Detailed Description of Data Analysis Process of Internet of Things System

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Abstract. The purpose of data analysis of Internet of things system is to concentrate and extract the information hidden in a large number of seemingly disordered data, and find out the internal laws and useful value of the data object. In practical application, data analysis can help people make judgments and take appropriate actions. The data analysis of the Internet of things is a process of organizing and purposefully collecting data, processing data and analyzing data to form information. The analysis process is the support and execution process of the algorithm. In the data processing cycle, data analysis should be used properly in every link from data acquisition in the field perception layer to data transmission in the communication layer to data processing in the application layer, so as to improve the effectiveness and rationality of data processing.

1. Introduction

Internet of things data analysis has a very wide range of applications. Data analysis may include the following four parts.

A. Exploratory data analysis
When the data is just obtained, it may be disordered and can't see the law. Through drawing, tabulating, using various forms of equation fitting, calculating some characteristic quantities and other means to explore the possible form of regularity, that is, the direction of data flow and how to find and reveal the law hidden in the data.

B. Model selection analysis
On the basis of exploratory analysis, this paper puts forward one or several possible models, and then selects some models from them through further analysis.

C. Inferential analysis
Mathematical statistics is usually used to infer the reliability and accuracy of the model or estimate. The main activities of data analysis process consist of identifying information needs, collecting data, analyzing data, evaluating and improving the effectiveness of data analysis.

D. Identify requirements
Identifying information requirements is the first condition to ensure the effectiveness of data analysis process, which can provide clear objectives for data collection and analysis. In order to identify information requirements, information requirements should be put forward according to the requirements of decision-making and process control. For process control, it is necessary to identify the needs and use the information to support the evaluation of data analysis process input, data analysis process output, rationality of data resource allocation and optimization scheme of process processing.
2. basic requirements for data collection
The purpose of collecting data is the basis to ensure the effective process of data analysis. The Internet of things system has planned, purposeful and selective data collection.

Looking at numbers and trends is the most basic way to display data information. In data analysis, through intuitive figures or trend charts, we can quickly understand such as the trend of data, the quantity of information, the performance of the situation, etc., so as to absorb data information intuitively, which is helpful to the accuracy and real-time decision-making. Data analysis should be purposeful and directional. It is to analyze a problem that is facing now, to sort out the overall business situation, or to forecast and monitor a certain indicator in the future. In short, it is to solve puzzles, monitor and forecast, with the aim of improving efficiency and gain.

After the purpose is clear, we need to sort out the ideas, how to sort out? If it is to analyze the reasons for the general decline of sales in the past month, we should restore the whole process of the progress from the bottom to the top. The purchase process involves volume, unit price and discount rate, and then it is divided into various products; browsing involves browsing volume, pv/uv; user dimension also includes loss rate, activity, and re-purchase rate. The purpose of analysis is divided into several different analysis points, and then the analysis method and specific analysis index are determined according to each analysis key point.

Plan the content, source and method of data collection. The following issues shall be considered in planning.
A. The requirements of identification are transformed into specific requirements, such as the data to be collected when evaluating data, including the acquisition process, data accuracy, acquisition system and other related factors.
B. Identify the source of data and the channels and methods to collect data.
C. The data record sheet shall be convenient for the analysis system.
D. Take effective measures to prevent data loss and data interference to the system.

Analysis data is to transform the collected data into useful information through processing, sorting and analyzing.

3. Validity and reliability of data analysis process
Data analysis is the hot spot of IT application. The focus of data analysis lies in the data technology itself, including data storage cost, data storage method and data processing technology. The storage level...
of data storage is constantly improving. Get new data and store it locally or in the cloud. The improvement of data volume promotes the upgrading of data processing technology, from the previous single machine data reading to the generation of system data architecture, greatly improving the magnitude and speed of data processing. When the system invested a lot of time and resources, established a complete set of data processing system, obtained the data required by the system. The value of data essence is the core reason of data processing.

Data analysis is the basis of data management system of Internet of things. The data analysis system should evaluate its effectiveness by analyzing the following problems when appropriate.

① Whether the data provided for analysis is sufficient and reliable, and whether there are problems of analysis errors caused by insufficient information, inaccuracy and lag.

② Whether the effect of information on the continuous improvement analysis system, process and goal is consistent with the expected value, and whether data analysis is effectively used in the process of system realization.

③ The purpose of data collection is clear, the collected data is true and sufficient, and the information transmission channel is smooth.

④ The data analysis method is reasonable and can control the risk in an acceptable range.

⑤ The resources needed for data analysis are guaranteed.

4. data analysis process and steps
The first step puts forward the problem of data analysis and establishes the demand of analysis.

The second step is to analyze the problem and put forward the scheme. Data analysis itself is a process of hypothesis testing and reasoning. This step requires good hypothesis and establishment, and the subsequent tests and analysis can be well carried out.

The main thinking is from which aspects to analyze this problem.

A. Objective and model of data analysis.
B. Attention to the results of data analysis.
C. Data analysis factors (time, capacity, storage).

Step 3: prepare data: create analysis table, collect data, apply data platform, data warehouse and data file.

CREATE TABLE lyj01_user_analyze ( ) ENGINE = INNODB DEFAULT CHARSET = dd88;

Data collection is basically completed.

Step 4 data analysis: import the data into the data analysis platform and data analysis software. Analysis software and tools are used to analyze the data.

Step 5 analysis report and chart presentation, the analysis report accurately expresses the data analysis objectives, and the chart visually presents the data analysis results.
5. Conclusion
The data analysis process used in the Internet of things system, according to the analysis software structure and analysis process, explains in detail the process of solving various Internet of things problems through data analysis. In the process of solving the problem, various data analysis methods are used. The data used in this paper are the original data after cleaning, and how to process the data for data analysis is also discussed in detail. The analysis program is used to operate the data and complete the data analysis process of the Internet of things. Around the data analysis method of Internet of things, this paper expounds the data acquisition method and data cleaning method, illustrates the effectiveness and reliability of data analysis, and discusses the detailed process of data analysis of Internet of things.

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