On the Visualization and Design Analysis of Intangible Cultural Heritage Information

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ABSTRACT
This paper analyzes the concept, significance, design principles, methods, evaluation criteria, and case studies of visualization and design analysis of intangible cultural heritage information. It explores the characteristics, purposes, values, challenges, and issues related to this form of visualization. The paper argues that visualization of intangible cultural heritage information is a way to help people understand, appreciate, and preserve intangible cultural heritage while also enhancing its influence and allure. It proposes design principles such as authenticity, diversity, and inclusivity, as well as methods for data collection, analysis, and presentation. By analyzing case studies of traditional opera, yoga, culinary heritage, and other examples, the paper demonstrates the practical applications of visualizing intangible cultural heritage information and summarizes the experiences and insights gained. This paper serves as a valuable reference for the design of visualization approaches for intangible cultural heritage information.

KEYWORDS
Intangible cultural heritage; Information visualization; Design principles; Design methods; Case analysis

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1 Introduction
Intangible cultural heritage represents the intangible cultural forms created and inherited by human societies, embodying human diversity and creativity, and serving as the common heritage of humanity. Information visualization is a technique and method that transforms data into visual graphics, helping people understand, analyze, and utilize data while enhancing its aesthetics and appeal. Intangible cultural heritage information visualization can assist people in understanding, appreciating, and preserving intangible cultural heritage, thus enhancing its influence and allure. This paper focuses on the topic of information visualization of intangible cultural heritage, analyzing and exploring it from aspects such as concept, design principles, methods, evaluation criteria, and case studies, aiming to provide a reference for its design.

2 The Concept and Significance of Information Visualization of Intangible Cultural Heritage
Intangible cultural heritage refers to various intangible cultural forms created and inherited by human societies throughout their historical development. These forms include oral traditions, performing arts, social customs, rituals, knowledge and skills, and related cultural spaces. Intangible
cultural heritage is a crucial part of human civilization, reflecting human diversity and creativity, and serving as the common heritage of humanity.

Information visualization involves the use of computer graphics, interactive design, cognitive science, and other technologies and methods to transform abstract data into visual graphics, facilitating people's understanding, analysis, and utilization of data. Information visualization helps individuals discover patterns and relationships within data, enhancing its value and efficiency, while also adding aesthetics and appeal to the data.

Information visualization of intangible cultural heritage refers to the visualization of content, forms, characteristics, and values related to intangible cultural heritage. It is a way to enable people to better understand, appreciate, and preserve intangible cultural heritage through visual representation. The characteristics of information visualization of intangible cultural heritage include intangibility, dynamism, multidimensionality, and contextuality. It faces challenges such as ensuring authenticity, diversity, and participation. The objectives and values of information visualization of intangible cultural heritage are as follows:

(1) Intangible cultural heritage is facing the danger of disappearance and oblivion. Information visualization can digitally preserve and showcase intangible cultural heritage, thus extending its vitality.

(2) Intangible cultural heritage is rich in content and diverse in expressions. Information visualization, through channels like the internet, media, and exhibitions, can enable more people to understand and engage with intangible cultural heritage, enhancing its influence.

(3) Intangible cultural heritage embodies human wisdom and experiences. Information visualization, using storytelling, games, interactive methods, and more, can enable more people to learn about and experience intangible cultural heritage, thereby elevating their cultural literacy.

Therefore, information visualization of intangible cultural heritage is a meaningful yet challenging task, requiring exploration of suitable design principles and methods.

3 Principles and Methods of Information Visualization for Intangible Cultural Heritage

Design principles refer to the fundamental norms and standards that guide the design of information visualization for intangible cultural heritage. They reflect the objectives and requirements of information visualization for intangible cultural heritage. This paper suggests that the design principles for information visualization of intangible cultural heritage mainly include the following:

(1) Authenticity: Authenticity entails respecting the essence and features of intangible cultural heritage in information visualization, avoiding distortion or manipulation, and preserving its originality and integrity.

(2) Diversity: Diversity involves showcasing the multiplicity and richness of intangible cultural heritage in information visualization, avoiding oversimplification or uniformity, and highlighting its diversity and complexity.

(3) Participation: Participation entails promoting the inheritance and development of intangible cultural heritage through information visualization, avoiding a closed or rigid approach, and enhancing its vitality and allure.

