Design of Computer Information System Integration Based on Metadata

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Abstract. With the popularization of artificial intelligence technology, system integration has become the development trend of various industries, which requires the integration of multiple heterogeneous systems into one system. Through the integrated system, we can query information from multiple data sources, which will provide a unified interface for users. At present, the information system has become the normal office of every company must use the system, which will have many differences in the development platform and development tools. Therefore, many subsystems often have different logical structure and physical structure, which requires us to process information through metadata. Metadata can complete the information exchange, integration, synchronization and other operations between multiple subsystems, which can meet the information exchange between heterogeneous systems. Firstly, this paper analyzes the related concepts of metadata. Then, this paper analyzes the integrated design of information system.

Keywords: Metadata, Information System, Integrated Design

1. Introduction

With the development of computer technology. Many industries, units and departments have introduced a variety of different enterprise information systems, which is often an integrated information system [1]. This information system will often contain multiple functions of the enterprise. However, each system has its own application, process and data, which results in poor scalability and interactivity [2]. Therefore, it is easy to form information islands among subsystems, which will result in low application of information resources [3-4]. Therefore, the traditional database technology has been difficult to meet the needs of society, which requires us to constantly improve the technology. At the same time, new data formats emerge constantly, such as word document, XML document, HTML document, etc., which requires us to change through new database schema [5-6]. Therefore, metadata has become an important direction, which can realize the effective sharing of heterogeneous data sources. Therefore, metadata has become an important research direction of system integration, which can effectively share the information of heterogeneous data sources [7].
2. Related concepts

2.1. Meta Data Define
The English word for metadata is metadata, which means standardized and orderly. Metadata is widely used in many fields. The general definition of metadata is "data about data" or "information about information". Metadata is the data that helps to find, access, use and manage information resources, which can provide the description of data sources. We can store metadata by using registration, cataloging, and space hierarchy. In many fields, the generation of many data is not repeatable, which must store complete methods and conditions of record data generation. Through metadata technology, we can effectively avoid the growth of unavailability caused by the passage of time.

2.2. Metadata classification
According to different partition principles, metadata can be divided into many types. According to the different functions of metadata in organizing information resources, metadata can be divided into four types: knowledge description metadata, structural metadata, access control metadata and evaluation metadata. From the differences of metadata description objects, we can divide into three types, namely database level metadata, dataset metadata and data element metadata. In practical application, we can divide it into system metadata, replica metadata and application metadata.

2.3. Metadata features
Descriptive, which is the most essential feature of all metadata. Metadata is the data that describes data, which describes objects through a conventional rule. Only by first describing can we have the function of organization and management. Dynamic. Metadata is not static, which changes with the object being described. Diversity, which is the diversity of metadata types. A metadata describing an object will have various characteristics. We can divide it from different angles, which will produce different results. Complexity, which is mainly manifested in two aspects. On the one hand, metadata can be either a collection concept or an individual concept. On the other hand, we can describe different objects. Mandatory metadata coexists with selective metadata. Multi level, which is determined by the multi-level of objects described by metadata.

3. The role of metadata in information system integration

3.1. Role of metadata
In the information construction, metadata can realize the identification and evaluation of information resources, which can track the changes in the use process. Through a large number of networked data, we can implement simple and efficient management, which can effectively describe, locate, retrieve, manage and organize information resources. The role of metadata is mainly divided into the following aspects. First, discovery and identification. Through metadata retrieval of information resources, people can confirm which information resources they need. Second, cataloging, which includes a variety of elements, such as content, carrier, location, acquisition method, production method, etc. By reflecting the basic characteristics of information resources, we can achieve a comprehensive description, which can lay a foundation for users to search, access and identify. Third, resource administration contains more data elements, electronic signature, payment audit, authority control and other information than description, which can provide support for storage and use management. Fourth, preservation and archiving, which includes detailed format information, protection conditions, conversion mode, preservation responsibility and other data elements, which is convenient for the long-term preservation of information resources.

3.2. Relationship of metadata
In addition to data description, metadata plays an important role in data management, such as data sharing, resource discovery, knowledge management, etc. At present, metadata has become an
important tool for data discovery and data management. Metadata is abstract data, which can shield the differences in data format and type. At the same time, metadata is the data of data description information, which is formatted. In the information system, metadata links all kinds of data, which will be convenient for users to retrieve and process effectively. Therefore, metadata acts as a bridge connecting data producers, users and managers, as shown in Figure 1.

![Figure 1. Metadata relationship.](image1)

### 4. Integrated design system

#### 4.1. System hierarchy
System hierarchy is a way to provide services for ordinary users. We can get the query results by inputting query conditions. The system has the functions of query command parsing, metadata management and data integration. The heterogeneous data source integration system based on metadata is shown in Figure 2.

![Figure 2. System hierarchy.](image2)

#### 4.2. System function design
The metadata based information system mainly realizes four functions: metadata standard, metadata input, metadata query and metadata maintenance, as shown in Figure 3.
4.3. System integration module

The system integration module is composed of command analysis, command dispatch, metadata management, data synthesis, data conversion and other functions, as shown in Figure 4. The key to the realization of metadata system is the integration of metadata. There are two kinds of metadata in metadata database, which are data source description and business data association rules. Through Metadatabase, we can store these two kinds of metadata in a centralized way, which will realize centralized and unified management.

5. Conclusion

Based on metadata, this paper proposes a system integration design scheme, which can effectively solve the problem of heterogeneous data sources. Through the analysis of key technologies, information transformation will be more accurate. Through the integration of heterogeneous information systems, we can improve the efficiency of system information acquisition, which can improve the operation efficiency of enterprises.
Acknowledgment
Fund Project of Leshan Normal University: Application of Fractional Fourier Transformochemistry Data Noise Reduction and Abnormal Feature Extraction (No. Z16010).

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