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Developing a Digital Library of Reusable Historical Artifacts

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ABSTRACT

This paper discusses the design and implementation of a digital library of historical artifacts. A major goal of the project is to create an architecture in which artifacts are reusable across various digital library applications. Two such applications have been developed and are described: a virtual exhibition system and a reference helpdesk.

Keywords

Reusable artifacts, digital library applications, archives

1. INTRODUCTION

The National Archives of Singapore (NAS) is a Singapore government organization tasked with the preservation of the country's records that are of historical importance and significance. These range from private memoirs to government records, and are in various formats including text, photographs, maps and video. A project is underway to develop a digital library offering a range of services to both patrons and staff of the NAS. The aim is to build a unified platform upon which all of the NAS' digitized resources may be accessed through various applications, in effect, creating a digital library of reusable artifacts. The eventual size of the collection will be relatively large. There are for example, currently 1.5 million photographs, 10,000 hours of oral history recordings and 130,000 maps and building plans in the NAS' holdings.

2. DIGITAL LIBRARY DESIGN

The digital library is Web-based and consists of two major architectural layers. The *infrastructure layer* consists of components that provide basic services such as artifact and

metadata retrieval as well as repository maintenance for *core artifacts* - the resources that form the digital library's core holdings (photographs, video etc.). As different core artifacts may have different requirements for their management and access, this layer supports independent repositories for the artifacts and their metadata. However because the digital library offers a single point of access to all artifacts, the infrastructure layer provides a component called the *repository gateway* that serves as a unified front-end to the various repositories. All core artifact access and management requests will be fulfilled via this gateway.

The *application layer* consists of applications that use the infrastructure layer components to deliver services to digital library patrons. Applications range from simple infrastructure component wrappers such as searching over a repository of photographs, to complex ones that may combine various infrastructure components to provide value-added services, for example, reference services. Applications may also combine core artifacts to produce new ones, such as virtual exhibitions, and these are maintained in separate application-specific repositories.

3. APPLICATIONS

To date, two digital library applications have been developed. *Virtual exhibitions* are collections of Web pages revolving around a certain topic. The challenge is to depart from the traditional "copy and use" means of authoring exhibitions to a more efficient "reference and reuse" model. In the former method, artifacts such as text and images are duplicated when new exhibitions are created. The result is that multiple copies of a single artifact are produced making updates difficult and storage inefficient. In the "reference and reuse" model, artifacts are stored in a single location (the core artifact repositories) and referenced in virtual exhibitions. Only one copy of the artifact exists, reducing storage requirements and facilitating changes to the exhibition content simply by changing the artifact(s) involved. Virtual exhibitions are stored as XML documents in an application-specific repository. At execution time, the virtual exhibition application retrieves the necessary artifacts and converts the XML documents into HTML using one or more XSL files.

The *reference helpdesk* provides reference services to common enquiries on Singapore's culture and history via a Web-based

interface. Virtual folders for topics as diverse as life during the Japanese Occupation or water management in Singapore are created and subsequently populated with appropriate references to artifacts in the digital library through a folder management tool. Users may search the helpdesk or browse the topic classifications until the desired folders are found. These folders are XML documents stored in the reference helpdesk repository and converted to HTML when accessed by the user. This application is expected to alleviate the heavy workload already faced by NAS staff and allow them to be involved in more complex tasks.