Cloud Service Model Based on University English Reading Database

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Abstract - **The Rapid development of cloud computing impels the new situation of information technology services in foreign language teaching in universities, and brings more quality requirements to subject librarians in universities. The teaching database of English reading in universities combines image, audio, video, text, animation and interactive contents for teaching to create a fresh, vivid, interesting English learning environment. The paper proposes the implementation strategies of university English reading teaching datebase construction and the cloud service model according to the concept of cloud computing; It thinks that the subject librarians should supply personalized services for the readers, at the same time, they should also strive to be "cloud librarians".**

Keywords - English reading database; cloud computing; cloud service

I. CLOUD COMPUTING AND SUBJECT SERVICE

With the digital library undergoing the generation of Internet, Grid and Web2.0, The year of 2009 is considered to be the first year of cloud computing. Based on the book lists of World Cat, "Library management and services with the collaboration of Web", introduced by OCLC (Online Computer Library Center), has been seen as the start of the widely applied cloud computing in the library field [1].

The so-called cloud computing is developed from Distributed Computing, Parallel Computing, Grid Computing , namely the commercial implementations of these computer science concepts[2]. By nature, cloud computing refers to that the users get the computing resources like storage, calculation, database via remote connection [3]. Faced with large scale distributed environment, the core of cloud computing is to automatically split the huge computational processing program into numerous smaller subroutines, and then after the processing analysis of the vast systems of several servers, the result will be back to the user. The ultimate aim is to make full use of internet resources, establish a powerful computing center, based on which a variety of computing services can be provided to the enjoyment of users in spite of time or places [4]. In other words, hardware and software of the data centers are called cloud. As the same with the other internet technologies, cloud computing technology will eventually be provided to the user in the form of services, namely the cloud service. Cloud service is like a

"supermarket" of network, enterprises or companies can enjoy high quality service as long as renting the equipment in the "resource pool", needless to add any hard drives and other facilities by the users. Cloud application services have features in common: resource sharing, cost savings, narrowing the gap between its members. At present, IT giants including the Amazon, Google, Microsoft IBM, SUN have joined the ranks of cloud computing. University Library using cloud computing service to teach, which can get at least five benefits: super computing power, user-centered, realizing green data calculation, reducing the possibility of data leakage, economy and simplicity.

Subject Service is a kind of extensional services from University Library, focusing on personalized users' information needs in different subjiects, and with the link to subject librarian service teams to organize resources. The service objects are professional teachers, researchers and students in the universities. The nature of the service is to try to help teachers achieve creative services of one-stop access to desired information resources under the circumstance of the limited teaching time and heavy teaching task [5]. In the environment of cloud computing, cloud services will make the subject service of subject librarian more penetrating, detailed and modernized. Foreign language subject librarians can squeeze out more energy to do the individualized service well, go deep into the first-line work of teaching, cooperate with the construction of foreign language university and maintain the database of university English reading teaching resources. For example, through the investigation, foreign language subject librarians learned, as a result of the constantly deepening developments of all universities, the Foreign Languages Universities have specialized their majors more specifically and teaching focuses and courses depth of curriculum are not the same. So it is necessary for the distinction to the contents of university English reading teaching information resources. From macro-aspects, the contents of the database of English Reading Teaching in universities cover three main aspects: pre-reading reading resource library, while-reading reading resource library and post-reading reading resource library. Among them, pre-reading reading resource library provides relevant background knowledge to teachers and students and forms reading situation resource library for mental preparation before reading. While-reading reading resource library offers reading resource and sharing resource between the

teachers and students in the classroom, and they can use the Web2.0 tools for collaborative learning; post-reading reading resource library is a kind of expansible resource. Students can use WiKi to publish personal point of view, write the abstract and so on after reading these resources after class, and develop their creative thinking and innovational ability by forming a real-time or non-real-time interaction and communication with the teachers.

II. PRESENT SITUATION OF THE DATABASE FOR UNIVERSITY ENGLISH READING

The latest "University English Teaching Requirements" promulgated by Ministry of Education of the People' Republic of China has clearly regulated that the goal of university English reading teaching is to develop the students' English reading comprehension ability, logical thinking ability and interest in reading; to improve students' reading speed, reading skills, and English language sense; to help students enlarge their vocabulary and absorb other countries's cultural background knowledge [6]. Therefore, the database of English Reading teaching must focus on the theme of dealing well with English reading teaching and then go on detailedly and deeply constructing database. In the process of construction, we should not only consider teachers' teaching target, teaching object and teaching content, but also consider the network environment, and how we can use abundant teaching resources in the reading teaching database conveniently and properly and through the forms such as texts, images or videos to bring auditory and visual shock to the students so that to improve the students' reading efficiency and English expression ability, to promote university students' English reading confidence. In the cloud computing environment, study on the construction of university English reading teaching database for teachers' teaching will create better and more modern sharing space of teaching information resources; and will provide the students with a more relax and more comfortable virtual learning environment. Cloud services will make the subject individuality service more meaningful.