The paper suggests that the design methods for information visualization of intangible cultural heritage mainly include the following:
(1) Data Collection: Data collection involves gathering relevant data of intangible cultural heritage from various sources and means, such as text, images, audio, video, etc., to facilitate data analysis and presentation.

(2) Data Analysis: Data analysis involves organizing, categorizing, filtering, summarizing, and abstracting the collected data of intangible cultural heritage, enabling the extraction of key information and values from the data.

(3) Data Presentation: Data presentation involves transforming the analyzed data of intangible cultural heritage into visual graphics suitable for people to view, understand, and experience, such as charts, maps, stories, etc., to convey the meaning and aesthetics of the data.

4 Evaluation Criteria and Case Analysis of Information Visualization for Intangible Cultural Heritage

Evaluation criteria refer to the fundamental indicators and requirements used to assess the merits and shortcomings of information visualization for intangible cultural heritage. They reflect the performance and characteristics of information visualization for intangible cultural heritage. This paper suggests that the evaluation criteria for information visualization of intangible cultural heritage mainly include the following:

(1) Effectiveness: Effectiveness refers to whether information visualization of intangible cultural heritage can achieve its intended purposes and objectives, such as preservation, dissemination, education, etc., as well as whether it can meet users' needs and expectations.

(2) Aesthetics: Aesthetics pertains to whether information visualization of intangible cultural heritage possesses a visually pleasing effect and aesthetic appeal, such as color, shape, layout, etc., and whether it aligns with the style and characteristics of intangible cultural heritage.

(3) Interactivity: Interactivity involves whether information visualization of intangible cultural heritage supports user interactions and feedback with the data or system, such as selection, zooming, rotating, etc., and whether it offers various interactive methods and modes.

Through the introduction and comparison of outstanding information visualization cases of intangible cultural heritage both domestically and internationally, this paper aims to demonstrate the practices and applications of information visualization for intangible cultural heritage, as well as summarize experiences and insights. The following selected cases will be analyzed:

(1) Information Visualization of Traditional Chinese Opera: This website, developed by the School of Design at Tsinghua University, aims to showcase various aspects of traditional Chinese opera, including its history, genres, repertoires, characters, costumes, music, and the relationships between opera and factors like geography, time, and society. The website utilizes multiple visualizations such as bar charts, pie charts, radar charts, heatmaps, timelines, and geographical distribution maps to present the multidimensional data of opera. It also offers rich interactive features like filtering, sorting, and comparisons, allowing users to freely explore the world of Chinese opera.

(2) Information Visualization of Indian Yoga: This website, developed in collaboration between the National Museum of India and Google Arts & Culture, aims to present information about the origins, development, styles, postures, philosophy, and other aspects of Indian yoga, as well as its connections with Indian culture, religion, and art. The website employs various visual elements, such as storyboards, videos, images, and animations, to present vivid data about yoga. It also provides
simple interactive features like clicking and sliding, making it easy for users to understand the essence of yoga.

(3) Information Visualization of French Cuisine: This website, developed in collaboration between the National Library of France and Google Arts & Culture, aims to showcase information about the history, regions, styles, dishes, beverages, and other aspects of French cuisine, as well as its influence on French society, politics, and economy. The website uses various visualizations such as maps, charts, images, and texts to present rich data about French cuisine. It also provides some interactive features like search and sharing, allowing users to experience the charm of French cuisine.

Through the analysis of these cases, we can observe that the design principles and methods of information visualization for intangible cultural heritage exhibit different applications, performances, strengths, weaknesses, and suitable contexts based on various contexts and objectives. Therefore, the design of information visualization for intangible cultural heritage needs to be tailored to the specific characteristics and requirements of each individual intangible cultural heritage, while selecting appropriate design principles, methods, and evaluation criteria.

5 Conclusion

Information visualization of intangible cultural heritage has played a crucial role in protection, dissemination, and education, achieving notable achievements and progress. However, it also faces some challenges and issues, such as lack of resources, difficulties in dissemination, and challenges in preservation, which require further improvement and refinement. Information visualization of intangible cultural heritage holds vast potential for development and can draw on various emerging technologies and methods, such as multimedia, virtual reality, and artificial intelligence, to enhance its effectiveness and quality. Additionally, fostering collaboration and communication, raising awareness and competence, and innovating models and forms are essential to promote the development and prosperity of information visualization for intangible cultural heritage.

References