Design of Fire Detection System Based on Artificial Intelligence Technology

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Abstract. In this era of rapid development of network and technology, data has become the most important part of companies and people. In fact, the software and system series are just the framework for storing data, and real data occupies an important position in the entire communication. This paper focuses on data mining and management models of public data resources. Starting from how to mine useful information from public data resources and how to manage such data, it puts forward several classifications of big data management models and their respective advantages.

Keywords: Data Mining, Common Data, Big Data, Management Models, Common Resources

1. Introduction
Data is a measure of all things and things, and this standard can limit people's use of things under certain conditions, and scientific data can reflect some facts and truths. Data management is also a complex and meticulous thing, and a little deviation of it cannot be tolerated. If the data is wrong, it may lead to very serious consequences [1]. This paper will start with the following steps (see Figure 1).

2. How to mine useful data
2.1. Start with public resources on the web
To get useful data, first know what you need and what kind of data can help you solve your problem.
Secondly, we should look more and compare more, find out the information and data needed in the process of comparison, and finally get a more accurate data through the results of comparison. To get an idea of air quality in Shaanxi province, for example, it is necessary to count and analyze the amount of gases in the air in Shaanxi's cities. To obtain these data, you can go to the Shaanxi Public data sharing platform for retrieval, or you can go to the official website of relevant departments for reference.

2.2. Derive results from experiments

No matter where the data are, they are made up by experiment after experiment, not by invention or imagination. Many physical and chemical experiments, for example, are calculated by comparing data in the experiment [2-3]. For example, the kinetic energy theorem in physics (formula 1) is the result of many experiments. Its specific experimental data are shown in Table 1.

| Table 1. Experimental data table of kinetic energy theorem |
|----------------------------------|
| m /kg | 1.0 | 2.0 | 4.0 | 6.0 | 8.0 |
| V1 /m/s | 2 | 4 | 6 | 8 | 10 |
| V2 /m/s | 4 | 6 | 8 | 10 | 12 |
| W /J | 6 | 10 | 14 | 18 | 22 |

It can be inferred from the data in the above table that:

\[ W = \frac{1}{2}mv_2^2 - \frac{1}{2}mv_1^2 \] (1)

2.3. Calculate the required data according to the known data laws

In the study of mathematics, certain learned to find rules, linear data can be obtained through functional expressions. For irregular data, we can find other proper expressions. For example, according to the statistical data of "daily data information of urban air quality" published by the public data opening platform of each province, we can roughly infer which city has better air quality and what level of air quality is in the cities of the whole country. First of all, the desired data should be collected, then known horizontal integration, vertical integration, and then data cleaning, cleaning missing values, outliers and repeated values, and finally all data data conversion. The information you want to know can be obtained from the processed data.

3. How to classify the resulting data

The basis of data classification is data, which can be divided into continuous variables and classified variables. Data classification is to merge the data with some common attributes or features and distinguish the data by the attributes or features of their categories [4-5]. In other words, it is the same content, the same content, the same nature of information and information that requires unified management together, and the different and need to be managed separately from the information, and then determine the relationship between each set, forming a systematic classification system.

3.1. By subject

The collected data can be sorted out a method suitable for data management and storage by distinguishing which subject or major it belongs to. Data of different majors have different meanings. Although seemingly the same data, it also has different meanings in different places. In the example above, the data can be grouped by province and then broken down by item. Since each city has different primary pollutants, cities with the same primary pollutants can be classified according to the types of these pollutants.
3.2. Classify by data type

Different types of data are common in computer programming, including integers, strings, floating-point and Booleans. To compare air quality across all provinces, the collected data can be grouped by subject, for example, by carbon monoxide content in the air, air quality level, AQL, etc.

3.3. Classify data according to its usefulness

This part is mainly based on the role of all the data to classify and analyze. For example, according to the role of metadata in system, it can be divided into two categories, the first is system level metadata, the data can be used to implement the file system characteristics or management of the data in the file system information, such as access to the data of the time, the size of the data, the current location in the storage level, how to store data blocks in place to ensure that the service control number, etc [6]. The second type is application-layer metadata, which helps users find, evaluate, access, and manage data and other information related to data users, such as summaries of text file contents, graphical snapshots, and information describing relationships with other data files. It is often used for high-level data management, users can quickly obtain appropriate data through it.