In China, most foreign language universities have built their own subject database of English reading teaching. However, with the developments of different kinds of foreign language universities, the differences in allocation of funds, teachers, and leaders' attention extent lead to uneven qualities of the digital resources of special subject database in university English Reading teaching, so the effect of teaching, teaching quality and level of improving students' reading ability vary considerably. What all university libraries, foreign language schools as well as information technology centers should work together to solve urgently is how to build foreign languages universities library alliances according to the characteristics of cloud computing, how to use cloud service system platform framework to make resource co-constructed and known as well as sharing to all, and how the leading member libraries

to applicate the new technology and to make full use of the subject database resources integrally in university reading teaching.

III. CLOUD SERVICE STRATEGIES IN THE DATABASE FOR UNIVERSITY ENGLISH READING

A. Building up foreign language library alliances in universities collaboratively

The formation of library alliance originates from the collaboration of libraries and depends on government's funding and leading. The Ohio Library and Information Network is a result of the University Library alliances established in the 1960s in the Ohio territory in America. It is financed by the state government, unified to offer database and library automation management system freely to the participant libraries, thus forming a successful example of library alliance [7].

In China, the development of library alliance began in the 1990s, the successful cases including China Academic Library & Information System (CALIS), National Science and Technology library (NSTL), Tianjin Academic Library & Information System (TALIS) etc. What Library alliances have in common is aiming at resource sharing, cost savings, reduction of the gap between the members. Therefore, in China, the database for university English reading teaching in the foreign language universities tends to form resource alliance in the top universities, such as Beijing Foreign Studies University, Shanghai International Studies University, and Xi'an International Studies University etc. The database contents based on these universities' English reading teaching resources; digitization, scientific and efficient management are achieved. And the establishment of Resource Sharing Coordination Committee will guide, regulate, interfere the shared database work, and formulate the related activities and behavior criterion, consultate and define the rights and obligations of its members [8], and provide reading teaching database information which can be queried online thereby making sure the resources sharing activities can be carried out smoothly.

B. Building up cloud service model through the integration of foreign language reading database resources

"Information resources integration" refers to a state of existence in information resource optimization. Based on the principle of systematology and some other requirments, it conducts the fusion, clustering and reorganization to data objects, functional structure and the interactive relationship in each independent system to form a new organic whole and a most efficient new information resources system [9]. In the cloud computing environment, university English reading teaching resources integration includes the following: a) seamless linking distributed heterogeneous database to form a whole database integration logically; b) the decomposition and recombination of resource and system to unify a systematical integration of resource

management platform; c) the combination of retrieval methods of supporting multiple retrieval operator; d) the integration of solving information isolated island technology; e) the integration of achieving integrated retrieval or retrieval protocol standards in the same interface.

In the process of universities' resources integration of English reading teaching database, we should first integrate multiple foreign language reading digital resources such as the top foreign language universities' original Reading teaching resources, TOFEL English corpus, special webpage and English literature reading materials. Second, we should set digitalizational standards in order to give data filtration, record, indexing, and ensure work of the resource audit, classification, query and management to be carried out smoothly. And we can consult CALIS teaching system construction standards to integrate digital machining process and standards. At the same time, full consideration of the system expansibility and the requirements of sustainable development should be taken. Finally, we should adopt abundant hardware facilities and professional technical team, unify technology standard and system to achieve sharing and permanency for heterogeneous distributed environment and different sources of data, realize the single input and multiple use; once input and can be used by all members, thus avoid data's incompatibility or loss.

C. Sharing cloud storage services of English reading teaching resources

Cloud storage is a complex structural system composed of multiple parts, such as network equipment, storage equipment, server, application software, public access interface, access network and client programs etc.. Each part of the system uses the storage device as their core which provides data storage service and access service by application software [10]. With the development of broadband network, Web2.0 technology, cluster technology, and distributed file system in China, cloud storage have begun to move toward a practical phase. Therefore, through alliance of foreign language university libraries in China, reading teaching resources integrated carefully for a long time can be stored at the same time, and to make full use of dynamic integration of data compression technology, data deduplication technology, data encryption technology, P2P technology to edit, add, delete and digitize the practical and typical audio data, video data, ROM data in need of English Reading teaching, and to form a nationwide reading teaching database "shared cloud", which can be shared by universities all over the country. The "shared cloud" offers cloud services to all members, resources safe kept by unified organizations. The database is protected by specialized cloud computing experts. The effective distribution, load balance, safety control and virus prevention for the data resources are conducted through professional management. English teachers can choose reading resources carefully from "shared cloud" according to actually used teaching material version, and combine with

image, voice, text, animation and digital in one, which enables students' various sense organs stimulated and converts students' boring English reading into a vivid, interesting English learning environment through multimedia computers across time and space. Not only thorough sharing of reading data resources can be realized, but also the utilization efficiency of digital special resources can be fully enhanced; and at the same time the money can be saved especially for small-scaled universities. It makes up for the problem of the scarcity of education resources, such as the insufficient funds, manpower, material resources etc.

