Research on Information Visualization Design Method under Mega Data Background

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Abstract: Mega data era has greatly reformed the way of data processing, and the progress of technology will inevitably reduce the cost. With the progress of sci & tech, many talents gradually devote themselves to the development and application of mega data. Now, an obvious problem is how to make large data sets simpler, and the visual application analysis of data is a very effective method. Under the background of mega data, with the progress of IT, a large amount of data can only get the required regularity through visualization. Through the analysis of data visualization report cases, this paper further confirms the significance and value of visualization, and puts forward some countermeasures and suggestions on how to better visualize data. Data visualization emerges with the arrival of mega data era, and only after understanding the essence of the concept of data visualization, can we obtain the hidden value of data by studying and reasonably applying its principles and methods.

1. Introduction

The wide application of mega data will also bring the upgrading of data storage and data processing [1]. It needs more huge storage space to accommodate these complex information [2]. As a data platform and data distribution center, the Internet gathers a large amount of data. Under the background of mega data, people have to deal with more and more data and data types, and have higher and higher requirements for the operation of data visualization, which requires the continuous improvement of the reliability and precision of visualization related operations [3]. The three main features of mega data are massive, diversified and rapid [4]. People urgently want to mine important information from the massive non structural database and promote the advent of the mega data era. Therefore, it is very important to study the data visualization application analysis based on the mega data era [5].

In the context of mega data, with the progress of it, a large number of data can only be obtained through visualization [6]. Data visualization is the product of mega data era and an important tool to promote the rapid development of various industries. Different visualization methods are used for different types of data. Through practice, it can be verified that the visual design of data and information can greatly improve the visualization of data [7]. The mega data era not only requires the collection and sorting of data, but also transforms various and complex data into charts and linkage images that non professionals can understand, so as to simplify the processing of a large amount of data and make it more intuitive to show some practical problems [8]. Nowadays, mega data gradually permeates every corner of life. In such an environment, the research on data visualization is worthy of our in-depth thinking. Through the analysis of data visualization report cases, this paper further confirms the significance and value of visualization, and puts forward countermeasures and suggestions on how to better carry out data visualization.

2. Definition of data visualization

In today's mega data era, we are faced with a large amount of data and information to be processed every day. We can analyze the laws and conclusions with a small amount of data, but we can't analyze the laws of data changes and draw some conclusions with a large amount of data and information in a short time. Data visualization usually refers to the use of sci & tech to transform

abstract data into visually observable forms, which usually include charts, graphics, animation, modeling and so on [9]. With the development of sci & tech, the content of data visualization is constantly expanding, from simple chart type in the early days to several forms of realization. In the process of data visualization, we can design the visualization forms of a large amount of data and information into simple and easy-to-understand forms, which can improve the efficiency of analysis and judgment and save time. Visualization of data can make it easier for people to get the laws that data should convey through concrete processing such as images, charts, animations, etc., and people can also have closer contact with computers and control computers more accurately according to these laws.

3. The process of data information visualization

At present, data visualization mainly uses software to carry out data visualization operation. The software is relatively simple to use, and the amount of data is not required. It can be preliminarily completed only by cleaning and sorting the data and importing it into the tool software, and analyzing and operating according to your own needs. First, simplify a large amount of data and information to reduce the amount of computation and improve the processing speed. Then, the simplified data and information are transformed, and certain symbols are used to express the relationship and characteristics between the data. Then, the process of data transmission is monitored by simulation, and the data and information are processed and calculated according to the monitored information, which paves the way for visualization. Finally, according to the characteristics of the corresponding data and information, the corresponding modeling is carried out, through which the data and information are analyzed and processed, so as to obtain the laws and conclusions expressed by the data and information. Figure 1 shows the unstructured data collection process in information visualization design.

