Ubiquitous and Open Access: the NextGen library

Edmund Balnaves, Phd

Information Officer, IFLA IT Section

Director, Australian Library and Information Association

Director, Prosentient Systems

ejb@prosentient.com.au

Abstract

Institutions have traditionally neglected the intellectual potential of their research and publishing output. The traditional model for academic publishing neglects the importance of the institutions contribution to the creation and innovation of intellectual output.

Since the turn of the century innovation in open source systems has been an enabler for libraries to extend their information management to digital libraries and to integrate these resources with other resource management and discovery tools. This presents an opportunity for institutions to make better use of the inherent knowledge in their reports and publishing activity by consolidating these resources in an institutional repository managed by an effective metadata framework.

This paper presents a model for development of a unified institutional electronic resources delivered through open access and open source models.   This provides a sustainable and low cost model for implementation of institutional repositories.   Libraries, with strong understanding of the importance of metadata and services standards should be well positioned to managed these resources as long as they position their skills to be actively engaged in this area.

Introduction

Many institutions have a continuous publishing output, of reports, research and information. This publishing is often "outsourced" through the traditional academic model of publishing , or is published ephemerally through the institutional website and lost with site upgrades and redesigns. The "outsourcing" model of academic publishing relies on the direct relationship between the author of research and the publisher, typically leaving out the institution that has contributed the infrastructure, and services to complete this research. The published work is then "owned" by the publisher with very little residual rights to the author, and usually none to the institution.   The Open Access movement represents an effort by authors and institutions to gain a better ownership or at least internal knowledge leverage over the research publishing of the institution.   Similarly, reports and internal publishing activity is often ephemerally delivered on websites whose longevity is poor. A website makeover will often not preserve older material and with such makeovers typically at least every 5 years, there is gradual loss of knowledge for the institution.

This is a problem that libraries are well equipped to address with the NextGen toolkit of services for libraries.   There has been a transformation in the last 10 years in the evolution of open source

systems for libraries. This evolution has paralleled the emerging open source movement, resulting in the development of highly functional open source solutions both for digital libraries and library management (Keast and Balnaves 2009). Such is the evolution of these systems, with 10 years of development under their belts, that these systems are not only robust and stable, but also increasingly capable of integration.   This integration capability introduces possibilities for a new generation of libraries systems: the Next Gen systems, which have the potential to act as a significant knowledge resource of the library.

This change is timely, as the role of the physical assets of the library declines and the importance of the management of digital resources grows.

Open Source as an enabler for Open Access

One of the great duo's that underlie modern NextGen libraries has been the rise of open source systems (OSS) and open access (OA). Adoption of OSS and OA has been extraordinary over the last ten years, has progressed in parallel, and in similar timeframes.   The synergies go deeper than this. First, open source can be an enabler for the adoption of open access in an institution. Equally a successful OA project can justify the ongoing improvement of the OSS implementation. Second, OSS can provide a level of certainty for an institution in their operation costs. The larger the community of adopters of open source the stronger the overall support. Third, the OSS can provide a level of security in that there is no proprietary lock-in and the code is visible (and therefore can be corrected).   The functional depth of this security will be improved by the work of those adopting the open source model.

Finally, open source systems can provide a cost-viable model for implementation of open access in smaller institutions. A common confusion is that open source means "free". While it may be lower cost, no information technology system operation is free.   The ongoing nurturing of a system, software upgrades over time, support for customisations and enhancements, server administration, network costs are just a few of the base-line elements of managing an information system. Nevertheless, the amortisation of the software support across a wide installed base makes for an effective cost model for smaller institutions.

The increasing access to digital resources entails growing complexity in the resources management by the library, including digital libraries/collections, digital news feeds, digitisation of Parliamentary resources. This additional complexity can lead to requirements for a Federated search capability (integrating into a single portal the major information resources) and workflow management systems (to management the complex processes in electronic collection development) and single sign-on(to hide the complexity of access to multiple underlying database resources). The rapidity of technological development brings long-term difficulties in the management of intellectual and creative output in digital form. Libraries and museums have a key role in the preservation of analytical and creative endeavours over the long term. However, most libraries are ill equipped to undertake research into the preservation of new media artefact's and creations. Where the preservation of printed works is well understood, issues of obsolescence of new media technologies affect all aspects of the new media artefact's. As each new technological innovation introduces new

methods of creative content delivery, our long-term horizons of archive planning appear to reduce. The widespread adoption of Information Technology as an integral part of the research process, and the speciation of software vehicles for content creation, mean that on the basis both of cost and volume of content creation the meagre budgets of most libraries simple are not sufficient to sustain the role of comprehensive collection builders. Digital Library collection building has associated with it inherent risks of technological obsolescence. In addition to the systematic risks associated to critical information technology architecture, are the problems of software and hardware obsolescence. Issues of obsolescence are not inherent obstacles to the move to management of electronic resources – but they are issues that need to be addressed by the institution in the management of the disparate resources that constitute an electronic collection. Information systems inevitably go through a continuous series of transformations over time, as do digital objects stored in an information system.

