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ILMS & digital libraries, Open Source, OER, Open Access, the Open Movement.

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Abstract:

This paper explores the synergies in different types of "open" as they pertain the library world. Open access, open source and open standards have all greatly influenced library technology over time. IFLA and the IT section have significantly contributed to all these "open" facets of library technology over the 35 years of the sections existence.
Introduction

Keywords: ILMS, Open Source, Open Access, Discovery

Libraries have been both contributors to technology and early adopters of technology. Library innovation has been driven in the first instance in the physics and logistics of physical collections. Large physical collections have also mandated methods for information discovery. Our large institutions have lead the way in systems and standards at the national level, including cataloguing standards and their supporting technologies and more recently innovations in linked data and web archiving. Smaller libraries have made efficient use of technologies at hand to maximise their reach and collaboration(Balnaves, 2007).

Libraries have explored discovery systems through systematisation of cataloguing and classification systems. They have pursued automation systems: exemplified by the Library Management System (LMS). They have implemented systems to manage large physical collections through RFID and barcoding. The 55 year history of the Information Technology Section in IFLA exemplifies the forward looking role of libraries in the deployment of technology.

However, like the industrious swiss watch maker, it is technology that threatens their role and purpose in the Google-connected world. These changes vary according to the type of library, but no library is emerging unscathed. National libraries struggle with the content explosion and their mandate to be the mandatory national deposit. The sheer scale of publishing in all formats requires challenging technical storage solutions for physical formats and scale-out of online content (especially with web archiving). Public libraries now serve an role in providing information access, resource access, training in information technology as well as a traditional lending role. This is especially evident in the special library sector where the library no longer has a place ias the primary information source. Chart 1 shows the decline in libraries in the Health library sector in Australia (decline in GratisNet Australia memberships due to library closures). Government libraries become increasingly involved in repository management and embedded research support.

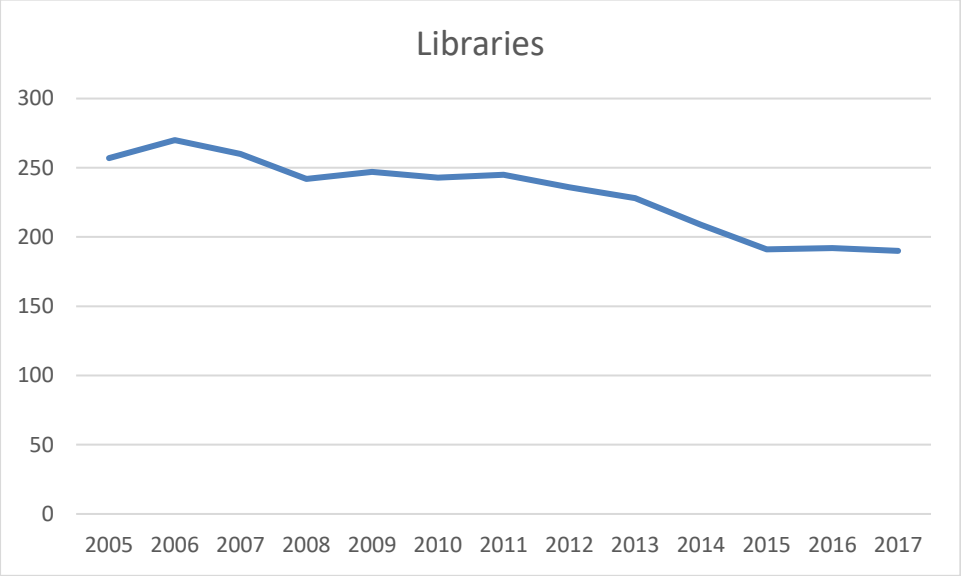


Chart 1: Health library membership decline for Gratisnet Australia due to library closures

Yet it is through continued innovation that libraries can meet the challenges of change that they face. The transition to digital has coincided with the emergence of open source library systems (Library management systems, digital library systems etc). More recently this innovation has expanded to discovery and interlinking with the semantic web and linked data. Looking forward we can see also the emerging impact of Big Data, AI and robotics. There remain great opportunities for libraries to retain a place in the world. This centres around a mixture of concents centred on "open" technology.

