Data Processing and Analysis Flow of Internet of Things System

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Abstract. The data processing and analysis flow of Internet of things system is the basic process of system design ideas and methods. It includes a series of operations such as requirement analysis, software function design, algorithm and method of implementation, overall structure design, module design, coding and debugging, program linking and testing, compilation and submission of the system. Data processing and analysis process can meet the needs of the system, and solve the problem of the main content of the process. This paper discusses the basic mechanism, principle, type and application of data processing of Internet of things, discusses the composition and elements of data analysis system of Internet of things, and explains the construction process and analysis process and steps of data processing of Internet of things.

1. Data processing and data analysis development cycle
Cycle and phase
From the perspective of management, that is, from the perspective of business and application, the life cycle of system process components includes four main stages.
   Inception
   Put forward a good idea to solve the problem.
   The conception of the system process and its business case are concretely conceived, and the scope of the project is determined.
   Elaboration phase
   Plan the necessary activities and resources, define the functions and design the architecture.
   Construction phase
   Build the initial vision, architecture and plan of the system until a complete system can be delivered to users. Delivery phase
   Deliver the system to users, including manufacturing, delivery, training, support and maintenance until users are satisfied.
   Completing these four stages is called a development cycle. An application system can repeat the same four stages of initiation, refinement, construction and delivery by repeating the next cycle.

2. Data processing and system analysis steps
Complete the data processing and analysis process of the Internet of things system, from the problem to the final goal. Need a series of operations, step by step, to achieve the ultimate goal. The action step is to determine the starting point and the end point first, and then divide the starting point and the end
point into small action steps to form the completion sequence of the system and form a complete system process.

(1) Sample, data sampling, to ensure the validity and reliability of the data.
   Validity refers to the accuracy of data, which means that the selected data is consistent with the analysis goal and business goal.
   Reliability refers to the stability of data, to ensure the representativeness of sample data. In a certain period, there should not be too large fluctuations, otherwise the model is unstable.

(2) Explore, data feature exploration and preprocessing.
   Look at the distribution of data and standardize the data.

(3) Modify, clear problems, model selection, scheme adjustment.

(4) Model to implement the modeling scheme.

(5) Assessment, outcome assessment.
   Accuracy, stability, whether it is in line with the business expectations, and the benefits.
   The steps of system analysis are shown in Figure 1.

3. Data processing and analysis process

(1) Business understanding
   Determine business objectives, evaluate existing resources, determine analytical objectives, and develop solutions.

(2) Data understanding
   Data collection, exploration and analysis, data quality verification.

(3) Data preparation
   Data filtering, data cleaning, data integration, variable derivation.

(4) Modeling
   Model selection, test design, model establishment and result evaluation.

(5) Model evaluation
   Confirm the matching degree between the analysis results and business objectives, check the implementation process of steps 1-4, and determine the next action.

(6) Results deployment
   Plan deployment scheme, monitoring and maintenance scheme, output project report and generate project.

The data analysis process is shown in the figure.
The process and content of data processing and data analysis are shown in the figure.

![Figure 2 flow chart of Internet of things data analysis](image)

Figure 2 flow chart of Internet of things data analysis

The basic steps of data processing and data analysis planning process of IOT system are as follows: Put forward problems → scheme planning → function setting → data acquisition → data processing → data analysis → system composition.

Ensuring the information demand is the primary condition to ensure the effectiveness of data
analysis process. Collecting data and analyzing data provide clear objectives. It is the responsibility of managers to identify information needs. Managers should put forward information needs according to the needs of decision-making and process control. As far as process control is concerned, it is necessary to identify the requirements and use the information to support the review of process input, process output, rationality of resource allocation, optimization scheme of process activities and discovery of process abnormal variation. Purposeful data collection is the basis to ensure the effective data analysis process. Need to collect data analysis diagram. Plan according to the content, channel and method of the project.

4. Summary
This paper summarizes the ideas of data processing and data analysis, involving specific business scenarios, but also combined with the characteristics of the business. Proficient in methods, in-depth business, diligent in practice, more summary, we can finally embark on the road of data analysis. For data processing process analysis of the target, looking for system solutions. Ensure the accuracy and stability of data. Data optimization can improve accuracy, efficiency and benefit. Optimize the system to achieve the goal of system optimization.

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