Content Management for Digital Museum Exhibitions

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ABSTRACT
An online exhibition of a digital museum often consists of a variety of multimedia objects such as webpages, animation, and video clips. Ideally, there should be different exhibitions on the same topic for users with different needs. The difficulty is that it is time-consuming to produce illustrative and intriguing online exhibitions. In this paper, we present a content management system for producing exhibitions. This framework is a novel approach for organizing digital collections and for quickly selecting, integrating, and composing objects from the collection to produce exhibitions of different presentation styles, one for each user group. A prototype based on our framework has been implemented and successfully used in the production of a Lanyu digital museum. Using our method, the Lanyu Digital Museum online exhibition has several features: (1) It provides an easy way to compose artifacts extracted from the digital collection into exhibitions. (2) It provides an easy way to create different presentations of the same exhibition content that are catered to users with different needs. (3) It provides easy-to-use film-editing capability to re-arrange an exhibition and to produce new exhibitions from existing ones.

Keywords
Digital Museum, Content Management, Multi-Presentation, XML.

1. INTRODUCTION
In addition to being a digital library, a digital museum also emphasizes on providing users with educational and well-motivated exhibitions. A digital museum designer implements the exhibitions using images, webpages, animation, video clips, and other multimedia objects. There are various factors that a designer needs to consider. For instance, the bandwidth that is available to different users can vary tremendously. Children may prefer more animated style than an adult. An expert and a novice may expect different depth of content. With the flexibility allowed to the digital form of media presentation, a digital museum should try to cater to as many different types of user needs as possible. A user, when browsing through an exhibition, can simply click and choose the style most suitable.

2. THE FRAMEWORK
An exhibition can be regarded as a choreographed presentation of a certain topic using artifacts from a museum. An online exhibition, from the user’s viewpoint, can be treated as a sequence of webpages. We call each webpage an exhibition element. Our methodology considers three central issues for producing flexible and easy to use exhibitions: (1) There should be an easy way to produce exhibition elements from the digital archive. (2) Once an exhibition is produced, there should be an easy way to create different presentation styles suitable for different users. (3) There should be an easy way to re-arrange an existing exhibition to create new ones for users with different needs.

Our framework contains a number of features for the entire production cycle. For the content provider, there is an easy-to-use database management environment for inputting multimedia objects with their metadata. The input is automatically incorporated into the associated database. For the exhibition designer, we provide an editing environment for extracting multimedia objects from the database and quickly composing them into exhibitions. This process is as simple as making a few clicks. For instance, the designer can click and choose a title, a set of pictures, some text, an audio clip, and a particular style sheet (in XSL form), and an exhibition is completed. What is chosen is automatically converted into an XML document, from which (and the XSL file) an exhibition element is produced automatically. An exhibition with the same content but for a different user group can be generated by simply replacing the style sheet with another XSL file. Modifying an exhibition can also be done easily by clicking and removing a chosen object and replacing it with another.

We should remark that the common document component types in a typical hypermedia document could include structural text, data series, graphic representations of functions and tabular data, geometric drawing, animations, video, etc. Yet, in this stage, our implementation considers only hyperlinks, text, image sequence, and audio/video clips. We are currently developing more robust conceptual document model using various media synchronization models to provide more sophisticated multimedia presentation.

3. SYSTEM IMPLEMENTATION
Based on the given framework, we have built a digital museum for the Lanyu Island and its inhabitants, the Yami people. (Lanyu is an island off the coast of southeastern Taiwan with many unique species of plants and animals not found anywhere in the world, and the Yami are a part of the Austronesian group.) The many multi-user exhibitions in the digital museum are all generated automatically by our system.

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