A Research on the Technologies of Credit Bank Data Exchange Center

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Abstract

The paper comes up with a unified and standardized integral technique-solving scheme of data exchange centre, providing a reliable and exchangeable data information service support for credit bank in application layer through studying the key techniques: systematic architecture design, diverse source data processing, heterogeneous data sources integration, integrated environment management in credit bank data exchange centre, combing service feature of credit bank, and orienting to the information security of credit and dependable credit gather and distribution.

Keywords

Credit Bank; Data Exchange

Introduction

Building lifelong education system is a fundamental tendency nowadays in the development of global education. The credit bank is a new mode of educational administration conforming to this trend. Imitating functions and features of commercial bank, the credit bank provides students the freedom of choosing the learning content, time and location. Students are able to deposit their taken credits into the "bank" in order to apply the matching degree after approaching a certain number of credits. The core of credit bank is the gather and application of credit. Therefore, a complete platform of data exchange needs to be built during the development of credit bank. This platform is the essential platform centre in the whole credit bank IT framework, delivering services of data exchange, business collaboration, and monitor for other upper business services.

Through building credit bank data exchange centre, it provides a crosswise-integrated basic platform for the business system of overall lifelong educational credit bank, satisfying the data exchange of heterogeneous application system for users in education institutions at all levels. Through the crosswise integration of

business, it achieves the service of business and innovation. Through the support of rich advanced and universal interface framework from the platform of data exchange, thorough technical support is provided for future business expansion in credit bank system.

The Framework of Data Exchange Centre System

The prime work of data exchange centre is to accomplish data integration and exchange between the head office and bank branches, meanwhile, providing technical support for other lifelong education information collection. Generally speaking, credits from bank branches can be deposited, collected and inquired by the head bank in order to ensure that collecting the needed business data from different business systems while operating credits collection.
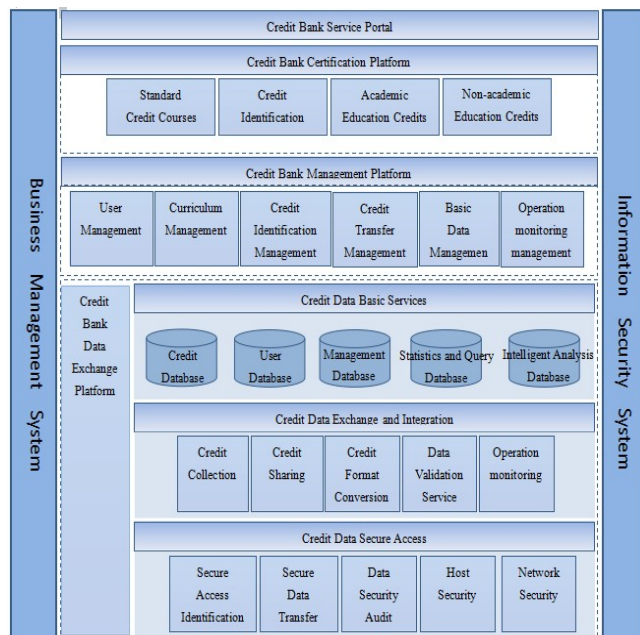

FIG. 1 THE INTEGRAL STRUCTURE OF CREDIT BANK DATA EXCHANGE CENTER

The integral structure of credit bank data exchange center is as shown in FIG. 1.

Credit bank data exchange centre is oriented by the need of actual data exchange, focusing on the management of data exchange and management service to ensure the credit information safe and reliable collection and distribution. In order to provide information on business support for the application layer to make the up-level application get reliable data service, credit bank data exchange centre achieves a unified, standardized platform for data exchange.

