Application and Research on Interface Design of Digital Government Operating System

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Abstract: As the first year of the digital economy, everything is underground earth shading changes in 2023 With the rapid development of information technology, the digital economy is also gradually growing and expanding As a derivative of digitization, digital government operating systems are playing an increasingly important role in government management and public services Interface design, as an important component of digital government operating systems, has a critical impact on user experience and system availability Therefore, exploring the application and research of interface design for digital government operating systems by UI designers is of great significance in improving the quality and effectiveness of government services.

Key words: Interface design, Digital economy, Digital government operating system, Intelligence, Efficiency and compliance

1. Introduction

The digital government operation system is the infrastructure for the digital transformation of the government. Through the digital government operation system, the government can integrate various government resources and achieve the digitization, intelligence, and efficiency of government services. This helps to improve the efficiency of government work, optimize the experience of government services, and promote the development of the digital economy. The digital government operating system provides a favorable development environment for the digital economy. The digital government operating system provides strong policy support for the development of the digital economy by simplifying administrative processes, optimizing the business environment, and improving policy transparency. At the same time, the digital government operating system can also promote data sharing

and communication between the government and enterprises, promote the market-oriented allocation and value release of data elements, and further promote the development of the digital economy. The development of the digital economy has also posed new challenges and requirements for digital government operating systems. With the rapid development of the digital economy, the government needs to be more flexible and efficient in responding to various problems and challenges to adapt to economic changes. The digital government operation system needs continuous innovation and improvement, improving its own level of digitization and intelligence to meet the diverse needs of the government and enterprises.

The interface design of the digital government operating system should follow the principles of users being able to feel intuitive and clear information in a friendly manner, easy to learn and operate, and easy to integrate new work content. A well-designed interface can provide clear navigation and information architecture, allowing users to quickly find the information and features they need, and increasing work efficiency with half the effort. In addition, interface design should also pay attention to color matching, font selection, and icon design, in order to create a comfortable and professional user interface to improve government processing efficiency.

2. Information architecture in the interface design of digital government operating systems

Information architecture is the core of interface design for digital government operating systems. A good information architecture should clearly display the hierarchical structure and classification of information, enabling users to quickly find the information they need. At the same time, information architecture should also have sufficient flexibility and scalability to adapt to constantly changing information content and user needs. Different types of government information require reasonable and compliant hierarchical differentiation, in order to enable government officials to save time and costs in their operations.

2.1 Characteristics of Information Architecture in Interface Design

It is a design for organizing, categorizing, and navigating information content, aimed at helping users quickly find the information they need and improving usage efficiency.

2.1.1 Clear hierarchy

The information architecture should have a clear hierarchical structure, making the information content organized and easy to understand. By establishing a reasonable hierarchical relationship, users can quickly locate the desired content.

2.1.2 Clear navigation

A good information architecture should provide clear and concise navigation, allowing users to easily navigate to other related pages. The navigation design should be concise and clear, easy to understand and operate.

2.1.3 Easy to search

For a large amount of information content, providing efficient search functionality is necessary. The information architecture should consider the implementation of search functionality to enable users to quickly find target content.

2.1.4 Personalized experience

Based on user needs and habits, the information architecture can be personalized and adjusted to improve the user experience. Meet personalized user needs through customized recommendations, filtering, and other functions.

2.1.5 Responsive design

With the popularity of mobile devices, information architecture should consider responsive design to adapt to different screen sizes and resolutions of devices. Ensure a good user experience on different devices. Issues such as small screen size and bad interface design can also make learning more cognitively demanding [1]

2.2 Color Matching and Application of Color Psychology in Interface Design of Digital Government Operating System

Color matching is one of the key factors in the interface design of digital government operating systems. Different colors can convey different emotions and meanings, which have a significant impact on the user experience. When choosing colors, consideration should be given to the image of government agencies and the public's cognitive habits, so that users can quickly recognize and remember the system interface. In color psychology, blue represents peace and stability, symbolizes the blue sea and sky, and can easily create a relaxed and joyful mood.

2.2.1 Color psychology is the study of the impact of colors on human emotions and behavior.

Different colors can trigger different psychological feelings, for example, red can stimulate enthusiasm, and blue can make people feel calm. Therefore, in interface design, the appropriate use of colors can have a positive impact on the user's emotions and behavior. For example, the interface design of shopping websites often uses red to stimulate consumer desire to purchase, while the interface of medical websites tends to use a peaceful blue tone to alleviate patient anxiety.

