



Library orientated portals solutions

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1 Executive Summary

This report reviews a new range of products from suppliers of Library Management Systems (LMS) and other library products which we are calling *library portal systems*. They are sophisticated tools to create portals for information resources, including electronic resources, owned or licensed by the library.

This can mean one or all of integrating multiple resources for the user into a comprehensible landscape; allowing cross searching or searching of many databases with one interface; personalisation; behind the scenes authentication; and the enhancement of simple bibliographic records with tables of contents, dust cover images etc. Also implied are management tools to customise the gateway for user groups and to consolidate usage statistics (sections 3,4 below). Many of the systems also have a capability to manage the digitisation process and local digital collections, though this is not the primary focus of this report. Other solutions exist to solve some of these problems (sections 2.4, 4.1). None offer as much control to the library, or such a complete professional solution.

The report is based primarily on a survey of suppliers, conducted in May 2002.

Most of the LMS suppliers have now come into the market, but few are mature products and there have been relatively few UK or worldwide sales to date. There will be a continuing problem of developing the products to support new standards: we found significant gaps in support. Critically for the UK, several are not Athens compliant. Z39.50 and Dublin Core are the core underlying standards/ technologies in use (for definitions of terms in this report see Glossary, section 7 below). We see this increasingly being superseded by XML (XPath, XML Query, XQuery, XSLT) and the notion of web services.

Important background developments that will affect the development path for these products are: collaborative configuration, metadata harvesting, institution level integration, supply-chain integration, digital asset management, skins and cross sector co-operation (section 5).

Library portal systems do offer greater control to a library over broad collection management. However, they also tempt libraries to try and create the 'front end to everything', when there are other more likely competitors to fill this role, such as departmental and institutional portals and virtual learning environments. Ideally, libraries should think in terms of offering services to other systems, for example managing reading lists or sets of subject resources within Virtual Learning Environments. Clearly they must also be suitable to work with JISC's Information Environment concept.

Proprietary publisher front ends continue to have value, especially where taxonomic support is offered.

It is important to remember that the solution to the problem of under used library supported resources should be sought as much in user education and culture change as through technology.

Progress will most rapidly be made through cooperative working: across HE / FE, with other library sectors in the UK (National, Health and public libraries), and with other libraries in Europe and the United States. The underlying requirements for most libraries may not be very different. There is a need for on-going collaborative work on collection level description and the sharing of configuration information. Publishers and information suppliers also need to be more informed about the implications of library portal systems.

2 Introduction and research method

2.1 What library portal systems are

The technology evaluated in this report allows libraries to create portals to electronic resources. The software systems are enhancements, add-ons or standalone products developed by suppliers of library management systems (LMS) and others. Their purpose is to integrate the diverse licensed and owned electronic holdings of libraries for users, through the whole process of discovery and searching to final delivery, regardless of the content's format, the metadata standard in use, publisher interface, authentication mechanism. Behind the scenes they offer tools for the librarian to manage the collection as a whole.

Library portal technology can be used as specialised content management systems to extend and promote access; build and manage electronic collections; deliver and integrate services. The systems put control in the library's hands. They offer a range of network communications, customisation and personalisation functions.

Portals and gateways are proliferating. The library portal should be one main way into institutional information resources, but it must also be capable of offering web services (see glossary) to other portals; just as they themselves will increasingly seamlessly integrate content and functions from other third party systems.

2.2 How library portal systems are used

The technology offers:

- a configurable and integrated interface to multiple resources
- to unify searching across multiple systems, including multiple makes of library system
- to unify searching across different metadata schemes, such as MARC, Dublin Core, CIMI, TEI, EAD etc and using multiple protocols (eg http, Z39.50), deliver results in acceptable response times, with de-duplication etc.
- to unify searching across different formats of material, eg bibliographic records, full text, graphics and multimedia objects
- to identify different sources for the same information and guide the user through choosing appropriate search targets or delivery options in line with library policy
- to simplify authentication and authorisation for the user, probably interacting with existing authentication systems through LDAP or Kerberos, and other digital rights management functions
- to store profiles of users to offer 'MyLibrary' interfaces and alerting of new resources
- to provide dynamic reference and citation linking
- to provide full and integrated management information and usage statistics

Increasingly the technology is itself based on open architectures and data types such as XML and J2EE/.Net, and more obviously on Z39.50. Precise licensing structures offered for the software also need to be considered in evaluating the software.

Solutions to these requirements are already recognised by academic libraries as critical to promoting and supporting the use of electronic information. Integrated interfaces and simpler authentication are the key to lowering the barriers to the use of library supplied electronic information, which the JUSTEIS project found to have a low profile and be under

used¹. Customisation of search screens and profiling would be valued new services. The potential to obtain superior management information is central to electronic collection development and rational resource allocation.

2.3 Method

This report is based on:

- A literature review, background monitoring of LMS developments, informal discussions at exhibitions, suppliers' sites/demonstrations.
- A 19 point survey².
- Correspondence with those who have evaluated such systems for use in their own library.

This is not a test bench review of demonstration systems. Nor is it a detailed review of user and administrator interfaces, though we accept this is critical to determining the value of a particular system. The report focuses on general principles and broad trends to help individual libraries understand the overall shape of the marketplace. Hopefully it should help libraries start thinking about their requirements and open up debate across the JISC community and beyond about how well the products described meet them.

2.4 The scope of this report

The scope of this report is deliberately quite narrow, focusing on selection rather than implementation, and on a small number of highly functional solutions developed by library systems suppliers. A library considering how to present and manage ejournal and other eresources - to provide a local portal service - would also consider one or a number of the following:

1. Cataloguing resources in the LMS in the usual way, as for books and journals.
2. A simple listing of available resources on static web pages
3. Subscription to ejournal systems managed by publishers/intermediaries (eg Swetsnet), or subject orientated systems like those offered by Ovid or HCN which integrate multiple datasets.
4. A commercial ejournal database system (eg TDNet, see section 2.5 below) or a local content management solution (eg MS Access, or Perl based catalogue system)
5. Library orientated authentication systems such as EZproxy or ITS Onelog.
6. Information retrieval products such as Autonomy, Verity and Google or portal solutions such as MuseGlobal or Blue Angel which are currently or could be adapted to provide library specific portals.

Several of the library portal systems evaluated here are conceived of as helping to manage the whole process of the digitization of local resources (especially images), the management of local digital collections and integration of searching of them with other information. But our focus here is on the management of resource discovery, searching and retrieval.

During the writing of the report we became aware of new portal products from Crossnet (Dsccovery) and Optology but there was not time to gather intelligence on them to include them in this version of the project.

¹ JUSTEIS project, <http://www.dil.aber.ac.uk/dils/research/justeis/JISCTop.htm>

² See Appendix two

3 The importance of library portals

Librarians have become increasingly aware that the multiplication of electronic resources is a problem for end-users. Users find it difficult to find the most appropriate database or resource to search for information relevant to their need. Even if they locate the right resources, since each service tends to have its own unique interface, they may struggle to search it effectively. A further obstacle to access is the need to remember and enter many different passwords to access the different databases. These problems may lie behind a perceived lack of use of library subscribed to electronic services³.

Librarians also need tools to manage a resource through its whole history from acquisition to presentation to users to evaluation for renewal or withdrawal. Tools exist within LMS to do this for books and journals.

In response to this need a number of suppliers of LMS systems and library products have developed sophisticated library orientated portal products. Nearly all the major systems suppliers have now entered the market, with epixtech and Talis amongst the most recent (announced during the writing of the report). It is this range of technology solutions that are discussed in the report.

It should be said that the fragmentation of information resources and variations in internal layout of information has always been a problem, as anyone who has had to explain where the quarto books are in the library will be well aware. Library portal technology offers a potential solution to ameliorate this long-term problem, when combined with appropriate user training and culture change.

3.1 Functional requirements

The library and end-user requirements from library orientated portal products can be summarised as follows⁴.

3.1.1 Core functionality: cross searching, common interface, single point of authentication, content enrichment

The core requirements are 3, 4, 5, 6, 7, 8, 12 and 16.

1. Searching would be far easier for the user if the library could present resources in a consistent, organised gateway or even an 'information landscape'. This should be customized for different user groups.
2. As well as browsing this landscape the user should be able to search for suitable resources to interrogate, using in depth collection level descriptions.
3. Users would learn to search more effectively if there was one fully functional library maintained search interface available for any database they wanted to use.
4. It would often be convenient to search multiple databases from one search box.
5. This implies the ability, in a single search, to interrogate databases that use different metadata standards, especially in different curatorial domains.

³ op. cit.

⁴ This analysis is based on study of the LITC's long term monitoring of the LMS marketplace and published and unpublished documents from the following projects and organisations Headline, Decomate, Agora, Sparta, Angel, Pride, Candle, but especially Headline (2001) and Russell (1999). See glossary for details. For another useful checklist of desirable functions see the appendix to ARL Scholars Portal Working Group (2002).

6. It should be possible to spread searches across locally held data, web based services, Z targets, XML datasets (increasingly using http protocols). The system needs to do this efficiently, warning the user of slow-to-respond Z servers for example. There will always be a case for harvesting and caching metadata for responsiveness in searching and to promote greater local awareness of quality network resources. The Open Archives Initiative, now supported by JISC, develops and promotes interoperability standards that aim to facilitate the efficient dissemination of content. Support for its OAI Protocol for Metadata Harvesting is therefore desirable in library portal products.
7. Specifically the system should be able to search databases of images and a proliferating array of multimedia types, and ideally show thumbnails or previews in search results.
8. The same linking/cross searching technologies could also be used for 'content enrichment', that is to supplement bibliographic records, e.g. with TOC, book reviews or cover images generated by dynamic look ups in third party data repositories.
9. The search results from spread searches need to be presented in an intelligible way to the user, ideally with de-duplication and sorting of results.
10. It might be appropriate to present search results in a way familiar from search engines.
11. The user should have the option to revert to the database's native search interface if this offers greater functionality.
12. The system must understand licences, such that it only offers options to users that are available to them, based on their access rights and the licence, although it can help create awareness and drive demand for protected resources through alerting, personalisation and customisation functions.
13. The search must offer the searcher the 'appropriate copy' offering delivery options (such as local library services, ILL, fee based document delivery) in the order of priority defined by the library, probably with different settings for different user groups. The whole process from discovery of resources, to searching and document delivery/location should be managed and supported.
14. Link resolution services should be supported. That is rather than pointing at specific static URLs for content, web requests should pass through an intermediary service where a final URL is calculated for any resource at the time of the user accessing it. This offers a scaleable way to manage constantly changing URLs and the opportunity to develop further middleware support services.
15. The user should be able to save hits or searches, including for reuse on databases other than the one it was first created for.
16. Another central requirement is that there be a single point of authentication. The user must not be constantly challenged for a password, in fact cross searching of multiple access controlled datasets is impractical without some sort of single sign on or caching of credentials or trust between servers.
17. The system must be able to interact in real time with other local authentication systems, and manage all sorts of users including alumni.
18. The system must provide central management tools for handling a variety of http based query syntaxes, since standards are developing rapidly to meet the needs of specific domains.
19. It should be web based, and accessible from anywhere, including off campus.
20. The interface should be customisable for the institution, allowing integration with other services and establishing who is paying for the end service. It is important

for the user to know that the library is supplying the content. Customisation includes the ability to turn features off.⁵

21. The system must fit into the JISC Information Environment concept, by being compliant with open standards and ready to interoperate with the RDN subject portals and systems in the 'fusion layer'.⁶

3.1.2 System features

22. The system must run under all common operating systems, including various flavours of Unix. Most institutions have preferred basic OS which is supported.
23. The software should be modular, so that a library can pick and choose which tools to buy.
24. The system must be able to interact with a LMS to pick up information about the user for example or interrogate the local OPAC. The management of electronic resources should be integrated with parallel processes and workflows for books, journals, especially for content enrichment.
25. Yet the system should stand alone from any particular LMS.
26. The portal should be capable of interacting with VLEs and MLEs. This could mean somehow offering management services to resources embedded in course materials. For example, such systems might be used to manage readings lists or collections of relevant resources that would be viewed through the VLE.
27. In fact the portal should be able to interact with many other systems, content and course management systems, document management systems, e-print archives and especially University / departmental portals. It would be wrong to assume that the library portal should be the only or main portal that users look to for in their studies/teaching. It should be expected that the library portal enhances these others systems by offering specialist services and quality assessed content.
28. The greatest complexity with making multiple systems interoperate will lie in the area of taxonomy. For example in a University the library portal may be able to contribute content to a University portal seamlessly, but the underlying subject understanding of resources must fit that used in the University portal. This implies agreement on what the subject structure should be. Given that Universities frequently restructure their academic departments this will be more difficult than is apparent.
29. Several of the previous points imply that the systems should be based on open standards.

