

Section 3 - Horizon Scan

Contents

3.0	INTRODUCTION	25
3.1	SCOPE AND FRAMEWORK.....	25
3.2	BACKGROUND AND ASSUMPTIONS	26
3.2.1	<i>Society and Technology</i>	26
3.2.2	<i>Students and Staff</i>	27
3.3	CHANGING USER REQUIREMENTS.....	27
3.3.1	<i>JISC Learner Experience projects</i>	27
3.3.2	<i>A North American Perspective</i>	28
3.6	VISION FOR DEVELOPMENT ('A PLACE IN BOTH WORLDS?').....	39
3.6.1	<i>Achieving critical mass, maximising value</i>	39
3.6.2	<i>The Approach – Liberation</i>	40
3.7	EXEMPLARS	41
3.7.1	<i>Library thing</i>	41
3.7.2	<i>Google</i>	42
3.7.3	<i>Amazon</i>	43
3.7.4	<i>Intute</i>	44
3.7.5	<i>Vertical Search</i>	45
3.8	SUMMARY OF KEY POINTS.....	47

3.0 Introduction

The Horizon Scan is a key element of the LMS Study commissioned by JISC and SCONUL. Its aim is to summarise the current and projected trends, developments and initiatives which impact on the future of the LMS market and the business and service models for HE library development.

This is a broad and wide-ranging remit, and presents a wide scope and array of potentially relevant issues. The report on the Horizon Scan offers a summary of some of the key points of debate and references further sources of information where appropriate. It informs – and is informed by – other elements of the LMS Study, particularly the Library Survey and Vendor Survey reports.

The Horizon Scan consists of the following sections:

- 1 Scope and Framework
- 2 Background and Assumptions
- 3 Changing User Requirements
- 4 The External Environment ('Out there')
- 5 The Library Context ('in here')
- 6 Vision for Development ('a place in both worlds?')
- 7 Exemplars.

The sections are the work of various contributors within the project team, and reflect different styles and perspectives. Together, however, they present both a wide view and specific comment on the developing context for UK HE libraries and the systems they manage.

3.1 Scope and Framework

'There are two worlds – out there and in here.'

We offer no apologies for appropriating Benjamin Disraeli's stark reflection on 'the two nations' of mid-Victorian Britain, 'the rich and the poor'. In the context of this study, we are less concerned with the digital rich and the digital poor (the so-called Digital Divide), and more with the worlds inside and outside the HE institution, and particularly with the worlds of information inside and outside the library.

It may be useful to scan the horizon through the lens of a simple model of the forces at play within the world of information.

Paradigm		
Platform	Patrons (users)	Process
	Practitioners	
Place	Publishers	Practice
	Partners	

This model may provide a framework or mapping device to assist considering the synergies, dependencies and implications of the forces identified in the Horizon Scan. The eight 'P's identified here are not particular to higher education, to scholarly information or to the United

Kingdom. Nevertheless there is within the UK HE community a heightened sense of urgency not simply to scan the horizon but to read the runes and to identify both the implications and the options for institutions, library users and professional colleagues.

The framework is intended to position people (patrons etc) at the centre, in relationship with the institutional service infrastructure (the IT platform and the library itself) and its ways of working (hard process and softer professional practice). These elements are not operating in a vacuum or an institutional black box (each itself has a relationship with the world 'out there'). Most significantly, each one is subject to the changing paradigms (business models, information ecosystems, research practices and community loyalties) in the wider world of information and information technology.

3.2 Background and Assumptions

This section looks at wider issues over a five-year time frame, from now until the end of 2012. The research methodology is basically literature search. Assumptions about the environment for this study are framed in terms of:

- society and technology
- universities and publishers
- students and staff

3.2.1 Society and Technology

There are a number of documents that pertain to this but the current HEFCE Strategy for e-Learning¹ can be assumed to have taken the most pertinent socio-economic conditions into account.

(For a longer term view, see the Social Issues Research Centre (SIRC) report Life Online: the Web in 2020.² For universities, there is little point in making assumptions based on the birth rate since by the time they bite, it is 18 years from now. This may be less so for immigration, especially of teenage children of immigrants, but the issue of the impact of immigration on HE is outside the scope of this study. However, one should note the evidence for a significant demographic downturn from 2011.)³

We can further assume that towards the end of the five-year period the carbon reduction agenda is beginning to bite and that there are active moves to reduce the amount of travel undertaken by citizens in their work, leisure and study.

The cap on top-up fees in England and Wales expires in 2010. Unlike for demographics, universities are already thinking about what to do in the era when there is most likely no cap on fees – it is expected that fee levels will rise at many universities.

We assume that the web and its associated technical standards continue to dominate, although within a framework of much more use of mobile devices. At a more UK HE specific level, we assume that the JISC Information Environment and e-Framework programmes⁴ set the technical framework (but other reports in this study have noted that management at many UK HEIs do not seem to be particularly aware of the e-Framework).

¹ 'HEFCE strategy for e-learning', March 2005/12, http://www.hefce.ac.uk/pubs/hefce/2005/05_12/. Note that the strategy and its implementation plan are currently under interim review.

² 'Life online: The Web in 2020', A study by the Social Issues Research Centre on behalf of Rackspace Managed Hosting, December 2006, <http://www.sirc.org/publik/web2020.shtml>. A good and very readable introduction to the literature in this area but rather light on predictions that can be applied to student and staff use of university libraries. From the same team that brought us 'Watching the English'.

³ See for example <http://www2.le.ac.uk/ebulletin/news/he-news/2000-2009/2007/11/nparticle.2007-11-07.1512947627>. However, there is little overt evidence of serious planning for this in most universities.

⁴ See http://www.jisc.ac.uk/whatwedo/themes/information_environment.aspx and <http://www.e-framework.org/> respectively.

3.2.2 Students and Staff

We make the following assumptions about the five-year period:

- a ubiquity of broadband (at current speeds)⁵ to student study locations (campus, residences, homes, workplaces and to many places of recreation)
- the PC (desktop or laptop, always with keyboard) is still the study workhorse and the relevance of other especially smaller devices is still marginal except in e-books and similar contexts not requiring significant keyboard input. (It is just possible that by the end of the period some version of the e-book will have reached the tipping point.)
- the increasing utility of mobile, as devices from laptops to phones mature and as access services increased coverage and establish more functional roaming models
- an innate conservatism among academics and students in that the resources they will be required to retrieve will be largely textual in nature for the majority of courses (text is a very efficient medium including for copying)
- a gradually increasing accountability burden on universities and on university libraries so that “who accesses what, and why?” becomes a key issue⁶
- students are still time-poor whether they are (allegedly) full-time or part-time
- no further reduction in the relative salary level of staff compared to the rest of society – meaning that staff will have discretionary income as at present to purchase PCs, broadband access and wireless communications if they wish – as well as continue to purchase some books and subscribe to some hard-copy journals as they do now

3.3 Changing User Requirements

3.3.1 JISC Learner Experience studies

The JISC ‘Learner Experience’ series of studies are one of the main sources of input on student behaviour, though still at a general level. In particular the overview report⁷ ‘Recommendations for post-16 institutions on enhancing the learner experience of e-learning’ states in its section on ‘Information searching, retrieval and evaluation’:

The learner experience studies suggest that Google and Wikipedia are the preferred information retrieval tools for many students. Learners frequently use search tools to find and retrieve learning materials from other universities. While most students appreciate that information found on the Web can be unreliable, they still see library resources as much harder to use than Internet search engines and free online encyclopedias. While some students develop sophisticated and effective information search and evaluation methods, many do not.

The report recommends that institutions should:

- provide learners with better information search and evaluation support and library tutorials, helping to develop the required information literacy
- work to improve the usability of their information and library systems
- rethink the worth of the course content they produce with a view to rationalising its production in a world where there is access to a vast amount of free content
- develop methods and tools such as repositories to aggregate and approve content

⁵ Speeds of 2 Mbit/s are quite sufficient to deliver LMS functionality including full-text downloads

⁶ Notice in particular paragraphs 19 and 22 of the DIUS Grant Letter to HEFCE.