The principles of color psychology can help designers better understand and meet user needs. By conducting color preference surveys on users, designers can more accurately grasp the psychological needs of the target user group, and thus design interfaces that better meet user expectations. For example, young users may prefer bright and lively colors, while mature users may prefer low-key and steady tones.

Color psychology can also help designers solve problems encountered in interface design. For example, adjusting color contrast can improve the user's reading experience; By adjusting color

saturation, certain information elements can be highlighted or hidden, making the interface more concise and clear.

In summary, color psychology plays a crucial role in interface design. By deeply understanding the principles of color psychology, designers can better grasp user needs and create interface designs that better meet user psychological expectations. This can not only enhance user experience, but also enhance the competitiveness of products or services. Therefore, for designers and practitioners in related industries, mastering knowledge of color psychology is crucial. Future interface design will pay more attention to user experience and emotional needs, and color psychology will play an increasingly important role in this process. With the continuous progress of technology and the changing needs of users, we look forward to seeing more creative and user-friendly interface design works.

2.2.2 The Definition and Classification of Color Tendency

Color orientation refers to the feeling and impression that colors give people, including emotional, cultural, and personal preferences of colors. According to the properties of colors, such as hue, brightness, and saturation, color tendencies can be divided into several types: warm, calm, bright, and dim. Besides, in the interface design of digital government operating systems, color orientation has a significant impact on user experience and system efficiency. Different color tendencies can elicit different emotional responses from users. For example, warm tones can bring a comfortable and friendly feeling, while cool tones can bring a calm and composed feeling. Therefore, a reasonable color orientation design can improve user satisfaction and work efficiency. Additionally, in order to better illustrate the color orientation practice of digital government operating system interface design, this article selects some successful cases for analysis. For example, in the interface design of the digital government operation system of a certain city's tax department, blue and white are used as the main colors, giving people a calm and professional feeling, which is in line with the characteristics of tax work. In addition, some government departments have adopted a combination of warm and gray tones to make the interface more warm and comfortable, in line with the characteristics of government work. The main color tone of flags from different countries also affects the main color tone of government operating systems. The VISA visa system in the United States uses flag blue as the basic color, while Chinese government websites generally use Chinese red as the basic color.

2.2.3 Optimization suggestions for color orientation in the interface design of digital government operating systems

Based on the above analysis, this article proposes the following optimization suggestions: Firstly, appropriate color tendencies should be selected according to different usage scenarios and user groups; Secondly, attention should be paid to the coordination and aesthetics of color matching; Finally, attention should be paid to the correlation between color orientation and information content to avoid

interfering with users' acquisition and understanding of information. China's digital government operating system, as the urban brain, relies on colors that make people appear calm and composed as the main visual color to ensure the stable and sustainable development of digital government services. In China, government software is mostly blue in color.

In Summary, the color orientation in the interface design of digital government operating systems is one of the important factors that affect user experience and system efficiency. By designing and optimizing reasonable color preferences, user satisfaction and work efficiency can be improved. In the future, it is necessary to further strengthen the research and practical exploration of color orientation in the interface design of digital government operating systems, in order to promote the sustainable development of digital government. Research the relationship between interface color and operator vision, investigate and analyze the visual needs of operators for PC end government data interfaces, find color design methods for PC end government data interfaces to improve visual fatigue symptoms, and guide later design practices.

3. Font selection and Icon design

3.1 Font selection

Different fonts can convey different emotions and meanings, which have a significant impact on the user experience. When choosing a font, consideration should be given to the readability and aesthetics of the text, as well as the image of government agencies and public cognitive habits, in order to create a comfortable and professional user interface.

There is a close relationship between font copyright and interface design. In interface design, font is one of the important visual elements for conveying information. In the field of visual communication, text design is also highly valued. Text is not only a visual symbol, but also carries the responsibility of cultural dissemination. Beautiful and attractive text design can resonate with viewers. However, many fonts belong to the category of intellectual property and are protected by copyright law. Therefore, designers and developers must consider font copyright issues when designing interfaces.

Firstly, for commercial projects, using copyrighted fonts requires obtaining commercial publishing authorization for the font. This means that designers or businesses need to pay a certain fee to the font copyright owner to obtain the right to use the font. If copyrighted fonts are used without authorization, it may constitute infringement and require corresponding legal liability. Secondly, for personal or non commercial projects, caution should also be exercised when using copyrighted fonts. Even for personal learning, research, and appreciation purposes, it is necessary to comply with the provisions of copyright law and not use copyrighted fonts arbitrarily.

To avoid font copyright disputes, designers and developers can choose to use open-source fonts or free fonts. These fonts are exempt from copyright fees and can be freely used in commercial or non-commercial projects. Of course, the use of these fonts also requires compliance with corresponding license regulations to ensure that they do not infringe any intellectual property rights.