D. Building up cloud service platform system of English reading database

At present, the general digital library in university mostly adopt B/S (Browser/Server) three layer structure, and this static deployment requires every library to configure a set of such systems to allow users' access, which can not meet the large range of use requirements of Web2.0 in universities. The application of virtualization and cloud computing provide us with a good solution [11]. At the same time, we find that there are a great variety of commercial and first-source cloud platforms to choose and exploit. If we adopt combined database method, we can get the scattered data aggregation together to make a solution. Open SkyQuery and Flick are successful examples. SkyQuery conducts a distributed query on combined multiple data sources, and Flick uses slices on joint MySQL database to support millions of queries each day, the success and scalability of this type needs cloud computing, especially IBM distributes the database up to more than 1000 nodes and Gaian DB which can be queried in 1/8 seconds and can be retrieved million records in 5 seconds [12]. In addition, we can also draw on the commercial AmazonEC2, IBM blue cloud, Microsoft Azure, and open source of AbiCloud, Eucalyptus, Fan, etc. to assure the practicality of the virtualization and cloud computing and to build concise and practical shared cloud service platform of English Reading teaching database resource in universities. Its basic frame figure is as following:
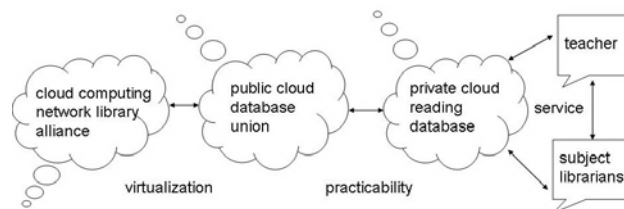
E. Building up collaborative service model of "public cloud" and "private clouds"

Public cloud (also known as the public owned cloud) refers to cloud that offers services for external clients, and all its service is available for others rather than itself. Its biggest advantage is all application procedures, services and

related data are stored by the public cloud providers themselves, without any corresponding investment and construction by clients. The general public cloud service platform consists of a set of softwares. After integration of English reading teaching database in universities, the basic public cloud services can provide unification authentication service, combined resource retrieval service, data service, knowledge service, digital object store and download service, metadata cataloging services, global resource scheduling service, etc. Public cloud storage space has high flexibility, so the user can pay according to his or her own need and increase storage space whenever they want to. No waste happens, and the cost is greatly saved.

Private cloud (also known as private owned cloud) refers to cloud which is founded by enterprises or companies themselves, and all its services are only available to their own internal staff or branches. Private cloud storage platform is composed of private and independent data storage platform in different foreign languages universities. Private cloud of English Reading database in universities should include the school teachers' quality course, high quality lesson, core course and other important reading resources integrated by subject librarians, as well as the strongly practical selective reading resources and cultivating the students' English reading ability resources chosen carefully by teachers according to the contents of teaching and students' language learning level. In the process of using private cloud, local English teachers have all permissions to store their teaching resources. The disadvantage is that only local private cloud has the permission to read and write the digital information resource content, and external users can only read on a designated opening part. But while sharing the resources, the security of the local information resources can be guaranteed to a maximum degree.

IV. CONCLUSION

Cloud computing makes university English reading teaching resource database construction and the use of university library alliance become a reality. It also broadens and enriches the available English reading teaching resources for the university teachers and students. Cloud computing provides a English reading teaching service collaborative platform between teachers and subject librarian, provides a cooperative learning mode between teachers and students according to their own needs; Cloud computing saves valuable time for teachers and arises

students' reading interest and motivation, and promotes the individualized development of the English reading teaching and learning; It also creates a new situation for subject librarians on subject services at the same time. But subject librarians' services are based on the "cloud", rather than services in entity of library. Under a cloud environment, though the subject librarians can have more time and energy to serve teaching and scientific research, subject librarians must have "cloud librarians" qualities, including a strong sense of information, the ability to use methods of data mining, the methods of knowledge discovery, the ability to predict the information users may need, and the ability to deepen processing and organizing information content. Therefore, subject librarians must be a composite high-tech talent under the cloud environment, even if a senior subject librarian should also study hard and try to reach the standard of services with knowledge of both cloud technology and cloud management.

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