3.1.3 Personalisation and customisation

30. It could be argued that personalisation by an individual user is less significant than customisation for groups (Harris 2002)⁷. Customisation can help point up new resources and direct users to the most relevant resources to them, based primarily on the subject they are studying. Existing research seems to suggest that personalisation by users is not highly valued by them, at the moment. Sophisticated dynamic personalisation based on historic behaviour rather than form

⁵ Headline (2001) for more detail of customisation requirements.

⁶ UKOLN JISC IE Architecture Web pages, <http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/>

⁷ Here personalisation is defined to mean adaptation to personal requirements by the user; customisation is configuration of resources for user groups by a third party, cf however, usage of Jakob Nielsen at useit.com.

filling seems some way off. A history list of recent resources searched would be useful to help the user orientate themselves.

31. The system should offer current awareness services to the user, based on their profile or choice, eg alerts of relevant Tables of Content, new acquisitions or re-runs of searches.
32. Privacy of the individual must be protected, as well as compliance with UK Data Protection legislation.
33. A neglected user requirement is the need for interactive, real-time support (it is quite prominent in the ARL Scholar's Portal Project model) and community building features. Once the core functionality of library portals is well established the knowledge management type benefits of connecting people with shared research interests could be exploited.

3.1.4 Management of resources

34. A large part of setting up and maintaining the system will be configuring settings (URLs, ports, data structures) for different services, since such settings constantly change. The system should be able to routinely test the settings (without overloading publisher's sites – a current problem). There is a requirement for the sharing of configuration data between user libraries or supply of such data from data service providers.
35. It is essential that the management of the system is scaleable for lots of datasets and lots of users.
36. All administration processes must be simple, be open to bulk uploads or migration of data, have wizards where appropriate.
37. LMS offer many management functions for acquiring and cataloguing new material. A mature portal system would provide the same functions for electronic resources. For example it might potentially have to manage budget centres for licensing of resources. A mature system will have workflow either built in or available as a separate module. It is likely that independent workflow modules developed in UML will begin to interoperate with library systems over the next few years to increase the range of management options.
38. Consolidated usage statistics with standard reports must be available.
39. The system must be future proofed as far as possible. It must be possible to export data in the system, probably using XML. This may be a requirement for e-Government e-GIF compliance in the UK as the policy to adopt XML for all public bodies and encourage full lifecycle management of content is developed. So compliance with standards is again critical.

3.1.5 Reputation of supplier

40. The reputation and creditworthiness of the supplier is important as in any major procurement.
41. Some attempt must be made to evaluate the company's development plan for the product and the likelihood of promised functionality actually being delivered.
42. It is relevant to look at the partners that are consulted in system development.

3.1.6 Cost and licensing model

43. There must be a 'fair' model of payment and cost level, particularly given the likely high level of cost in administering the system. ROI is to be sought either in making a critical contribution to the quality of service or in making a significant saving of staff time in administration.

3.2 Scenarios of use

To more fully explain the use of these systems we offer these two scenarios of use, imagining what is required even if it is not yet offered (the Manager scenario is somewhat futuristic):

3.2.1 User

The user, an academic, logs onto a networked machine using his main log on. He is not challenged again for a password. Intent on collecting references for a course he clicks to use the library resource bank from an icon on his desktop (click one). He searches for a suitable database that might have resources about British films of the 1950s (click two), he is offered three resources. He enters a few keyword terms to cross search these databases (click three) and is returned a list of hits. Scanning down three towards the top seem to fit his need. He can see immediately that one is an item in the library. He looks to see how many copies there are (click four). Then he opts to save the details to put into his BlackBoard course (click five). Returning to the hit list (click six) he sees that another item can be obtained full text from a journal service. He clicks on the link and goes straight through to read the article on screen (click seven). Deciding it is suitable he creates a deep link for the VLE (click eight). From the hit list he sees that the third item is a movie clip. He quickly views a couple of thumbnail stills (click nine). He decides it is not needed at this stage, but saves a bookmark to it (click ten). He logs out saying Ok to save the search and to rerun it every month and email him the results (clicks eleven and twelve). He turns back to a colleague heaping praise on the librarian.

3.2.2 Manager

The Library Portal administrator logs on to review routine reports. He reviews a report on an overnight job to check the integrity of resource configurations. Everything appears to be OK, though there are a couple of Z targets that are close to failing the standards for responsiveness at certain times of day. He adds a help note into the system so that users of the two databases will realise there is a known problem, and fires off an enquiry to the Z server administrators to report the problem, finding their contact details on the system. A second report shows accesses to databases, and types of activity. Usage of a geography database has dipped dramatically. He rechecks the settings, and fires up the database on his machine. It seems to work. He switches to a report displaying activity by user group, this shows that hardly anybody from the geography department are logging on at all, and he remembers that they are probably all on field work that week. He checks this on the University portal, and concludes that this probably explains the drop in usage of the database. Usage of another database is still low, despite a small jump around the last library run course. He quickly reviews lifetime usage of the resource and the detailed licence terms. A third report alerts him to updates of shared collection description level data, and he ponders whether to upgrade the local record with the new information. He is interrupted by a chat message from a colleague who is offering support to a user who is having difficulty

accessing an ejournal. It turns out the user has lost his password. He does a reset. He returns to a report on the quality of harvested OAI metadata.

4 Products

Fuller details of the library portal products are given in Appendix 1 below. Here we summarise the main features.

The number of such products seems to be growing rapidly as LMS suppliers such as VTLS, SIRSI and Innovative Interfaces seek to prevent user migration to generic products, and, to a lesser extent, as third party suppliers seek to break into what they see as new long-term markets for enterprise wide integration.

Most products are Java based, with some suppliers preferring to support only Unix platforms. Oracle is widely used as an underlying relational database, with MS SQL Server an option for MS Windows servers.

Note that as these products are intended to support systems integration, most of them could be developed to support missing functions, and the feature summaries here are only intended to be indicative of the current state of the products.

Table 1 lists the products described in the report (for relevant URLs see 8.2, for more detailed description see 9). We have cited suppliers' own descriptions supplemented by survey material and other trade literature in an attempt to give a flavour of the focus of claimed benefit for each product (for more detail see section 9).

Table 1 Main library portal products and suppliers

Product	Supplier	Summary (see Appendix 1 for details)
Chameleon iPortal	VTLS Inc	The Chameleon iPortal is an enhancement to the Virtua LMS, offering a Z39.50 based OPAC search engine; calendar of events; management/display tool; patron self-registration and updating tool; virtual reference and chat service; thesaurus browse interface; virtual news service integration with moreover.com; ability to maintain several "skins" (A skin is a term used by VTLS to indicate multiple user interfaces that cater to specific user classes); SDI Service; book locator service; ISO ILL Service. [http://www.vtls.com/Corporate/Releases/2001/rr19.shtml]
DigitaLink / iPac	Epixtech	The DigitaLink digital library system was launched in June 2002. DigitaLink can be combined with <i>epixtech's</i> iPac to search across local library collections and subscription databases of third parties (called consolidated searching), it also performs content enrichment.
ENCompass	Endeavor Information Systems Inc	ENCompass is a "complete XML-based solution for integrated end user searching across multiple data types and databases." [http://encompass.endinfosys.com/faq.htm] The stress is on overcoming the problem of having distributed 'silos' of information that have to be searched separately.
iBistro / iLink	SIRSI Ltd	iLink provides 'a gateway to a whole world of expertly organized, library-caliber information and services that can be delivered directly to users.' Features include content enrichment, library information, advanced search techniques, cross searching and personalisation. Content enrichment seems to be a particular strength. The company has a parallel

Product	Supplier	Summary (see Appendix 1 for details)
		product called iBistro for public libraries.
IPort	OCLC/PICA	"iPort allows you to offer an extended library collection, promote a library's services, link to professionally selected resources for additional services, provide an easy and powerful searching interface, provide precise and relevant retrieval from multiple data sources from one search and interface, display integrated results and provide a tailor made interface to your users." [supplier's email May 2002]
MetaLib	Ex Libris (UK) Ltd	"MetaLib is the perfect platform for managing a hybrid library environment, including both the emerging electronic collection with its digital resources and the traditional library with its print resources. MetaLib serves as a gateway to local and remote databases." [http://www.exlibris.co.il/metalib/] "MetaLib/SFX are independent tools that enable the library to configure resources and services without limiting their scope to certain data or service providers. Furthermore, they can be integrated in an existing environment, not forcing the institution to replace any of the currently installed systems." [survey response]
Millennium Access Plus (MAP) Portal	Innovative Interfaces	'Libraries offer a diverse array of information resources—both in electronic and print formats. The challenge for libraries is to provide access to all of these resources in an integrated and user-friendly way. Millennium Access Plus (MAP) meets the challenge ... These resources may include any digital collection such as image databases, archival collections, finding aids, Abstracting and Indexing (A&I) databases, full-text aggregators, and library catalogs.' [http://www.iii.com/html/products/p_map.shtml]
TalisPrism	Talis	The first component of the Talis Information Environment architecture, launched in June 2002, TalisPrism provides integrated searching of local and external databases in different locations and formats, and web access to content including full text, abstracts and tables of contents services. TalisPrism also offers management information on usage, single sign-on and seamless linking services.
xdirectory	Esprit Soutron Partnership Ltd	"xdirectory provides a flexible solution for recording, managing and re-purposing e-resource information in a distributed model. Integration with VLE and MLE products is delivered through the open architecture and the ability to deliver 'persistent' links to target resources." "xdirectory and xflow are both open, independent products focused on creating pathways and other modes of access to e-resources without the need to replace or upgrade established 'legacy' systems."

