

Research on the Logical Structure Design of Rural Art Space Design System based on Data Mining

Feifei Pei

Shandong Institute of Commerce and Technology, Jinan, Shandong, China

peifeifei@foxmail.com

Abstract. In the rapid development of the theory of big data technology, people in the pursuit of the unique beauty of natural landscape at the same time, the design and transformation of rural art space put forward higher requirements, research scholars in the practice of research, the use of big data information transmission can be more intuitive expression of the pattern of people and landscape. According to the transformation of rural art space design in recent years, rural space, as a basic component of environmental landscape design, has begun to develop towards the direction of diversification, multi-level and digitalization under the influence of big data technology theory. Based on the understanding of the research status of big data technology, according to the basic requirements of rural art space design and transformation, this paper deeply discusses the practical significance of big data for rural art space design and transformation, in order to provide technical support for the creation of high-quality natural landscape in the new era.

Keywords: Big Data; The Countryside; Art Space; Design and Transformation; Massive Amount of Information.

1. Introduction

With the rapid development of modern science and technology, the global economy has entered the era of big data. In essence, big data is also known as massive data or massive data, which means that the amount of data involved is so large that it is impossible to use the existing mainstream software tools to quickly obtain, manage and process it within a specified time, and it is difficult to provide effective basis for the management decisions of all enterprises. According to practical survey and research, big data has the following characteristics: first, the quantity is huge; Second, diversification; Third, high speed; Fourth, authenticity; Fifth, high value. From the perspective of practical application, big data is not only an unprecedented large-scale data set in human history, but also valuable information for the innovation and development of the whole society. In the 1980s, renowned futurist Alvin Toffler raised the issue of big data in his book *The Third Wave*; In the 21st century, big data has become the focus of the development of the network information technology industry. In 2012, the United States government put forward the Big Data Research and Development Initiative, which clarified the national policy of the United States on big data. This is also the first big data strategy report at the national level in the world. Since then, developed countries such as Japan and the United Kingdom have made clear their strategic plans with big data as the core. When scholars around the world have extensively studied the concept of big data, computer science, mobile Internet and other contents, the outline of big data thinking has become clearer and has shown strong application potential in many fields.[1-3]

In the construction and development of modern society, big data has a great impact on the social economy and life pattern. People can quickly find new ways to solve problems in the big data information and effectively control the negative impact of problems. Taking big data as the effective basis for practice and development, the design and transformation of rural art space can better reflect the concept of human-oriented environment landscape design. From the perspective of art design, rural space is the basic component of building a harmonious and stable ecological environment. The integration and application of big data thinking and technical software for design and transformation can not only build an intelligent simulation operation platform, but also master more valuable data information in the comparative analysis. Combined with the case analysis of rural space design

transformation in recent years, it can be seen that the rural space design under the big data technology has the following characteristics: On the one hand, it has the aesthetic feeling of science and technology. In the interaction between big data and science and technology, the practicability and modernity contained in the technical theory have brought infinite possibilities for the rural spatial development. The integration of big data technology in the process of project design and reconstruction is the basic driving force of rural space upgrading and reconstruction in the new era. The mined data can enhance the aesthetic feeling of rural art space design and combine rural development with the progress of The Times. For example, in the design of rural art space, natural light should be used as far as possible to increase the beauty of light and shadow inside the space. The way of setting glass curtain wall can be given priority to reflect the natural beauty of the countryside, which can not only reduce the time cost of resource loss, but also provide residents with more novel life experience. On the other hand, there is a sense of local beauty. In the innovation and development of network technology, cloud tourism and cloud boarding are the focus of current research and discussion, providing a new idea for the design and innovation of rural art space. In order to ensure the sustainable development of rural space, at present, all regions use big data platforms for publicity and education. They will make comprehensive use of their own rural cultural differences, highlight the local aesthetic characteristics, improve the regional value of rural art space, and truly understand the service needs of different groups. For example, the Forbidden City, as the most representative case of cultural creation at present, has completed the creation of films, novels, variety shows and other themes with the support of big data technology platform, which not only enhances the popularity of the Forbidden City in the social development, but also enables more groups to know about cultural relics in different periods. On the basis of understanding various cases of rural art space design and transformation, this study uses big data technology thinking to optimize and innovate, and builds a massive information software system with big data analysis as the core for design and transformation, so as to really clarify the practical significance of big data for rural art space design and transformation, so as to provide technical support for the development of art space in the new era.[4-6]

2. Method

2.1 Big Data Analysis System

After defining specific requirements and technical methods for the design and renovation of rural art space in the new era, big data thinking should be used to build a system structure combined with the following figure 1, so that the design and renovation scheme can be presented in the big data platform, reduce data errors, improve work efficiency, and control resource cost loss.[5-8]

