

Meeting the Demands of Digital Scholarship: Challenges and Opportunities

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The synergies of numerous emerging trends such as the development of open standards and open source software, geometric growth of blogs and podcasts, peer-to-peer networking, cross discipline collaborations, etc. provide new directions for scholarship. Likewise, digital libraries and supporting technologies have now matured to the point where their contents are incorporating complex and dynamic resources and services. Powered by network capability and fuelled by digital developments, research is becoming more data intensive in almost every discipline. The rapid pace of development poses new threats and problems. Many of these innovations, for example, may have come at the expense of simplicity, sustainability, and other commonly understood applications in the life cycle management of digital resources. Based on the University of North Texas Libraries' "Portal to Texas History" implementation experiences, this paper provides a general overview on the emerging trends and innovative usage of digital library technologies. This paper provides an overall scenario in the areas of aggregating a variety of digital formats; deploying, maintaining, and archiving digital contents; and other innovative uses of digital library technologies.

Introduction

Today our entire information landscape has changed and continues to change at a breathtaking pace. The synergies of numerous emerging trends such as advancement in information communication technologies, development of open standards, and collaboration across disciplines etc. change learning and research environments and provide new directions for scholarship.

Digital technologies are shaping creation, management, access, use, and preservation in ways, which are so profound that traditional methods are no longer effective. A review of the recent literature shows no shortage of views on the future of digital libraries. Breaks (2005), Association of Research Libraries (2004), Lavoie and Dempsey (2004), and Lagoze et al. (2004) among others, articulated a vision of a digital library environment that resonates with possibilities to create a knowledge management system on the Internet that will enable scholars to navigate through these resources in a standard, intuitive, and consistent way. Kumar et al. (2004) and Birmingham et al. (2003), agree that the new scholarly communication systems will inevitably be based on capabilities of interoperable network technology.

Trends and Challenges in Digital Libraries

Recognizing the central role of a digital library in scholarly communication, academic libraries are now seeking to create a digital environment that provides scholars with access to more diverse and previously unavailable information sources and services. In order to exploit the power of the Internet, where many different platforms come together, digital libraries and supporting technologies have now matured to the point where their contents are incorporating complex and dynamic resources and services.

However, these innovations may have come at the expense of simplicity, sustainability, and other commonly understood applications in the life cycle management of digital resources. For instance, architectural complexity may have a significant impact on internal efficiency/effectiveness, preservation, provenance, and intra- and/or inter-object interoperability issues. The growing number of digital library initiatives and the wide variety of application technologies make the need for collaboration and compliance with standards more critical than ever.

Bellinger (2001) stated that while the capacity to create digital content is great and the appetite for it seemingly insatiable, much work remains to make the infrastructure robust for creation, description, storage, access, and preservation. Considering the central role of a digital library in scholarly communication, the digital preservation and long-term access challenges are fundamental concerns. Adequately addressing these issues is paramount for the success of digital library in supporting current digital/virtual learning environments.

The University of North Texas Libraries' Initiative

In order to support e-scholarship and improve the accessibility and delivery of digital resources to faculty, staff, students and other users, academic libraries are working on various digital library development activities such as purchasing digital formats and digitizing analog collections. Likewise, the University of North Texas Libraries have designed and implemented a robust portal system that facilitates single-point access to vast and heterogeneous digital resources. Recognizing the importance of building and managing flexible and interoperable library portals in this rapidly evolving technology landscape, the Portal to Texas History Project integrates and ensures long-term access to large quantities of diverse, multi-platform digital resources from many different institutions. As can be seen from figure-1 below, the service-oriented architecture and design of the Portal to Texas History supports and facilitates such digital resource management activities as automatically extracting and/or harvesting metadata from various sources including MARC (Machine-Readable Cataloging) records.

Portal Architecture

The central portal exists as a Linux server, running several open source components to effectively manage the Metadata records. The backbone of the system is the Apache Web server with customized extensions to handle the XML records. Perl and PHP scripts implement the front-ends. Master, archival quality files are stored off the actual Portal in a Xiotech system. Figure-1 describes the architecture of the Portal to Texas History project in a graphical format.