Product	Supplier	Summary (see Appendix 1 for details)
		[survey responses] Ultra*access is their authentication proxy server.
ZPORTAL	Fretwell-Downing Informatics	<p>'For the user, ZPORTAL provides a personalised, reliable place to begin information discovery or research. Users can see information retrieved from websites, e-journals and library catalogues side by side in a single list, enabling the most useful information to be targeted quickly and effectively. ZPORTAL takes users beyond just references by presenting users with a choice of content delivery methods which include open URL linking to link direct to e-journal subscriptions and ILL/document delivery for physical item delivery. '</p> <p>[http://www.fdggroup.com/fdi/news/latest.html#zportal] Product literature stresses support from discovery to delivery.</p>

Table 2 Selected features comparison of library portals

Key

●=yes - ○=no - ·= not stated note=see below

Feature	Chameleon iPortal	DigitalLink / iPac	ENCompass	iBistro / iLink	iPort	MetaLib	Millennium Access Plus (MAP) Portal	TalisPrism	xdirectory	ZPORTAL
Standards now available										
OAI-PMH	○	○	○	○	●	○	○	○	●	○
LDAP	●	○	●	○	●	●	○	●	●	●
Bath Profile	○	●	○	●	●	●	●	○	●	●
SQL	●	●	●	●	●	○	●	●	●	●
XQuery	○	○	○	○	○	●	○	○	●	○
Integrated ISO ILL	●	●	○	●	○	○	●	○	○	●
Standards planned										
OAI-PMH	●	○	○	●	●	note 1	○	●	●	●
LDAP	●	●	●	●	●	●	●	●	●	●
Bath Profile	●	●	○	●	●	●	●	●	●	●
SQL	●	●	●	●	●	note 1	●	●	●	●
XQuery	○	·	●	●	note 1	●	●	note 19	●	●
ISO ILL	●	●	●	●	●	●	●	2003	○	●
Authentication										
ATHENS	○	○	note 7	note 5	●	note 2	○	note 7	●	●
Kerberos	○	○	note 7	○	○	●	note 7	note 20	●	note 7
Origins										
Developed collaboratively(note 8)	○	note 21	●	○	●	●	○	○	○	●
Other features										
Standalone	○	●	●	●	●	●	●	●	●	●
Target capability	●	●	○	●	●	●	●	●	●	●
Non-web staff client	●	·	●	○	○	○	○	·	○	●
Full statistics	note 5	●	note 14	●	note 7	●	●	●	●	note 10
Tech skills needed	note 17	○	note 13	note 3		note 3	note 3	note 22	note 3	note 3
Modules	note 18	note 24	note 12	note 6	note 15	note 4	note 9	note 23	note 16	note 11
Extras	●	●	●	·	●	●	●	●	●	●
Platform										
Unix	●	●	●	●	●	●	●	●	●	●
Windows	○	●	●	●	○	○	○	○	●	●

Table 2 Notes

- 1 Can be added using extensions
- 2 SFX now, Metalib planned
- 3 existing tech skills, e-publishing, librarianship
- 4 Info Gateway, Universal Gateway, SFX, User module, KnowledgeBase
- 5 work in progress
- 6 iBistro/Ilink, OneSearch, Itablet, Hyperion
- 7 planned
- 8 All products have been developed with customer guidance, but here we refer to products that are outcomes of formal collaborative research projects
- 9 MetaFind, WebBridge, Web Access Management
- 10 separate product EDRM planned for integration in 2003
- 11 Authentication, Seamless search, Linking + complementary products
- 12 Search and discovery, object management, collection management, licensing, linking
- 13 XML/XSL skills recommended
- 14 Comprehensive log used to generate search statistics
- 15 Broker, Multi Protocol Server, Results Optimisation Daemon, Authentication Broker, Admin
- 16 Record shaper, search engine, associations, thesaurus and resource gateways
- 17 Unix, perl, Z3950, XML/HTML, MARC
- 18 search, events, self-registration, virtual ref, thesaurus browse, virtual news, skins, SDI, book locator, ISO ILL
- 19 waiting for standards to mature
- 20 view Kerberos as security technology and do offer security in authentication
- 21 DigitaLink developed with Progressive Technology Federal Systems (PTFS)
- 22 SOAP, XML and Java skills to embed Talis functions into own portals
- 23 metasearch, request workflow, borrower account, Configuration, Business Server with API, Ztarget
- 24 iPac patron interface, DigitaLink import/migration tools, data archive, web editor

4.1 Other products and technologies

See the Glossary under XPath/XML Query/XQuery/XSLT for details of basic XML standards, also see Web Services, SOAP. The three most important other products developed for libraries we identified were solutions to the problems associated with authentication of users (see 4.1.1), linking solutions based on the OpenURL standard for managing links (4.1.2) and third party solutions to managing library ejournal collections (4.1.3)

4.1.1 EZproxy / Onelog from ITS

EZProxy is an application proxy solution to access control that provides a simple way for libraries to manage access to web-based licensed databases to their remote users.

Available at around 500 dollars per server for servers running Linux, Solaris or Windows NT, EZproxy works by the user pointing his browser at an on campus proxy server that fetches the pages from the remote service provider, and rewrites any URLs in the resources to point them back via the proxy. The application proxy is also known as a 'pass through proxy' or 'accelerator' or 'gateway'. The solution can be used in conjunction with LMS. [<http://www.usefulutilities.com/ezproxy/>]

Onelog provides similar functionality. [<http://www.itsltduk.com/onelog.asp>]

4.1.2 OpenURL and open linking

This standard, arising from work on SFX and being developed by NISO Committee AX, will allow users to be connected to the appropriate copy of any chosen web resource by transferring bibliographic or descriptive information about it as metadata and by taking

into account the user's organizational context or starting point. Most major LMS vendors and commercial scholarly content providers support OpenURL as a simple http based standard for LMS developers and target content providers to implement. It has been used for providing dynamic links, for example to local copies of ejournal articles, library catalogue records relating to citations, and large commercial ejournal article services. The SFX server from Ex Libris, for example, is an institutional service component (ISC) that can read an OpenURL as input and take action upon it, checking that the user has suitable permissions to access each relevant resource before enabling links to them.

1Cate and link servers

1Cate is primarily a link server system from Openly Informatics, Inc., similar to SFX or LinkFinderPlus. SFX is related to the MetaLib portal and LinkFinderPlus is related to EnCompass, 1Cate could be added to a portal product and in fact its code and data is used in some portal products. The company also supplies *LinkBatons*, which are user-customizable links that can be placed on any website to enable user preference and to enhance website revenue. These are "links that learn" about the destinations users prefer, 'assisting their navigation to bookstores, shopping robots, and other libraries'.
[<http://my.linkbaton.com/>] [<http://www.openly.com/1cate/>]

LinkOut (PubMed Entrez)

LinkOut allows publishers, aggregators, libraries, biological databases and other Web resources to display links to their sites on items from the PubMed Entrez databases of the US National Library of Medicine. Links to the external resources are listed in the LinkOut Display of an Entrez record. These links can take users to the provider's site (there are 568 of these currently) to obtain details of library holdings, the full-text of articles or related resources, e.g., consumer health information. LinkOut standards are XML based.
[<http://www.ncbi.nlm.nih.gov/entrez/linkout/doc/linkoutoverview.html>]

4.1.3 TDNet / Journal Web Cite / Serials Solutions

TDNet Journal Web Cite and Serials Solutions are similar third party ejournal management services.

TDNet is a electronic journals management system produced by TDNet Ltd, a subsidiary of Teldan Information Systems. The system allows subscribing libraries to offer a customised interface to all the ejournals they subscribe to, both to local and remote users, with article level searching as well as browsing and searching of journal titles. TDNet check and update the integrity of links for the 40,000 ejournals they know of, including free ejournals. They also supply subscribing libraries with suitable bibliographic information for upload to the local library catalogue. Users of the library are directed to the most appropriate copy, authenticated through to the aggregator/publisher site, linked to local holdings where available, and to document delivery services if required. Journals can be searched at the article level. The user can save preferences for alerts of TOCs of particular journals. The library can access statistics of usage at the aggregator, publisher, title and individual user, though not group, level (with an option to export the statistics to excel). It is licensed as an annual subscription. [<http://www.tdnet.com>]

Dorman reported at the January 2002 ALA Midwinter: TDNet has 16 library customers, including the Library of Congress, for its Reference and Reading Room service.
[<http://www.ala.org/alonline/ts/ts302.html>] Oxford University has a service running at [<http://tdnet.bodley.ox.ac.uk/>]. Talis are now distributors of TDNet billing it as part of their Talis Information Environment. 20% discount is available through Talis.

Serials Solutions and Journal Web cite offer a range of comparable ejournal management services. [<http://www.serialssolutions.com/products.asp>, <http://www.journalwebcite.com>]

5 Developments

5.1 Collaborative configuration

There is a risk for early adopters that library portals will become unmanageable and costly to maintain because configuration of individual resources in the system could be time consuming. Configuration would benefit from the sharing of expertise and development work, preferably coordinated by and between libraries and information providers for global benefit. However, this requires that thought is given to how to localise records for a particular institution and how to share the service cost.

From examination of supplier websites, survey returns and reports from users in the UK, there appears still to be a lack of UK localised services to supplement library portal products. Some suppliers do not yet offer any formal services to reduce library configuration efforts and promote resource sharing. This is likely to become a major growth area that should be encouraged by funders, and will need to relate particularly to collection description metadata initiatives.

5.2 Metadata harvesting

Increasingly metadata will be harvested to local systems or intermediaries for efficient searching, instead of spread searching. OAI offers an obvious model of this. In the US particularly there is some evidence at the University of Chicago that the use of OCLC CORC is growing for harvesting metadata and cataloguing electronic resources, although it was not mentioned by suppliers in survey responses. Sophisticated metadata harvesters that are fully integrated with legacy systems and data are some way in the future, since standards are still being developed and integrated, but systems such as CORC and OAI-PMH (already supported by recent JISC development programmes) can already show how distributed systems can speed development.

[<http://www.ala.org/alcts/organization/div/bh/bh62001rr.html>]

5.3 Institution level integration

Institutions will wish to integrate diverse content into single port of call offerings to users: for example, library managed resources will sit alongside course content or registry information in universities' portals (eg Paschoud 2002). A university will say that everything should be accessed through the institutional portal, meaning that the library service must be offered as a resource within it, as a web service. It is likely that wider institutional initiatives will come after libraries develop their own systems.

The demand for institution level integration is evident from wider policy trends. For example SCOUNL suggest that 'the concept of Managed Learning Environments will expedite inter-working of library management and other systems, and the notion of an e-university suggests both collaboration and competition with the private sector.' [Vision 2005, SCOUNL, January 2001, quoted in Teaching and learning infrastructure in higher education, Report to the HEFCE by JM Consulting, Issues Paper, June 2002/31 available at http://www.hefce.ac.uk/Pubs/hefce/2002/02_31.htm] This trend is apparent in the thinking of the JISC Information Environment concept.

Not only will users benefit from integration of content, it will allow collaboration between authors working within different systems. It could enable distributed authoring of metadata relating to learning objects, for example.

Increasingly perhaps many systems offered to the user will in fact be composite systems integrating a number of different systems: not just multiple information sources, but supporting services such as link resolvers, authentication systems etc.

These middleware systems, as agents invisible to the user, work at a fusion layer to connect the user interface of choice and systems holding information. Creating universal connectors is more cost effective in the long term than specifically engineered interfaces between specific systems. (Paragraph paraphrases Paschoud 2002).

5.4 Supply-chain integration

Just as within the institution diverse sources will be integrated into portals, increasingly any final library service to the user will be built out of content assembled on the fly from multiple, third party sources. Thus rather than essentially accessing a single database in the library catalogue, the user will be accessing content from multiple sources eg a link resolution service, several bibliographic record enhancement services, ejournal suppliers etc – but all seen as one catalogue of resources.

The context supplied by JISC for this will be important. For future negotiation of deals with database suppliers, users will want JISC to encourage publishers to open their services to common access protocols. For example, they could be encouraged, during licensing negotiations, to offer collection and service descriptions in standard formats and provide access to a Z39.50 server or to a server with a protocol that can be exploited for cross-searching purposes, such as PubMed's Entrez LinkOut protocol. Products such as the library portals here could provide the means to promote JISC's Content Disclosure and Submission policies, and there could be active links maintained with suppliers to ensure maximum efficiency.