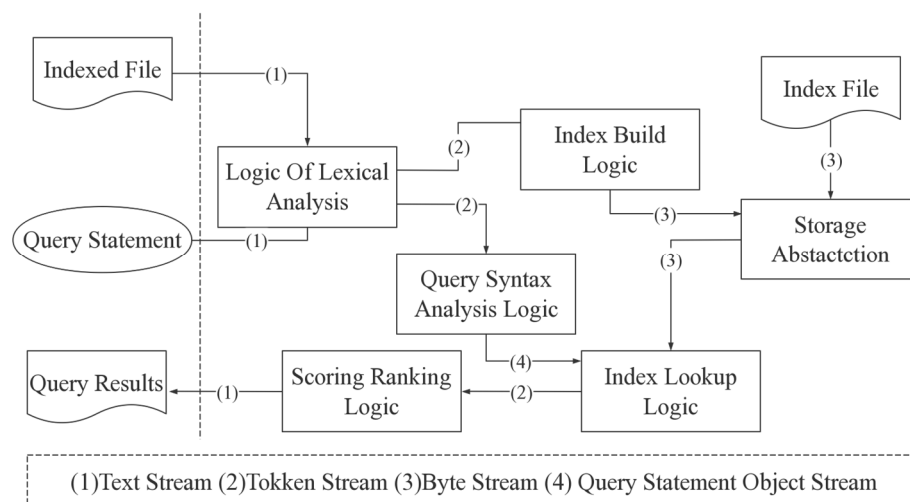


Fig 1. System structure diagram of big data analysis

Based on the analysis above, it can be seen that the logical structure of the system with big data analysis as the core is mainly divided into the following contents:

First, logical layering. According to the requirements of software processing, scientific segmentation of data information makes the data of different functional layers have independent states in the transmission process to prevent excessive interference between data information. After the stratification will form a number of areas, on this basis to improve the control software program, can achieve the best use effect. During the operation period is likely to appear a variety of technical hidden problems, this needs to explore the corresponding control methods, pay attention to the internal improvement of the system. It should be noted that logical stratification is closely related to the control system software segmentation. If the input data of the segmentation software reaches the accuracy standard, it can efficiently complete the task of mass information processing. According to the acquired processing information to achieve command control, can achieve the best control management effect. The database layer needs to be connected to the final processing information data to prevent connection interference during information transmission. The logical hierarchical structure is shown in Figure 2 below:[10-13]

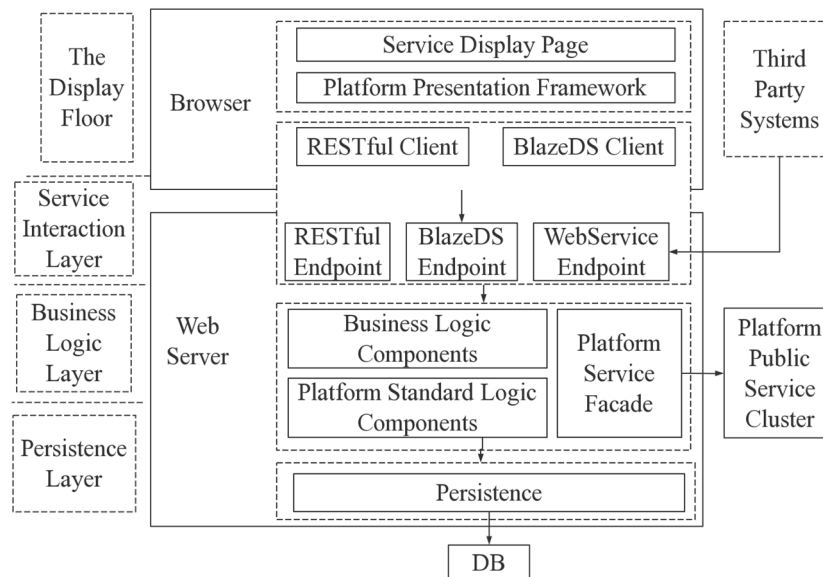


Fig 2. Structure diagram of the logical layers of the system

Secondly, data extraction. To deal with massive information in the big data environment, it is necessary to extract the required data effectively, scientifically control the security risks during the application, and gradually improve the relevant content. Complete data extraction under program control environment, carefully observe the working environment of data transmission, use system procedures, encryption control to reduce the impact of environmental factors, and provide effective basis for big data analysis applications. The data extraction process is shown in Figure 3 below:

Finally, data tracking location. In the environment of big data processing, information acquisition should be located. Only in this way can we find out whether there are relevant factors affecting data operation. After data tracking and positioning, we can accurately grasp the main content of data information acquisition, and on this basis, complete massive information processing, complete various tasks in the system at the same time, and build a good operating environment for the final management and implementation. Combined with data accurate tracking and positioning to improve the work efficiency of mass information processing, truly achieve the expected processing effect, and lay the foundation for the development of various management control plans. Combined with the data tracking and positioning structure diagram shown in Figure4 below, it can be seen that data analysis is not only reflected in scheme control, but also directly related to the stability of platform operation.

