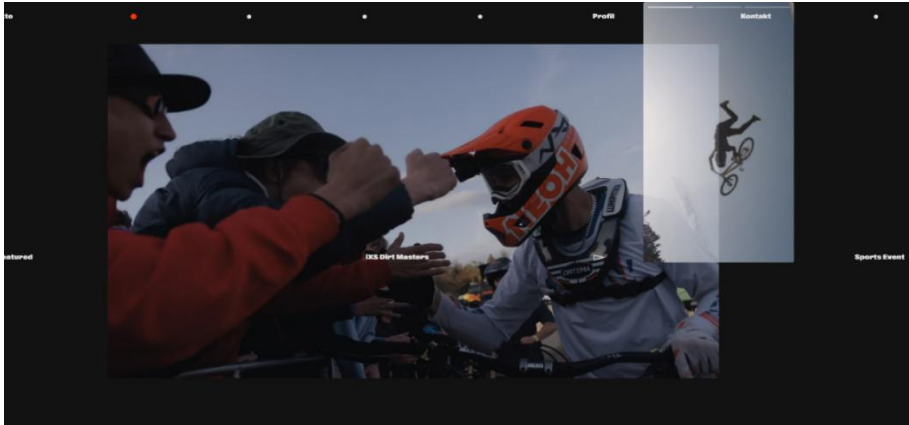
Fig. 3. Examples of Interface Interaction Design [11].

4   Suggestions for Dynamic and Diverse Visual Design of Web Pages

Firstly, for the dynamic design of webpage vision, adding animation effects, inserting moderate animation files into the webpage, using Flash interactive animations, web image demonstrations, and interactive design of Flash navigation systems can achieve good network information interaction, which can increase the vividness and fun of the page [12]. However, it should be noted that the animation effects should not be too many or too complex to avoid interfering with user browsing or causing visual fatigue and confusion. Add interactive design, such as page design buttons, sliders, drag and drop, to guide users to interact with the page, improve user engagement and immersion.

Then, for the diversified design of webpage vision, color matching can be reasonably applied, and the impact of color collision can capture the user's attention, creating different atmospheres and emotions. It is still important to ensure overall coordination and consistency and avoid being too flashy. In page layout design, the layout, position, size, and other factors of each ornament can have an impact on the aesthetics of webpage design. For example, the correct placement of the navigation bar can enhance visual search performance by adopting diverse layout methods [13]. Adopt different page layouts, such as column, flow, and card layouts, to adapt to different content and needs. At the same time, attention should be paid to the sense of hierarchy and rhythm in the layout, making the page more readable and understandable. Secondly, graphic elements can be imposed to increase the use of image icons and enrich the visual effects of the page. These elements can intuitively convey information and emotions, enhancing user understanding and memory.

Finally, it should be noted that web pages need to be continuously optimized and updated. Web pages need to be constantly debugged and updated, discovering and fixing bugs, adding new content, keeping up with the trend of the times, and regularly

optimizing and updating web pages. It is also reflected in improving performance, updating content, and other aspects to maintain the timeliness and competitiveness of the webpage.

5   Conclusion

In summary, as a platform for people to acquire knowledge, solve doubts, and relax, websites require the support of various design methods to meet the aesthetic needs of the public and improve the happiness of users when using them. Every web page creator needs to carefully study visual design methods in computer web page development, match colors reasonably, standardize page layout, choose fonts suitable for web page content and style, increase the use of image icons, enrich page elements, visually display content, proficiently apply interface interaction design and responsive design, making web pages more professional and attractive.

References

1. Han, X. C.: Practical Application of Aesthetic Elements in Web Design. Research on Art Education (23), 87-89 (2022).
2. Wang, Q. T.: Research on Visual Elements of Web Design in New Media Technology. News Research Guide 14(09), 48-50 (2023).
3. Zhao, Y. S., Fan, M. Y.: Research on Web Design Technology Based on HTML5 and CSS3. Journal of Chengdu University of Information Technology 36(06), 641-645 (2021).
4. Sung, H. Y., Muammer, O., Xu, J. J.: Relative effects of the different bundles of web-design features on intentions to purchase experience products online. Decision Support Systems 179, 114-171 (2024).
5. Canva Website (dataset): canva website homepage. Available at http: //www. canva.cn/ en/ (Accessed on [27 Apr,2024]).
6. Li, J. L.: On Common Layout Methods in Web Design. Computer Products and Circulation (11), 253 (2019).
7. Cheng, L., Yin, Q. F.: Research on the Design of Web Interface Icons as a Navigation Icon for Websites. Art Review (02), 182 (2009).
8. Zhao, F. G.: Research on Web Interface Design in the Dimension of Immersive Experience. Software 43(07), 163-165 (2022).
9. Feras, A.: Software design patterns for data management features in web-based information systems. Journal of King Saud University-Computer and Information Sciences 34, 10028-10043 (2022).
10. La Shop Studios Website (dataset): La Shop Studios website homepage. Available at http://lashopstudios.com/(Accessed on [27 Apr,2024]).
11. Studio Rueda Filmproduktion Website (dataset): Studio Rueda Filmproduktion website homepage. Available at http://www.manuel-rueda.com(Accessed on [27 Apr,2024]).
12. Chen, J. X.: Application and Development of Flash Animation in Web Design. Industry and Technology Forum 12(05), 103-104 (2013).
13. Schaik, V. P., Ling, J.: The effects of frame layout and differential background contrast on visual search performance in Web pages. Interacting with Computers 13(5), 513-525 (2001).