5.5 Digital asset management

In products in the content management market there is a clear distinction between asset management systems (which store digitised material and diverse forms of econtent) and user interface systems (like portals). Asset management systems may serve content to a number of different content platforms, and these are likely to proliferate along with tools for handling specific types of content, such as streaming media.

5.6 Skins

The user interface of portals do not seem yet to be an emphasis of suppliers, as customers may not yet be demanding much standardised sophistication. However, at the 2002 ALA Midwinter exhibition "skins," or "skin technology" were hot topics. Skins take advantage of stylesheet standards to control the font and layout of the content, what graphics and descriptions accompany it, and even whether pieces of the functionality are enabled or pieces of the content are displayed. Deep customisation of library portals will require greater knowledge of interface design by library staff.

While many vendors still work primarily with HTML encoding in their Web-based products, there is a clear trend to embrace XML. [<http://www.ala.org/online/ts/ts302.html>]

5.7 Cross sector working

At the moment it is primarily academic libraries and national libraries that are using library portals. In the future there will be scope for cross sector working, for example with the NHS (where there is increasingly centralised procurement of systems and already a shared user community with HE/FE) and the public library sector (witness Co-East Plus)⁸.

⁸ Co-East Plus is creating an East of England model for regional cross sector networking.[<http://www.co-east.net/projects/plus/>]

6 Assessment

6.1 Core functionality

1. In promotional literature about library portals the two ideas of searching multiple datasets at once and providing a common interface to many datasets are often elided. The latter is beneficial if it is possible to achieve it without loss of critical functionality. It would allow the user to be trained in using one interface, rather than having to master many. The former is probably of value in the important but proscribed range of cases where it is a user requirement to search multiple services at once. It is reasonable to ask whether searching multiple databases is meaningful. Why would one search MEDLINE and the local phone directory in one search?⁹ This implies the need for help or pre-clustering of resources. With this style of searching greater stress is on the user's ability to distinguish between data from different sources, and evaluate it critically. It is highly likely to produce very high recall but low relevance. This may be a familiar experience to users well practiced in using search engines, but it may not be desirable.
2. We can expect publishers to continue to want to maintain a proprietary look and feel to using their data, to protect their search interfaces. Furthermore as those publishers develop more and more sophisticated front ends, eg with taxonomic support, common interfaces will continue to be less effective tools than the publisher's or aggregators. The real weakness of cross searching multiple datasets in one go is the weakness of taxonomic support. Indeed there are fundamental conceptual problems with ever being able to do this, across subject domains. However for the relatively unskilled searcher being able to search multiple resources in a relatively simple way is likely to encourage use of library subscribed to resources. The effort of making such searches as meaningful as possible should lie with the library and its systems.
3. Search sets from multiple remote systems are likely to be complex, however presented. No system can by itself completely solve these problems.
4. Portals of all kinds will need to interoperate with a growing range of protocols and exchange standards, so the rate of adoption by suppliers of standards will become increasingly important. This applies both to types of metadata standard and to the proliferating array of media types. There are a large number of competing standards and standards themselves evolve. This presents a moving target which has inhibited the development of the systems. None of the systems we had returns from yet supported all the relevant search protocols. In some cases the plans to support key new standards (OAIMPH for example) seemed remarkably vague, suggesting a weakness in development resources or lack of awareness of emerging user needs or a lack of coherent voice from the library community for the demand. In some areas appropriate standards do not exist or are still being formed, eg in the area of academic user namespace (eduperson) or representation of licences or are in development such as the openURL.
5. Most of these systems rely heavily on Z39.50, but there are a number of known problems with the quality of search results from Z39.50. For example the evidence

⁹ At the Digital Libraries 99 conference, a report was discussed from Rutgers University which compared two interfaces to information services: HERMES, where any database could be searched from one common interface and HERA, where multiple databases could be searched from one integrated interface. A sample of 28 users was used and 29% preferred HERA whilst 64% preferred HERMES, with 7% preferring both equally. JISC 4/99 call. http://www.jisc.ac.uk/pub99/c04_99.html para 46.

seems to be that Z servers are not well maintained. Cross searching will not work well if the data in the target system is poor or inconsistent. Serial holdings are catalogued differently in different suppliers' systems. Searches are often slow. In the medium term a lot of these problems are likely to be ameliorated as open architectures become more and more the norm. The value of consistency and standards is becoming more and more apparent, creating the need to improve data quality.

6. The level of integration achieved with Z39.50 is less fundamental than that achieved through web services. The latter look more like the way of the future.
7. Some of the systems rely on DC as a lingua franca. There is a question mark about whether this is a rich enough metadata set to support all sorts of searching.
8. Some of the authentication functions of these products may be supplied by Athens Single Sign On or Sparta.
9. We asked suppliers to say what new skills the librarian might need to effectively operate the new system. While most did not foresee any major impact, some seemed to require a knowledge of XML, others of scripting in php. Many ARL institutions seem to be developing their own solutions, implying that they have better access to technical skills than many UK academic libraries. It will take time for suppliers to adjust product design to meet the typical skill sets available in UK academic libraries.
10. Whereas ZPortal stresses cross searching, and supporting the whole process from resource discovery to delivery, iBistro and MAP stress enhancement of bibliographic data. The ambitions of the products vary.
11. There is evidence of the suppliers looking at developing their systems to deliver services within VLEs, though several were cagey about their precise plans; and more surprisingly others did not consider it was an issue. Endeavor Information Systems announced in June 2002 the development of an interface between the ENCompass system the Blackboard Learning System. This allows users to search ENCompass from within a Blackboard page and get the results back inside blackboard. FDI stresses its leading edge support for searching across educational metadata.
12. Esprit Soutron's toolkit of products for an information portal and for document management, workflow, authentication is the most modular of the systems available, and suitable for quick, flexible, bespoke solutions to local problems and a wide range of applications. Although other systems are offered standalone, it is the suppliers' expectation that most sales will be to libraries using their own system.

6.2 System features

13. Several of the systems are only offered for a limited range of basic platforms, such as a few flavours of unix.
14. How far these systems are truly capable of interacting with library systems other than those sold by that particular vendor is not yet clear. It seems to us possibly significant that despite having been involved in developing Agora with FDI, UEA have bought Metalib to go with their Aleph library system. This could reflect the fact that though the portal products may be based on standards where they exist, this is less true of library systems themselves and that the benefits of buying a portal from your LMS supplier are potentially great. Having said this, ExLibris have an impressive list of sales of Metalib bought by libraries who do not use Aleph as their library system. Existing penetration of the academic library market may be an issue if sales are tied to LMS sales. Suppliers without a large existing academic user base not surprisingly place the most stress on the entire system being open.

They are also more likely to have demonstration sites using other core library systems.

6.3 Personalisation and customisation

15. It has been pointed out many times that portals are proliferating. MacColl (2002), for example, suggests that multiple, fluid, personal portals may be demanded by users, meaning that libraries and even their parent institutions may have to optimise their services for 'plumbing' into these, promoting themselves effectively to ensure that they survive.
16. User interfaces need to be professional to survive, but may be short-lived anyway. Hidden middleware able to save individual effort is more likely to have a long future than systems that need costly frequent graphic design exercises and redesigns.
17. Library portals may themselves provide some of these personalised services, but in the long-term are likely only provide services relevant to information management, leaving others to deliver added institutional, pedagogical or commercial value.

6.4 Management of resources

18. Basic settings for target resources change, creating an unknown level of workload of configuration for library staff.
19. Since these products are so new the publishers and data providers have not yet understood the implications for them.
20. System suppliers may see setting up and maintaining this data as a revenue source. This would have advantages to the individual library, compared with having to have technical expertise in-house, but would create a lack of flexibility in adding new resources. Co-operative library work in this area would be preferable. OCLC appears to be thinking along these lines¹⁰ as does Ebsco¹¹. Publishers could also supply configuration data for each of their customers if the standards existed.
21. Due to the lack of standards in usage statistics providing meaningful consolidated usage information is problematic¹². There is not yet agreement about terminology in which statistics are reported or format of reports. Furthermore the library portal can only supply part of the story eg who logged on and searched which datasets for how long. It may not be possible to discover the number of downloads, reasons for turnaways etc.

6.5 Reputation of suppliers

22. While in several cases development of the product was based on working with academic library partners (Endeavor) or through funded projects with library partners (OCLC, FDI) or through close integration of customers with the ownership of the system (Talis) in other cases there was little evidence of consultation with libraries or users about development or awareness of the UK hybrid library research as such.

¹⁰ Extending the cooperative: a summary of OCLC's global strategy. [<http://www.oclc.org/strategy/>]

¹¹ Ebsco Information Services announced a new ejournals service from mid July 2002. [<http://www-uk.ebsco.com/home/whatsnew/press.asp>]

¹² Project COUNTER is addressing this. [<http://www.projectCounter.org>]

23. Several of the systems have been developed by US companies, with a consequent potential for neglect of the local requirements of UK HE/FE. The most obvious result of this is low support for Athens. It seems to us that the rapid changes in UK HE/FE authentication practice, with the evolution of Athens and Sparta will be only slowly adopted by these systems. FDE are notably better at speaking the familiar language of the hybrid library / MODELS than the other vendors; and are on message with the UK HE agenda. Another interesting pattern of development is for companies to seek strategic alliances. This is a general trend in the software industry and may be partly a function of responding to consortial purchasing, but is primarily linked to the rapid change in core technologies. A common link up is between system suppliers and non-exclusive deals with suppliers of content such as record enhancement data. Another paradigm is suggested by the fact that the core of the Talis Information Environment, is their open architecture is their own product PRISM, but the second tool to be added is the third party service TDNet. This could be a step forward towards completely modular systems where libraries can pick and choose systems and content suppliers within an open architecture.
24. Major sales in summer 2002 by FDi to several ARL member institutions and of SFX (but not Metalib as such) by Ex Libris to the California State University system make them market leaders.

6.6 Cost and licensing models

25. The base cost of the systems is high, although like most software systems the cost to the supplier of one more sale is close to zero there is great scope for discounting. Suppliers are likely to try to introduce more add-on modules and ongoing subscription based services to supplement the basic portal products.
26. There are diverse licensing models, some of which are probably not 'fair' to all potential licensors: charging basis can include number of staff users, number of simultaneous users, size of database, the 'size' of the library, a simple one-off fee with annual maintenance, none as part of a purchase of the core LMS. The cost of support, training, continuing administration of resource profiles, the supply of data will also be high, and might be the area that the suppliers see as the most profitable. It is significant that Innovative configure target resources for libraries, a library interface to the system is only now being designed.

6.7 Conclusions and Recommendations

6.7.1 Conclusions

Commercial library portal systems could be effective for improving access to learning resources, e-collection building, and for services delivery and integration. Only a few academic libraries in the UK have adopted them so far.

Offering a customised information environment, with integrated support is highly desirable. The library portal systems offer this.

Having emerged rapidly in the last two to three years, not surprisingly the current range of products cannot be regarded as mature. Although our administrator scenario of use is deliberately forward looking, it describes the level and type of functionality required, but it still feels futuristic.

Currently the products can offer something approaching the experience described in our user scenario, but given the base cost of the products the ROI may not be perceived to be sufficient. Certainly in these early stages of use the administrative load of configuring

services and liaising with baffled publishers may be quite great. A lot depends on how vital the library sees resource integration, and how successful each library has been in adopting or developing one of the range of alternative solutions referred to in 2.4 above. Vendors will no doubt offer very favourable terms to pioneers of use.