Tracking and positioning operations can help users judge the legality of requests faster and avoid illegal requests affecting the system operation effect.

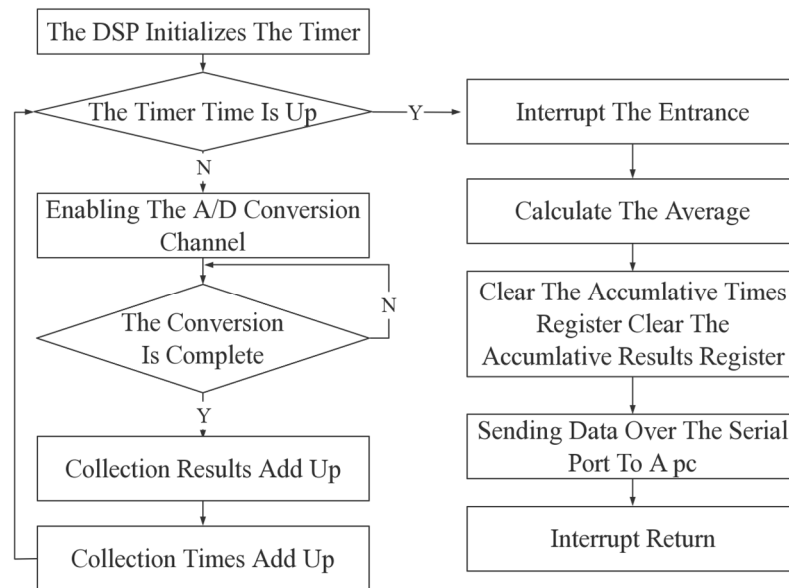


Fig 3. Flow chart of data extraction

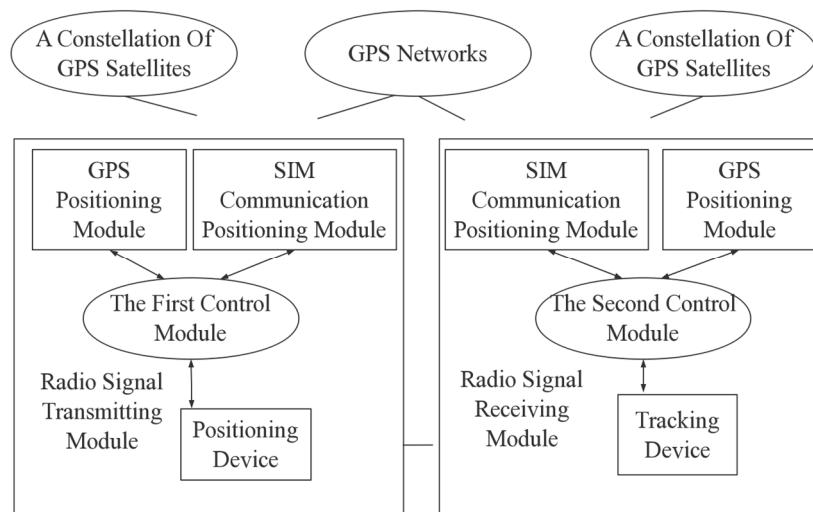


Fig 4. Structure diagram of data tracking and positioning

2.2 Data Application

To implement the design and transformation of rural art space based on big data technology, it is necessary to transform the data into available information in the operation process of data extraction, data conversion, data fusion and data analysis, and the decision-making guidance should be assisted according to the form of intuitive and better understanding. As an application technology formed after the commercialization of data warehouse, connection analysis, data mining and other related technologies, BI can effectively process numerical data and quickly find the correlation relationship between data. Combined with the system logic architecture shown in Figure 5 below, it is divided into three parts: the data layer refers to the ETL process, the business layer refers to the process of OLAP and Data Mining, and the application layer refers to the process of data display, result analysis and performance analysis. When designing and transforming rural art space, we should usually pay attention to the following points: First, adapt to the local topography and make use of the unique landscape of natural ecology. When designing and planning the rural art space, it can be integrated with the local natural landscape and cultural landscape, which can not only present a more real

landscape environment and show its own unique artistic charm, but also derivative the natural wisdom into the homestay to create a better art space for the residents. For example, when a place is constructing a rural art space, it chooses to build it high in the south and low in the north, with a land level difference of 18 meters from top to bottom. In the low place, you can enjoy the beautiful courtyard of the river, landscape and bamboo forest, while the high place can see the clouds of Huangshan Mountain far away. More importantly, it also creates a unique garden landscape inside and outside the rural space, so as to ensure the unique scenery inside and outside the rural space. Secondly, respect the architectural prototype. When transforming the rural art space, we should pay attention to the protection and restoration of the original architectural system, respect the architectural prototype to the greatest extent, and skillfully use the terrain advantage to introduce the mountain stream, so that each building will eventually converge to form a wave of clear pool in front of the hall. For example, using the natural method of borrowing scenery, the window frame is regarded as a picture frame. On the basis of not affecting the appearance of the building, the design retains the old pane elements, re-expands the original window, chooses wood material or exposed rough wood structure, which can not only make people feel the passage of time, but also can experience the unique fun of changing scenery step by step.[11-15]