The importance of Interoperability and metadata

Metadata is the information describing objects in the Digital Library. For instance, the item title, author, dimensions and format are all examples of metadata. Metadata serves three purposes in the Digital Library:

> Descriptive metadata - as with traditional cataloguing, digital objects need to be described and identified so that they can be discovered within the Digital Library. Digital Library metadata standards for describing objects serve the same role as AACR2 and MARC standards do for traditional catalogues. Examples of Descriptive metadata standards commonly used in Digital Libraries are Dublin Core Metadata Initiative (DCMI), Metadata Object Description Schema (MODS), and Metadata Encoding & Transmission Standard (METS). While DCMI is probably more widely used by Digital Libraries, MODS and METS provide a fuller descriptive framework as a successor to MARC. DSpace and Greenstone use DCMI as their descriptive metadata framework.

> Semantic metadata - the semantic metadata provides the subject classification and relationship information for objects in the Digital Library. While this may be based on a traditional name/value pair of identifiers (subject = 'Parliamentary History'), the current trend is to move to Resource Description Framework (RDF). RDF underpins many projects that are realising the possibilities of the Semantic Web for purposes of stronger metadata description of documents on the web (and in archives). A semantic metadata description goes beyond the name/value descriptive pair to describe metadata in a series of "statements" in a subject, object and predicate statement (the title of the book is 'The history of Parliaments'). Central to the concept of RDF is the ability to unify concepts across many resources in a meaningful way. Fedora Commons implements RDF as its underlying schema.

> Harvesting metadata - There are many Digital Library systems - commercial, open source and bespoke (home grown). Irrespective of the internal metadata approach for description and subject classification of the objects in the library, support for a harvesting metadata

standard provides a means for inter-operability between Digital Library systems. The most widely implemented harvesting system is Open Archives Initiative Protocol for Metadata Harvesting (OAI/PMH). This scheme supports metadata "harvesting" between digital libraries to allow discovery of digital resources between systems. Kete uses OAI/PMH for its internal schema. DSpace, Greenstone, Fedora Commons and Kete support an OAI/PMH harvesting interface.

The long term inter-operability of your resources with other digital resources being developed in-country and regionally will be enhanced or impeded by the level and quality of the metadata collected and linked using NextGen digital resources. The selection of a metadata framework should be undertaken with reference to existing projects nationally and regionally.

Case study: building open access repositories

Libraries are making a progressive transition from physical resources to electronic resources.   The digital library system acts as an enabler for the library to:

- Provide local and public access to the intellectual output of the organisation
- Provide local access to born digital resources that are locally cached in the digital library

The National Parliament of Solomon Islands illustrates just this methodology. In March 2012 they implemented a combined open source solution of open source digital library software (DSpace) and library management software (Koha) to create an electronic library service providing:

- Access to legislation, committee reports, gazettes and Hansard records of debate
- Access to media clippings and media releases by parliamentarians.

The Parliamentary Library will need to manage an increasingly divers range of electronic resources, including:

- online electronic databases services - external provides with search services and possibly full text
- digital libraries - providing a facility for managing digital documents created by the library (either born-digital or converted to digital form)
- syndication feeds - information feeds providing current information resources based in information preferences (for instance news feeds)
- electronic subscriptions - including e-books and e-journals.

A framework built around open source provides a cost-viable framework for access to complex information resources.

Services for ubiquitous mobility

More recently on the scene, but showing massive take-up, is the delivery of NextGen services via mobile devices.   Full mobility of access to information expresses the very nature of direct connection between the end client and the resources they need, unmediated by fixed IT

infrastructure. Clients are voting with their feet on this as a preferred method for social networking and information access.

Mobile devices are transforming the delivery of information.   They do this in two ways:

- The limited screen space of some mobile devices focusses the design on directness and simplicity of information delivery.   The "clutter" that inevitably creeps into web page designs by graphical designers who have 30" monitors is swept away in the design constraints to build systems suitable for mobile devices.   This is actually quite refreshing for information professionals whose focus tends to functional rather than design.
- Design-for-purpose mobile apps tend to use services interfaces with the web server rather than web-based interfaces.

Conclusion

The new generation of open source systems are functionally rich and well placed to provide the services layers to support an increasingly digital, mobile, client community for libraries. Libraries such as the National Parliament of Solomon Islands can use this technology to "leapfrog" a generation of systems to provide new access services through to digital resources in a practical a cost effective manner.