For users researching in a relatively narrow field it is highly likely that publisher's proprietary front end may be preferred, and it is reasonable for libraries to focus on training users to make the best use of the sophisticated taxonomic tools that are provided for searching. In a limited set of cases rather fuzzy spread searching of a pre-prepared cluster of resources has a value.

Authentication is a somewhat grey area, given uncertainty about the timescales of development for JISC's own authentication strategy. But few academic libraries are likely to consider opting for a system that does not fully supply Athens now, at least if where remote access is a key issue. This rules out some of the products.

Interoperation with other systems such as local LMS, VLEs and University portals is critical. However, the effects of implementing the distributed model of networked service provision are not yet fully understood.

For any UK HE institution it is essential that any system is capable of interacting with the JISC information environment, ie that it is compliant with the appropriate standards.

The implementation of some non library-based institutional portal products may result temporarily in the development of more easily managed local systems on campuses, in government and large enterprises. But it may also increase central control by institutions, and there is a risk that research and teaching materials will be less often shared than has hitherto been the case. It is important for learning that information professionals to implement advanced systems to ensure that the risks are minimised. Libraries cannot expect to control the average student or staff desktop, but they can provide good models for institutional and departmental portal management and quality assured content for everyone.

Although most of the suppliers of library portals felt that library staff needed no new skills to operate their portal systems, the proliferation of electronic systems and the speed of technical change mean that there is a growing need to spread fundamental technical and web skills further through library staff.

Librarians will need to continue to monitor the market place for portal products, considering their own needs, the adequacy of the existing solutions they are using and local institutional developments (eg plans for local portals); taking also into account JISC's IE plans and technology trends, such as the rise of web services. Whether they buy now or continue monitoring the marketplace is likely to be a function of the adequacy of their existing solution, who their LMS supplier is, how well off they are, how critical the extra functionality offered by library portals is considered to be and the strength of staff in technical areas. The development of portal solutions will increasingly influence choice of LMS, giving the edge to market leaders. The complexity of the choice however may discourage early decisions, especially independent of the need to buy a new LMS. JISC can have a major impact by taking a lead in encouraging cooperative evaluation and purchasing, and most of the recommendations below refer to how JISC could offer leadership to the academic library community.

6.7.2 Recommendations

- a.** JISC could support a survey and evaluation of all current solutions in use in academic (and other) libraries to manage resources with a view to sharing useful practice.
- b.** The survey should also encompass solutions in use or being developed in other sectors such as national libraries, law and commercial libraries.

- c.** Library cooperation in further clarifying community needs from library portal systems should be fostered.
- d.** JISC should support the creation of a mechanism or forum for sharing detailed evaluations of library portal products between libraries. Because these are sophisticated complex products the library community needs to continue to develop experience and understanding of the technical and standards issues. At the same time the needs of different academic libraries may not be greatly different.
- e.** JISC could support or encourage the forum described in d. to develop a model Request For Proposals.
- f.** JISC could support the creation of a test facility to trial the different solutions in a variety of situations. The nature of the underlying technology such as web services makes such an online test system feasible.
- g.** There should be cooperative pressure to influence development paths of the developers, eg through JCAS and DNER/JISC Information Environment in relation to current and future likely authentication solutions.
- h.** Pressure needs to be brought to bear on all LMS vendors to open up their systems to the needs of these products. This might best be done through development and promotion of common, shared terminology to describe features, functions and applications for library portal systems.
- i.** JISC could support cooperative purchasing. Given the cost of such systems central or cooperative licence would be of value.
- j.** An aspect of h. could be the creation of briefing papers for data service providers to help them understand what they have to do and what data they have to supply to smooth the operation of portal solutions.
- k.** JISC should open up a dialogue with parallel work by libraries in Europe and the United States, eg participants in the Scholars Portal Project through the Portal Applications Working Group.
- l.** JISC should support or encourage more direct research on the relation between such systems and VLEs and institutional portals.
- m.** At the institutional level there is a need to rethink information strategies to plan for increasingly integrated systems.
- n.** There needs to be forward thinking about possible changes to the librarian's skill set.

7 Glossary

.Net	Microsoft's approach to delivering web services , in competition with Sun's J2EE .
Agora	an eLib project that developed a specification and prototype for a system for "mixed-media information management, based on an open standards-based platform". Fretwell-Downing were the development partner. [http://hosted.ukoln.ac.uk/agora/]
Angel	DNER development programme project to develop "middleware services to integrate 'open' library resources into 'closed' online learning environments and courseware portals, providing solutions to problems that are currently obstructing the fluent and free use of the full available information landscape by course instructors and learning technologists". A testbed for Sparta [http://www.angel.ac.uk/]
Athens	Eduserv service delivering "authentication, authorisation and distributed user administration services to UK" HE/FE. [http://www.athens.ac.uk/]
Bath Profile	"an ISO Internationally Registered Profile (IRP) of the Z39.50 Information Retrieval Protocol, intended as a basis for effective interoperability between library and cross-domain applications. Conformance to this Profile's specifications will improve international or extra-national search and retrieval among library catalogues, union catalogues, and other electronic resource discovery services worldwide", [http://www.ukoln.ac.uk/interop-focus/bath/]
Candle	A European Commission funded project to design an access management system for electronic journals and other e-resources, with simplified access for users, off campus access to resources, easy password administration, subscription management and detailed usage statistics. [http://litc.sbu.ac.uk/candle/]
Consortium for Interchange of Museum Information (CIMI)	Standard for the representation and communication of Museum item descriptions [http://www.cimi.org/]
CrossRef	CrossRef is an organization of publishers that offers a collaborative reference linking service allowing researchers access to journal articles by using digital object identifiers (DOI's) to uniquely identify them. To date, there are 128 publishers participating in CrossRef, accounting for over 6,520 journals with over 5 million article records in the database. CrossRef plans to incorporate other reference content such as encyclopedias, textbooks, conference proceedings, and other relevant literature. [http://www.crossref.org/]. Endeavor formed an alliance with-CrossRef in June 2002 to integrate digital object identifiers and CrossRef linking using the LinkFinderPlus product

Decomate	EC project to develop an "end-user service which provides access to heterogeneous information resources distributed over different libraries in Europe using a uniform interface, leading to a working demonstrator of the European Digital Library for Economics", [http://www.bib.uab.es/decomat2], OCLC's iPort is based on Decomate ideas.
Dublin Core (DC)	"Dublin Core metadata is used to supplement existing methods for searching and indexing Web-based metadata." "The Dublin Core Metadata Initiative (DCMI) is an organization dedicated to fostering the widespread adoption of interoperable metadata standards and promoting the development of specialized metadata vocabularies for describing resources to enable more intelligent resource discovery systems." [http://dublincore.org/]
ELib	the UK JISC funded electronic library programme whose third phase funded research into the hybrid library.
Encoded Archival Description (EAD)	A standard for encoding archival finding aids using the Standard Generalized Markup Language (SGML). 'A nonproprietary encoding standard for machine-readable finding aids such as inventories, registers, indexes, and other documents created by archives, libraries, museums, and manuscript repositories to support the use of their holdings'. [http://www.loc.gov/ead/]
Headline	eLib project "to design and implement a working model of the hybrid library" closely associated with Decomate [http://www.headline.ac.uk/]
Hybrid library	the elib concept of a library "where 'new' electronic information resources and 'traditional' hardcopy resources co-exist and are brought together in an integrated information service, accessed via electronic gateways available both on-site, like a traditional library, and remotely via the Internet or local computer networks". [http://hylife.unn.ac.uk/toolkit/The_hybrid_library.html]
ISO ILL	The ILL protocol is an open international standard for Interlibrary Loan (ILL). It supports automated ILL messaging in a heterogeneous computer environment. [http://www.nlc-bnc.ca/iso/ill/]

JISC Information Environment	<p>JISC's concept of secure and convenient access to a comprehensive collection of scholarly and educational material.</p> <p>Fit to serve all sorts of digital content.</p> <p>Fully supporting the submission and sharing of research and learning objects, providing a range of meaningful, rich and innovative methods of accessing electronic materials, to enrich and develop the learning and research process.</p> <p>A collaborative landscape of service providers who work together to seamlessly cater for the needs of the community on a national basis.</p> <p>Underpinned by real world interoperability, based upon a common standards framework and common semantic for digital resource description and access. [http://www.jisc.ac.uk/dner/development/IEstrategy.html, also see UKOLN JISC IE Architecture Web pages, http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/]</p>
Java 2 Enterprise Edition (J2EE)	<p>Sun's approach to delivering web services, in competition with Microsoft's .Net.</p>
Kerberos	<p>A network authentication protocol that is designed to provide strong authentication for client/server applications by using secret-key cryptography (as opposed to public key cryptography, which is probably more scalable). Kerberos is available in both free software and many commercial products.</p>
Lightweight Directory Access Protocol (LDAP)	<p>A protocol for accessing online directory services, for example of people, library addresses or library service definitions. It is a cut down version of X.500. OpenLDAP is an Open Source LDAP suite developed by the Internet community. [http://www.openldap.org/]</p>
Library Management System (LMS)	<p>Highly complex systems for managing data about users and bibliographic data, with typical core functionality of a public access catalogue (OPAC), acquisitions and budget management, cataloguing, circulation and reporting.</p>
Local portal	<p>JISC term for 'hybrid library developments, allowing tailored access to a selection of datasets of importance to an institution, plus integration with other locally licensed datasets and local products'. [http://www.jisc.ac.uk/pub99/dner_desc.html]</p>
MAchine-Readable Cataloging (MARC)	<p>The MARC formats are standards for the representation and communication of bibliographic and related information in machine-readable form. Main such standard used for the last thirty years by libraries as the basis for their catalogues. [http://www.loc.gov/marc/]</p>

Managed Learning Environment (MLE)	A software product that supports educational activities which are normally associated with the learning experience. In this respect 'MLE Applications' will offer functions to support pedagogy, the management of learning materials, student administration and a communications environment. The may also be able to interact with other systems and services. [adapted from http://www.angel.ac.uk/public-files/html/doc004.htm]
Models information architecture MIA	A layered logical framework developed within UK higher education for discussing the requirements for a hybrid library network, that indicates where interoperability standards may be required [http://www.ukoln.ac.uk/dlis/models/requirements/arch/]
OAI-PMH	the Open Archives Initiative's protocol for metadata harvesting [http://www.openarchives.org/]
Open Linking	A NISO supported concept for using OpenURLs and link resolvers to select and present hyperlinks to appropriate related information resources independent of the original information resource. [http://library.caltech.edu/openurl/Presentations.htm]
OpenURL	A metadata transportation format, standardizing the syntax but not the content search queries, planned for NISO trial late 2002
Portal	'network service that provides access to a range of heterogeneous network services, local and remote, structured and unstructured. Such network services might typically include resource discovery services, email access and online discussion fora. Portals are aimed at human end-users using common Web 'standards' such as HTTP, HTML, Java and JavaScript'. [http://www.ariadne.ac.uk/issue30/portal/]
Pride	A European Commission funded project "to build components for an infrastructure to sustain access management and interoperability in a global distributed information services environment". [http://www.viscount.org.uk:8000/pride/]
Resolver	In the context of the JISC Information Environment , "a network service that takes metadata about a resource and supplies pointers to services on, or related to, that resource, for example delivery services. In the context of the JISC IE, metadata is passed to the resolver using an OpenURL ." [http://www.ukoln.ac.uk/distributed-systems/dner/arch/glossary/]
Angel Resource Manager (RM)	A tool for libraries to manage their diverse collections of electronic and non-electronic materials; a database describing each collection with details including standard RSLP Collection Level Descriptions, but also 1. metadata about the access management of the collection (both rules and the technical means of getting access control) and 2. meta-meta-data about how the resource is catalogued and organised, using which schemas and protocols and how items in it can be searched and retrieved. [paraphrase of Paschoud 2002, an earlier model of the concept is more fully described at http://www.ariadne.ac.uk/issue27/paschoud/]
Simple Object Access Protocol (SOAP)	'SOAP provides a simple and lightweight mechanism for exchanging structured and typed information between peers in a decentralized, distributed environment using XML.' It is an XML-based protocol to allow you to activate an application or object within an application across the Internet. It would be the basis of a web service . [http://www.w3.org/TR/SOAP/]

