Research on Adaptive Information Retrieval of Educational Resource Library Based on Web Knowledge Discovery

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Abstract. Based on the collaborative thinking of the digital campus information system using two design ideas, embodied in the collaborative matrix model and gear interaction model. Through these design ideas, you can integrate a variety of applications and information together, so as to achieve a smooth flow between each other and coordinated management.

Foreword

Network teaching resources are the prerequisite and basis for carrying out network education. With the development of Web technology and network information technology, the network teaching resources are becoming more and more abundant, and the variety of forms is rich, which provides a wide range of choices and broad development space for learners' learning. Web has become a public application platform, the diversification of Web resources, the autonomy of knowledge learning and the sharing of resources and learning virtualization has become a major advantage of today's online learning.

Semantic Modeling in System Construction

The semi-structured and structured fuzzy features of Web resources are typical features of Web resources [1]. In the process of managing Web resources, due to the existence of resource structure differences, the traditional relationship model between Web resources cannot meet the modeling requirements of Web resources. Therefore, in the construction of semantic Web for college professional curriculum teaching resource library system, it also requires the model must be defined in a clear semantics. In general, the extent to which metadata can be described in terms of resource-related context knowledge is a measure of the semantic description of metadata [2]. Therefore, it is the key to the design of semantic metadata to describe the domain resources, to determine the appropriate metadata vocabulary, and the relationship between them. In addition, the ontology, especially the descriptive ontology, provides the basis for the design, extraction and generation of semantic metadata, because the ontology is a conceptualization of domain knowledge, which describes the concept and the semantic relations between concepts.

Ontology Description of the Knowledge of Subject Curriculum Resources

According to the C # professional workflow and the typical task of knowledge is based on the skeleton of the flesh and blood, the body is the skeleton of the knowledge base. In other words, the subject knowledge base is the body's blood, the body is the subject of the professional knowledge base. The main purpose of the ontology is to provide a number of applications and users can use the method to understand the areas involved in the knowledge and concepts, so as to achieve the purpose of reusing resources. The knowledge ontology is the conceptual model of knowledge that constructs the most important ontologies of the knowledge base and is stored in the nodes of the knowledge base. It is usually described by class and attributes [3].
Grid Technology for Professional Course Resource Knowledge

The goal of intelligent information processing is to realize the intelligent sharing of knowledge resources and information resources, and to effectively eliminate the knowledge island and information island, so that users can effectively obtain and distribute, distribute and manage knowledge resources. Therefore, the main purpose of this paper is to provide the necessary knowledge service for users and other services, and to realize knowledge innovation, problem solving, collaborative work and decision support in constructing the knowledge resource library based on knowledge grid technology.

Knowledge Retrieval Technology for Semantic Web

The traditional retrieval technology is based on the keyword search, can not meet the needs of users of information query, the urgent need to help users can quickly and accurately retrieve the required knowledge of the search technology, knowledge retrieval came into being. Knowledge retrieval is a new retrieval idea which is aimed at the inexact, inefficient and useful information of the information resources on the Internet. This new search mechanism can discover knowledge and locate accurately from a large number of fragmented data information. It also has the ability of autonomous learning to form its own knowledge base and can carry out knowledge mining. It applies semantic reasoning, knowledge organization and knowledge retrieval theory and method to realize knowledge discovery, description, storage, retrieval and utilization, and can provide retrieval results to users in many ways [5].

WEB Data Mining for Semantic Text

Using the existing Web query technology to retrieve the amount of information resources on the Web, and cannot meet people's application needs. Traditional data in the database is fully structured data, relative to the Web data, the most important feature of the data on the Web is unstructured or semi-structured, dynamic, and easily confused, it is difficult to directly Web Data on the page for data mining. As a result, Web-oriented data mining is much more complex than data mining for a single data warehouse.

Heterogeneous database environment

The traditional Internet consists of various types of services and data sources. All the information data is in a heterogeneous data environment, including WWW, FTP, Telnet, etc., each site, each page is a data source, there is no uniform structure, easy to cause confusion, so the data directly to the Web page data mining is very difficult, data mining must go through other aspects or technical data processing.

Semi-structured data structure

The traditional database has a certain data structure and model, according to the model to describe the specific data, for the data on the Web, each site of the data are independent design, data structure is different, very complex, no specific model Description, and the data itself is self-explanatory and dynamic variability, is a semi-structured data. Therefore, for this non-fully structured data, to carry out data mining is very complex.

