Research on An Information Integrated Management Platform

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Abstract. At present, all kinds of information from the quality monitoring work in accordance with the division of functions of business management produce and the quality control should be highly integrated products of all kinds of information. The information of the depth of excavation and fusion is the most urgent task for quality control. This paper designed a comprehensive information management platform for the acquisition of product development, utility and maintenance of all kinds of state information in the process, through data analysis, quality monitoring of products, providing a basis for the improvement of the next generation of products.

1. Introduction
At present, the equipment is not only abundant data, a huge amount of information, information types, complex structure, element structure and multidimensional characteristic information is more prominent, and the update of dynamic, real-time demand is very strong, equipment data resources already has a large data typical of the "4V" feature, namely the massive data size (volume) fast data transfer and dynamic data system (velocity), multiple data types (variety) and the huge data value (value). The application of large data technology to military data engineering has become the consensus and important development direction of all countries in the world[1].

In 2011, the US Strategic Command commander Robert Kohler, once pointed out: "the gap between the increasing data collection ability and limited data processing capacity is expanding." Therefore, the U.S. military is stepping up the development of big data plan, determine the "from data to decision-making, network technology, electronic warfare and electronic protection, engineering elastic system, 7 key research areas of mass destruction weapons of defense, autonomous system and man-machine interaction etc.[2]. The basic strategy for us to deal with big data is to continuously improve the ability of "data to decision making", and realize the transformation from data superiority to decision-making advantage.

In 2012, the United States released the "big data research and development initiative", the formation of "big data advanced steering group", the big data technology to the national strategic level, while the "national strategy" layer[3]. The National Science Foundation (NSF), National Institutes of Health (NIH, Department of Defense (DOD), the Department of energy CCDOE, the Defense Advanced Research Agency CDARPA, Geological Exploration Bureau (USGS) 6 federal departments and agencies committed more than $200 million in funding for research and development ", acquire the necessary knowledge and skills from the tool massive data information"[4].

With the continuous development of science and technology, product structure is more and more complex, the use of maintenance technology requirements are getting higher and higher, the amount of data is very large, do not use data management, sharing and use. The quality control of the product is
necessary, but the current quality control work in accordance with the business functions of the division of information generated by the division of information, and quality control should be a variety of products, a high degree of integration of information, the depth of these information mining and high degree of integration is the current quality control The most urgent task.

This paper designs an information management platform for collecting various status information in product development, use and maintenance. Through the large data analysis, the product quality status monitoring is provided, which provides the basis for the improvement of next generation product.

2. Platform Function
The main objectives of an information management platform are intensive management, multi-dimensional display and data mining. Breaking the current management in accordance with the business division of the data barriers arising from the product as the core data for correlation analysis and data mining, in order to grasp the product protection laws and support the decision support to provide basic data support.

The goal of platform construction is divided into four steps: accumulation data, data mining, research law and technical consultation. Accumulation of data is the basis of the current product management, repair, equipment and other original business systems to produce the protection of data collection and re-processing. Data mining and research law is the correlation analysis of these data, in order to find out the characteristics of protection and protection laws. Technical advice is the ultimate goal, is to solve the specific problems of product support technical support, but also product security management strategy of technical support.

2.1. Centralized Data Storage
The heterogeneous data for centralized storage, to achieve the accumulation of data. Data types include pictures, multimedia video, audio, text, relational data (database storage) and so on.

2.2. Data Exchange Service

2.2.1. Data Import Interface
The development of standard data import interface, to achieve the resource planning in the various types of data import function.

2.2.2. Data Export Interface
The development of standard data export interface, to achieve the process of the various types of platform data export function.

2.2.3. Real-time Data Transmitted in
To build a real-time communication system to achieve automatic transmission of changes in data, record the flow of trajectories, to achieve changes in strength, maintenance process management, maintenance equipment consumption and other information to achieve a variety of terminal real-time transmission of information.

2.3. Data Sharing Services
The platform provides a variety of basic data sharing services, the use of advanced data services technology to achieve the data level of standardized sharing services, so that any other software directly call the data service interface, to achieve a single data processing and flexible call. The technology can be used to achieve the platform can be extended three-tier loose coupling architecture, can greatly improve the reliability of the platform.
2.4. Statistics Show

2.4.1. Charts Show
Interface Services
The development of a variety of charts to show data service interface, to achieve a direct call to the commonly used chart. The graphical interface includes bar charts, pie charts, line charts, scatter charts, radar charts, dashboards, and other common graphical interfaces.

2.4.2. multidimensional chart display
Will be all kinds of data for multi-dimensional, multi-type chart display.

2.4.3. Geographic display
Through the GIS geographical location to show the product distribution, maintenance equipment, etc. can be involved in the need to display the information displayed, so that information display visual and intuitive.

2.4.4. software interface visualization display
Through the development of B / S and C / S structure of the software for various types of software software visual display.

2.5. Data mining analysis
The data analysis and data analysis, to provide technical support and decision analysis.

3. platform development

3.1. software structure
Platform software uses data layer, business layer and presentation layer three-tier structure, to achieve data, business and show the separation, the use of this three-tier structure, to overcome the latter part of the business needs change due to a comprehensive change in the system to maintain the stability of the platform. At the same time this structure can greatly improve the platform scalability.

In the data layer implementation, all the basic data are used to call the form of data interface. The final structure of the platform is as Figure 1.