In short, when designing interfaces, designers and developers need to fully consider the issue of font copyright. Respecting copyright laws, complying with relevant regulations, and using legal fonts are important aspects of interface design, and are also necessary conditions for maintaining a good design ecosystem.

3.2 Icon design

Good icon design can intuitively express the meaning and function of information, enabling users to quickly understand and operate. In icon design, attention should be paid to the easy recognition and consistency of icons to avoid confusion and misoperation by users.
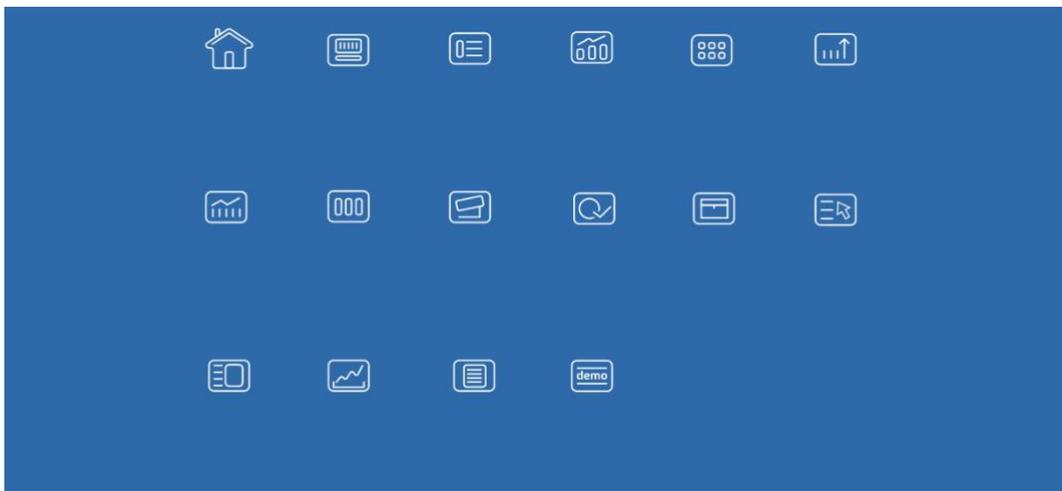
Picture 1: Icon schematic

Icons play a crucial role in interface design. As one of the core elements of visual communication design, icons can convey information in a concise and clear way, guide users to operate, and improve the user experience.

Firstly, icons can effectively express abstract concepts or operations, replacing lengthy textual descriptions with visual graphics. In interface design, using icons can simplify design elements, reduce user cognitive burden, and enable users to understand interface content more quickly.

Secondly, the design style and style of icons should be consistent with the overall interface design. The design of icons needs to coordinate with other elements in the interface to ensure a harmonious and unified overall visual effect. Meanwhile, the design of icons also needs to consider their recognizability and aesthetics. A concise, intuitive, and aesthetically pleasing icon can attract users' attention and enhance their user experience.

In addition, the design of icons also needs to consider their adaptability to different platforms and screen resolutions. Designers need to make appropriate adjustments and optimizations based on different platforms and screen sizes to ensure that icons maintain good recognizability and clarity in different environments.

In summary, icons play a crucial role in interface design. By utilizing icons appropriately, designers can enhance user experience, reduce cognitive burden on users, and make the interface more concise, intuitive, and user-friendly. Therefore, in interface design, designers need to fully consider the use of icons to create an excellent user experience.

4.The interface design trend of digital government operating systems is mainly reflected in the following aspects:

4.1 Mobility

With the popularization of mobile devices, the interface design of digital government operating systems will pay more attention to the needs and experience of mobile users. The future digital government operating system will be more adaptable to the characteristics of mobile devices, providing a more concise, intuitive, and user-friendly mobile interface design. In the process of UI designers carrying out their work, it is also important to pay attention to the compatibility and compatibility between the computer and mobile ends, in order to prevent potential problems and make government work more convenient and efficient.

4.2 Intelligence

With the development of artificial intelligence technology, the interface design of digital government operating systems will become more intelligent. The future digital government operating system will utilize artificial intelligence technology to analyze user needs and behaviors, provide more personalized and intelligent services, and improve user satisfaction. As the direct audience of government social media, the public has high expectations and requirements for government social media, which are different from other media. They often hope to obtain effective information in the shortest possible time.

4.3 Cloud based

With the development of cloud computing technology, the interface design of digital government operating systems will become more cloud based. The future digital government operating system will utilize cloud computing technology to achieve cloud services such as data sharing, collaborative office, and online services, improving the efficiency and quality of government services.

