

## Chapter 2

# Digital Libraries and Scholarly Communication: A Perspective

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### **ABSTRACT:**

*The chapter examines various components of scholarly communication in the context of digital technologies as being applied in libraries. It highlights the role of digital environment in research and its impact. Chapter provides both a historical and contemporary perspective of digital library movement and discusses issues like sustainability and preservation. It argues that Research libraries have begun to take on the provision, organization and preservation of digital information with the same long-term commitment they have made for print materials*

### **INTRODUCTION**

The term “digital library” is simply the most recent in a long series of names for a concept that was written about long before the development of the first computer. The idea of a “computerized library” that would supplement, add functionality, and even replace traditional libraries was invented first by H.G. Wells and other authors, who caught the imagination of millions with speculative writing about “world brain” and similar fanciful devices.

There is general agreement that much of the early actual application of computers to information

retrieval was stimulated by the prominent scientist Vannevar Bush who wrote about the “memex”, a mechanical device based on microfilm technology that anticipated the ideas of both hypertext and personal information retrieval systems. The first real world application of computers to libraries began in the early 1950s with IBM and punched card applications to library technical services operations, and with the development of the MARC (machine readable cataloging) standard for digitizing and communicating library catalog information. In 1965 J.C. R. Licklider coined the phrase “library of the future” to refer to his vision of a fully computer based library, and ten year later F.W. Lancaster (Lancaster, 1978) wrote of the soon-to-come pa-

DOI: 10.4018/978-1-61520-767-1.ch002

perless library. About the same time Ted Nelson invented and named hypertext and identified later in this paper in some detail, but never built to refer to the concept of a digitized library, including electronic library, virtual library, library without walls, bionic library and others.

The relatively recent use of the term digital library can be traced to the Digital Libraries Initiative funded by the National Science Foundation the Advanced Research Projects Agency

There are many definitions, fringing from the electronic catalog that describes physical items in a “brick and mortar” library to advanced multimedia environments housing all-digital collections. H. Thomas Hickerson, Cornell University’s associate University Librarian for Information Technologies & Special Collections, believes it is time to erase the line between physical and digital libraries. “A major portion of library activities are technology-supported and have been for years. The internet has had an incredible impact, but libraries have a history of managing large systems and using technology to deliver bibliographic information,” says Hickerson (Personal Correspondence).

Sun Microsystems (<http://www.sun.com>) defines a digital library as the electronic extension of functions users typically perform and the resources they access in a traditional library. These information resources can be translated into digital form, stored in multimedia repositories, and made available through Web-based services. The emergence of the digital library mirrors the growth of e-learning (or distance learning) as the virtual alternative to traditional school attendance.

Digital libraries began to appear on the campus in the early 1990’s as research and development projects centered within computer science departments, sometimes funded by government grants. Campus librarians were often uninvolved in these early projects, which focused on digitization technology, metadata schemes, data management techniques, and digital preservation. Digital library use shifted to large and diverse campus audience, and information technology (IT) groups began to

partner with the library to develop campus-wide standards for the deployment and operation of digital libraries as an integral part of the education enterprise. This development paralleled the development of heightened student requirements for access to library resources. (Headstrom, 2004) With the advent of the Internet, individuals’ expectations for access to information have increased dramatically. Patrons increasingly expect instant access to all the information resources they require, from any location, at any time, and from any device. This is the objective that the digital library is fulfilling. With digital libraries, and individual can:

- Gain access to the holdings of libraries worldwide through automated catalogs.
- Locate both physical and digitized versions of scholarly articles and books.
- Optimize searches, simultaneously search the Internet, commercial databases, and library collections.
- Save search results and conduct additional processing to narrow or qualify results.
- From search results, click through to access the digitized content or locate additional items of interest.

All of these capabilities are available from the desktop or other Web-enabled device such as a personal digital assistant or cellular telephone. Additionally, the user can customize his or her information request so that search results reflect individual needs and preferences. Sun considers personalization the next killer application, creating a more valuable and richer user experience in the digital library environment. ([www.sun.com](http://www.sun.com))

These components might not all be part of a discrete digital library system, but could be provided by other related or multi-purpose systems or environments. Accordingly, integration is a consistent issue cited by digital library developers. To interoperate with the existing library infrastructure, the digital library must be designed to work

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