SFX	'SFX permits context-sensitive linking between web-based resources; whereby the target of a link depends on the digital library collection of the institution to which the user who requested the link is affiliated... SFX allows the librarian to define the library's electronic collection, including both licensed and freely available resources; and to determine the manner in which the component resources can be linked to best suit the library's users.' [http://www.sfxit.com/]
Sparta	JCAS' specification of a second generation access management system for UK HE/FE. [http://www.jisc.ac.uk/jcas/]
Structured Query Language (SQL)	SQL is the language used to access the data and structures within a relational database.
Universal Discovery Description and Integration (UDDI)	A way of registering web services . See http://www.uddi.org
Text Encoding Initiative (TEI)	'an international and interdisciplinary standard that helps libraries, museums, publishers, and individual scholars represent all kinds of literary and linguistic texts for online research and teaching, using an encoding scheme that is maximally expressive and minimally obsolescent'. [http://www.tei-c.org/]
Virtual Learning Environment (VLE)	"web-based toolkits that facilitate learning through provision and integration of online teaching and learning materials and tools. These materials and tools usually consist of most or all of the following: facilities for electronic communication between teachers and students, such as discussion lists, bulletin boards and chat rooms; facilities for group work online; online learning materials; links to remote resources; course timetables and reading lists; online assessment tools; and an administrative area, including a log-in access function". [http://inspiral.cdrl.strath.ac.uk/about/vlemle.html]

Web services	<p>The term 'web services' has a specific meaning, it does not just refer to an information service on the web say. They are interfaces for communication between two applications, using XML. In the same way that programmatic interfaces are available via HTML forms, programs are now able to call on each other by exchanging XML data through an interface, e.g. by using SOAP Version 1.2, the XML-based protocol produced by the XML Protocol Working Group.</p> <p>XML is the standard language used by a Web service. A Web service will receive XML and send the output back as XML. The specification provides rigour, structure and a standard for importing information from location to location.</p> <p>"The power of Web services, apart from their great interoperability and extensibility thanks to the use of XML, is that they can then be combined in order to achieve more complex operations. Several programs providing simple services can interact in order to permit complex operations." [http://www.w3.org/2002/ws/]</p> <p>[http://www.ariadne.ac.uk/issue29/gardner/]</p>
Web Services Description Language (WSDL)	An XML formal markup language to describe web services .
XPath XML Query XQuery XSLT	<p>XPath is a language developed by the World Wide Web Consortium (W3C) for addressing parts of an XML document. It is designed to be embedded in a host language such as XSLT 2.0 (part of the XSL language for transforming XML documents) or XQuery (for querying them). XPath 2.0 (released 30 April 2002) is more powerful, as an expression language for processing sequences, with built-in support for querying XML documents, and including greater support for data types such as dates.</p> <p>The XML Query working group of W3C has been working with XPath developers to try "to provide flexible query facilities to extract data from real and virtual documents on the Web, therefore finally providing the needed interaction between the web world and the database world. Ultimately, collections of XML files will be accessed like databases". Their XQuery 1.0 specification includes XPath 2.0 and provides additional query features not required by XSLT. [http://www.w3c.org/XML/Query]</p>
Z39.50	Z39.50 refers to the International Standard, ISO 23950: "Information Retrieval (Z39.50): Application Service Definition and Protocol Specification", and to ANSI/NISO Z39.50. The standard specifies a client/server-based protocol for searching and retrieving information from remote databases. The Library of Congress is the Maintenance Agency and Registration Authority for both standards, which are technically identical (though with minor editorial differences). [http://www.loc.gov/z3950/agency/]

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8.2 Web sites

Product	Type	Web Address
Chameleon iPortal	Supplier: Product: Demo:	http://www.vtls.com/index.shtml http://www.vtls.com/Products/gateway/ http://hermes.vtls.com:8000/cgi-bin/gw_40_2/chameleon
DigitaLink / iPac	Supplier: Product: Demo:	http://www.epixtech.com http://www.epixtech.com/products/ipac.asp http://www.epixtech.com/streaming/ipac/demo.asp
ENCompass	Supplier: Product: Demo:	http://www.endinfosys.com/ http://encompass.endinfosys.com/
iLink	Supplier: Product: Demo:	http://www.sirsi.com/ http://www.infobistro.com/ http://www.sirsi.com/Sirsiproducts/elibdemos.html
iPort	Supplier: Product: Demo:	http://oclc-pica.org/?id=2&ln=uk http://www.pica.nl/en/news/iport.shtml http://192.87.104.20:5110/iport?language=eng
MAP	Supplier: Product: Demo:	http://www.iii.com/ http://www.iii.com/html/products/p_map.shtml

Metalib	Supplier:	http://www.aleph.co.il/
	Product:	http://www.aleph.co.il/metalib/index.html , http://www.sfxit.com/
	Demo:	
TalisPrism	Supplier:	http://www.talis.com/
	Product:	http://www.talis.com/pressrele/talisprism.htm
	Demo:	
XDirectory	Supplier:	http://www.espritsoutronpartnership.com/
	Product:	http://www.espritsoutronpartnership.com/products/xdirectory/index.asp
	Demo:	
ZPORTAL	Supplier:	http://www.fdggroup.com/fdi/
	Product:	http://www.fdggroup.com/fdi/zportal/about.html
	Demo:	

8.3 Projects

See glossary under Agora, Angel, Candle, Decomate, Headline, Pride.

9 Appendix 1: Product details

The product information here is intended to supplement information in the main body of the report and is intended to reflect what suppliers say about their own products. Details have been taken by the researchers from supplier answers to the survey, supplemented by other sources where possible, including web sites, product literatures and personal contacts.

Please note that where no information was available to the researchers under a particular product section heading, we have omitted the section to save space.

9.1 Chameleon iPortal

Brief description: The Chameleon iPortal is an enhancement to the Virtua LMS, offering a Z39.50 based OPAC search engine; calendar of events; management/display tool; patron self-registration and updating tool; virtual reference and chat service; thesaurus browse interface; virtual news service integration with moreover.com; ability to maintain several "skins" (A skin is a term used by VTLS to indicate multiple user interfaces that cater to specific user classes); SDI Service; book locator service; ISO ILL Service

Supplier: VTLS Inc.

UK address: Aly Badr, Manager, European Operations

Pau Claris, 162-164, 8o 2a, 08037 Barcelona, Spain

Tel: 34 3 487 19 87

Email: chachrav@vtls.com

Tel/Fax: 540 557 1200/ Fax: 540 557 1210

UK customers: unknown to the researchers

World wide customers: 34 systems, based on Virtua, Release 40 installations

Standalone product status: Optional module to enhance use of the company's Virtua LMS

Licence model:

Simultaneous User Pricing (Minimum of 8 Users to maximum of >2056)

License Level Pricing (Levels go from 1 through 12)

Product development path: The idea originated internally. VTLS developers using advice from customers and internal designers developed the major components of the Chameleon iPortal software. Feature were added in stages. The Web Gateway, migrated to the Chameleon Gateway, then digital content was added and finally, the Chameleon iPortal. There are no formal development partners, but development specifications were modified to meet the requirements of NDLTD (Networked Digital Library for Theses and Dissertations) and AMICO (Art Museum Image Consortium)

Standards: A range of distributed search protocols are supported, including various LDAP, SQL, Z39.50 and ISO ILL (via Virtua). The Bath Profile is partially supported now, with full support planned for December 2002. Future support for OAIPMH is planned, but there are no plans to support XQuery. iPortal does not support Athens or Kerberos authentication and there are no plans to do so.

Claimed benefits over rivals: Skin technology; based on Z39.50 protocol; support of drop-in and pull-out components; layered software; image navigation software (see AMICO database)

Features: Complete integration with Virtua; SDI capability; thesaurus capability; book locator service and extended MARC service. Related to the iPortal, VTLS offers a full hosting service that allows libraries to take advantage of our IT experience. VTLS also provide scanning services, digital library services, and graphic design and custom development services. There is a basic statistics package available. The development of a more comprehensive integrated statistics gathering/reporting tool is currently underway.

Platforms: Unix platforms:

- 1) Intel Pentium, Red Hat Linux 7.2
 - 2) Sun UltraSparc, Solaris 8
 - 3) PowerPC 604, AIX 4.3.3
 - 4) DEC Alpha, Tru64 UNIX 5.1
 - 5) PA RISC 1.1, HP-UX 11.00
- All platforms support the Oracle 8 RDBMS.

9.2 DigitaLink and iPac 2.0

Brief description: The DigitaLink digital library system was launched in June 2002. DigitaLink can be combined with epixtech's iPac to search across local library collections and subscription databases of third parties.

Supplier: epixtech Inc.

UK address:

The Chequers
St Mary's Way
Chesham
Buckinghamshire
HP5 1LL

Email: sales@epixtech.co.uk
Tel/Fax: (44) 1494 777 666

UK customers: launched June 2002

World wide customers: launched June 2002

Licence model: "iPac is site licensed through a one-time fee and an ongoing annual maintenance fee. DigitaLink is available either as a one-time site license with ongoing annual maintenance fee or as a subscription that includes maintenance. Both are licensed based on system size as determined by the number of concurrent users, collection size, and material type and then set up as a site license with support for remote users"

Product development path: "epixtech, formerly Ameritech Library Services, was the first library systems company to introduce web-based access to a library's catalogue and coined the term "WebPAC" in the early 1990's. iPac is the result of a natural evolution of WebPAC from HTML and Java-based searching to an XML portal environment in response to the evolving technology landscape and the needs of libraries. iPac was developed entirely and exclusively by epixtech. DigitaLink has been developed in conjunction with PTFS who has been providing digital library systems and digitisation since 1995."

Standards: XML, http, no support is planned for ATHENS

Claimed benefits over rivals: "epixtech delivers the only end to end solution to help libraries create, manage, search and retrieve digital materials. iPac is a highly customisable interface that provides patrons with a single interface to search all of a library's resources"

Features: "As another part of the DigitalLink offering, digitisation services will be available on a service bureau basis. This includes the ability to digitise microfiche and microfilm, rare and fragile books and manuscripts, as well as other items that are difficult to digitise. Sophisticated document touch-up and OCR cleanup is also available as part of these services"

Wizards: iPac Admin tools have wizards that enable you to modify the fonts, logos, text, search options, and other aspects of the display screens

Platforms: Unix on Solaris, with Oracle 9i or Windows 2000. AIX in development.

9.3 ENCompass (v2.0) and LinkFinderPlus.

Brief description: "ENCompass is a complete XML-based solution for integrated end user searching across multiple data types and databases."

<http://encompass.endinfosys.com/faq.htm>

Seeks to solve the problem of one search across multiplying silos of information.

Supplier: Endeavor Information Systems Inc, owned by Elsevier the STM publisher.

UK address:

Endeavor Information Systems Inc
84 Theobald's Road
London WC1X 8RR
United Kingdom

Email: info.europe@endinfosys.com

Tel/Fax: +44 (0)20 7611 4500 (Voice)
+44 (0)20 7611 4501 (Fax)

UK customers: 0

World wide customers: 24 (at 5/15/02)

Standalone product status: Stand alone system

Licence model: Pricing is based on the library size. Each system is a one-time purchase with a moderate annual maintenance fee.