⁷ ‘Recommendations for post-16 institutions on enhancing the learner experience of e-learning – Guide 1’, JISC Learner Experiences of e-Learning Programme, April 2007, <http://www.jisc.ac.uk/media/documents/programmes/elearningpedagogy/guide1.pdf>

Confirmation of these points at a much more detailed level has come from the ‘Google Generation’ series of reports,⁸ commissioned by JISC and the British Library. However these became available to us too late in the lifetime of this project to allow full incorporation of the details of their analyses.

3.3.2 A North American Perspective

Marshall Breeding of Vanderbilt University has produced in 2006 a masterly presentation ‘Trends in Library Automation: meeting the challenges of a new generation of library users’⁹. In it he makes the following points:

- Given the relative parity of library automation systems, choosing the right automation partner is more important than splitting hairs over functionality (slide 21)
- The core ILS focused mostly on print resources and traditional library workflow processes. Add-ons available for dealing with electronic content ... are [now] “must have” products for academic libraries with significant collections of e-content (slide 23)
- [OPAC] Interfaces often do not compare favourably with alternatives available on the Web. Print materials becoming a smaller component of the library’s overall collections.
- Where do you typically begin your search for information on a particular topic? College Students Response: 89% – Search engines (Google 62%) (slide 29)
- The New Library Search Model: Don’t count on users beginning their research with library catalogues or Web site. Consider the library’s Web site as a destination. Make it a compelling and attractive destination that users will want to explore more. Web users have a low tolerance for ineffective and clunky interfaces (slide 30)
- Expose library content and services through non-library interfaces: Campus portals, courseware systems, e-learning environments; County and municipal portals and e-government; Other external content aggregators: RSS,¹⁰ etc
- Web services is the essential enabling technology for the delivery of library content and services to external applications.
- Library community lags years behind other IT industries in adoption of SOA and Web services¹¹ (slide 33)
- Millennial generation library users are well acclimatised to the Web and like it. [They are] used to relevancy ranking.

Breeding also gives many more detailed insights in his presentation.

3.3.3 Economic and Social Research Council Review

Key insights into the needs of the academic community were provided in early 2006 by Schmoller and Ferguson in their 98-page report ‘Review of the information environment for social science researchers’, commissioned by ESRC in 2005. The report was never published by ESRC¹² but seems to have affected the thinking of at least one agency, as judged by public statements of their response. Though seemingly controversial at the time, many of the points are confirmed in the later ‘Google Generation’ studies.

Below are some of the key extracts from the Review that are particularly relevant to this Study. (Note that the Review was considerably wider-ranging than the remit of our Study. The numbers

⁸ ‘Google Generation’ web site, <http://www.jisc.ac.uk/whatwedo/programmes/resourcediscovery/googlegen.aspx>.

⁹ ‘Trends in Library Automation: meeting the challenges of a new generation of library users’, Marshall Breeding, Vanderbilt University, November 2006, PowerPoint presentation, <http://www.oclc.org/research/dss/ppt/breeding.ppt>.

¹⁰ See Section 4 for a definition of this.

¹¹ See Section 4 for definitions of these.

¹² The consultancy brief is available at http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/Images/Consultancy_Brief_Review_Information_Environment_Social_Sciences_tcm6-9390.pdf.

are not in the original report but are added for our convenience. Points of particular relevance to this Horizon Scan are italicised.)

- We believe that it is vital for the ESRC information services, and all ESRC-funded resources, to open as much as possible of their data and records to indexing by Google and other search engines. (page 4)
- Information skills' training has a bad name, with some justification, because of workshops focussing on skills which are not transferable and rapidly out of date, particularly the details of using particular databases and services. "Why can't these services be as easy to use as Google?" is the reaction. (page 5)
- We note that the mandatory deposit in open access repositories of all ESRC research results and resulting publications (*and all PhD theses*) is supported by the community and we recommend this should be pursued with vigour.
- The primacy of online search means it is vital to ensure that all resources have some sort of web presence that is indexed by Google. In such an environment, it is crucial to "Get offline stuff online" (either by digitising the resources themselves or, as is suggested by the British Academy review, by digitising catalogues of the resources). *It seems clear that, in the near future, resources which have no web presence will not be seen or used by the majority of their potential audience.* (pages 10-11)
- The search tools on existing web sites (and this is true for the environment as a whole but we have noticed it particularly during our scanning of the information environment for social sciences) are rarely good, often poor or worse. Our conversations lead us to believe that many users share our view. The more e-literate of them are going to Google and using the advanced search to search a site rather than use the site's own search engine.... Confidence is a key issue here and Google inspires confidence... For information services with limited budgets and without the power of a huge, technically powerful entity behind them, saying "Use us first not Google" is futile and should be abandoned. Saying "Use Google to find us" is much more sensible. (pages 22-23)
- Our conclusion is that the semantic web, as foreseen by some its proponents, will have a rather limited impact on the information environment for social science research in the near future.¹³ What we do expect to see is a dramatic increase in services using a changing mixture of technologies to supply information based on its meaning and in the process accomplishing some semantic-web-like things. (page 48)

The only public response to the Review is in the 2005-2006 Annual Report¹⁴ of IBSS, the International Bibliography of the Social Sciences, based at the London School of Economics. This signalled phased acceptance of several recommendations, in a climate of accepting the overall report. Among other things IBSS noted:

- The ESRC Review of the Information Environment for Social Sciences Researchers provided very positive feedback from researchers on IBSS, and led to 2007-08 funding for IBSS being released by ESRC. (page iii)
- Looking ahead to 2006-07, our major task will be bidding for continued (post-2008) funding from ESRC, and this we will do based on the recommendations of the Review of the Information Environment, and in a way that builds upon our existing strengths and the findings of our 2006 User Survey. (page iii)
- As a result of the ESRC Review, IBSS identified a number of key strategies to work toward. (page 4)
- The Review of the Information Environment noted that search engines, despite their shortcomings for precise and comprehensive research, were useful and much used tools

¹³ Our italics.

¹⁴ 'IBSS Annual Report: October 2005 to September 2006', <http://www.lse.ac.uk/collections/IBSS/pdf/Annual%20report%2005-06.pdf>.

for resource discovery. It therefore recommended that services work to ensure that they have a visible presence through search engines, especially Google. With this in mind, IBSS has already made the following changes...

- IBSS is also investigating exposing some of the data itself, though this is a longer term project. (page 5)

The work to ensure that all PhD theses are available is now ongoing – see the report from ETHOS in 2007.¹⁵

A search for ‘information environment’ on each of the web sites for other research councils – Arts and Humanities, Biotechnology and Biological Sciences, Engineering and Physical Sciences, Medical and Natural Environment Research Councils – reveals only a handful of hits, and none relevant.¹⁶ It is not clear what to make of that especially since it is unlikely that researchers funded by AHRC for example are more technically expert than those funded by ESRC. One theory is that the demands of e-Science have driven many other issues from the headline agenda.

3.3.4 Challenges

The key challenges for library services arising from the ‘Google Generation’ may be summarised as:

- Undergraduate and increasingly researcher experience of the wider online world in terms of work flows (such as discovery to delivery in an aggregated service such as Amazon), tools (such as search and recommendation) and collaboration (learned through wikis and book marking as well as social networking)
- The implications of that experience for perceptions of interface, efficiency and ultimately use of time
- The disruptive impact of Web 2.0 thinking, albeit over a longer time, on scholarly behaviour – ranging from research methods to judgements on authority

Underlying all these is a fundamental attitude which is growing in respectability in the world of commerce and public service as well as in the minds of young people – crudely characterised in the judgements that ‘if you can’t Google information, it doesn’t exist’ and ‘if the services are painful to access, they’ll not be worth using’. In stark McLuhanesque terms, the medium is taken as wholly representative of the message.¹⁷

However, in any fast moving area, it is not necessarily essential or even desirable to be the early bird – the key is getting both the response and the timing right. As Terry Mayes wrote in the HE Academy weblog in response to the 2007 JISC Learner Experience report:

the conclusions make fascinating reading, and contain the following interesting, and to my mind, important principle: “if universities want to take advantage of, for instance, web 2.0 or distributed learning systems, they could choose the launch time carefully, waiting until the target audience have already been ‘trained’ by consumer systems, and then presenting adaptations of the systems that audiences are already familiar with.