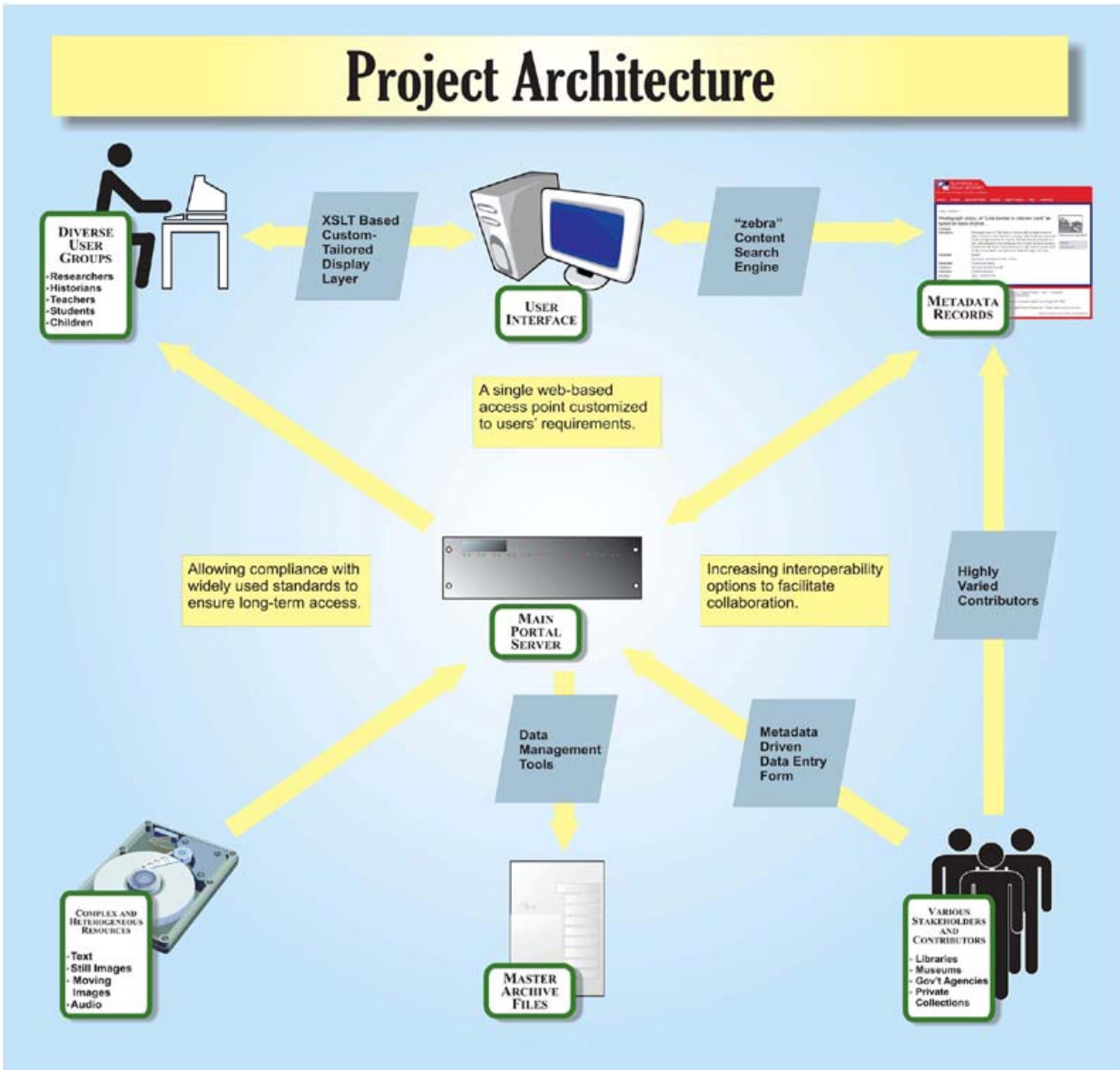


Figure 1: Portal to Texas History Project Architecture

Summary

While our entire information landscape has been changing at a breathtaking pace, there is a spectrum of roles for digital librarians in making previously inaccessible objects both accessible and usable. As noted by Breaks (2005), the key in this area is linking into learning and research and establishing partnerships so that the library is part of the learning and research process. This might require unbundling spaces, collections, services and staff from the physical environment of the library and recombining them with virtual learning and research environments.

Indeed, building a robust, service-oriented, interoperable digital library is not just a question of scaling existing techniques. It may require a departure from established information systems protocols and procedures. Any solution will perhaps be as complex as the problem it seeks to solve. Even though each and every one of us has

a unique perspective on how libraries will adapt to changing times, most agree that libraries continue to be central to our lives. After all, the future of an information society and a knowledge economy will continue to be built around digital forms (e-government, e-commerce, e-health, e-scholarship, e...).

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