Product development path: Developed with Cornell, Getty Research Institute, Kansas State University, University of Pennsylvania as development partners. Launched March 2001. Second and current release is 1.1 Now split into three products, one focussing on integrating external content, one on internal content (digitised material). Since 2000, vendor development partners for ENCompass have included Openly Informatics, Syndetic Solutions, Elsevier Science, CrossRef and Blackboard.

Standards: DC, EAD, TEI Lite, http, ATHENS planned at an unspecified date.

Claimed benefits over rivals: "If a library happens to use the Voyager integrated library management system in addition to ENCompass, the Voyager patron database can be used to authenticate end-users. Data from the Voyager database can be used to pre-populate several of the functions in ENCompass." "ENCompass provides an framework that is designed to incorporate a wide range of searching and metadata types. This is reflected in the multi-protocol search access that ENCompass supports. It is the only product to provide access via Z39.50, HTTP, and XML gateways. This flexibility extends to the user interface by using XML/XSL style sheets to generate the public interface. The library has complete control over the style sheets for an unprecedented customization opportunities. ENCompass also provides flexibility for creating local collections by allowing the library to defined the metadata supported for each local repository."

Features: LinkFinderPlus was designed for quick implementation of an OpenURL resolver, with a large knowledge base (11,000 resources).

Wizards: for limited functions

Platforms: Unix on Solaris, with Oracle 9i or Windows 2000. AIX in development.

9.4 ILink

Brief description: 'a gateway to a whole world of expertly organized, library-caliber information and services that can be delivered directly to users.'

(parallel product called iBistro for public libraries). Hyperion is dedicated digital image managing software.

Supplier: SIRSI Limited

UK address:

Sirsi Limited

Unicorn House

Station Close

Potters bar

Herts EN6 3JW

Email: sales@sirsi.co.uk

Tel/Fax: 01707 858000 Fax: 01707 858111

World wide customers: 75 (preponderantly US public libraries)

Standalone product status: Integrated with SIRSI LMS.

Licence model: size of database / number of users

Product development path: "Building on from SIRSI's tradition of focussing on end-user needs" SIRSI are developing OneSearch and iTablet.

Standards: Bath profile, ISO ILL and SQL are supported now. Others including ATHENS are planned for 2002/2003.

Claimed benefits over rivals: "The degree of integration and ease of use. This includes both ease of use for end users and ease of administration and maintenance for library staff."

Features: SIRSI are particularly strong in 'content enrichment', having deals with a large number of book reviews, TOCs, cover images etc. They have also done a lot of work to make the initial interface and result screens more exciting and informative with favourite titles, or classifying returns by subject terms associated with hits. Used with imagination these could be useful. Cross searching functionality is confined however to Z39.50 searches. More developed for public library sector as iBistro.

Platforms: all versions of UNIX and Windows NT/2000

9.5 iPort

Brief description: iPort is a highly configurable, translatable, standalone portal product developed in Europe by and for academic libraries, based on current standards such as XML and HTTP, and supporting ATHENS authentication.

Supplier: OCLC/PICA. It is currently available across Europe.

UK address:

OCLC PICA
7th Floor Tricorn House
51-53, Hagley Road
Edgbaston
Birmingham
B16 8TP

Email: europe@oclc.org

Tel/Fax: 0121 456 4656

UK customers: 0

World wide customers: 5 (European academic libraries)

Standalone product status: Standalone service

Licence model: Three-year licence to use the service, with automatic annual renewal

Product development path: based on Decomate II software, developed by Tilburg, Universita Autonoma de Barcelona and LSE.

Standards: OAIPMH, LDAP, Bath Profile, SQL, ATHENS. ISO ILL planned.

Claimed benefits over rivals:

Rather than being bundled with other components in a LMS iPort is a standalone product with a modern modular architecture, adhering to current standards such as XML and HTTP. This modularity enables new protocols, and data formats in particular, to be integrated quickly.

High degree of parameterisation with high use parameters included in a simple web interface via the Admin module. For site tailoring and adding new formats and displays, the SiteBuilder is readily accessed by trained library staff. Therefore the level of tailoring possible on site is impressive.

Linking. iPort can link to external resources such as abstracts, full text, reviews etc. using embedded or dynamically created links. A database of rules for the creation of dynamic links is supplied and can be easily extended.

The iPort interface is easily translated to different languages using its XML based lexicon. English Dutch, Spanish, and Catalan are already available and other languages can be added quickly and easily.

Ongoing development. iPort is backed by a permanent team that is also supplemented by university based research from Tilburg University. Current development is being focused on intuitive subject browsing via a concept browser and on an ongoing theme of personalisation of the user interface. The current awareness service is an initial part of this theme.

Features: Current development is focused on intuitive subject browsing via a concept browser and ongoing personalisation of the user interface, including current awareness. OCLC is also developing its strategy for a Library Integration Manager. This is now in the first stages of research and development. The Library Integration Manager may well eventually include features from iPort and many other OCLC products.

Wizards: Planned for unspecified date.

Platforms: Linux, Solaris or Digital Unix.

9.6 MetaLib with SFX

Brief description: Available now a year, MetaLib (including the SFX linking framework) is a library portal offering a gateway to the institution's resources, parallel, unified search in heterogeneous resources and a personalised scholarly environment and services. Links can be made with any resource catalogued in MetaLib's KnowledgeBase.

Supplier: Ex Libris (UK) Ltd.

UK address:

Bridge House
119-123 Station Road
Hayes, Middlesex
UK
UB2 4BX
Tel/Fax: 020 8561 5614/020 8561 5634

UK customers: 9 (mostly SFX), including Univ of East Anglia (MetaLib).

World wide customers: 40+ (including SFX); 180 SFX only. In 17 countries

Standalone product status: Stand alone system including SFX. SFX is also available separately

Licence model: License pricing models are based either:

- Unlimited on the basis of total FTE (students and staff)
- CPU based

Maintenance at 15% of license

- Services include installation, training and consulting.

Product development path: SFX originates from research work done at the Ghent University, Belgium, by Dr. Herbert van de Sompel and his team, in co-operation with Ex Libris and SilverPlatter. Two years of research yielded the SFX framework.

MetaLib originated from a framework described by the members of the Cooperative Library Network for Berlin and Brandenburg (KOBV) about five years ago. The technological infrastructure was not feasible until later. The deduplication algorithm developed by ZIB, the mathematical institution responsible for the KOBV project, is the basis of the deduplication algorithm used in MetaLib.

Both MetaLib and SFX were beta tested at several customer sites, including the Los Alamos Laboratories, the California Institute of Technology (Caltech), and KOBV.

Standards: LDAP, Bath Profile, XQuery, ISO ILL. A range of distributed search protocols are supported, including various http (such as Entrez), Z39.50 and target proprietary APIs. SFX currently supports Athens. Future support (no date given) is planned for MetaLib. Also supports Kerberos.

Claimed benefits over rivals: 20 years library market experience; significant customer base; mature software currently in full operation; sophisticated KnowledgeBase configuration tools and data services; integration with frameworks such as the CrossRef/DOI initiative, with reference tools (ProCite, EndNote, Reference Manager), and with other products such as SerialsSolutions; MetaLib/SFX are independent tools that do not limit users to certain data or service providers; they can be integrated in an existing environment.

Features: The MetaLib/SFX KnowledgeBase is a repository that holds data and rules applying to the usage of the institution resources for the sake of searching and obtaining

services. This large KnowledgeBase is provided along with the software. Special tools enable the customers to automatically update their local KnowledgeBase.

Discussions are underway with sites who wish to implement VLE/MLE links and with vendors of such products. OAIMHP and XQuery protocols can be implemented on request using an extensions mechanism. ILL requests are currently supported via existing local ILL gateways, but ExLibris has plans to offer an integrated ILL module in the future.

Wizards: No 'wizards' as such, but the administrative tool is Web-based and is intended for librarians.

Platforms: Unix platforms. Sun Solaris 2.8; Linux Red Hat 7.1 and 7.2. Ex Libris installs other software programs on the server including Oracle (currently, version 8.1.7), Apache server, Java, PERL, and more. Internet Explorer 4.0 and up, Netscape 4.x.

Note: A confidential evaluation of MetaLib/SFX has been conducted by HeadLine Project staff at the LSE Library on behalf of JISC/DNER (July 2001) to inform DNER planning.

9.7 Millennium Access Plus (MAP)

Brief description: Libraries offer a diverse array of information resources—both in electronic and print formats. The challenge for libraries is to provide access to all of these resources in an integrated and user-friendly way. Millennium Access Plus (MAP) meets the challenge by enabling libraries to provide access to all of their information resources. These resources may include any digital collection such as image databases, archival collections, finding aids, Abstracting and Indexing (A&I) databases, full-text aggregators, and library catalogs.

Consists of WebBridge (content enrichment and linking), MetaFind (cross searching), Web Access Management (proxy based authentication solution – enhanced with ideas from EZProxy). Also offer Metasource to manage multimedia objects and to harvest XML metadata.

Supplier: Innovative Interfaces, a US company.

UK address:

3 York Court, Upper York Street,

Bristol

BS2 8QF

Email: info_uk@iii.com

Tel/Fax: Tel 0117 910 8116 – Fax 0117 910 8117

UK customers: 1 with 4 claimed to be pending in May 2002.

World wide customers: 26 academic and public libraries

Standalone product status: Initially available integrated with the company's LMS, MAP is now available as a standalone product.

Licence model: Typically licensed for a fixed number of staff users, based on the needs of the library, and an unlimited number of public users.

Product development path: "Innovative recognised the growing need for libraries to integrate diverse resources. Libraries want to provide patrons with enhanced access to information from disparate sources beyond the bibliographic catalogue, such as other library catalogues, image databases, abstract and full text databases. MAP is the answer to integrated access to a broad spectrum of resources.

Innovative has worked with small and large academic and public libraries and consortia world wide to develop a Portal system that meets the needs of all types of library communities."

Standards: EAD, Dublin Core, MARC, TEI (Text Encoding Initiative), and XML. ATHENS is supported.

Claimed benefits over rivals:

"MAP's growing popularity with libraries is due in large part to its ability to provide seamless access to a diverse array of information resources. More than ever, the integration of library resources is essential in providing an efficient and appropriate research environment for patrons, and the Millennium Access Plus Portal is a one-stop solution.

Beyond integrating the library's resources, the components of MAP are fully integrated themselves; by combining multiple components to manage multi-protocol searching, context-sensitive linking, and remote authentication, MAP offers superior access and management of resources without requiring coordination of multiple products from different suppliers. However, MAP's use of standards and support for widely recognised protocols also ensures that libraries have the flexibility to work with the suppliers and services of their choice.

The MAP Portal allows libraries to coordinate authentication and access for all their users, regardless of what approach a user takes. MAP opens up access to the virtually limitless world of online information sources and quickly guides patrons to the most relevant web-based content available related to a specific search. The MAP Portal provide all libraries with the ease-of-use and direct access that Innovative's Millennium libraries have come to expect.

Finally, like all Millennium products, the MAP Portal offers superior options for customisation; the system is very locally configurable, making MAP the ideal choice for large library consortia. as well as small libraries with specialised needs."

Features: Highly developed solution. "The Millennium Access Plus Portal product functions as an integrator of services for the Library. Innovative takes pride in offering Libraries flexible options and direct control over customisation and choice of supplementary services.