3.4 The External Environment (‘Out There’)

3.4.1 Technology

There is no possibility of identifying the full technology picture even in the medium term. We are aware of how the industry as well as education has been unprepared for successive waves of hardware, software and network developments over the past decade; consider the web, search

¹⁵ ‘ETHOS – the Electronic Theses Online Service’, 2007, http://www.jisc.ac.uk/publications/publications/pub_ethosbp.aspx.

¹⁶ A recent search on PPARC suggested rather more of a footprint.

¹⁷ For an informal overview see http://en.wikipedia.org/wiki/The_medium_is_the_message.

engine application, music downloads, text messaging and the take up of mobile in all its forms (from laptop to phone). Even in a climate of constant and uncertain change, there are however assumptions we can make and attitudes we can take.

Notably, we should:

- assume digital access devices and broadband connectivity are pervasive across the HE audience – and make that happen rather than investing in alternatives
- think mobile in terms of new procurements and service developments – ensure everything works regardless of IP address and device type and is reliably persistent for the person on the move
- watch the domestic market (as opposed to the business market) for the trends that will matter to the learner and will bite quickest and hardest; likewise, watch the schools environment for the learning habits arising from the Harnessing Technology drive¹⁸ and large scale programmes such as Glow¹⁹ in Scotland
- consider efficient tools for creation and publication will become increasingly important, especially in the HE community
- value learner ideas and attitude as the wellspring of ideas and even applications
- watch out for influences from peripheral fields and leverage them before they become threats (Google being a prime example in recent years)
- encourage agility in systems development – the ‘beta forever’ culture²⁰ is dangerous in terms of quality but can be powerful with the right management

These assumptions and attitudes will generate demands of the corporate technical infrastructure and the conditions under which it is operated (way beyond but not ignoring the LMS).

Service Oriented Architectures (SOA), using technologies such as Web Services, provide dynamic and flexible approaches to system integration and reflect the motivations behind the JISC Information Environment.²¹ SOA are crucial as the manageable means of defining and providing interfaces (open and closed) in a rapidly changing solution space, an issue right across the HE information environment. The two key principles are:

- Ensuring Agility – whilst SOA provides the design and development method, open source should be considered as the source of building blocks that will enhance agility – the ability to respond quickly with reliable code and to work across corporate boundaries without licensing blockages
- Driving Value – whilst open source offers opportunity to derive value from software development across a potentially global community, it is ‘Software as a Service’ (SaaS)²² that could make the most significant difference in terms of getting what you need when you need it, by leveraging consortium buying power and perhaps by providing the service underpinning for the possibility of HE assets achieving a critical mass of ‘network effect’ (see later).

¹⁸ See the Harnessing Technology Delivery Plan at <http://publications.becta.org.uk/display.cfm?resID=28223>

¹⁹ For the Glow programme see <http://www.glowscotland.org.uk/about/index.asp>

²⁰ For more on this see the high-ranking hit ‘Beta today, beta tomorrow, beta forever’ at <http://informl.com/2008/01/18/beta-today-beta-tomorrow-beta-forevah/>.

²¹ For a brief introduction to this topic see the article ‘Service-Oriented Architecture Introduction’ by Michael Stevens at <http://www.developer.com/services/article.php/1010451>. (The wikipedia article is not recommended.)

²² A software application delivery model where a software vendor hosts and operates an application for use by its customers over the Internet. For a reasonably neutral and user-oriented view of SaaS see the article ‘The Truth About Software as a Service (SaaS)’ on the CIO web site at http://www.cio.com/article/109706/The_Truth_About_Software_as_a_Service_SaaS_.

3.4.2 Media

The world of media is changing beyond recognition – especially the relative cases for print and electronic sources, regardless of how they are managed.

It is evident that the realities of the web and of network capacity (notably as an end-to-end discovery-to-delivery channel)²³ have transformed the possibilities for electronic delivery. Whilst issues remain relating to such as business models and the roles of intermediaries, the direction of travel is clear. It may be assumed that e-books will become pervasive realities on the foreseeable horizon, changing the requirements for library book stock. Such developments may offer transformative opportunities, potentially including consortium models. For example, putting access to physical book stock principally on a regional or specialist Inter-Library Loan basis might transform far more than acquisitions and cataloguing and would certainly devalue the local LMS.

Multimedia, cross-platform hybrids and other large scale digital media requiring real time delivery (as opposed to file download) present their own challenges. Consider examples ranging from simulations to virtual laboratories to mixed media ‘datasets’ generated by publishers, projects, researchers or students. In curatorial or delivery terms, these are neither the concern of the LMS nor the VLE (perhaps the VRE, however that is defined²⁴) – though LMS vendors may wish to fill this space with a ‘solution’. However the challenges require the combined attention and skills of the librarian and the service provider.

User participation in publishing presents a further media challenge. To some extent nothing has changed for libraries accustomed to taking responsibility for theses and other local research publications. Furthermore VLEs and e-portfolios offer space for undergraduate deliverables. However we should recognise an increasingly complex set of relationships between the canonical (a published resource) and the formal and informal inputs that will be increasingly be regarded as parts of the whole. For example, as librarians or archivists or researchers, will we come to care about the workgroup weblog underlying the 21st century equivalent of Einstein’s Theory of Relativity?

3.4.3 Web 2.0

Tim O’Reilly’s thinking on Web 2.0 included the following definition from his blog in 2005:²⁵

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an ‘architecture of participation’, and going beyond the page metaphor of Web 1.0 to deliver rich user experiences.’

There is no doubt that Web 2.0 has very particular implications for library services. There is however a real danger that Web 2.0 and its application in the world of the libraries (sometimes called Library 2.0)²⁶ becomes an ill-defined catchall, representing ‘all things to all people’.

²³ NISO, the (US) National Information Standards Organization, has some useful resources on this concept. See for example ‘Discovery to Delivery: Solutions to Put Your Content Where the Users Are’ at http://www.niso.org/news/events_workshops/D2D-06-wkshp.html.

²⁴ JISC defines the purpose of a VRE as to help researchers in all disciplines manage the increasingly complex range of tasks involved in carrying out research. ‘A VRE provides a framework of resources to support the underlying processes of research on both small and large scales, particularly for those disciplines which are not well catered for by the current infrastructure.’ See http://www.jisc.ac.uk/whatwedo/programmes/programme_vre.aspx.

²⁵ ‘What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software’, <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>.

²⁶ For an introduction to Library 2.0 see the article ‘Library 2.0: Service for the next-generation library’ by Michael Casey and Laura Savastinuk in Library Journal, January 2006 – <http://www.libraryjournal.com/article/CA6365200.html>.

In service terms, the Web 2.0 label tends to be used in two different ways, those differences being important for the context of this investigation:

- Diffusion – involving such as blogs, syndication (RSS), mashups and RIA²⁷
- Concentration – driven by major data hubs which are characteristic of so much of our internet use (e.g. both the generalist like Google, flickr, Facebook, and the specialist like Amazon, Propertyfinder and etree)

Whilst social networking underlies both of these, it is important to recognise that the critical factor on the library horizon is the 'ownership' (perhaps better expressed as 'exploitation' or 'leveraging') of the means of the concentration and diffusion.

A 2008 perspective in the library services context is offered by a member of the JISC SCOUNL LMS Study Reference Group:

It seems the main factor is the network effects generated by the major data hubs. They may 'diffuse' some of the benefits through service and data syndication, APIs, participation, etc, but their value derives from successfully driving those network effects through wide participation, from consolidation of data and from mobilizing usage data to improve their services. Of course their success may also depend on the diffusion features and on co-creation with a large user community.