The evolution of libraries has been in parallel with a long-running and uneasy truce centered around copyright and the rights of content owners and technology. Many content owners would much rather deal directly with those using content, for reason of both profit and control of their content. The library has always been centred around information sharing and preservation. The early Mechanics institues served a perhaps (word here overbearing) but important role in providing access to books and publications.

In the 1970's libraries pioneered automation of processes in the library, embracing technology to realise the effective models for circulation and classification of information that materialised in the Library Management System. By the1980's the Library management System had become the preserve of large commercial providers who roosted on a profitable market of

libraries as the privileged hub of information in the organisation and access point for the public library. 'this phenomenon had advantages for the library. Librarians contributed to the evolution of a functional model of library systems that encapsulated evolved toward the almost perfect expression of the Library Management System as an expression of the Library as Information King. This paraigm however had downsides. While the major National libraries where great innovators of technology in the early days of the evolution of the LMS, libraries progressively became technology "takers" as the software formed the full expression of this model of library operation.

The online phenomenon upturned a stable paradigm in several ways. The content world has seen phenomenal consolidation o publishers, content owners and content aggregators. Libraries have progressively ceded their role as Information Management Kings. The Swiss Watch maker tragedy is in full play in both the library and publishing world. The printed encyclopaedia was one of the first casualties. The emergence of excellent commercial search engines such as Google, and Social networking exemplified by Facebook have challenged the central role of news agencies. Publishers have not emerged unscathed. Publishers have adapted to this new world: through aggregation, e-delivery and evolution of businesses and information structures. For instance, the emergence of i-Tunes as a delivery platform for music has fundametally changed the music industry. The future of libraries lies in the degree to which they take agency as information and technology mediators and even owners.

The LMS achieved a peak of perfection in is central role in a traditional library paradigm. However the internet officered possibilities in both delivery and functionality of technology potential for libraries. And here there are two key movements: the open access and the open source movements. The centralisation of content ownership presents a huge challenge in information equity that has been of course much discussed. Universities produce much of the research content which is then "sold back" to these institutions in terms of massive journal and publication databases. The largest Universities have participated and perhaps even encouraged this trend as their access to these phenomenal research resources acts as a barrier to entry for the smaller players.

The open access movement represents a push-back from researchers and organisations that have recognised the capability of the internet to manage and deliver these systems themselves. The open source movement has been the enabler of delivery systems to store, share and aggregate information and publications.

Open standards in information share a fundamental part in this. IFLA has fostered such standards in the bibliographic arena from the earliest times. Machine Readable Cataloguing (MARC) was central in consistent sharing and management of bibliographic data. While it is now a little long in the tooth, it still remains central to a worldwide network of bibliographic resource sharing.