4.4 Multimedia

With the development of multimedia technology, the interface design of digital government operating systems will become more multimedia oriented. The future digital government operating

system will utilize multimedia technology to provide richer, more intuitive, and more vivid multimedia services and interaction methods, improving user experience and government service effectiveness.

4.5 Security

The interface design of digital government operating systems will place greater emphasis on security. The future digital government operating system will adopt more advanced security technologies to ensure the security of user information and data, and improve user trust and satisfaction with digital government.

5.The Relationship between Interface Design and Large Model Technology of Three Digital Government Operating Systems

A large model refers to a large-scale pre trained language model with strong natural language processing and generalization capabilities, which can be applied in various fields, including digital government. In the interface design of digital government operating systems, large models can be used in the following aspects:

5.1 Intelligent Recommendation:

Through large models, digital government operating systems can analyze user behavior and needs, intelligently recommend relevant policies, services, and information, and improve user experience and government service efficiency.

5.2 Intelligent Q&A:

Large models can be applied in intelligent Q&A systems to help users quickly obtain the necessary information and answer questions. In digital government operating systems, intelligent question answering can improve user trust and satisfaction with government services. Intelligent Q&A will combine psychology to analyze and answer the user's psychology; Combining sociology to analyze and classify user behavior, ultimately serving users to answer questions and clarify doubts.

5.3 Automated Office:

Through large models, digital government operating systems can achieve automated office work, improving the efficiency and quality of government services. For example, functions such as automatic classification, automatic summarization, and automatic translation can accelerate the process of government work.

5.4 Personalized Services:

Through large models, digital government operating systems can analyze user preferences and needs, providing personalized services. For example, recommending relevant policies and services based on user preferences and needs to improve user satisfaction.

5.5 Data Mining and Analysis:

Big models can be used in data mining and analysis to help government agencies deeply explore the value of data and provide support for policy making and decision-making.

6. Future development prospects of interface design for digital government operating systems

6.1 Continuous improvement of user experience

With the increasing demand for government services from users, the interface design of digital government operating systems will pay more attention to user experience. This includes more intuitive interface design, more user-friendly interaction methods, more intelligent service recommendations, etc., to improve user satisfaction and government service efficiency.

6.2 Data driven decision support

Through the collection and analysis of user behavior data, the interface design of the digital government operating system will achieve personalized recommendations and intelligent warning functions, providing data support for government decision-making, and improving the accuracy and scientificity of government services.

6.3 Responsive and mobile design

With the popularization of mobile Internet, the interface design of digital government operating system will pay more attention to mobile terminal and responsive design, meet the user's use needs in different devices and scenarios, and improve the convenience and inclusiveness of government services.

6.4 Enhanced Interactivity and Sociality

The interface design of future digital government operating systems will pay more attention to user interaction and social needs, such as introducing social media functions, online evaluation systems, etc., to increase user participation and transparency of government services.

6.5 Integration of Artificial Intelligence Technology

The development of artificial intelligence technology will bring more possibilities to the interface design of digital government operating systems. For example, using natural language processing technology to achieve intelligent question answering, speech recognition technology to achieve barrier free communication, etc., to improve the intelligence level of government services.

6.6 Digital Privacy and User Data Security

The digital government's digital governance needs to prioritize the handling of digital privacy and user data security issues, strengthen the protection of data storage by the government, and establish a national level data bureau to ensure data circulation and transactions. Therefore, it is crucial for digital government operating systems to ensure user privacy and data security.

6.7 Prediction of Technological Development Trends

With the rapid development of technologies such as artificial intelligence, the Internet of Things, and big data, future technologies will pay more attention to intelligence, personalization, and interconnectivity. Interface designers need to closely monitor the development trends of these technologies and predict their potential application scenarios and impacts in the future. For example, artificial intelligence will play a more important role in product design, enabling products to more intelligently adapt to user habits and needs. At the same time, the popularization of the Internet of Things will make it possible for products to be interconnected, bringing users a more convenient user experience.

6.8 Insight into changes in user needs

User needs are the core of design. In order to accurately predict changes in user needs, designers need to have a deep understanding of the user's lifestyle and behavior patterns, and discover their potential needs through user research, market research, and other means. Meanwhile, with the rapid development of society, the values and consumption concepts of users are constantly changing. Interface designers need to keenly capture these changes and integrate them into their designs.

