Building Archaeological Photograph Library

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Abstract. The photographs taken at excavation fields are one of most important materials. It is expected to digitize and save these photographs in the computer system because of difficulty of management to many photographs and losing color problem. We designed and implemented prototype of archaeological photograph library. The library is designed based on Dublin Core Metadata Element set and XML We describe the photograph library project and design concept of the library.

1 Introduction

The study of ancient societies, Archaeology, in Japan examines the period from ten thousands B.C. to seventh century A.D. For archaeologists it is important to taking many photographs of these historical sites like remains, buildings and graves for the purpose of leaving precise records. The thousands of photographs have following problems.

- It is difficult to manage, classify and sort these photographs for investigation. The maintenance cost is so high, it is hard to find appropriate data or detect relation between these data.
- Old films of photographs have become to lose color. In general, films of photograph are able to keep color only twenty years. The films that have lost colors also lose the value as precise materials; it is urgently necessary to take action for saving these data.
- Most of photographs are kept in a warehousing, not used other archaeologist or another purposes.

It is one solution to problem to digitize photograph and archive to the large computer system. The advantages of building digitized film library are not only saving enormous data but also finding appropriate easily and enabling to describe cross-reference. The archaeological remains have metadata (data about data) that explain period that these are used, type of the remains and place these are excavated

so on. The goal of this system is publish these data and enable to inter-connect or exchange data to similar server, the metadata definition have to be based on international standard. The core metadata of archaeology is discussed by Archaeological Sites Working Group of the International Committee for Documentation (CIDOC)[1] of the International Council of Museums (ICOM)[2]. On the other hand, Dublin Core Metadata Element set [3] is international standard, especially, adapted by library and museum. The library is based Dublin Core because it is open to public though the Internet.

In this paper, we describe the project building film library of Japanese archaeological relics: the overview of this project, proposal archaeological metadata based on Dublin Core, design of database system and database.

2 Archaeological Photograph Library Project

2.1 Target

The emeritus Professor Katata has taken photograph at the excavation field; the collection is about tens of thousands. At the first step, the target is digitizing his entire photograph and saving in the computer organized by giving metadata. The final goal of this library is making connection to other server through the Internet to searching across these sites and exchange data. In this paper, the goal is building stand-alone server that has all facility such as scanning, database, giving metadata and browsing.

2.2 System Design

The Archaeological Photograph Library consists of three four components: digitizing, database, giving metadata and browsing.

In digitizing component, the films of photograph are scanning to digitized data such as JPEG or photoCD format. The giving metadata component consists of two tools: metadata input form and input support tool that assists people who give metadata.. To retrieve and browse is realized through WWW browser. The data retrieval is mainly executed using metadata as a key.

3 Designing Metadata of the Archaeological Photograph Library

Dublin Core Element Set consists of fifteen core elements, each element is optional and repeatable. It is possible to add sub element called qualifier. Definition of qualifier in the specific field is discussing for saving flexibility and interoperability.

Table 1 shows Metadata designed to this photograph library. Since this list is provisional version it might be change by implementation and evaluation. After the

final version is completed, we will propose the designed Metadata as an archaeological standard.

DC.Title	Title of the digitized data.
DC.Title.relic	Title of the relic.
DC.Title.ruin	Ruin the relic belongs.
DC.Title.historicalsite	Historical site the relic belongs.
DC.Creater	
DC.Creater.relic	Person/people who make the relic.
DC.Creater.photo	Person who take a photograph of the relic.
DC.Creater.digitize	Person/organization who digitize photograph.
DC.Subject	
DC.Subject.relic	Keywords of the relic
DC.Subject.ruin	Keywords of the ruin
DC.Subject.historicalsite	Keywords of the historical site
DC.Subject.photo	Keywords of the photograph
DC.Description	Description of the relic.
DC.Publisher	Person/organization who publish the digitized photograph.
DC.Contributor	Contributor.
DC.Contributor.excavation	Person/organization who contributed to excavate the Historical site.
DC.Contributor.photo	Person/organization who contribute to take photograph.
DC.Date	
DC.Date.period	Era the relic was used.
DC.Date.excavation	Date the relic was excavated.
DC.Date.photo	Date the relic was took photograph.
DC.Date.digitize	Date the photograph was digitized.
DC.Type	
DC.Type.period	Period the relic was used.
DC.Type.relic	Type of relic (earthenware, sword etc.).
DC.Type.ruin	Type of ruin (house, grave etc.).
DC.Type.photoangle	Angle of the photograph.
DC.Format	Format of digitized data.
DC.Format.size	Size of digitized data.
DC.Identifier	Identifier of the digitized data.
DC.Identifier.address	Address of the Historical site.

DC.Identifier.point	Longitude and latitude.
DC.Identifier.number	Number of photograph.
DC.Identifier.relic	Number of relic in the photograph.
DC.Source	Relic (object) in the photograph.
DC.Language	Language
DC.Relation	
DC.Relation.relic	Relation among other relics.
DC.Relation.panorama	Panorama of the relic, ruin, historical site.
DC.Relation.neighborphoto	Photograph came out neighbor of the relic.
DC.Coverage	
DC.Rights	People/organization who hold rights.
DC.Rights.relic	People/organization who hold rights of relic.
DC.Rights.photo	People/organization who hold rights of photograph.
DC.rights.digitize	People/organization who hold rigths of digitized data.

Table 1. Metadata for archaeological photograph

4 Database and browsing

The database is a core component in the library system. Generally, the most important function required for database is searching appropriate data fast and exactly. The database is also expected to develop for providing support to person who gives Metadata automatically by learning. There are two ideas to implement this function. One is implementing a reference counts in the database. Metadata that used many times might be used next time. This method is not fair because the number of appearance dose not indicate the importance of information. Second is making relation table to select appropriate Metadata. It is more certain than the first method, since it can describe to original relation and apply to select showing Metadata.

The library opens to the public through the Internet with WWW browser. The format is XML to display result of searching, digitized film data and metadata. It makes available to exchange data among other server or library in the futer.

Conclusion

We described importance of digitizing and archiving of archaeological photograph. The design of the archaeological photograph library is completed and prototype

implementation is started. In the future, the evaluation process is required for propriety of the metadata based on Dublin Core Metadata Element set and database.

References

[1] International Committee for Documentation (CIDOC) (http://www.cidoc.icom.org/)
[2] International Council of Museums (ICOM) (http://www.icom.org/)
[3] Dublin Core Metadata Initiative (http://purl.org/dc/)