Semantic Modeling in System Construction

The semi-structured and structured fuzzy features of Web resources are typical features of Web resources. In the process of managing Web resources, due to the existence of resource structure differences, the traditional relationship model between Web resources can not meet the modeling requirements of Web resources. Therefore, in the construction of semantic Web for college professional curriculum teaching resource library system, it also requires the model must be defined in a clear semantics. In general, the extent to which metadata can be described in terms of
resource-related context knowledge is a measure of the semantic description of metadata. Therefore, it is the key to the design of semantic metadata to describe the domain resources, to determine the appropriate metadata vocabulary, and the relationship between them. In addition, the ontology, especially the descriptive ontology, provides the basis for the design, extraction and generation of semantic metadata, because the ontology is a conceptualization of domain knowledge, which describes the semantic relations between concepts and concepts.

**Ontology Description of Curriculum Resource Knowledge**

Knowledge is based on the flesh and blood of the ontology skeleton, which is the skeleton of the knowledge base. In other words, the subject knowledge base is the body's blood, the body is the subject of the professional knowledge base. The main purpose of the ontology is to provide a number of applications and users can use the method to understand the areas involved in the knowledge and concepts, so as to achieve the purpose of reusing resources. The knowledge ontology is the conceptual model of knowledge that constructs the most important ontologies of the knowledge base and is stored in the nodes of the knowledge base. It is usually described by the class and attributes.

Through knowledge collection, access to the ontology server to fully understand the domain knowledge. Data mining ontology service provides domain experts to solve different kinds of data mining functions, algorithms and software reference models for specific problems. The knowledge integration ontology service is responsible for querying the relationship between entries, maintaining the public effective ontology set to facilitate the communication and knowledge exchange between different knowledge bases, scoring the mining pattern of the data mining ontology, providing on-demand services to support problem solving and Decision support, and effective knowledge of the knowledge base. While also responsible for the translation and mapping between different ontologies and the integration of different levels of knowledge to support the analysis and resolution of the problem. Security policies and ontology services are mainly responsible for resource access, quality of service, internal roles, acceptable trust, and internal user rights related to domain security policies. The security strategy of virtual organization has the strategy of user user role, user right, rule, dispute resolution and so on. In the professional knowledge base system design, the relationship between professional knowledge, professional knowledge model, knowledge representation and professional knowledge base is that the knowledge base is based on the knowledge model to express the knowledge of the professional knowledge, the domain of all possible knowledge of the collection is Professional knowledge, it reflects the concept of professional knowledge collection. The professional knowledge model is the structured and formal description of knowledge; the representation of knowledge is that knowledge representation is used to reflect and express domain expertise.

**Design and Implementation of Intelligent Retrieval System**

In general, the semantic Web-based knowledge retrieval system is more able to meet the user's personalized information needs and provide intelligent services. On the basis of the semantic Web and the knowledge retrieval system of semantic Web and knowledge retrieval system, we can realize the intelligent retrieval of teaching resources based on Semantic Web.

From the system point of view, the design from top to bottom will be oriented to the semantic Web knowledge resource retrieval is divided into four layers, namely the user layer, functional layer, processing layer and resource layer.

1. **User layer.** Users generally include ordinary users, system administrators and domain experts or knowledge workers. The semantic Web-based knowledge retrieval system is more able to meet the user's personalized information needs and provide intelligent services, which is different from the general knowledge retrieval system. In addition to information needs, the system ontology construction and maintenance, domain experts and knowledge workers play a vital role.

2. **Functional layer.** The main function of the function layer is to provide query service for
information users, provide system management services for system administrators, and ontology maintenance of domain experts or knowledge workers. It is mainly based on user layer and reflected in the function part of the system. In addition, the knowledge retrieval system in knowledge discovery, knowledge automatic mining.

(3) Treatment layer. The processing layer is the foundation of intelligent service and knowledge retrieval, which is the core layer of knowledge retrieval system for semantic Web. It is the main function of query planning based on retrieval reasoning and concept recognition. It also includes knowledge mining and ontology planning based on ontology and ontology storage.

(4) Resource layer. Including the user in the resource layer to access records, document resource data and ontology files can be stored in a variety of knowledge base or database, by the semantic Web ontology organization of the various resources are one of their common ground, resources and resources are the semantic relationship that can be recognized by the computer.

Summary

With the development of Web technology and network information technology, the network teaching resources are becoming more and more abundant, and all kinds of various forms of professional teaching resources are endless. At present, there are many kinds of educational resources on the Internet, such as learners provides a wide range of options and broad development space. But the information resources overload phenomenon is also increasingly serious; how to hundreds of millions of information resources from the ocean to quickly and accurately find the information needed, has become an important issue of people increasingly concerned about. At the same time, the effective management of teaching resources is the key to carry out network education. This paper puts forward the construction framework of the professional curriculum teaching resource library platform of semantic Web, and realizes the intelligent retrieval of teaching resources based on semantic Web.

References