6.9 Proposal of Innovative Solutions

Based on predictions of future technologies and insights into changes in user needs, designers need to propose innovative solutions. These solutions may involve multiple aspects such as product functional design, interaction methods, and interface appearance. For example, using artificial intelligence technology, designers can create more personalized product experiences for users; Through the Internet and the Internet of Things technology, intelligent linkage between products can be realized to bring users a more convenient use experience. Responding to the national call, we deepened the construction of "Internet plus government service", gave full play to the function of the Internet as a powerful engine for improving the quality of government service, and actively built government service platforms in various provinces and cities across the country, truly implementing the integration of Internet high-tech and government service [5].

6.10 Future oriented design framework construction

In order to implement innovative solutions, designers need to build a future oriented design framework. This framework should include multiple aspects such as design principles, design processes, and design tools. In terms of design principles, interface designers need to emphasize concepts such as innovation, user centricity, and sustainable development; In the design process, it is necessary to focus on user research, conceptual design, prototype production, testing and evaluation, and other aspects; In terms of design tools, advanced technological means such as design software and 3D modeling are needed to assist the design process.

In short, with the continuous progress of technology and the increasing demand for applications, the interface design of digital government operating systems will develop towards a more humanized, intelligent (Figure 3), convenient, and interactive direction, in order to better serve the people and improve the level of government governance. Faced with constantly evolving technology and user needs, designers need to constantly innovate and progress. By predicting technological development trends, gaining insight into changes in user needs, this enabled us to identify users' perceptions of user interface (UI) as well as identifying the most user friendly UI design [6], proposing innovative solutions, and building a future oriented design framework, we can better cope with future challenges and opportunities. Future designs will place greater emphasis on intelligence, personalization, and connectivity, bringing users a better user experience. At the same time, we also need to constantly learn and explore new design concepts and technical means to promote the progress and development of design.

7. Conclusion

The interface design of digital government operating systems has made significant progress in the application and research of the 1920s. During this period, the application fields of interface design for digital government operating systems continued to expand, involving multiple aspects such as government management, public services, and urban planning. Meanwhile, with the continuous innovation of technology and the diversification of user needs, research on interface design has become more in-depth and refined. Our findings establish a dynamic relationship between information seeking and goals, asking designers to rethink their rules of thumb in the mobile government administration context [7]

In terms of application, with the popularization of online government services in China, the development of mobile government apps is rapid. A large number of government apps neglect usability during development, only proposing design requirements for government affairs from the perspective of government function division and office processes. Their service categories and processing processes are difficult to meet the psychological expectations of the public, and poor user experience directly leads to weak promotion, resulting in huge resource waste [8]. Therefore, the interface design of digital government operating systems should focus on user experience and interactivity. By adopting a concise and clear interface layout, intuitive operational processes, and personalized service recommendations, the convenience and satisfaction of government services have been improved. In addition, the popularity of mobile devices and smart terminals has also promoted the mobility and responsive design of interface design, meeting the needs of users in different scenarios.

In terms of research, interface design focuses more on the application of data-driven and artificial intelligence technologies. By collecting and analyzing user behavior data, personalized

recommendations, intelligent warnings, and other functions have been achieved, providing data support for government decision-making. At the same time, the integration of artificial intelligence technology has also improved the intelligence level of government services, such as the application of intelligent question answering, speech recognition and other technologies, improving the efficiency and accuracy of government services.

In summary, the interface design of digital government operating systems in the 1920s made significant progress in application and research, promoting the digital transformation of government services and the improvement of government governance level. In the future, with the continuous innovation of technology and the diversification of user needs, the interface design of digital government operating systems will continue to develop towards a more humanized, intelligent, convenient, and interactive direction, providing the people with better quality and efficient government services.

The update and replacement of artificial intelligence models will drive the innovative development of interface design for digital government operating systems, from flat to three-dimensional, from CHATGPT to MIDJOURNEY and then to SORA (from text generation to image generation and then to dynamic video generation). Traditional interface design tends to be two-dimensional, while future interface design will have a visual effect that combines three-dimensional dynamics, combined with sound effects, allowing information to enter the user's senses through multiple channels. The use of generative artificial intelligence technology to participate in the construction of digital government has important historical significance and practical value in promoting the modernization of national governance. The natural language understanding and generation ability, text generation ability, and knowledge updating ability of generative artificial intelligence such as ChatGPT play an important value function in improving the level and efficiency of digital government construction. However, at the same time, the participation of generative artificial intelligence in digital government construction poses risks of government and public data leakage, government authority shifting towards technological capital, and deep information forgery.

In the future, a qualified interface designer should possess the logic of an engineer, the imagination of an artist, and the insight of a designer, leveraging high-tech capabilities to produce excellent interface designs for digital government operating systems.

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