It is essential to tie these impacts down to real changes in the use of data which drive both business intelligence and better user services where individual institutions do not scale.

Examples include:

- aggregating user data across sites (e.g. click counter data)
- aggregating user created data (tags, reviews)
- aggregating transactions (e.g. circulations)

There are profound challenges about the relationship of an isolated library service to these types of services, and whether libraries (individually or even jointly) should be trying to generate these types of aggregate services.

Applying Web 2.0 principles to libraries, Jack Maness of the University of Colorado observes:

While Library 2.0 is a change, it is of a nature close to the tradition and mission of libraries. It enables the access to information across society, the sharing of that information, and the utilization of it for the progress of the society. Library 2.0, really, is merely a description of the latest instance of a long-standing and time-tested institution in a democratic society. Web 2.0 and libraries are well suited for marriage, and many librarians have recognized so.

However, Maness goes on to identify a range of shifts from Library 1.0 to Library 2.0 practice and services which have significant implications from professional practice to systems design. For example:

- Controlled classification schemes > Tagging coupled with controlled schemes
- OPAC > Personalized social network interface
- Catalogue of largely reliable print and electronic holdings > Catalogue of reliable and suspect holdings, web-pages, blogs, wikis, etc.

3.4.4 Business Models

We complete our review of the drivers 'out there' by considering the business models that have emerged from the take-off of the network economy. Whilst recognising that critical mass of online activity in most areas has only moved beyond the viral 'tipping point' in very recent times

²⁷ RSS – see [http://en.wikipedia.org/wiki/RSS_\(file_format\)](http://en.wikipedia.org/wiki/RSS_(file_format)).

Mashups – see http://en.wikipedia.org/wiki/Mashup_%28web_application_hybrid%29.

RIA, Rich Internet Application – see http://en.wikipedia.org/wiki/Rich_Internet_application.

(for example, perhaps Christmas 2005 for shopping), there are specific business models that have made that possible.

In the world of information services, within which HE libraries operate, three complementary models are noted:

- **Aggregation** of metadata wins over federation of targets when it comes to search (Google) and even more for delivery (the Amazon marketplace operating as a one stop supply chain behind Amazon.com)
- In a Web 2.0 world in which user input is integral to the desired service (e.g. recommendation based services such as book or CD shops) gaining the **'Network Effect'** is the key to maximising value and potentially to reducing the unit cost. A service needs to determine the reach that would give the best cost / value return; for example, a consortium of HE libraries with a shared catalogue would benefit from critical mass of reader feedback and click patterns as well as from reduced maintenance costs. However, taking the service beyond the HE community might introduce undesirable network effects, such as casual traffic and poor quality user inputs.
- **The 'Long Tail'** represents a new opportunity for such as subject specialists – this simple business equation is based on the fact that a specialist service (e.g. a unique collection) has little local mass but is highly likely to have critical mass with sustainable community loyalty in a wider geography (e.g. The legal file-sharing community using Bit Torrent).²⁸ In many cases that will be global, though national or regional may be 'sticky' in specific cases, perhaps restricted more by licensing than by the community of interest.

Each of these models involves critical mass and reach, raising questions about the value of service partners focused solely on the local market.

We close this section with an example from 'out there', which illustrates the business models of the 'Network Effect' and the 'Long Tail', based on many of the technological assumptions described here. The legal music file sharing community from which these statistics are drawn includes etree.org where you can see one of the most compelling examples of the Long Tail on one web page.²⁹

At the moment of writing there are 1.357 million people active online at this Bit Torrent based service, using a download technology that works for music, video and any large scale media. With extensive metadata and an interactive review capability linked to every torrent (i.e. catalogue item), this service represents a classic combination of concentration and diffusion. Here are three examples of what the users are doing:

- In past week 81 people worldwide have downloaded the 310mb file set of a 1973 concert by the bluegrass combo, the Seldom Scene
- Meanwhile 161 people have found the network and disc resources to download a 4gb 1971 concert series; 44 people are currently assisting 8 latecomers and so it will go on for some weeks
- Less pre-historically, 2180 people have downloaded the 809mb recording of a November 2007 concert by Phil Lesh.

²⁸ See <http://www.bittorrent.com>.

²⁹ See <http://bt.etree.org>.

3.5 The Library Context ('In Here')

3.5.1 The Library Business Case

The Corporate Case

Opinions relating to recent publications such as the 'Google Generation' report indicate that libraries need to express their business case (even their core *raison d'être*) unambiguously in terms of their HEI's corporate rationale.

That is not to suggest that heads of library and associated converged services are not already operating in that mode. However, there is a sense that such rationale needs to be even sharper and more explicit as we enter in to an era in which both learners and researchers may ascribe increasing value firstly to what's 'out there' (both content and networked opinion) and secondly to how it's done 'out there'.

The warning signs are stronger when that patron thinking is linked to issues of economy, efficiency and effectiveness, taking account of a lower valuing of physical stocks, a convergence of the roles of learning support and library services and a sense of dislocation between LMS and mission critical corporate systems (e.g. VLE as well as MIS).

Therefore it is essential that even the greatest of libraries know their unique selling points (USP) and let others do the rest. For example:

- Work with the vendors of LMS and other applications to Identify the essential points of integration and co-operation between corporate systems, questioning duplicated functions (perhaps such as 'Patrons' and 'Acquisitions')
- Embrace the network, recognising that some things are better done by others out there (e.g. search engines), others might be done by the individual library but still out there (e.g. the National Library of Wales digitisation project for literature in Welsh),³⁰ others by consortia sharing assets and services, leaving a question mark over what truly needs to be maintained internally to the institution
- Consider realistically the potential of the physical and the online library to become a special space, offering things that cannot be found more easily and in better combination elsewhere – a different resource landscape than Google, a better workspace than Starbucks.
- Review the assets in terms of both content and intelligence and consider the cost / benefit business case for exploitation:
 - Unique or rare collections, exploitable in terms of metadata and / or digitisation via the Long Tail of such as subject specialties.
 - Localisation of services and resources in the context of courses, research specialties and special collections (as above)
 - Intelligence about the user community, though the advantage might not be local. The challenge may be to aggregate 'business intelligence' across network spaces and institutional boundaries, remembering that academic loyalty is primarily to discipline and that the network effect lies in speciality not geography. Whilst the 'long tail' in some disciplines must rely on a global community, JISC and its partners may find the scale to aggregate this nationally in many cases, perhaps shaping the next generation of e-Lib's subject networks.
- Take the 'high ground' by applying library expertise to new views of corporate intellectual assets, such as the long term management and 'exposure' of both research and undergraduate outputs in a multimedia and collaborative world.

³⁰ See <http://www.llgc.org.uk/index.php?id=2>.

The User Case

Whilst it is tempting to see the business case for the patron in terms of feel-good factors, libraries should be rigorous in seeking out tangible 'business benefits' from the user perspective.

Selling points for the user will include services that:

- save time or money (e.g. print on demand, optimal workflow)
- are unavailable elsewhere (especially 'out there' on the network)
- come with the kite mark of authority (e.g. direct linkages to study programmes)
- are supported by value added expertise (e.g. from subject librarians)

These principles are emphasised in a 2007 US study by ProQuest, 'Observing Students in their Native Habitat',³¹ which reported that:

Student researchers have an overwhelming preference for online resources that make the best use of their research time ... Students prefer the content available in library databases for its ability to deliver more relevant information in a single search. However, if discovery and access to library databases is more cumbersome than they expect, they will abandon library resources for the more familiar terrain of Google and Wikipedia.

Inhibitors

There will be many inhibitors to the approaches suggested here. To name but a few, these will include:

- existing commitments to evolutionary change
- lack of finance to take risks
- professional development challenges
- unending uncertainty
- not least the shape, malleability and maintenance demands of Library Management Systems

However, there is no doubt that a strong and sustainable business case must extend beyond the reputational importance of the traditionally defined library and its collections. Furthermore it is increasingly evident that the business case must focus on success factors derived from corporate strategy and patron expectation.