Take the sources of credit information of Credit Bank for example, it can be stored from head office and obtained from various different branches. But the business case for each branch, as well as the construction and the level of implementation are various. So, through a unified data integration and exchange platform to solve various business constraints due to objective reasons, and provide a variety of data integration and exchange ways and means to fully guarantee the Credit Bank of scalability. Credit Bank building for lifelong education has various credit transfer conditions. And the bank may need include credits, as follows: training of migrant workers and junior high school; high school credits convergence and transformation of academic education; training of demobilized soldiers with a high school diploma education credits convergence and transformation; national vocational qualification certificate training and high school; credits convergence and conversion vocational (specialist) academic education; vocational qualification education to vocational (specialist) academic education; vocational (specialist) academic education to college education credits convergence and transformation; non- service teacher training college to graduate academic education credits convergence and transformation, colleges and universities convergence between credit and conversion (including Shanghai and the outer regions, as well as foreign universities , etc.)we can see that, to the Bank of credit , its branch categories and business are complex, and through data integration and exchange platform , all the complexity is encapsulated in an exchange platform.

Credit Bank data exchange centre technology structure consists mainly of business service integration, service monitoring integration, data exchange and integration, security access and transport management in four areas shown in FIG. 2.

Business monitoring service is to provide the data exchange process monitoring, including data acquisition, conversion, mapping the whole process

output, as well as the operation of the internal thread, various abnormalities, offers a variety of alarm mode, including pop-ups, music, e-mail etc., which can perceive various problems during real-time operation, a timely response.
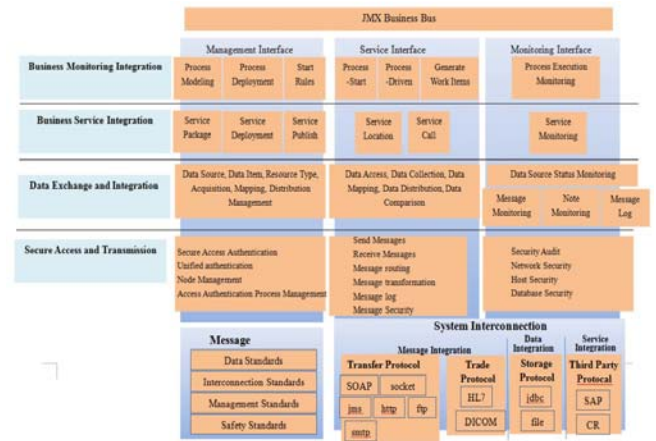

FIG. 2 THE TECHNOLOGY ARCHITECTURE OF CREDIT BANK DATA EXCHANGE CENTER

Business service integration mainly takes the form of exchange between nodes service call to complete the process of sending and receiving data between each other, support the use of common industry standards for various services in the business service invocation protocol integration module, for example: web service, xml-rpc, ejb, dcom, corba so on.

Data exchange and integration are mainly provided for outreach Credit Bank users, with access to a unified data access, and processing of various features, which include unified access data exchange services and data processing services, and it is faced with different heterogeneous system environments. And it can conduct combined queries or data exchange infrastructure management services to smallest unit of information resources, for fine-grained data, based on rich metadata content management. Data acquisition enables heterogeneous sources of data base and it will be an important means of sharing one resource all or part of the data in a data source data extraction and output via a flexible way to collect another data source, and the transmission process data conversion services, distribution, comparison, search, load and other data processing services.

Secure access and transmission of data exchange module can be exchanged for credits from the bank data platform, providing good security features, supporting both centralized deployment, distributed deployment, switching modes include synchronous, asynchronous, documents and other means, which is different exchange between security domains, through

front-end, data network gateway (unidirectional or bidirectional) exchange, the exchange between the networks and so complex physical partition in case of security to provide a guarantee.

The Key Technologies of Data Exchange Centre

Diverse Source Data Processing

Each information system provides data exchange centre data format and it is not very uniform. The problem with non-uniform data structure, the data coding is not uniform. In addition, the data is provided by various information systems, and there are some differences in format and quality, such as: extra spaces, empty values, and dates show format. However, the data in the database before entering each topic must be completed standardized to ensure the theme library is trusted, and high-quality.

