THE FUTURE OF THE INDUSTRY

Linked Data

It would be a brave commentator that would pick the outcome in current trends affecting libraries. However some calls are pretty clear: electronic is replacing print; the role of the librarian is changing in the organisation. Behemoths such as Apple and Google have launched exciting and challenging electronic resources that have the potential to change the scene. It is tempting to advocate these as the universal one-stop-shop of the future, encompassing research, audio, video, and digital resources, and perhaps representing the future, to the exclusion of the library and the LIS professional.

However, the internet, as a concept, has been successful not because it is monolithic, but precisely because it acts as an effective glue between multiple resources. It is flexible and uniquely easy to hook into. The web, on the foundation of a simple protocol (HTTP), provided a framework for easy document sharing. This is the recipe for success for libraries: to build, own, contribute to, and participate in a rich collection of inter-connected electronic resources. LIS professionals *understand* metadata, and have worked with systematic expression of metadata for many, many years.

There are several Information Technology movements which are exciting for libraries, and which will touch libraries in various ways:

- The open source movement and the emergence of stable, robust, digital library systems that can be owned and managed by libraries.
- The open access movement, and the increasing desire for institutions to own and publish their own intellectual output
- Systematic metadata search and harvesting tools to provide aggregation tools and service layers for libraries
- The linked data movement, to provide a successor to purely bibliographic data sharing systems to valuable ways of systematically inter-connecting digital libraries (and other web-accessible resources) in semantically meaningful ways

These movements, taken together, represent an alternative to the monolithic vision of the web information resource. This is a distributed vision – where quite small and very large collections can be brought together in a meaningful way. It is also one where the library and LIS professional mediate internal datasets, digital and physical collections, and external resources such as supplied by the behemoths to the benefit of their organisation in effective knowledge management, education, and entertainment.

Linked data has been emerging at the last few IFLA conferences as a growing force for interconnection and discovery of resources. While libraries have typically previously dealt with "documents" rather than "data", the data that is "linked" drills down for the traditional publishing unit of a "document" to a lower level: databases and research datasets can be presented as linked datasets. So also can digital libraries as collections of documents. The important thing about linked data is to prise apart and explicitly express the relationships between data items in a systematic way so that data as unitary information sets can be related to other relevant information sets. The Bernes-Lee vision on this was to express these relationships of using the internet URI naming conventions and the HTTP web framework as a way for massively interlinking data. This vision has been slow materialising, in conjunction with the semantic web. Bernes-Lee's best allies have been libraries, because the bedrock of a semantic web vision is the sort of authority control and structured metadata that libraries have dealt with over many years. Linked data featured at a number of sessions at the recent IFLA congress in Helsinki (**http://www.ifla.org/news/presentations-from-oclc-linked-data-round-table-available**). The GenNext conference in Dubai recently illustrated the resources emerging from libraries: for instance the Lontar Digital Library project in Indonesia, with its integration of RDF and linked data for its underling collection of digitised books, film, slides, photographic, and audio collection of Indonesian resources (**http://gennextbrunei.wordpress.com/2012/07/12/the-lontar-digital-library/**).

What we see are previously isolated digitised resources being made available through linked data in interesting new ways. Evolving in Europe are the most impressive national and transnational integrated resource collections: Europeana (**www.europeana.eu/**) being just one of them. Europeana represents a massive, multi-lingual, online collection of digitised items from some of the greatest libraries, archives, and museums in Europe: **http://www.europeana.eu/portal/**

The Euorpeana Linked Open Data (LOD) project contains metadata on well over 20 million digital resources. Such a rich resource has not materialised by itself: it has taken solid work by the major library institutions. Significant in this is the Data Exchange Agreement (DEA) that provides a consistent framework for delivery of the linked data. In Australia and regionally there is lots of potential in this area, and many exciting projects that are either nascent or underway (**http://pro.europeana.**

eu/linked-open-data). Many institutions in Australia, especially governmental agencies, have rich research and report resources collected over time, including data sets. These *can* be made available. They *can* be linked together. The library should be central in this process because libraries *understand* metadata and are proven custodians over time of valuable knowledge resources. Trove in Australia has illustrated how multiple resources can be pulled together in great ways.
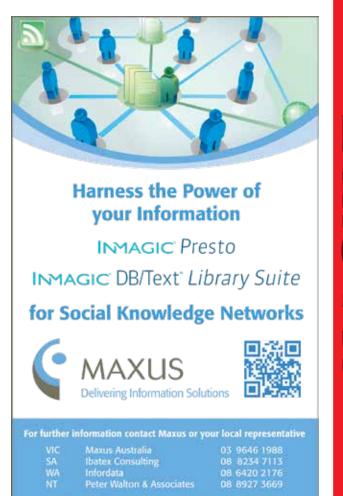
The technological platforms to build and make available these resources are now available, and not just to the large national institutions. Libraries have been early adopters of open source and open access. Indeed, open source has transformed the library technology marketplace. Open source has *not* eliminated commercial library software: if anything it has invigorated the whole information technology scene by fronting up a challenge to what was otherwise a pretty static technology marketplace. It has raised the bar in expectation of what commercial systems have to deliver, and has also raised the bar on expectations for open interchange of data.

The internet has prised open the possibilities of libraries, but at a cost to the library profession: the nature of the librarian, and the library is changing rapidly. This represents a challenge, of course, and a common theme. Nearly every conference I have been to recently is the open discussion of the nature and relevance of the library. In this context, engaging the professional association has got to be one of the most important things that you could do: for instance, locally with ALIA and internationally with IFLA. And why? Because change is upon us – right now. Librarians need to be engaged in their professional association precisely as a way of engaging in the new and changing ways the library can operate. On the professional front, there is the importance of engaging with ALIA actively to promote the profession in its stewardship of new and valuable digital resources. There is a great deal more to do in promoting Australian and regional linked data resources and the opening of valuable institutional data sets and resources. Linked data is the systematic expression of relationships that are there already, just perhaps not well expressed. These natural relationships are profoundly expressed by Donne: "No man is an island, Entire of itself. Each is a piece of the continent, A part of the main." (see the Library of Congress linked data record for John Donne at **http://id.loc.gov/authorities/names/n84121411.html**).

Internationally through IFLA and locally through ALIA the major conferences represent a great opportunity to take the measure of new developments affecting libraries. The best way to get the most out of such conference is to not only attend, but also be involved. While IFLA is a large, even daunting, event, it is also an exciting one. I have been going to IFLA for 6 years now, as part of the IFLA IT Section, and it is quite apparent that IT affects every part of the library operation. Locally, a quick glance at the ALIA Online 2103 programme (**http://www.information-online.com.au/**) shows the ways in which librarians are agents for change and the ways in which libraries are engaging with technology. Linked data is one of the topics you will certainly hear more about over the next few years.

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