Global Digital Museum (1) - Concept

4J－11

Junichi Takahashi Masahiro Kusaba Takayuki Kushida Jung-Kook Hong
Tokyo Research Laboratory, IBM Japan, Ltd.

Shigeharu Sugita
National Museum of Ethnology

1. Introduction

Multimedia information access on the global network such as the Internet is becoming a new museum education method that will broaden the international horizons of museum users. We are proceeding a joint research project on Global Digital Museum with National Museum of Ethnology, the British Museum, and Cornell University. In this project, we are building a prototype system on the Internet for global access to multimedia contents of cultural heritage stored at museums, and its application to museum education. The technical issues we are addressing include 1) unified access to heterogeneous and distributed museum contents, and 2) interactive use of museum contents on WWW. This paper describes the basic concept of Global Digital Museum, and access modality of museum contents on the Internet.

2. Requirements and issues

Museum has the traditional international role as a center for visitors, collections, and study, since the museums serve to an international community and invariably possess international collections. The requirements of museum education on the Internet are increasing including 1) a framework and tools for authoring teach-the-teacher materials for curators and school teachers, and 2) interactive access of multimedia information for museum teachers, school teachers and students.

Although the number of museum homepages on the Internet is increasing, they are hardly satisfactory with respects to educational requirements because of contents quality and globalization. The prestige of the traditional museum educational service is not reflected enough to the homepage search. Contents and concept are localized at each museum, and consequently the users very easily loose the way during searching the homepages. It is one of the most urgent and important things under the circumstances to develop global digital museum education, and enabling technology for making the new education paradigm in the era of globalization.

3. Concept of Global Digital Museum

Global Digital Museum (GDM) is a virtual museum where users can easily access multimedia contents from a plural of museums on the global network. The contents of museums are virtually integrated into a database to provide users a unified view of distributed and heterogeneous databases. Users can access the museum with guidances of museum experts knowledge, such as theme and area they are interested in. Users can also create their own personal museum into a working space by authoring using retrieved museum contents. The personal museum can be shared among users for collaboration.

4. Contents data model

We define a conceptual data model and protocol for access modality of museum contents on the Internet. Figure 1 shows the conceptual data model of GDM. Museum contents is composed of digitized museum collections, stored in each local archives, such as slide/photo images and related artifact images and bibliography.The contents is specified as a composite structure of links to multimedia archives, including links to archives on other sites. The contents also has a scenario, such as slide show, which is an intention of contents creator in showing the contents. Template specifies how to view the search results according to museum's intention. The template is independent from the contents, and the contents is viewed differently by using different templates, such as slide show template and template for text reading. The contents may

have related information such as references of further reading. Archive index is a museum unique local database which specifies relationships among contents and archives.

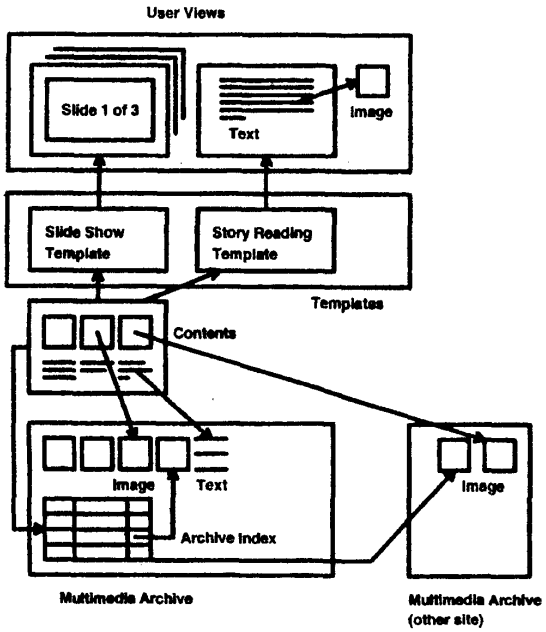

Figure 1: Museum contents model

5. Protocol

Figure 2 shows the WWW-based configuration for global search of museum contents. GDM server consists of WWW server, Dienst server for global search, and DBMS for local search. Dienst server has CGI interface to WWW server, and provides transparent access to museum contents in a server group. Dienst is an operational protocol and server for distributed search of digitized documents such as technical reports, on WWW. With this protocol, a query submitted to WWW server is passed to Dienst server, and the Dienst server then forwards the query to other Dienst servers defined in the server group on the network. Dienst servers search for museum contents at each of the server site, and then returns list of URL to the querying server. The returned lists of URL are merged into a HTML document so that the results is send to WWW browser. WWW browser can access the results directly to WWW servers through URL. DBMS manages multimedia archives at each server site, and has an index for local search of related information to the contentes. The relationship of the contents and local database objects can be defined at each server site.

In order to access museum contents with relationship to local database objects, we extended Dienst protocol by including the following URL lists into the server-to-server communication information: 1) a list of archive URL which is a component of contents, and 2) a list of local dabatase object URL which has a relationship to the contents.

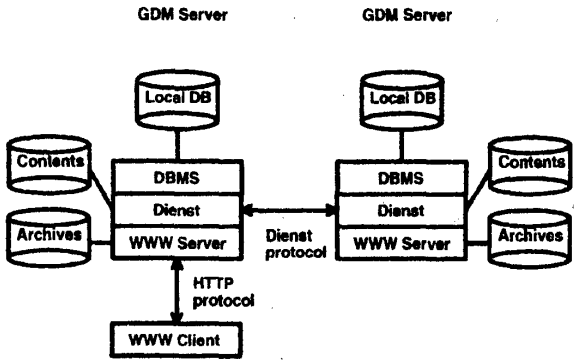

Figure 2: Server configuration for global search

6. Concluding remarks

We built an initial prototype on the Internet to implement basic functions of access modality of global museum contents for museum education application. Distributed search protocol for museum contents accommodates control of contents quality at each museum site, as well as globalization of the contents. We plan feasibility study of the prototype by increasing the number of museum sites and school monitors.

Acknowledgment

This paper is a part of results of the joint research project on Global Digital Museum with National Museum of Ethnology, the British Museum, Cornell University and IBM Japan, Ltd. The data used here belong to National Museum of Ethnology and the British Museum.

References

"Dienst protocol version 4.0," NCSTRL Documentation, http://www.ncstrl.org/Dienst/htdocs/Info/protocol4.html