A pre-configured WebBridge knowledge base of coverage and linkage information is currently under development, which will increase the range of detailed linking profiles available and streamline the administration of those profiles.

Innovative provides a single-supplier subscription option to a number of data sets from third-parties to its MAP customers."

Wizards: "Yes. Innovative configures profiles for MetaFind target resources according to Library specifications at the time of implementation. However, a graphical Management Interface to MAP MetaFind is currently under development, which will guide Portal system administrators in adding and customising the configuration of resource targets, easily and efficiently.

Currently, the contextual relationships used by MAP WebBridge are completely under the control of the Library; locally-defined profiles can be added, modified, and managed directly by Portal system administrators using an easy-to-understand web-based interface. Additionally, a pre-configured WebBridge knowledge base of coverage and linkage information is currently under development, which will increase the range of detailed linking profiles available and streamline the administration of those profiles.

Finally, context-sensitive example screens are available to guide public users, and the Library can customise or remove these files according to the needs of their users."

Platforms: any version of Unix.

"Innovative is committed to providing Libraries with open, platform independent solutions. The Millennium Access Plus Portal product operates on any UNIX platform, and the underlying structure includes a relational database used to store coverage and linkage information.

The MAP Portal is a completely Web-based product that is accessible via any standard Web browser (e.g., Netscape and Internet Explorer), regardless of the client's operating system platform. Innovative is committed to ensuring that our Millennium software remain compatible with the latest versions of standard, commercially available browser software."

9.8 TalisPrism

Brief description: TalisPrism provides integrated searching of local and external databases in different locations and formats, and web access to content including full text, abstracts and tables of contents services. TalisPrism also offers management information on usage, single sign-on and seamless linking services.

The first component of the Talis Information Environment architecture, launched in June 2002.

Supplier: Talis Information Ltd, based in Birmingham, UK.

UK address:

Birmingham Research Park
Vincent Drive
Edgbaston
Birmingham
B15 2SQ

Email: sales@talis.com

Tel/Fax: +44 (0) 121 471 1179 / +44 (0) 121 472 0298

UK and world wide customers: Launched end June 2002, installed by July in "a small number of customer sites". As it is part of the core Talis system it is being rolled out to all Talis customers as part of the normal Talis upgrade programme.

Standalone product status: Designed to integrate with other Talis products for community information, image and archive resources, reading lists and library management.

Licence model: TalisPrism is part of the core offering to current customers of the Talis Library Management system and does not attract an additional charge. It is being offered to other potential customers wanting to create portals, licensing information available on application.

Product development path: Replacing the Talis OPAC as a broader discovery tool, TalisPrism was developed with customers as part of a new range of Talis products

Standards: Dublin Core and XML, Java, web, XML and SOAP based. Future support for ATHENS is planned, but no date given.

Claimed benefits over rivals: TalisPrism is the first LMS vendor to replace its OPAC with a portal tool, rather than offering one as an added cost and added layer option. The product also offers fully integrated metasearching, an easy user interface and an intelligent dialog to aid users in locating relevant information

Features: DDA compliant, Bobby approved, able to search RDN

Wizards: Admin workflow; search help

Platforms: Solaris 8, Linux with Sybase 12.

9.9 xdirectory and xflow

Brief description: xdirectory provides a flexible solution for recording, managing and re-purposing e-resource information in a distributed model. xdirectory and xflow are both open, independent products focused on creating pathways and other modes of access to e-resources without the need to replace or upgrade established 'legacy' systems. There are a wide range of potential applications for the product, managing eresources is just one of them.

Supplier: Esprit Soutron Partnership Ltd

UK address:

Esprit Soutron Partnership Ltd
Charlotte House,
Wyvern Business Park
Derby
DE21 6BF

Email: sales@espritsoutron.com

Tel: +44 (0)1332 821 800

FAX: +44 (0)1332 821 801

UK customers: including the University Birmingham, Brunel University, City of Westminster (Sense of Place London project)

World wide customers: Since launch in June 2001 approximately 30 systems in USA, UK, World- Wide

Standalone product status: Stand alone systems that integrate with other content management products.

Licence model:

Single departmental server licence - £15,000*

Enterprise server licence (multi-department/ multi-server) - £50,000*

* Unlimited staff and end-user access

Product development path: xdirectory and xflow both originated in house in response to customer demand for open, distributed, wholly web based portal applications.

Standards: A wide range of distributed search protocols and standards are supported, including OAIPMH, LDAP, Bath Profile, SQL, XQuery and Z39.50. Integrated support for ISO ILL is not planned. Support for both Kerberos and Athens is currently available.

Claimed benefits over rivals: xdirectory and xflow are both open, independent products focused on creating pathways and other modes of access to e-resources without the need to replace or upgrade established 'legacy' systems e.g. library management solutions, personnel record systems, etc

Features: xdirectory has been designed as an open, independent product, capable of integrating with any Library Management System at the database level (three universities to date have integrated it with LMS from other vendors). xdirectory's field level 'methods and scripting' interface and JCA (Java Connector Architecture) interface enables deep field level integration with any external system.

xdirectory is a flexible record 'shaper' with unlimited length fields capable of recording any type of information; integrated search engine with real time indexing and data recording directly into chosen RDBMS; 'associations' mechanism for creating sophisticated taxonomies, thesauri and resource gateways, narratives and pathways.

ESP offer a full enterprise information management solution with integrated workflow for enquiry, research and other task management, an authentication and access management

module and a fully auditable, version controlled, document/records management software module.

Wizards: xdirectory does not presently incorporate any wizards, but has been designed to be simple to operate and amend.

Platforms: xdirectory and its sister product xflow both operate on any J2EE compliant web application server, under Unix (Solaris, Linux, etc) and Wintel (95,98, NT and 2000) with any ODBC/JDBC compliant database e.g. Oracle, SQL Server, DB2, Sybase, MySQL, PostgreseSQL, etc.

9.10Zportal

Brief description: "Today library users can search more than one library catalogue, find where a book is located, search electronic journals and hunt for information from Internet search engines. ZPORTAL allows access to all of these things from one place, creating a single interface where valued information resources can come together. For library users, ZPORTAL allows them to identify resources from libraries, museums, archives, and the Web, irrespective of how and where it's stored."

(with plug-ins such as **Zmbol** to integrate non Z databases and **Z2web** to integrate search engines)

Supplier: Fretwell-Downing Informatics Limited, a UK company.

UK address:

The Portergate,
257 Ecclesall Road,
Sheffield
S11 8NX

Email: mark.allcock@fdgroup.com

Tel/Fax: 0114 281 6040

UK customers: 1.

World wide customers: 8 (including ARL consortia)

Standalone product status: Available as a stand alone system or integrated with OLIB LMS

Licence model: based on 1. concurrent users 2. overall user population 3. Plug-ins required to search non-z39.50 targets are priced individually according to the customer's needs

Product development path: whole concept evolved out of eLib and EC projects especially Agora. Views have come from: EU funded projects, eLib Phase 3 notably AGORA, Association of Research Libraries and other existing customers.

Standards: LDAP, Bath Profile, SQL, ISO ILL. Z in the name implies the centrality of Z39.50 in their thinking. ATHENS is supported.

Claimed benefits over rivals: Stresses cross searching and supporting the whole process from resource discovery to delivery of final document, ie also encompassing document delivery options.

"FDI's approach is to create non-LMS vendor specific products that are wholly standards based. This means that our customers have a wide range of options with regards to the resources that can be integrated by ZPORTAL. Furthermore this approach ensures that FDI's portal products are truly scalable and do not depend on proprietary solutions to system integration.

ZPORTAL fully enables the complete "Discovery to Delivery" process – searching for and identifying resources from the widest range of targets both internal and external to the organisation, and then delivering those resources to the user's desktop either in e-form or hardcopy. Open URL means that the most appropriate copy of any particular item is identified for each individual user or groups of users, and users can directly access full text of articles online from the citation.

ZPORTAL fully implements the MODELS information architecture.

Interface design is a crucial differentiator – both in terms of user interface ergonomics and addressing accessibility issues. ZPORTAL has a UI's constructed by an experienced web designer and this has already had a positive impact on the success of the products in their market sectors. ZPORTAL ensures usability keeps pace with high levels of functional richness."

Features: "Plug-ins Z2Web for searching web sites that are non-Z39.50 compliant. Zharvest that searches web metadata and presents that information seamlessly to the end user and Z'Mbol that allows the integration of online and offline data sources into the ZPORTAL – i.e. any structured data i.e. Access databases. ZPORTAL can also provide access to unstructured data sources"

"ZPORTAL interfaces with the following vendors' systems in a number of individual institutions and consortial installations worldwide including Macquarie University, ARL, RIDINGS, COOLCAT –

Ex Libris, SIRSI, Endeavour, Epixtech, DRA/SIRSI, GEAC, III, and Talis."

Wizards: "ZPORTAL makes use of simple form filling interface to guide users and administrators. The quality of our design delivers a genuinely intuitive user interface."

Platforms:

Unix: Solaris 7+, HP-UX, AIX

Windows

Oracle 8I

Apache TomCat v4

Sun Microsystem's Java Virtual Machine 1.3

10 Appendix 2: the survey questionnaire (May 2002)

Introduction

LITC at South Bank University (SBU) in London is a specialist agency dedicated to improving library and information services, with long experience of product evaluation and procurement and strategic planning for networked information services.

We are undertaking an overview for JISC TechWatch (<http://www.jisc.ac.uk/techwatch/>) of the marketplace for what we are calling **library portal** products. We would appreciate it if you or a colleague would spare the time to answer this short questionnaire.

Our purpose is to be objective as possible, and to help librarians and information staff in their initial thoughts about product selection criteria.

Data protection

Information given below may be published as part of the report.

Please indicate if you do NOT wish us to publish this information

Supplier details

Company name:

Supplier address for the UK:

.....
.....
.....

Email.....

Tel/Fax

Library Portal Product Name(s)

.....
.....

Product information

1. What pricing/licensing model(s) do you offer?

.....
.....
.....

2. Please indicate what UK/worldwide sales you have achieved?

.....

3. For the following protocols and query languages, please indicate your support for standards (please tick where

appropriate):

Specification	Support now	Plan support by (date)	Plan future support	Have no plans to support	Notes
OAIPMH					
LDAP					
Bath Profile					
SQL					
XQuery					
ISO ILL					

.....
 4. Where did the idea of your software originate? Who have been development partners?

.....

5. Please indicate support for authentication protocols (please tick where appropriate):

Specification	Support now	Plan support by (date)	Plan future support	Have no plans to support	Notes
Kerberos					
ATHENS					

6. Can your system be the target of requests as well as an origin for distributed query?

.....

7. Which basic hardware/software platforms and databases are supported (eg which version(s) of unix, S Windows, Oracle)?

.....

8. What extra benefits would a library derive if they also have your mainstream library product?

.....

9. What are the main components of your product?

.....

10. How are new data source targets added to the system?

.....

11. Can administrators pre-group targets for users (explain how)?

.....

12. Do you provide any 'wizards' to guide administrators and users?

.....

13. Do you provide integrated statistics of usage of target resources?

-
14. Have you an implementation which demonstrates your system working with library management systems (LMS) from other vendors?
-
15. What related services do you offer to customers of this product?
-
-
16. What do you see as the relationship of your system to a VLE or MLE?
-
-
17. How would you say your product is distinguished from your competitors' products?
-
-
18. Do you think the development of these products will impact on the relationship between LMS vendors and end publishers?
-
19. Which new skills will librarians need to run this product?
-
-

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Information provided is accurate to the best of the authors' knowledge at the time of writing, but should not be used as the basis of purchase decisions without verification.

[end]