A wealth of built-in features to support data processing should be provided in the design, such as sorting, merging, union, filter, convert, modify, field inspection, and aggregation. In addition, code management services provided by the use of environmental management systems running Data Management section, data processing, information systems can also be for each data encoded using different codes for the automatic conversion process. Provided in the control code management relationship among different encoding scheme, and therefore the automatic code conversion relationship can be done automatically by using this control code conversion.

Heterogeneous Data Sources Integration

Database management systems using various information systems are not unified, and there are Oracle, MSSQL Server, etc.; in addition, various information systems to provide data exchange file format data centre may be inconsistent, the majority of the database file format, but also supports text format; also exist and may have different information systems data interface conditions.

This aspect of the existence of heterogeneous data sources is the primary obstacle data exchange centre to get the data from the various information systems face. Of course, the heterogeneity of the disorder is not just to get data from information systems, data exchange centre released to write data information systems, data exchange centre sends a query to the data information system and it will face many types of data sources problems. For the integration of heterogeneous data sources used in the design is the deployment of a data integration platform information system, terminal unified access heterogeneous data sources to complete information systems, and data integration platform for data exchange between the centre and each information system based on the integration of unified data source for data collection, dissemination and other functions.

The design has the following characteristics: First, eliminating the need for direct data exchange centre heterogeneous data sources facing each information system pressure. Data exchange centre will handle more tasks devoted to aspects of aggregated data collection; Second, reducing the cost of access to information systems. By providing a unified data integration platform access services deploying information systems, information systems, clients can easily turn a variety of heterogeneous data sources, such as: data files, Oracle, MSSQL Server, DB2 and other integrated information systems to data integration platform.

Integrated Environment Management

Normal operation of various functions for data exchange centre needs sound management. Data exchange centre needs to manage wide content, including connecting the various information systems management data integration, data from each information processing system management, data management, and maintenance of a unified meta-model resource directory management and operation management.

In these managed objects, user interface management are completed by user interface provided by the platform management tools , while the presence of data exchange centre also exists multiple platforms tools; Some are custom-developed systems, such as: resource directory management. Management personnel management functions for so many sets of interface, very often disoriented. Therefore, in order to diversify the management of content management systems, it provides a unified necessary to achieve a uniform B / S structure management interface, simple operation, and quite user-friendly, simplified management through the use of various types of package management functionality.

Conclusions

The changes and developments of lifelong education

and information technology in Credit Bank are promoted by the continuous improvement of lifelong education and the gradual advancement of Credit Bank. In this case, building a standard, complete and flexible data exchange centre is essential. It is the technology and security to realize the Credit Bank service. This data exchange centre can package the complexity and variability of date through advanced technological and sophisticated product features, to achieve data standardization easily, robust fault-tolerant data exchange mechanism, flexible configuration ways to adapt to the changing and complex business needs.

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REFERENCES

Chen Jingjing&Chen Longgen (2010). The Introduction and Enlightenment of South Korea Credit Bank System.Higher Agriculture Education08:88-92.

Guo Yanxia (2013). A Research on the Credit Bank System of the Continuing Education in China.(Shanxi University).

Huang Xin&Wu Zunmin&Jiang Houling (2011). Construction of Modern Credit Bank System.Open Education Research03:42-46.

Tang Shubo&Chen Yanmei&Li Zhiping (2011). Discussion on Open Educational Credit Bank System Design.E-Education Research 08:78-82+87.

Wang Chunxiao (2012). The Research of "Credit Bank" Impact on Student Learning Style.(Southwestern University).

Wang Yin&Zhang Runzhi&Huang Ronghuai (2012). Practice and Analysis of Credit Bank Construction from International view.Distance Education in China06:47-54.

Wei Xiongfeng (2013). A Research on Continuing Education Credit Bank in Guangxi.(Guangxi University).

Yang Liming (2009). Theory and Practice on Creating "Credit Bank"in Shanghai.Vocational Education Forum09:4-9.

Zhang Runzhi&Wang Yin&Huang Ronghuai (2012). A Research on Model and Path of Credit Bank in China.China Educational Technology06:30-36.

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