The challenge for the HE library is therefore to re-position its investment and skills, perhaps based on data and co-operating services rather than physical assets, whilst staying on the institutional map as a study location of choice.

3.5.2 Service Challenges

Any horizon scan from the library perspective must seek to identify key features in the landscape rather than becoming mesmerised by the overall vista, by all that is going on – quite simply, to separate the wood from the trees.

The idea of Library 2.0, an archetypal freeform tag cloud conjured from the primeval sludge of Web 2.0, represents a classic example. Perhaps the most important thing in respect of Library 2.0 is to advocate stronger emphasis on the 'wood' (connectedness, platform, network effect) than the 'trees' (blogs, wikis, social software, Facebook, flickr, etc.). The underlying service platform is the key, not the social wraparound or the public interface or the revitalised role of 'Librarian 2.0'.

In this context the platform is what enables data to be reused in many different contexts, encouraging participation and contributing to the network effect. Amazon and Google are popular examples. Anyone can make use of Amazon web services to repurpose the Amazon data in their own service or application. It is arguable that most HE services are the opposite.

³¹ For the press release on this see <http://proquest.com/pressroom/pressrelease/07/20071105.shtml>.

They are data silos. A service may open up access via Z39.50³² but it is still a silo as outsiders (and even insiders in some cases) are not able to take the data and repurpose it.

Institutions must consider what it means to 'liberate' their data, to allow all comers to create new and innovative services and applications. To do so their platforms will require easy-to-use and accessible services like Amazon and Google. Once open to that model, some services will become seriously challenged. For example, do we really need around 200 Online Public Access Catalogues (OPACs) to serve the purposes of UK HE?

Given that platform, the community can look to derive both local and national benefit from innovative services on a cost effective basis. For example:

- Recommender services, which are based on a critical mass of commentary on single canonical items, as opposed to local copies
- Union catalogues, which will come back in to the frame as Amazon-like aggregators
- Smart applications, which derive intelligence from the mass of clicks and profiles within the variety of academic communities to inform the future design of workflows, to focus purchasing, to pinpoint redundancy and services to be divested to increase network effect

3.5.3 LMS Positioning

Central to this horizon scan is the positioning of the Library Management System (covering traditional modules plus relatively recent add-ons such as Electronic Resource Management and Vertical Search) in relation to the perceived landscape.

A number of inferences can be logically drawn, which (if even partially correct) may have a significant domino effect:

- The concept of a total solution or a forever expanding one stop integrated system from a single LMS vendor is anathema set against the trajectory of corporate systems and global services; the LMS is a cluster of small stars in a very large constellation.
- The LMS should find its place as a back of house application, doing things that have to be done and that no one else does better (or could do more appropriately do better in the case of VLE or MIS); bear in mind this is where the core library management modules (such as Catalogue and Serials Management) originated.
- The back of house functions must interoperate (or cooperate) with other applications – corporate (such as student and staff records, purchasing processes) and external (such as search and delivery and therefore aggregators).
- Ideally these back of house functions will be modular, though that requirement declines in importance once LMS is reduced to a much smaller back of house footprint.
- The business case for the library OPAC as a key LMS 'module' is challenged by this perspective; whilst users seem to reflect positively on a view that combines local resources with local courses (etc) , the challenge is whether this function needs to be part of the LMS or rather to exploit data exposed by the LMS.

Such a prognosis may to some extent be in conflict with the business needs of LMS suppliers, and especially those public corporations which must seek increasing returns for their investors and therefore cannot stand still. Assuming therefore a decline in the value of the core LMS solution and increasing difficulty in persuasively tacking on further modules, there may be a shake up in the LMS market.

Given this backcloth, three possibilities should be considered very seriously:

³² A client server protocol for searching and retrieving information from remote computer databases. See <http://en.wikipedia.org/wiki/Z39.50>.

- It may be unadvisable to engage in the **procurement** a new, replacement or significantly upgraded LMS in this climate
- It may become essential for the 'community' to have the option of **open source** LMS modules that might be economically developed (globally) and implemented (perhaps by consortia)
- It may be the right time to review the value of **consortia**, not just for purchasing purposes but also with a view to the radical re-casting of services on a shared or out-sourced basis (perhaps based on SaaS); this would apply to both physical and electronic services (e.g. book stock and e-books) and should be considered on a case by case basis.

It should be noted that sub-national geographic proximity is just one basis for consortium formation, others including subject networks (which might be international) and shared service vendor groupings. Considerations will include

- common management vision, balancing value against reputational threats
- existing shared facility arrangements, as already exist over a number of remote campuses (such as Medway and Tremough, near Falmouth)
- enhanced or reduced collection, based on shared specialties or conversely lack of shared specialties

3.5.4 Corporate Implications

Much of what is on the horizon suggests the threatening likelihood of disruptive change and also the potential for pre-emptive transformation.

The issues apply to both research and teaching centred services and therefore to all types of institution. Furthermore it is reasonable to suggest that size and location are not significant factors in mitigation, simply because the challenges relate to the ability of services (ranging from Google to Intute, from Amazon to etree) to benefit their patrons and to exploit their assets by exploiting the potentially global network effect.

Some of the corporate implications for HE institutions have been detailed above. We conclude this section with a summary checklist:

Human Resources and Professional Change

- Levels of library staffing, relating to 'traditional' roles
- Roles and skill sets of library staff (e.g. relating to learner support, cataloguing)
- Business process changes (e.g. Acquisitions)
- New approaches to authority, authorisation and authenticity
- Increased dependency on cross-service working (e.g. Information Systems, Knowledge Management, Library & Learning Support)

Systems

- Requirement to expose data and services
- Risks (and potential benefits) of an 'always beta' systems culture
- Integration required to right size the LMS footprint
- Possible dependency on vendor cooperation

Wider

- Challenge of establishing new licensing models with publishers
- Reputational impact of change and collaboration relating to the library
- Opportunity to re-purpose significant intellectual assets (for those who have them)

3.6 Vision for Development ('a place in both worlds?')

3.6.1 Achieving critical mass, maximising value

We introduce this section with a contribution from a member of the LMS Study Reference Group:

Rather than creating their own online one-stop-shops using environments created by library system suppliers, libraries really need to surface their resources in the online environments already inhabited by their users. This is something discussed in several places by Lorcan Dempsey, for example.

Such an approach implies a more open architecture using standards and protocols to be able to move structured information around so that it can be presented in other places. We cannot expect users to come to us, but should rather design systems that can go out to them. We should be able to present library-managed information and services in institutional environments such as VLEs and institutional portals, as well as in other [external] environments such as Google Scholar and iGoogle.

If implemented, systems like this would mean that information managed by the library could become far more prominent in the online lives of learners and researchers instead of running the risk of being sidelined by Google, etc.

The model is that the availability of easily re-usable data ('consumable' through web services) encourages innovation, increasing use and higher visibility in a virtuous cycle, yielding critical mass for the user and the service provider. Consider what Tim Spalding has done with catalogue records in LibraryThing, which is now one of the largest 'libraries' in the world.³³

The biggest driver in the liberation of data and services is the removal of barriers – technical and commercial. If the barriers to participation are low then this will encourage a 'network effect'. For example, the more people that sign up to Facebook the better (broadly) it is. That is one reason why Skype is free. The Union Catalogue offers a library oriented example, for which value would be a function of such as:

- the more people contributing their metadata (formal and grey publications, other objects of all media types), enhancing coverage
- the more people contributing such as recommendations and reviews, adding value from all angles
- the more activity passing through, yielding more robust click counter data
- balanced with the quality of participation or filtering thereof, which is where personal profiles may be the HE community's major asset

However, it would be dangerous to restrict our thinking to the traditional (though essential) workflows and processes of the Discovery to Delivery (D2D) cycle. The Web 2.0 experience emphasises that the user as participant, rather than just as consumer, needs to be central to the process model. As a member of the LMS Study Reference Group observed:

While D2D [the Discovery to Delivery process model] has served us well up until now, we need to start thinking more about what happens before the first 'd' and after the second. D2D is in fact only part of what I would term user 'creativity cycle' whereby people create innovative objects (in any medium they care to), expose them to others, contribute to others' objects, discover new stuff, get it, modify it, re-purpose it, use it to create something new and so on round the cycle. We could call this a C2C [Create to Curate] model which circles round the core concept of creativity.

