

## The Research of Library Digital Resources Retrieval system Integration

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**Abstract**—This paper analyzes the situation of the library digital resources integration in China and abroad, following service oriented criterion. This paper divides resources into three types, which are local special database resource, introduced resource, and Internet resource. Based on these resources, this paper proposes service-oriented integration technology. This system puts forward library digital resources retrieval process design and digital resource integration design. The system has the higher resources retrieval and resources integration ability.

**Keywords**-Library; Digital Resources; Retrieval System; Integration

### I. INTRODUCTION

In recent years, with the rapid development of the computer technology, the network technology and storage technology, the contents of information become diversified, the carriers of information become diversified, which increasingly enrich the library digital resources. Digital resources are much better than the traditional information resources in quantity, distribution and transmission range and other aspects. In the face of the dispersion of the mass information, how can we find relevant information quickly and accurately? This has become the focus of the research on the digital library. Digital resources of different types, different organization forms, different releasing platform and retrieval strategy are showed to users on a unified retrieval platform, which effectively improve the utilization ratio of digital resources.

### II. BASIC RESEARCH ON LIBRARY DIGITAL RESOURCES

#### A. Digital library and Web service concept

Digital library is the digital information resources system with the modern advanced technology. Digital library is running under the environment of network<sup>[1]</sup>. It is a large scale, easily usable knowledge center without time limit. It is the next generation of the INTERNET information resource management mode<sup>[2]</sup>.

#### B. Current research situation at home and abroad

HTTP is a commonly used agreement in digital library system. With the application of Web service technology in the digital library, the digital library research will be refreshed. Foreign mature products are based on the metadata of digital library unified retrieval system. Qinghua

University and Beijing University are leaders in researching digital resource integration in our country.

#### C. Present library digital resource types

According to different standards, the digital resources present different types. According to the distribution of resources, the digital resources can be divided into the local resources and network resources. Local resources refer to digitization document deposited in the library. It includes CD, diskettes, tapes, etc. The network resources refer to the digital resource which deposited in other places including online database purchased by the library and various types of free online information. According to the different sources, the digital resources can be divided into self-built resources and introduced resources. Self-built resources mainly include library collection bibliography database, the characteristic database based on the characteristics of library resource advantage, and the navigation storehouse. The navigation storehouse was built by the librarians who classify, reprocess, and collect the introduced or self-built library resources and the network resources. The introduced resources include OCLC, CA, CNKI journal, etc. According to the form of publication, the digital resources can be divided into electronic books, electronic journals, conference papers, degree thesis paper, etc.

### III. THE THEORETICAL BASIS

#### A. Web Service

Web Service<sup>[3]</sup> is a distributed computing model, widely used in the network. Web Service is a standard totally based on XML (extensible markup language), XSD (XML Schema). Web Service is independent of platforms and software suppliers. Web Service is a new platform which creates interoperable, distributed application program. Web services can provide an independent platform which has nothing to do with programming languages, the operating system, and the running environment. Web Service realizes the integration between different application system and remote procedure call through the network.

#### B. DO metadata standard

Because of the various types of heterogeneous data resources, the different metadata standard<sup>[4]</sup> may be adopted. If resource integration and service integrated system want to realize the unity of retrieval information display, it should follow a unified metadata standard so that the mapping from the heterogeneous data end metadata to the resource

integration and service integrated system metadata can be realized. Metadata is called data based on data; it is used to describe characteristics and attributes of data. The most basic purpose of metadata data is positioning and managing data, so as to realize the query, reading, exchange and sharing data. Metadata not only provides standard description and retrieval tools for various forms of digital resources, but also provides the tools and the link for information integration system of distributed the digital resources. Therefore, metadata is the foundation of technical support in the unified retrieval entrance of the digital library resources integration and integrated service platform.

### C. DOM technology

DOM is the abbreviation of Document Object Model Document Object Model [5]. DOM is an interface which has nothing to do with browser, platform, and language. DOM can visit any other standard components arbitrarily on the page. In brief, DOM solved the conflict between Netscape's Java Script and Microsoft's Jscript. DOM gives a standard method for Web designers and developers. DOM provides object of visiting the site data, script and performance layer. DOM is a hierarchy organization node or information collection of fragments. The hierarchical structure allows developers to look for specific information in the tree navigation. Analysis of the structure usually needs to load the entire document and structural hierarchy, and then you can do any other jobs. Since it is based on the information level, DOM is considered to base on tree or object. DOM also provides an API, allowing developers to add, edit, move or delete the tree node at any position, so as to create a reference program for developers to provide convenient operation documents. The advantages of DOM are mainly reflected in easy use. When you use the DOM, it will put all of the XML document information stored in memory. Since ergodic process of DOM is simple, the accessibility is enhanced.

