

## Chapter 22

# Service–Oriented Reference Architecture for Digital Library Systems

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### ABSTRACT

*Developing and maintaining Digital Libraries requires substantial investments that are not simply a matter of technological decisions but also organizational issues. While digital libraries hold plenty of promise both now and for the future, they have been slow in taking off. Some digital libraries have either been completely abandoned or they have been put on hold indefinitely. One of the reasons for this predicament is that developers of digital libraries have approached their implementation the same traditional way of building applications, which is also akin to how structures of physical information organizations are built. Digital Libraries with their universal functionality may be even more flexible and reusable, if designed in a service-oriented manner. Such design should allow decreasing the effort of the creation of new digital libraries and the maintenance and scaling of currently existing large installations. Service-oriented architecture offers a better approach to building digital libraries, including streamlining business components, employing reusable services and connecting existing applications to communicate efficiently. The SOA is still a fairly new concept in DL systems. This chapter investigates the applicability of SOA as a fundamental architecture within the system. Its objective is to design a Service-Oriented Architecture for Digital Library System (DLS) using Web Service technology. SORADLS includes different layers which provide primitive services to the library applications built on top of the DLS. DLS techniques of personalization, alert, and caching build SORADLS as services. This architecture provides a fast, safe, convenient, and efficient service to users connected through the Internet.*

## **INTRODUCTION**

The library services are always followed by library works. Information and communication technology (ICT) have brought changes in the concept of traditional library work as well as service. The recent trend and change in the information related field especially in collection, storing, processing and dissemination of information have resulted in to the evolution of digital libraries. Now most of the reference books like encyclopedias, dictionaries, directories, hand books, and so forth, are published in electronic form. At present, most of the digital libraries have been highlighted mainly on providing access to diverse digital information resources. A digital library is an information retrieval system in which collections are stored in digital formats and easily accessed by networked computers (Bergeron, 2004). Advantages of digital libraries include limitless storage, no physical boundary, multiple accesses, instantaneity of retrieval, round-the-clock availability, indestructible, preservation and conservation, and so forth.

The Digital Library is completely dealing with the digital data in the form of text, graphs, images of photo copies, sounds, and so forth. Digital Library and its storage systems need various technologies, including scanning, OCR, digital storage techniques, data compression, indexing and search algorithms, display devices and the Internet. The digital searching becomes so easy, inexpensive, fast and ubiquitous that users will not tolerate, or will not access, traditional materials, special techniques for non-textual materials, such as music, images, videotape, and so forth. For the Digital Library, the core data required for it must be in the Digital format. So if the collected data of any format should be converted into digital form. Converting text, images, and objects to digital form requires much more than digital photography or even high-resolution scanning and requires some process, like:

- Initial input, either scanning or keyboarding.
- Conversion to one of a set of standard digitals.
- Optical character recognition (OCR) to capture text characters for searching.
- Creation and input of metadata and cataloging information.

The provision of personalized reference and information services is considered as one of the important characteristics of the library and information profession (Baman, 2004).

## **Digital Library System**

Digital Library System (DLS) stores content digitally and is accessible by computers. DLS retrieves comprehensive yet accurate information and virus-free, delivering it instantly at the click of the mouse across the intranet. This efficient and interactive software platform, boasts the most up-to-date information on every subject that is quickly retrievable by keying in some elementary fields in the search options. This eliminates the innumerable hours spent crawling search engines which more often than not spews out contradicting and unreliable information while restricting unnecessary Internet access, which is difficult to control/monitor.

The key principles of DLS architecture are open architecture, modularization, federation and distribution. The Open Architecture partitioned into set of well-defined services and these services accessible via well-defined protocol. The Modularization promotes interoperability and scalable to different clientele

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