³³ See <http://www.librarything.com>.

This view is well aligned to library landscapes proposed elsewhere³⁴ (see the Collection Management quadrant) as well as to the thinking on participation and publishing underlying Web 2.0 more broadly. Institutional repositories are one of the early services which academic institutions are putting in place to support this emerging cycle, though the components are not yet integrated to support the likely workflows. The challenge is whether academic libraries are well placed and agile enough to facilitate their users in exposing and re-mixing content. Certainly, they have key strengths in the curatorial part of the cycle, if they have the mindset and the resources.

3.6.2 The Approach – Liberation

This final section provides a high level summary of the approaches to deliver these objectives, which are already highly developed in both commercial and free services across the web. Whilst these services may be characterised as being inspired by Web 2.0, we need to recognise the business and technical models underlying what is often portrayed as a social phenomenon. These were summarised in the External Context section of this report as concentration and diffusion supported by exposure through Web Services (SOA).

Expose

- Data and services must be ‘liberated’ – surfaced and freely exposed for re-use and wider exploitation by anyone (subject to unavoidable licence constraints)
- Libraries will need to understand the real barriers (political, legal, financial) to their exposing consumable data, content & services
- Originators and curators, such as libraries, should not be concerned with the shape and scale of the resulting services – they may be personal, collaborative, institutional, sector wide or domain specific, global.

Re-use

- The result will be opportunity for fusion (perhaps synergy is a helpful alternative) – exploiting canonical data by re-purposing, remixing or mashing it up. Whilst the use of Google Maps is the most common mash-up example, it is no coincidence that remixes and mash-ups originate in the music industry, which passed ahead of others down the path of financial and intellectual deconstruction and reconstruction in the digital age.
- Developers of services should be concerned about hitting the network level to suit their purposes, to maximise the network effect or to engage the long tail
- Libraries may not be best placed to develop the end services
- The community should engage with disruptive innovation, encouraging information professionals to lead the way with services of specific value, as exemplified by such as LibraryThing.
- Professional development should address head on issues of intellectual authority and loss of control, alongside introducing the skills for librarians to ‘do it for themselves’.

Participate

- There is a fundamental pedagogic link between the enfranchisement of individual participation in the library domain and the national policy objective of greater personalisation in learning
- All players (students, lecturers, researchers, learning support staff and librarians) must be free to contribute through such as recommendation and other forms of interaction
- Some participation will use local services, some will take data to spin new services
- Whilst some forms of participation can be set up locally at low cost (such as tagging and recommending), instigators should always consider the mass of the network effect

³⁴ See <http://www.slideshare.net/lisld/library-landscape-large-2007-04/>

- Links to peripheral 'stuff' such as social networks and ephemeral information should not be judged as 'off model'.

Optimise

Library managers will be seeking to optimise (enabler, enhance) key patron facing processes. These will include workflows such as:

- Discovery to delivery for electronic, print on demand and physically deliverable items
- Search models involving historically distributed resources
- Decision support through qualified recommendations and statistically validated user pathways ('Other people did this').

3.7 Exemplars

3.7.1 Library thing

<http://www.librarything.com/>

Description of the service (adapted from Wikipedia)

LibraryThing is a prominent social cataloging web application for storing and sharing personal library catalogues and book lists. LibraryThing was developed by Tim Spalding, a web developer and web publisher based in Portland, USA (not a librarian!) and went live on August 29, 2005. By its one-year anniversary in August 2006, LibraryThing had attracted more than 73,000 registered users who had catalogued 5.1 million individual books, representing nearly 1.2 million unique works. By February 2008 the figure was more than 23 million books catalogued.

Users (informally known as *thingamabrarians*, a term coined by contributor RJO) can catalogue personal collections, keep reading lists, and meet other users who have the same books. While it is possible to keep a library catalog private, most people choose to make their catalogs public, which makes it possible to find others with similar tastes. Thingamabrarians can browse the entire database by searching titles, authors, or tags generated by users as they enter books into their libraries.

Libraries can also make use of Library Thing. Library Thing for Libraries³⁵ (LTFL) lets libraries add tag-based browsing, book recommendations, ratings, reviews etc to their OPAC.

Business model

The LibraryThing website displays Google AdSense advertising on work and author pages for users that are not logged in, and receives referral fees from online bookstores that supply book cover images. Individual users can sign up for free and register up to 200 books. Beyond that limit and/or for commercial or group use, a subscription fee is charged. Online bookseller Abebooks bought a 40% share in LibraryThing in May 2006 for an undisclosed sum

Significance for the LMS Study

- This is an exemplar of the re-use of library metadata for a Web 2.0 Social Networking site. The site uses MARC records from Library of Congress and many other libraries. In February 2008 Talis and LibraryThing partnered. In return for access giving LibraryThing users access to two core databases (The British Library catalogue and a union catalogue of over 6 million records, catalogued by public and academic libraries in the UK over the last 30 years) within their Talis Base service, Talis customers will gain access to LibraryThing book jackets and ratings data.

³⁵ <http://www.librarything.com/forlibraries/>

- LibraryThing demonstrates that even very conventional ‘library’ (meta)data can be repurposed for something librarians themselves may not have thought about in advance.

Lessons to be learned

- Value is not so much in the (meta) data itself but rather in how it is used.
- JISC and SCONUL should consider encouraging libraries and services to expose metadata more widely to enable imaginative re-use in innovative applications.
- JISC is perhaps well positioned as a pan-HE (and FE) body help lower administrative, technical and legal barriers to data re-use. For example they should look at the applicability of ‘The Open Data Commons Public Domain Dedication and Licence’,³⁶ which is the basis for The Talis/LibraryThing partnership.

3.7.2 Google

<http://www.google.com/>

Description of the service (adapted from Wikipedia)

Google is largest search engine on the web and indexes a portion of the total amount of web pages. Google.com uses a patented algorithm called PageRank to rank web pages that match a given search string. The PageRank algorithm computes a recursive score for web pages, based on the weighted sum of the PageRanks of the pages linking to them. The PageRank derives from human-generated links, and so correlates well with human concepts of importance.

The exact percentage of total of web pages that Google indexes, is not known as it is very hard to actually calculate. Previous keyword-based methods of ranking search results would rank pages by how often the search terms occurred in the page, or how strongly associated the search terms were within each resulting page. In addition to PageRank, Google also uses other secret criteria for determining the ranking of pages on result lists, reported to number over 150.

Users can customize the search engine somewhat. They can set a default language, use ‘SafeSearch’ filtering technology (which is on ‘moderate’ setting by default), and set the number of results shown on each page. Google has been criticized for placing long-term cookies on users’ machines to store these preferences, a tactic which also enables them to track a user’s search terms over time. It retains this data for more than a year.

Non-Web sources of data including library catalogues

Despite its immense index, there is also a considerable amount of data in databases, which are accessible from websites by means of *queries*, but not by links. This so-called deep web is minimally covered by Google and contains, for example, catalogues of libraries, official legislative documents of governments, phone books, and more. By default the ‘Library Search’ option in Google Scholar links to library holdings via OCLC’s WorldCat platform. The Talis platform (UK libraries only) will also provide a link to library holdings but has to be actively selected in the Google Scholar preferences. COPAC³⁷ is also looking at providing such a link to holdings service from Google.

Business Model

Google gets its revenues from online advertising related to its Internet search, web-based email, online mapping, office productivity, and video sharing as well as selling advertising-free versions of the same technologies

Significance for the LMS study

- Google is a clear demonstration of the advantage of *aggregation* (as opposed to federated search for example) technologies to search massively large distributed content.