In unified retrieval entrance of the digital library resources integration and service integration platform system design, each integration resources alone establish corresponding XML configuration files, because every resource XML file is very small, we can make the most the advantage of DOM technology processing XML configuration file.

### D. Ajax technologys

Ajax is the abbreviation of Asynchronous JavaScript and XML. It means Asynchronous JavaScript and XML in Chinese. Ajax is not a single technology, but organically combined several technologies. In order to improve the user's browsing speed, Ajax technology has done a lot of processing work. Ajax provides asynchronous communication ability for server, thus the user is free from the cycle of request/response. With the aid of Ajax, the user can submit request, update immediate UI using JavaScript and DHTML, send the server asynchronous request, and update or query the database.

Using Ajax asynchronous communication technology in unified retrieval entrance of the digital library resources

integration and service integration platform system can realize the effect of retrieval results and at the same time can realize the dynamic refresh effect in resource browsing navigation service can also be realized which reduce the user's waiting time and improve the user experience.

## IV. UNIFIED RETRIEVAL SERVICE

Process of unified retrieval service: the user inputs index word in retrieval interface, sending out a retrieval request, this retrieval request will enter the system request service queue. The system will be established to request corresponding retrieval thread for external resources retrieval and local resources retrieval. According to user retrieval resources, system extracts resource configuration file information and assemble retrieval URL according to the user retrieval request, this URL directly establish connections with data of the Web server, or establish the connection and data sources by calling the corresponding Web Service Client, so as to call server retrieval Service interface launch retrieval, after all the retrieval results through the analysis of data extraction, cache exists in server memory, through using Ajax technology results will present dynamic to users. For local resources retrieval request, the system will generate corresponding retrieval thread, according to the selected resources, through the Web Service calls, retrieval local resource base, the retrieval results will be shown to the users.

## V. THE DESIGN OF RESOURCE INTEGRATION

Through the investigation, analysis and comparison to the existing library resources, the library digital resources are divided into the characteristic database, introduced database and web resources. The characteristic database can fully reflect the literature and data resources characteristic information summary. The library makes full use of their own collection and establishes literature information resource Introduction of database means the distribution in different parts of the database. The database be can accessed in different ways, each with different characteristic. Web resources refer to the most commonly used methods providing Internet user retrieval service. Internet users get the data through the visit of the other website.

Map image described the three types of library digital resource integration schematic diagram.

## VI. CONCLUSION

Library digital resources are all-inclusive. In view of the digital resources retrieval system more and more, the development of unified retrieval service of digital resources will solve the problem that users have no idea how to choose are in various retrieval system. Providing a unified retrieval interface, the system can not only save a lot of energy for the user, but also improve the retrieval efficiency.

The system will also be perfected and expanded in retrieval sort, retrieval efficiency optimization, classification of retrieval resources type, retrieval function and so on.

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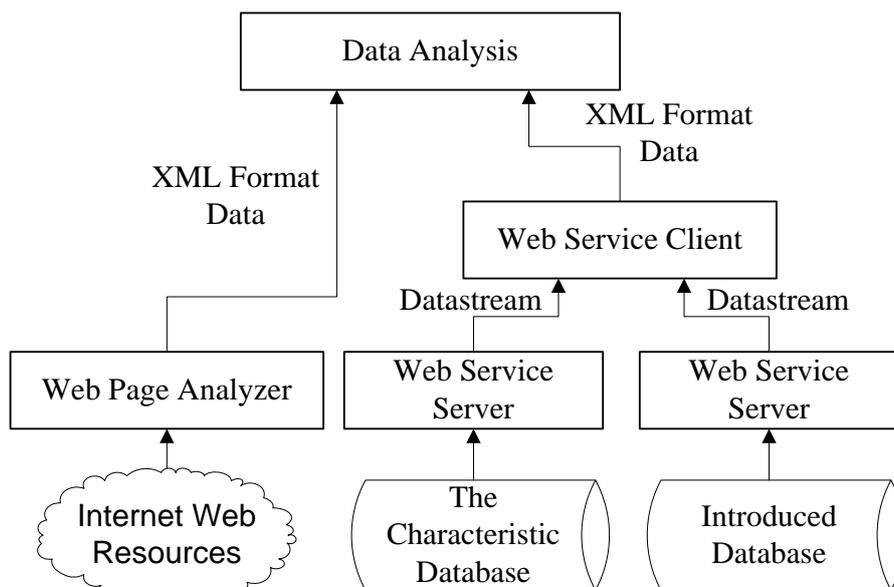


Figure1. Resource integration data flow graph