The Design of Intelligence Analysis Platform Based on Big Data

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Abstract. There are many problems in the current intelligence analysis work. Data islands and data transmission monitoring problems have severely restricted the further development of intelligence analysis work. To promote and improve the level of intelligence analysis work, this article mainly introduces how to apply big data to intelligence analysis. It enters into the analysis of the problems faced by the current intelligence analysis platform, focusing on the importance of big data technology for intelligence analysis. The structure and key technologies of big data can effectively solve various problems existing in intelligence analysis work. The structure of the intelligence analysis platform based on big data and the structure of the Hadoop+Spark+Steam platform are designed, including intelligence analysis and intelligence analysis. Functional modules such as data management and intelligence storage. This platform design of this article can effectively improve the effect and efficiency of intelligence analysis, and has very high practical value.

Keywords. Big data; intelligence analysis; platform design and implementation.

1. Introduction
Intelligence analysis work was mainly based on manual methods. With the rapid development of big data and artificial intelligence technology, the current way of intelligence analysis work has also undergone great changes. This paper puts forward the application method and key technology of big data technology in the intelligence analysis platform, gives the architecture and design plan of the intelligence analysis platform based on big data, and gives the realization process and method of the intelligence analysis platform based on big data [1].

2. Challenges Faced by Existing Intelligence Analysis Platforms
In the past, intelligence analysis work was based on the historical experience of technical personnel to make estimates and judgments on the data to be analysed, which caused the analysis process to be unrepeatable and uncontrollable, and the analysis results uncontrollable. The specific problems are as follows:

2.1. The Issue of the Independence of Intelligence Data
The big data-based intelligence analysis platform can provide the entire chain of intelligence analysis docking services, integrating intelligence demand analysis, data collection, data processing, data management and other functions, so that information can be accurately communicated [2].

It is an isolated island of information, but a unified whole, so as to solve the bottleneck problem of mutual independence of intelligence data.
2.2. Intelligence Analysis Process Tracking and Supervision Issues
In all analysis processes at this stage, manual recording and submission are required. It is inevitable that there will be missing content and content that is considered to be modified and adjusted, resulting in insufficient data clarity and accuracy. After the big data-based intelligence analysis platform is launched, all data comes from the support data for intelligence analysis tasks within the system.

3. Key Technologies for the Realization of an Intelligence Analysis Platform Based on Big Data
The key technologies implemented by the intelligence analysis platform mainly include intelligence big data computing framework technology, multi-source data comprehensive processing technology, distributed intelligence application services, etc. [3].

3.1. Intelligence Analysis Big Data Calculation Analysis Framework Technology
Intelligence big data analysis and processing uses Hadoop+Spark+Steam as a typical framework, large-scale clusters is used to build HDFS. HDFS is processing of large-scale intelligence data, and realizes fast interactive processing of real-time intelligence data based on the Spark and Storm. Spark supports High-real-time and large-capacity processing, which requires intelligence data.

3.2. Comprehensive Processing Technology of Multi-source Heterogeneous Intelligence Data
Due to the large amount of intelligence data, the quality of data varies, and there is great uncertainty in intelligence analysis, how to extract the rough from big data intelligence, remove the false and save the truth, is the key challenge for intelligence big data analysis. The comprehensive processing of multi-source heterogeneous intelligence information is based on the intelligence format [4].

3.3. Distributed Intelligence Application Service Technology
Facing the distributed space and diversified external environment, in response to different intelligence analysis needs, using service-oriented technology, it can flexibly define the intelligence analysis processing process, organize and dispatch the intelligence analysis services deployed at each node to work together, provide intelligence data management and the unified interface of service application realizes systematic intelligence analysis.

4. Big Data-Based Intelligence Analysis Platform Architecture and Functions

4.1. Intelligence Analysis Platform Architecture Based on Big Data
The intelligence analysis platform based on big data can be divided into four levels, including resource layer, support layer, service layer and application layer [5]. The intelligence analysis platform architecture based on big data is shown in figure 1.

4.2. Function Design of Intelligence Analysis Platform Based on Big Data
The function design of intelligence analysis platform based on big data is shown in figure 2.

4.2.1. Implementation of Intelligence Analysis and Processing Sub-system. The intelligence analysis and processing sub-system includes three modules: data preprocessing, intelligent analysis, and pattern recognition [6]. The intelligence data analysis and management sub-system can use big data technology to pre-process and store intelligence data, and use big data analysis methods to perform statistics and intelligent analysis on intelligence data, and perform pattern recognition to find out its time and space on the law.

- Realization of data pre-processing
  Users can read intelligence data, set data pre-processing requirements, and perform operations such as extraction, cleaning and conversion of selected intelligence data to ensure the accuracy, completeness and consistency of the data [7]. The specific process is shown in the figure 3.
Figure 1. Intelligence analysis platform architecture based on big data.

Figure 2. Function design of intelligence analysis platform based on big data.

Figure 3. The data pre-processing process.
- **Intelligent analysis**
  Using this module, users can select data to be mined according to attributes, values, etc., automatically complete functions such as association and law analysis, and use analysis algorithms such as association, classification, and clustering to analyse intelligence data on activity laws and working methods [8].

  The main work of intelligence analysis is to establish an intelligent analysis model based on artificial intelligence algorithms. Through studying various models that may be used in the process of model establishment, select suitable models, train and evaluate the models, and determine the final model and its required parameters [9]. The specific workflow is shown in figure 4.

- **Pattern recognition**
  The pattern matching module can match the intelligence data with the data intelligence or expert database, and give the judgment result of the intelligence data object. The realization of the pattern matching function starts from the knowledge base, through controlled reasoning, and obtains the required conclusions [10]. The basic workflow as the picture shows in figure 5.
4.2.2. Intelligence Big Data Analysis and Management Sub-system. The big data analysis and management system is mainly composed of law analysis, correlation analysis and data visualization [11].

- Law analysis
  According to the results of the intelligence data statistical analysis, the behavior and attribute characteristics of the intelligence object target can be analyzed, and the next behavior of the target can be predicted. At last, abnormalities and discover new situations can be found out.

- Correlation analysis
  Using this module, users can select the data to be mined according to attributes, values, etc., automatically complete the correlation analysis, and finally form the correlation analysis result [12].

- Data visualization
  GIS, charts, tag clouds and other human-computer interaction technologies to display the analysis results. For the target attribute characteristics of intelligence objects, it can be visually represented in a graphical way. Graphs, histograms, pie charts, and scatter points can be adopted as needed. Various display methods such as pictures.

5. Conclusion
This article mainly starts with the main problems existing in the intelligence analysis platform, introduces the feasibility of applying big data technology in the intelligence analysis platform, and discusses the key technologies, platform structure, and platform functions. The platform uses big data technology, which can solve the problem of low efficiency in the current intelligence analysis work. The practice of intelligence analysis work will be continued to further verify the effect of this platform.

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