4. Classification of big data management models

4.1. Behavioral event model

In the operation process of APP or website products, they often have an intuitive grasp of the overall data such as daily page views, unique visitors and daily active users of the website, and make clear the trend of daily data changes [7-8]. Or after the promotion of third-party paid channels, it is necessary to intuitively and clearly compare the traffic brought by different channels. This is where the behavioral event analysis model comes in.

An event is a behavioral action by a user to operate a product, that is, something a user does within the product. Event analysis is an analysis operation such as statistics, segmentation, and screening of the indicators of what users do.

Behavioral event analysis includes:
   ① Define and select: when, where, and how the user completes an event;
   ② Drill-down analysis: the highest behavior event analysis needs to support all refinement condition screening;
   ③ Explanation and conclusion: rationalize the analysis results.

4.2. Distribution analysis model

Product optimization and operation is a dynamic adjustment process, which requires constant monitoring of data changes, adjustment of product design and operation methods, and comparison of monitoring effects. Distribution analysis is the classification and presentation of frequency and total amount of users under specific indicators. It mainly shows the degree of users' dependence on products and analyzes the number and frequency of purchase of different products used by customers in different regions and time periods. This model can help operators understand the current status of customers.

4.3. Behavior path model

Analysis of user behavior path refers to the user's access path in APP or website. In order to measure the effect of APP optimization or marketing promotion, and even to understand the user's behavioral preference, it is necessary to analyze the data of the page he visits. The behavior path is to restore the full user behavior [9]. If we only have data like page views or unique visitors, we have no way to understand how customers are using the product. Users' behavior paths can help operators pay attention to users' real experience and usage habits.
The user behavior path analysis model can track the use frequency, page access, path and source of product software, and obtain the data of page access behavior, times, duration, jump rate and per capita use duration.

Funnel analysis and path analysis have some similarities, but they are different. Funnel analysis is mainly to strengthen the specific analysis process or business links, and then analyze the transformation between these major links; Path analysis strengthens the user's path sequence. Each path sequence contains major services. Therefore, services in each step are likely to be similar. In short, funnel analysis focuses on the relationship between links, while path analysis focuses on the order of users in different businesses. Theoretically, funnel analysis is part of path analysis.

4.4. User clustering analysis
For the operation of software, clustering analysis is generally used. User clustering is to find the corresponding group through the specified rules. In actual use, groups can be defined based on service requirements. The common methods are as follows:
- Find people who have done something: people who have gone swimming in the past week;
- People with certain attributes: women under the age of 24;
- People lost in the conversion process: people who paid but didn't go, for example.

4.5. User Attribute Analysis
User attribute analysis is to classify and count users according to their own existing attributes. Attribute analysis is one of the methods to realize the fine operation of user behavior. For example, you can view the change trend of the number of users in the time of first use and the distribution of users by province and county. User attributes include user information, such as name, age, marital status, gender, highest education level and other information, as well as product attributes, such as resident province, level and first access channel of the user. The main value of attribute analysis is to enrich the dimension of user portrait and make user behavior insight more detailed.

4.6. Retention analysis model
Retention is an important part of the AARRR model (Figure 2). Retention analysis is an analysis model used to analyze user engagement or user activity. It is an important method to measure the value of software products to users [10]. Observe how many of the users who took the initial action will take the next action. Generally speaking, the retention rate refers to the proportion of users who return to the website or APP to complete a certain behavior in a certain period of time. That is, if x users meet a certain condition and Y users return to the site at a certain point in time, then the retention rate at that point is Y / X. Common metrics include next-day retention, seven-day retention, and next-week retention.

![Figure 2. AARRR model](image-url)
5. Conclusion
This paper studies the big data management model of public resources based on data mining, and illustrates the characteristics and working methods of the model from how to mine useful data to the classification of the management model. The inverse way of data search and the advance classification of data provide help for the management model to find the corresponding user groups. In this era of data network, every event has its corresponding attribute data. The above management model brings great convenience to data classification and storage, and can also push more topics that users are interested in according to their usage data. The model will continue to be refined and perfected.

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