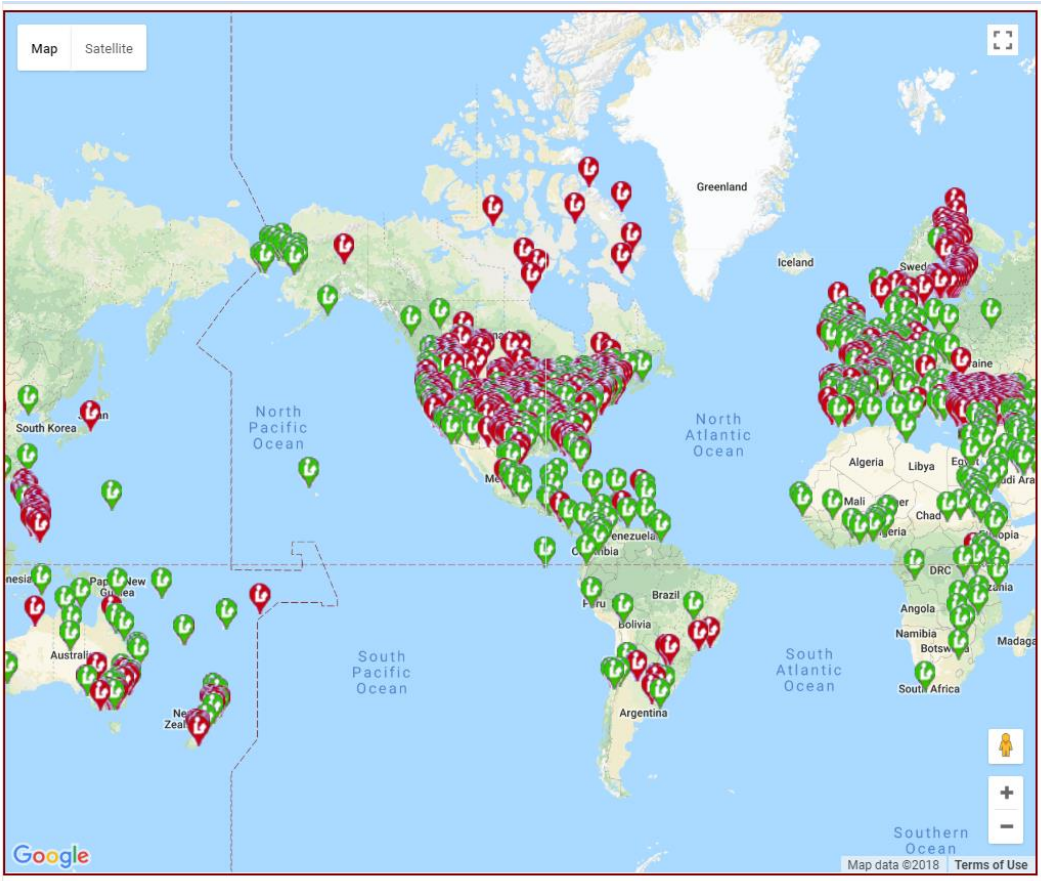
Public ("open") access to information through public libraries ameliorates the information gap that widens between the information rich and the information poor.

Open source

The open source movement has shaped the information technology industry over the last 30 years. Universities were the creative engine for Unix and a whole planopy of utilities for operating system and system management. Linus Torvalds released linux modelled on Unix

providing a full open source core in 1991 ("Linux's History," n.d.). Andrew Tidgell developed the Samba file sharing system in 1991 as a PhD student at ANU ("10 years of Samba!," n.d.). The rich open source toolset around database systems such as MySQL, programming languages such as Perl provided the platform for sophisticated open source applications to emerge.

In the library world, the work of the Library of Congress in MARC/SGML was foundational to the evolution of a rich set of tools for bibliographic data handling (such as MARC::Record) ("MARC.pm : Machine Readable Cataloging Perl Module," n.d.). These in turn were foundational to the development of full function library management systems in open source - the preeminent example of which is Koha. Koha was developed by Katipo Communications on behalf the Horowhenua Library Trust in New Zealand after a failed commercial tender process("History – Official Website of Koha Library Software," n.d.). While there were other bibliographic systems in evolution, Koha as succeed in building a true community of developers around the world.



("Map of Libraries: the library automation system used is Koha," n.d.)

The open source movement arguably also returns some level of technological agency to the library: they have the opportunity to move away for being information takers and to participate in the evolution of the systems they are using. Open source also presents a challenge to traditional LMS providers because it follows the path over time in the IT industry from selling "software" to selling "services". This is expressed as SaaS (Software as a Service). In this context much SaaS infrastructure is open source.

The spectacular rise of the open source LMS however does come at a time when the centrality of the role of the LMS has diminished. No longer is the library catalogue the "portal to

knowledge". Discovery systems that are much more granular in providing access to indexed content and full text of publications have challenged the role of the LMS.

Discovery systems are themselves also expensive to evolve and entail complex relationships with publishers. They do have their challenge in systems such as Google Scholar and indeed Google search.

The parallel evolution open access, very often complemented by open source systems for repository management has seen one of the challenges to the emerging paradigm of central control of key aggregated information. Open access is being embraced as a means of bringing the ownership of published research and information "closer to home" to the authors of this research in a way that shares this information.