³⁶ <http://www.opendatacommons.org/odc-public-domain-dedication-and-licence/>

³⁷ <http://copac.ac.uk/>

- Google (Scholar), in combination with the OCLC WorldCat platform, provides a richer and more fulfilling ‘catalogue’ experience that most individual library OPACs and UK union catalogues (e.g. COPAC M25). For example it includes reviews, author notes linked articles and alternative (e.g. purchase via Amazon) routes to fulfilment.
- There is potential for a combination of Google, a library platform (that aggregates and exposes data to Google) and standard (potentially OpenURL) that enables library fulfilment (deliver and request) to transform the traditional OPAC dominated discovery to delivery paradigm in HE libraries. COPAC, OCLC and other have already developed the request transfer message³⁸ - a Community Profile of OpenURL to enable inter library requests to be made.

Lessons to be learned

- There is genuine value in libraries exposing their (mostly currently hidden) catalogue (Meta) data to Google and alternative search services.
- This is most effectively done by a shared ‘platform’ (such as OCLC WorldCat) that can, not only make the job easier (no need for each individual library to do it) but, on the basis of a significant aggregation, is also able to get the attention of Google.
- The Google+ library platform combination now provides direct competition to conventional library OPACs and union catalogue services like M25 and COPAC. These will need to look at how they can offer *competitive* advantage to justify their cost over what is a free (or low cost) and pervasive service.

3.7.3 Amazon

<http://www.amazon.co.uk/>

Description of the service (adapted from Wikipedia)

Amazon.com, Inc. is an American e-commerce company based in Seattle, USA. It was one of the first major companies to sell goods over the Internet. Founded by Jeff Bezos in 1994, and launched in 1995, Amazon.com began as an online bookstore but soon diversified its product lines by adding VHSs, DVDs, music CDs, MP3s, computer software, video games, electronics, apparel, furniture, food, toys, and more.

Amazon has established separate websites in Canada, the United Kingdom, Germany, Austria, France, China, and Japan. It ships globally on selected products

Business Model

As well as being an online retailer itself Amazon is a ‘platform’. The Web sites of Borders (borders.com, borders.co.uk), Waldenbooks (waldenbooks.com), Virgin Megastores (virginmega.com), CDNOW (cdnow.com), and HMV (hmv.com) are powered and hosted by Amazon. Amazon.com powers and operates retail web sites for Target, the NBA, Sears Canada, Sears UK, Benefit Cosmetics, Bebe Stores, Timex Corporation, Marks & Spencer, Mothercare, and Lacoste. It also powers AOL’s Shop@AOL service via Web Services technology. Amazon provides a variety of web services to enable developers of other applications to make use of Amazon content and services.

Significance for the LMS study

- Amazon is preeminent as platform for discovery and delivery of books. (As noted above it has now extended beyond books). It was an early demonstration of the value of the long tail. ‘As the costs of production and distribution fall, especially online, there is now less need to lump products and consumers into one-size-fits-all containers. In an era without the constraints of physical shelf space and other bottlenecks of distribution, narrowly-targeted goods and services can be as economically attractive as mainstream fare’.⁴

³⁸ For background and details see http://www.oclc.org/content/1409/xsd/RequestTransferMessage_v5.doc

- As a *marketplace* platform for books it has attracted second hand booksellers and even individuals who now have a global market for their wares and do not have the barrier of cataloguing their stock or setting up their own web presence/e-commerce system.
- Libraries use it to purchase material and some have used it to get better value for their 'withdrawn' stock sales. Amazon.com has established a specific service for libraries³⁹ that provides books with protective jackets and even a MARC record service.
- Amazon's 'catalogue' is now the benchmark against which many users will judge their library catalogue experience. Amazon provides much 'enhanced content such as review, blurbs, book jackets and recommendations
- A key element of Amazon is its recommendation service which is based on tracking the search and purchase history of users. Based on a large aggregation of user activity it can be uncannily prescient for regular customers. Users can also actively improve the recommendation service by 'rating' their past purchases.

Lessons to be learnt

- Aggregating data and a global web presence provides a market for much material that would otherwise stay on the shelf. This has had an effect in lowering the costs of book purchasing. This kind of model might be usefully applied to fulfilment in a library context (e.g. what is now known as Inter-Library-Loan –ILL)
- Amazon is a prime example of the value of the aggregating users' clickstreams to determine relevance. User *behaviour*, as manifested in their clickstream, *automatically* provides relationships between books. This is information about books that is not included in the catalogue record itself. Users are additionally able to 'refine' their own 'context' by rating their purchases.
- In terms of the 'customer experience' most library OPACs rate poorly against Amazon in terms of the range and depth of information about resources they provide. They are also poor at offering alternative fulfilment mechanisms. If a book is not available new in Amazon it is often available second hand from an alternative source (but still via the Amazon 'marketplace' so it feels like you are getting it from Amazon). Why don't libraries routinely offer such alternatives?

3.7.4 Intute

<http://www.intute.ac.uk>

Description of the service (adapted from information on the Intute website and Wikipedia)

A free online service (hosted by MIMAS) providing access to *authoritative* Web resources for education and research. The service is created by a network of UK universities and partners. Subject specialists select and evaluate the websites and write high quality descriptions of the resources. The database contains ca.120, 000 records. The basis of the Intute service is a large database of resources submitted and edited by subject specialists. Each resource is reviewed and described via various metadata fields, such as which subject discipline(s) it will be useful to, what type of resource it is, who created it, who its intended audience is, what temporal or geographical coverage the resource has, and so on. Intute was formed in July 2006 after the merger of the eight semi-autonomous "hubs" that formed the Resource Discovery Network (RDN). These hubs each served particular academic disciplines:

Altis	Hospitality, leisure, sport and tourism
Artifact	Arts and creative industries
Biome	Health and life sciences
EEVL	Engineering, mathematics, and computing
GEsource	Geography and the environment
Humbul	Humanities

³⁹ The Librarian's Store <http://www.amazon.com/Librarians-Corporate-Accounts/b?ie=UTF8&node=13753131>

PSIgate	Physical sciences
SOSIG	Social sciences

The restructuring and re-branding was undertaken to create a service with a more uniform identity and appearance, better cross-searching facilities, and more focused technical and management teams. As part of the restructuring, the eight RDN hubs were reorganised into four subject groups.

The Intute repository search

Intute has been commissioned by JISC to develop a repository search infrastructure. This development will build on the ePrints UK project, and aims to facilitate the discovery, access and retrieval of material. In doing so, the project aims to raise the visibility of repository content and perpetuate the deposit of content. The project initially ran from March – August 2006. The second phase of the project will run for three years from September 2006 – August 2009.

Business Model

Intute is free to access. Grant funding (c £1.5m) pays for hosting and includes in house cataloguers at the seven key institutions and external staff on a per record basis. The service is being evaluated by JISC and AHRC.

Significance for the LMS study

- Intute offers a personalisation service, 'MyIntute', which enables users to tag records, set up email alerts, export data, and construct remotely-maintained lists of resources that can be used as reading lists.
- It also offers the Virtual Training Suite, with over 60 free online tutorials teaching Internet research skills for most of the subjects taught in UK universities and colleges.
- The Intute Integration service enables users to customise and export Intute content to their own web pages or VLEs. This includes newsfeeds, an embedded search box and MyIntute (where users can save Intute content in their own online space, tag and export it). Machine-readable interfaces to the database are available using the Z39.50, Search/Retrieve Web Service and OAI-PMH protocols.
- A collection of bookmarks showing examples of how universities or colleges have integrated Intute content is available on del.icio.us.

Lessons to be learned

- Demonstrates the value of a community based effort in locating and describing authoritative web resources. For specific subject areas there may still be value in a traditional 'cataloguing' approach to the web.
- Exemplar of a JISC Web services: Intute can be 'embedded' in other services. It also uses Web 2.0 technologies, for example in employing RSS to report new addition.
- Uses Opensearch⁴⁰ (developed by Amazon –A9) so didn't have re-invent a the search capability—just took it as a service from the web
- The additional Intute repository search project shows how the HE community can provide sector wide access to repository content and importantly *deliver* the resource - not just find out where it is.