The most important part of software system is data and data management, including data acquisition, data maintenance and rights management:

(1) data acquisition
Automatic acquisition of data management system to support the data, when the contents of data warehouse component is created or business indicators are loaded into the data warehouse, the corresponding data can be automatically loaded into the storage data management system.
A. gets and imports data based on predefined auto loading mechanisms. Including batch loading, loading automatically, loading manually and so on;
B. system supports synchronization with data from different data warehouse systems;
C. provides data loading interface, and ensure its scalability, this is mainly on account of the development process of data warehouse spiral will source the new business system or the new subject field is constantly being integrated, so the integrated data management system must provide a convenient interface expansion data.

(2) data maintenance
When the business system data source changes (insert, delete, modify), data management system to be able to automatically update themselves with the corresponding data, and this update can be set according to the requirements for real-time or regular updates;
A. data management system to provide users with friendly interface, user-friendly data modification. This is for the technical personnel sometimes need to artificially modify the already loaded into the data in the database, to ensure that users can modify, but can be found associated with
the data, and can facilitate the judgment of this data will produce the modified;
B. supports undo and rollback of data changes, i.e., restoring the modified data back to its original state;
C. supports data usage tracking, that is, it is convenient to find out where each data is applied and what is associated with other data. What is the impact of the change?
D. supports data auditing and testing, which provides the function of data accuracy, judgment and verification.

(3) authority management
To access and modify data, it is necessary to assign different permissions to users, and to facilitate the adjustment and access to permissions.

3.2. LabWindows / CVI
LabWindows / CVI is a virtual instrument software development platform developed by NI (National Instruments) for computer monitoring and control, and can be run on a variety of operating systems (WindowsXP / Vista / 7, Mac OS and Unix). LabWindows / CVI is an integrated development environment (IDE) for C language programmers. In this development environment, C language and its library functions can be used to realize the design, editing, compiling, linking and debugging of the program. Use LabWindows / CVI to accomplish the following but not limited to the following:
Interactive program development;
- A powerful library of functions for creating data acquisition and instrumented applications;
- Full use of complete software tools for data acquisition, Analysis and display;
- Use of the wizard to develop IVI instrument driver and create ActiveX server;
- For other programs to develop C target module, dynamic link library (DLL), C language library.

LabWindows / CVI is powerful in that it provides a rich library of functions[5]. Using these library functions in addition to conventional programming, but also to achieve more complex data acquisition and instrument control system development. Data collection. IVI library, GPIB / GPIB 488.2 library, NI-DAQmx library, traditional NI-DAQ library, RS-232 library, VISA library, VXI library and NI-CAN library.

Using LabWindows / CVI's user interface editor allows you to create and edit graphical user interfaces (GUIs), while LabWindows / CVI's user interface library functions can be used to create and control GUIs in the program. In addition, LabWindows / CVI for the GUI panel design, prepared a number of professional controls, such as: curve control, strip control, header, knob and indicator, etc., to meet the needs of monitoring and control system software development, the use of these controls can Design a professional monitoring and control program interface. Network and interprocess communication library. Dynamic data exchange (DDE) library, TCP library, ActiveX library, Internet library, DIAdem connection library, DataSocket library and so on. In addition, the user can use all the standard functions in the ANSI C library in CVI.

Once the reference to NI, we may be the first to think of NI is the introduction of LabVIEW software. LabWindows / CVI compared with LabVIEW, mainly in a variety of test, control, fault analysis and information processing software development, which is more suitable for large and complex complex test software development, engineering and technical personnel to develop a monitoring system, automatic measurement Environment, data acquisition system, process monitoring system preferred tool.

4. platform hardware
The hardware device architecture is as Figure 2:
4.1. storage device
A disk array with a fiber interface for fast storage. Hard drive support hot-swappable, the capacity of more than 10TB. This project uses RAID 5. RAID 5 is a storage solution that addresses both performance, data security, and storage costs. RAID 5 can be interpreted as a compromise between RAID 0 and RAID 1. RAID 5 can provide data security for the system, but the degree of protection is lower than that of Mirror, and the utilization ratio of disk space is higher than that of Mirror. The RAID 5 has a data read speed similar to the RAID 0, with just one more parity message, and writes data at a slower rate than a single disk. At the same time, because multiple data corresponds to a parity check information, the disk space utilization ratio of RAID 5 is higher than that of RAID 1, and the storage cost is relatively low, so it is a solution that is used more frequently.

4.2. server
Server for the rack server, the server is divided into application server and database server, the two can be a server, but also for two servers. The server requires a fiber switch port to access the storage device.

4.2.1. fiber switch
The server accesses the storage device through the fiber switch. This project adopts the Ruijie router. Ruijie core routers use industry-leading multi-core CPU and distributed architecture flexible sharing business processing, screen business card and physical separation of RG-RSR77-X series core routing engine, exchange, in high performance multi-core platform, distributed architecture based on three level separation management, control and data forwarding. RG-RSR77-X pioneered the use of double...
core router data plane, further enhance performance while ensuring uninterrupted operation, support the whole business card, MPLS, QoS, IPSec, NAT and other high performance business processing capabilities.

4.2.2. Hot Standby Equipment
Used for data backup of application servers and database servers to prevent data loss. The use of intelligent video transmission protocol, maximize the use of network bandwidth, especially for front-end network of limited bandwidth, the system based on guaranteeing the image quality, in a very low network bandwidth, but also to ensure the normal operation of the system. Support distributed deployment, centralized management, and achieve the system's powerful scalability. The system supports distributed deployment, centralized management, while ensuring integrity, it can add servers flexibly and effectively improve the system processing capacity.

4.2.3. Display device
Used to display GIS location information or other multimedia information. Requires large screen, also equipped with engineering projectors.

5. Conclusion
This paper designed a comprehensive information management platform for the acquisition of product development, use and maintenance of all kinds of state information in the process, through data analysis, quality monitoring of products, provide a basis for the improvement of the next generation of products.

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