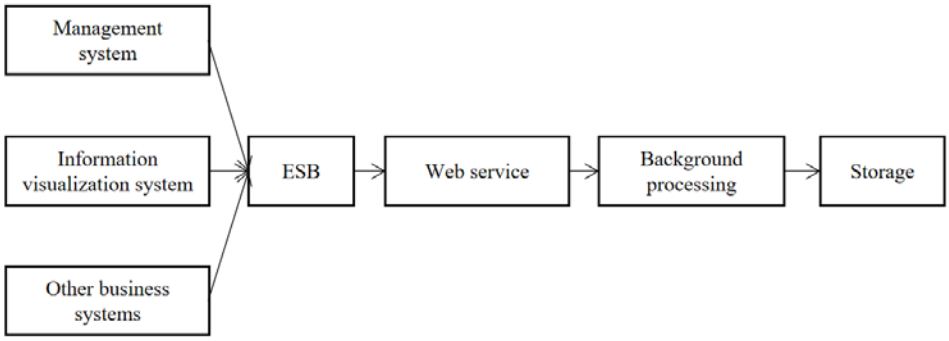

Figure 1 Unstructured data collection process

4. Suggestions on the development of data visualization in mega data era

4.1. Visual design of multidimensional data

In order to improve work efficiency, during data visualization, we should not only pay attention to the accuracy of data visualization related operations, but also pay attention to the beautiful design of visualization charts and enhance visual design. There are also a lot of multidimensional data in a lot of data and information, and it is an important point to visualize these multidimensional data. In the operation of sorting, cleaning and analyzing data, all kinds of information in different forms will appear at the same time, and the huge amount of such information is not conducive to discrimination, which makes it difficult to find the required information in different types of information at a glance and wastes time. Therefore, we need to pay more attention to the design of the visual interface, and strive to make the design of the visual chart as easy as possible to be observed on the panel, so that users can find out the specific content of the required information efficiently and accurately.

4.2. Visual design of text data

The core operation idea of data visualization is from complexity to simplicity. If the data processed by visualization is still jumbled, it will lose the significance of visualization. Therefore, as far as the visual panel effect is concerned, less is more. With the least and most concise content, the most information can be displayed, so as to facilitate people's observation and analysis. In the process of data processing and analysis, we will encounter all kinds of text information, and the amount of text information is also very large. In so much text information, it is very difficult to find the text we need. We must design a very clear visual interface to facilitate us to quickly find the text information we need. Fig. 2 shows the structure of mega data storage in cloud environment based on information visualization design.

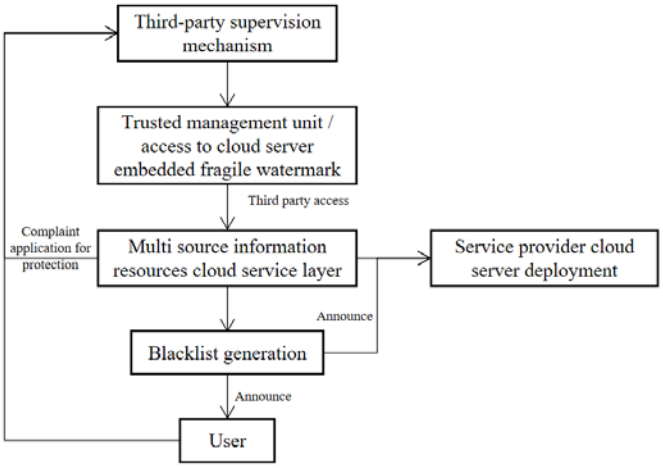

Figure 2 Cloud environment mega data storage based on information visualization design

When dealing with text information, we should emphasize the differences of text information, such as using more conspicuous colors, or changing the shape size and background color of fonts, so that they can be clearly distinguished from other information. At the same time, attention should also be paid to the design and collocation of the whole panel color, and color should be used to indicate the priority of information. Users can observe and analyze the data more conveniently, so as to obtain valuable information, which greatly reduces the workload for users and improves the work efficiency. Visualization does not require that the panel be covered with data before it is visualized. The truly excellent visualization operation should be that the interface reduces irrelevant content as much as possible and highlights key information. At the same time, it should have the functions of deleting, hiding and regrouping. When designing a single text information, we should highlight the characteristics of the text information to distinguish it from other text information, and pay attention to the visual effect of the text information, so as to be clear at a glance, so that the text can be visualized.

5. Conclusions

With the development of information and computer technology, a large amount of data can get the required rules only through visualization. With the rapid development of network technology, mega data era has gradually started to change from quantitative change to qualitative change. It is precisely because of the popularity of data visualization that people in every field want to find their own place in it and use it for their own use. As a result, the definition of this interdisciplinary field is more vague. It's like a map that can't see the whole picture. Everyone can see a part of it, and they all have their own vision and are limited. Users should not only passively accept information, but also participate in data visualization operation, which also provides more room for users to experience data visualization. It takes much thought to design the visual interface, and is committed to making the visual chart design as easy as possible to be observed on the panel, so that users can

find out the specific content of the required information efficiently and accurately. When dealing with text information, we should emphasize the differences of text information, such as using more conspicuous colors, or changing the shape size and background color of fonts, so that they can be clearly distinguished from other information. Different visualization methods are used for different types of data, and it can be verified through practice that visual design for data and information can greatly improve the visualization of data.

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