3.7.5 Vertical Search

Encore : <http://www.encoreforlibraries.com/>

Primo: <http://www.exlibrisgroup.com/category/PrimoOverview>

AquaBrowser: <http://www.medialab.nl/>

⁴⁰ OpenSearch is a collection of simple formats for the sharing of search results. The opensearch.org website was created by A9.com, Inc., an Amazon.com company. The web site is maintained by members of the OpenSearch community. <http://www.opensearch.org/>

Description of the service (adapted from Wikipedia and vendor web sites)

Vertical search, part of a larger sub grouping known as ‘specialised’ search, is a relatively new tier in the Internet search industry consisting of search engines that focus on specific businesses. Niche search engines are not new. Web sites that help users find people, shop and get business information have existed for years. But the number of these search engines being introduced has greatly increased in recent years. Local search is already a burgeoning subset, with Google Local and many newspapers offering this functionality. The rationale for vertical search is that, although users are sometimes looking for all the information they can get, (and for that the likes of Google and the Yahoo search engines are used), often they are looking for something very specific related to their businesses. In the library domain we can characterise new products such as Encore (Innovative Interfaces), Primo (Ex Libris) and AquaBrowser (Media Labs/CSA) as ‘vertical search’ applications. Whilst they are not targeted at a specific *topic*, they are targeted at a specific *business channel* of (in HE) undergraduate and postgraduate research. Google Scholar might be considered a vertical search application.

Vertical search vs. broad-based search

Broad-based search engines such as Google or Yahoo fetch very large numbers of documents using a Web crawler. Another program called an indexer then reads these documents and creates a search index based on words contained in each document. Each search engine uses a proprietary algorithm to create its indexes so that, ideally, only meaningful results are returned for each query.

Vertical search engines, on the other hand, send their spiders out to a specialised set of databases/resources. Ex Libris expresses it like this. ‘Primo is designed to work with standard integrated library systems (ILS) and other library applications, regardless of vendor. Built-in pipes enable harvesting of library collections—the library catalogue, digital repositories, and knowledge bases (such as the SFX and MetaLib KnowledgeBases)’.

As the broad-based search engines have become broader still, so have their search results. This has become increasingly frustrating to users who have turned to search engines to find information on a specialised topic, be it local information, travel sites or specific business channels. A vertical search product will deliver more relevant results for its target audience than a broad search application. LookSmart, an online media and technology company that has launched more than 180 vertical search sites, contends that Web users will increasingly use the Internet the way they do cable television, opting for specialized channels that speak directly to their concerns. This company says vertical search engines will chip away at Google’s and Yahoo’s audiences the same way cable TV channels such as TLC and the National Geographic Channel have eaten into network audiences.

Business Model

Library Vertical Search products are sold as straightforward commercial application software. In some instances (e.g. AquaBrowser) they can be made available as a hosted (or SaaS) solution.

Significance for the LMS study

- ‘Vertical Search’ products represent the LMS vendors’ response to the Google ‘metaphor’. This is the battleground upon which the conventional LMS vendors have raised their standard. If we look at the wider global search context it can be seen that vertical search is not uncommonly perceived by as having genuine value against the broad based Google search approach. So it is not unreasonable to think it might have value in the ‘library’ domain.
- Aggregation is a key technology -over federated search. Products still have to incorporate federated search, as they currently can’t aggregate all e-journal resources--- but this is likely to change.
- Primo for example makes discovery a ‘service’ that can be ‘consumed’ by external systems (like a VLE or a Portal).

Lessons to be learned

- Other (non library) domains do not necessarily see Google as the *only* player in search so there may be a positive message here for libraries. Clearly Google itself saw some value in a ‘scholarly’ approach or it wouldn’t have introduced Google scholar. However Google’s business model at the moment is advertising and the scholarly market may not be that important to it.
- Aggregation is (once again) a key attribute to the success of this approach.
- Library vertical search products have started to do something about ‘personalisation’ but it is not very remarkable. Currently there is no evidence of them exploiting the user’s ‘context’ as expressed in clickstreams. This would require a bigger user base than simply a single HE institution.

3.8 Summary of key points

Key point	Section(s)
Assumptions	
Whilst issues of demographics, learner diversity, fee structures and even carbon reduction will ripple through university planning, none are as immediate in terms of impact on library services as the march towards ubiquitous broadband access underpinned by a wide range of mobile devices. In that context the web and its associated technical standards will continue to dominate.	3.2.1 3.4.1
To spot the breaking wave watch the domestic market (as opposed to the business market) for new trends, value learner ideas and attitudes, watch out for and leverage influences from peripheral fields.	3.4.1
The moves by publishers towards more open access to electronic versions of journals will continue, extending slowly to books, but progress will be patchy and inhibited by cost barriers.	3.2.2 3.4.2
An innate conservatism among academics and students will dictate that the resources they will be required to retrieve will continue to be largely textual in nature for the majority of courses	3.2.3
The User Experience	
Key challenges for library services arising from the ‘Google Generation’: (a) impact of the wider online world in terms of workflows, tools and collaboration; (b) perceptions of interface, efficiency and ultimately use of time; (c) disruptive impact on scholarly behaviour	3.3.4
Discovery to Delivery (D2D) processes are only part of the emerging user ‘creativity cycle’ (C2C - Create to Curate) whereby people create and expose innovative objects, contribute to and repurpose others’ objects.	3.6.1
User participation raises challenges in an increasingly complex set of relationships between the canonical (a published resource) and the formal and informal inputs that will be increasingly be regarded as parts of the same whole.	3.4.2
There is a pedagogic link between individual participation in the library domain and the policy objective of greater personalisation in learning; libraries can play a facilitating role through enabling such as recommendation services, tagging and links to social networks and ephemeral information.	3.6.2
Web 2.0 and the Network Effect	
Web 2.0 has very particular implications for library services, differentiated between ‘diffusion’ (involving such as blogs, syndication & mashups) and ‘concentration’ (driven by major data hubs, generalist like Google and specialist like Amazon)	3.4.3
The Web 2.0 network economy model suggests that re-usable data	3.4.3

Key point	Section(s)
encourages a virtuous cycle, yielding critical mass for the user and the service provider alike. Concentration, leveraging the 'network effect', is the key consideration involving aggregation resources, metadata, user created data and user activity.	3.4.4 3.6.1
The 'Long Tail' represents a new opportunity for specialist services with little local mass but highly likely to have critical mass with sustainable community loyalty in a wider geography	3.4.4
Libraries should realistically assess the USPs of their assets, especially in terms of collections and user intelligence, and consider the cost / benefit business case for exploitation	3.5.1
Whilst the 'long tail' in some disciplines must rely on a global community, JISC and its partners may find the scale to aggregate this nationally in many cases.	3.5.1
Creators and curators, such as libraries, should not be concerned with the shape and scale of the resulting services – they may be personal, collaborative, institutional, sector wide or domain specific, global.	3.6.2
The Library Business Case	
Libraries should identify their unique selling points and let others do the rest: (a) recognising essential points of integration with corporate systems, questioning duplicated functions; and (b) embracing the network, recognising that some things are better done by others 'out there'.	3.5.1
Libraries should seek out tangible 'business benefits' from the user perspective, to be found in services that save time or money, that are unavailable elsewhere, that come with the kite mark of authority or are supported by value added expertise.	3.5.1
Libraries should prioritise optimisation of key patron facing processes. These will include the workflows for such as discovery to delivery for electronic, print on demand and physically deliverable items	3.6.1
The LMS Position	
The concept of a forever expanding one stop integrated system is anathema set against the trajectory of corporate systems and global services. The LMS should be a back of house application, doing things that have to be done and that no one else does better, interoperating with other corporate and external applications.	3.5.3
In this climate it may be appropriate to channel resources into rethinking library services rather than re-procuring the LMS.	3.5.3
Corporate Implications	
There are implications for levels of library staffing and the roles of library staff, taking account of business process and user workflow changes and of new approaches to authority, authorisation and authenticity.	3.5.4

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