Finally, the integration of regional culture and B&B requirements. After defining the basic concept of rural art space design and renovation, it is necessary to integrate the regional cultural characteristics of the local area for optimization and innovation, and then put forward a new design and renovation scheme, so that residents can truly feel the unique charm of rural art space

3. Result Analysis

As the application of big data thinking technology in the field of art design becomes more and more extensive, the analysis and query of massive data make the art design work more standardized and clear. Therefore, art scholars around the world gradually strengthen the research of big data thinking technology and pay attention to the application research combined with practical cases, so as to optimize the final effect of art design. In the future innovation and development of science and technology, the research on the design and transformation method of rural art space with big data as the core is mainly reflected in the following points: First, digital graphics. The optimization of digital graphic design based on the big data platform can ensure that the final design scheme is more reasonable; Secondly, image processing. The integrated use of big data and intelligent technology to analyze image information can enhance the effect of art application and guarantee the quality of final design presentation; And finally, intelligent algorithms. Intelligent algorithms represented by genetic algorithms, neural networks and support vector machines play a positive role in the application of big data technology platforms, which can not only dig more valuable data information in depth, but also master the optimal scheme in multiple training studies.

4. Conclusion

To sum up, according to rural regional advantages and rich cultural connotations, the integration of big data thinking technology to transform and design rural art space can not only improve the aesthetic level and innovation ability of rural space, but also present a multi-functional environmental landscape, which can truly meet the construction needs of the development of modern society. Therefore, we should pay attention to the rural art space research, combined with big data resources and technology to explore the corresponding design and transformation scheme, only in this way can better reflect the modernization and function of rural space.

References

- [1] Guanghua Luo, Chang Song. Research and Practice of Digital Economy Helping Rural Industry Revitalization: A Case study of the construction of Big Data Platform for Agricultural Innovation Space in Guangqing [J]. New Generation Information Technology, 2022(003):005.
- [2] Zhongzai Zhang. Art Risk in Digital Age: Public Art and Big Data Capitalism [J]. Public Art, 2020(3):6.
- [3] Qizhi Zhang, Xiaorui Zhang, Fangtao Lu. Study on the spatial layout of flammable and explosive places in Hefei based on POI big data [J]. City Architecture, 2020, 17(20):3.
- [4] Zhiliang Xing, and Yu Yu. Art intervenes in the contemporary art exhibition space in the countryside [J]. Art Education Research, 2021(16):3.
- [5] Huailiang Qi. Research on new practice methods of film and Television art education under the background of big data [J]. Media Forum, 2020, 3(7):2.
- [6] Yuyuan Song. Research on Visual Communication Design in Digital Media [J]. Tomorrow's Fashion, 2020(10):76-77.
- [7] Xinghua Yu. On the effect of artistic space planning on the cultural construction of university libraries [J]. Comparative Study of Cultural Innovation, 2022, 6(7):4.
- [8] Zhengyu Ding. Study on the theory of rural green space Construction [J]. 2021(2017-12):343-343.
- [9] Xinyi Niu, Yufeng Yue. Research on rural planning supported by mobile positioning big data: progress, difficulties and prospects [J]. Urban and Rural Planning, 2020(2):9.
- [10] Xianfeng Zhai, Baozhen Shi. Landscape planning and design of beautiful rural pastoral complex under the background of big data [J]. Journal of Agricultural Engineering Technology, 2021, 41(24):2.
- [11] Xiaorong Yi. Application of big data to support the cultivation of local pottery talents under the background of rural revitalization [J]. Knowledge Window (Teachers Edition), 2022(6):3.
- [12] Xiaotong Cui. Research on the effective connection between the achievements of poverty alleviation and Rural Revitalization enabled by Big Data [J]. Leadership Science, 2021(22):4.
- [13] Counting rain in the morning. Two-way Empowerment of Public Art's involvement in rural Space: A case study of regional Art Festival "Art in Fuliang 2021" [J]. Architecture and Culture, 2022(8):3.
- [14] Anqi, Jialu Liu, Xizi Zhang. Research on the intervention of art in rural space design under the background of rural revitalization Strategy [J]. Art Science and Technology, 2022(006):035.
- [15] Qiman Li. "Big Data" -- A Bridge between the Development of Teaching and Learning [J]. Teachers, 2020(31):2.