How this affects the library is an "open" question. The risk around the adoption of discovery systems is that libraries once again become information "takers". University Libraries are an example. While they are the source of the larger part of bibliographic reserach data, and could have themselves owned the distributed systems for information discovery, they have instead allowed this role to be co-opted by commercial and pubishing interests. Discovery systems have the risk of exemplifying the partitioned access to information to the degree affordably by the organisation and all the restricitons to information this exemplifies. It was always true that libraries that could afford extensive serial subscriptions could build impressive research libraries. As these publication became available online, researches have made a fundamental shift from print to online to the extent that few will research beyond the online content available to them. This change is profound and over a short time. While some (Sathe et al., 2002) saw little change in research behaviour at the turn of the century, others saw the wrinting on the wall for scholarly journal print subscriptions (Butler, 1999).

For better or for worse, the digital age has changed research behaviour, and arguably is changing human cognition. (Loh and Kanai, 2016) As online research displaces the print collection for research purposes the library role changes also: as a mediator for subscription management and integration of online access services. It also suggests a growing role for the library in digital literacy and the systems that can support digital literacy. The advent of the smartphone has further potential changes in behaviour and cognition (Wilmer et al., 2017).
The affect on libraries is even more profound in government and special library sectors. Many institutions have forgone their library altogether. Time will tell, but it is likely that they have foregone too much. Santyana's saw "Those who cannot remember the past are condemned to repeat it"(Santayana, 1905) is apt in this context. Organisations that forge their library to fulfill their own knowlege resources also forge some element of good information management.

What has emerged is an alliance between researchers and librarians to embrace open access and publication repositories. The (open) software is there. The paradigms for open access and open sharing (harvesting) such as OAI/PMH are available. As ever, technology offers solutions as well as challenges.

Open as an intrinsic virtue

Open source systems have the complementary virtue of being open in other ways. They tend to leaverage open standards for information interchange. They are open to scrutiny (Balnaves, 2008). Closed systems that have a vulnerability depend on a single source to remedy this

vulnerability. Open source systems are open to both scrutiny and immediate change. Open source gives libraries the opportunity for enriched agency in the evolution of the open source systems they are using. Open access based on open source has the virtue of reduced "lock in". Closed LMS providers often charge large amounts for libraries to export their own data in otherwise open formats such as MARC.

Open has great meaning in the evolving tensions around aggregation and control around publishing and discovery systems. Open access offers an institution control over its own repository: as a knowledge resource.

Where next

"Being open" in philosophy can play a big part in where things go next in the information sphere. Big Data we have already seen can be used or abused. The Cambridge 'Analytica scandal has highlighted the risks around misuse of large aggregated closed data that fails to respect privacy. Being "open" can there for mean be honest about how information is (or isn't) used, and how it is protected in the case of privacy of information.

"Free" is a different thing of course. Open source is nominally "free" in the sense that anyone can nominally download and install the software. However there is a maintenance cost to running any software, so it is not necessarily free in that sense. "Free" systems such as Facebook may be simply a road to information serfdom: handing over our thoughts/ideas/expression at no charge to an organisation that can profit from this in big data profiling and matching to advertising. "Free" google search has extraordinary immediacy in leveraging activities in advertising results – many will have experienced the disconcerting speed with which a flight booking surfaces as ads for the same flight in search results. There is a cost to everything – even a free library service. The emergence of the free public library service has been an extraordinary thing. The public library performs an increasingly important role in access to information resources and offsetting and increasing inequity information access.

Linked Data is an example of the "heroic" phase in library systems development. Major libraries have led the development, for example BNF's data.bnf.fr (Simon, 2014). Linked data is now entering the practical phase where the capability is embedded in the open source applications (eg DSpace and Koha) (Cook, David, 2018). Linked data and big data can if deployed to the public good achieve the elements of the vision of the semantic web. During the heyday of the Dot Com book the catch word from Bill Gates was "Content is King". Content ownership is still crucial in this context. Technology offers a closed or an open future to content. Libraries have a role in the direction of this choice.

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