AARLIN: Seamless information delivery to researchers

Doreen Parker,
Victoria University of Technology, Melbourne

Earle Gow,
La Trobe University, Melbourne

Edward Lim,
La Trobe University, Melbourne

Summary

The Australian Academic Research Library Information Network (AARLIN) aims to provide seamless access to Australian and international information resources for researchers via their personal computers through a personally customisable portal. The project has funding from the Australian Government. AARLIN commenced in the year 2000 with a pilot project and will develop into a fully operational service in Australian universities over the next three years. During the pilot project Ex Libris' Metalib and SFX software have been used to trial the AARLIN portal concept with a group of researchers. The results of a survey of the researchers are presented. It is concluded that the portal has the potential to enhance the work of researchers by improving their success in information searching.

Keywords = portals, research, information resources, libraries

1   Background

The Australian Academic Research Information Library Network (AARLIN) project emerged from a Council of Australian University Librarians (CAUL) planning workshop in 1999 and was adopted as one of the strategic objectives of CAUL. Twenty of the thirty eight Australian universities and the National Library of Australia are active participants in the project and have contributed funds. The AARLIN project has established cooperative arrangements between the institutions involved for the direction and management of the project. The project is based at La Trobe University where a Project Officer has been employed. The project is guided by a Steering Committee which includes representatives of CAUL and the Council of Australian University Information Technology Directors (CAUDIT). The Project Officer is supported by designated staff in each of the participating universities.

2   Aims

AARLIN aims to develop a major network infrastructure to support research in Australian universities and other research organisations. The AARLIN vision is a national virtual research library and information system that will provide unmediated, personalised and seamless end user access to the collections of Australian libraries, to research databases and to document delivery services from the work stations of research staff and students. To achieve this vision the AARLIN project is using portal technology. The first stage in the creation of AARLIN is the development and testing of the AARLIN portal prototype. Subsequent developments will involve the establishment of an administrative structure or entity; a legal framework to ensure compliance with agreed performance standards and quality assurance; and a business plan to ensure sustainability and financial viability of AARLIN as the national vehicle for discovery of, and access to, research information resources for the Australian research community.

It is intended that the national portal will have context sensitive and open reference linking software which will permit researchers once authenticated to:

- access a context-sensitive and "standardised" search interface and undertake concurrent searches of electronic databases, web sites, online library catalogues and other electronic information resources;

- pass appropriate metadata for an unmediated document delivery request and generate a document delivery request, if required;

- access a range of appropriate or extended services (including deeplinking to full-text where available) using context sensitive reference or OpenURL linking software;

- personalise their search "environment", including access to the information resources which are relevant to their research interests, the capacity for them to suppress and expand various resources presented to them as a default, and the capacity for them to add their own bookmarks;

- have pushed to them the relevant "information landscape" or suite of information resources as determined by their authenticated user profile;

- establish or modify profiles for, and receive literature alerts informing them of newly available material matching the criteria specified.

It is envisaged that, in due course, the services offered through the AARLIN portal will incorporate a payments system and a rights management system.

It is intended that the software which is selected for the operational system will have the capacity to integrate with local authentication and profiling systems and services and will comply with industry standards.

Diagram 1 outlines the components of the proposed national system.

3   Related portal developments

Portals are being used by a number of universities, university libraries and by library consortium.

In Australia ten of the thirty eight universities had operational portals and another ten or more were actively planning the implementation of portals in the year 2000 (CAUDIT, 2000). Monash University has incorporated library portal functionality in the design of its university portal. The "My Monash" personal portal includes "My Library" and "My Digital Library". (http://my.monash.edu.au/). Curtin University of Technology library's portal "My Library@Curtin" draws on the experience of the Digital Library Initiatives Department of the NC State University in the USA (http://john.curtin.edu.au/mylibrary/). Victoria University of Technology library has implemented the Innovative Interface Innopac system catalogue portal "Your Library" which allows searches to be saved and updated results to be emailed periodically (http://w2.vu.edu.au/library/cat/yourlibrary.html).

Collaborative portal developments have the potential to complement individual library portals by providing access to a wider range of national and international information resources and document delivery services. They also reduce duplication of effort through use of common hardware, software and systems administration. The Denmark electronic research library's deff.dk service provides web page links to portals, databases and research library resources (http://www.deff.dk/). The Association of Research Libraries in the USA has developed specifications for a Scholars Portal which will aggregate, integrate and delivery a licensed and openly available digital content across a broad range of subject fields and from multiple institutions.

The authenticated network graded environment for learning (Angel) project in the UK is creating middleware services to integrate learning environments with digital library developments. Angel plans to address the issue of appropriate end user authentication and access management (Angel, 2002). The development of an authentication and access management system will be a major part of the wider implementation of AARLIN over the next two years. AARNet is not at this stage providing access to undergraduate students or linking to online learning resources however these are future possibilities.

Although libraries have been using portals for about four years and they are installed in more than thirty-six U.S. libraries, the number of clients using portal services is relatively small at around 5%. Attention will need to be paid to the protection of user confidentiality and the design of the portal if use is to be increased (Crawford, 2002).

Portal services are also provided by commercial organisations directly to researchers. TheScientificWorld (www.thescientificworld.com/) is an integrated scholarly web portal to services, resources and products intended to enhance and accelerate the research efforts of science professionals. Services which are provided on a fee for service basis include e-publishing, personalised e-mail alerts, forthcoming information, the ability to prepare and submit funding applications online and procurement of scientific equipment and supplies (McKiernan 2002).

AARLIN aims to use "push" technology to provide current awareness services to researchers. The challenge will be to provide this service in a way that does not create information overload for the user. In the longer term it may be possible to utilise an intelligent agent system to assist in pushing information to users in the portal environment (Martin and Metcalfe, 2001).

4 Implementation of the pilot project

Planning for and implementation of the pilot project were undertaken during 2001. This involved selection and installation of hardware and software; training of library staff and researchers, programming and configuration of databases. Researchers who attended the training expressed enthusiasm for the service.

The AARLIN pilot project aims to establish proof of the AARLIN portal concept. Issues being explored during the pilot project include the availability of suitable software for the components of the portal and the usefulness of the portal to researchers.

The pilot project is the precursor to a fully operational service which will be implemented on a staged basis in Australian university libraries. A tender process for the selection of software for the operational service commenced in early 2002.

The software and hardware required for the system was installed during 2001. Available portal software was evaluated for its functionality, cost and other features. Ex Libris' Metalib and SFX software was selected for the pilot project. A Sun server was installed at La Trobe University. The Australian Academic Research Network (AARNet) provides communication facilities for the project.

The Metalib software is used to search resources in a range of subject areas. Searches can be made of multiple resources and searches can be saved. Users can set up a personal profile. Once search results are obtained, the SFX software is used to access the selected items online in full text format or via library catalogues or document delivery services.

For the purposes of the pilot project a centralised authentication system was used. It is planned to develop "handshaking software" using. XML which can communicate with the local authentication systems of participating universities for the operational service. In connection with this, a survey of the existing authentication systems is being undertaken jointly by CAUL and CAUDIT. One of the objectives of the survey is also to ascertain what additional profiling metadata may need to be added to the directory services used by the local authentication systems. Thus it is intended that the authentication systems will also provide the profiling data that can be used to "push" relevant research resources to the users.

It was decided to develop the portal, for the purposes of the pilot, in the major research areas of health sciences/medicine, engineering and humanities. Six of the twenty participating universities were selected for participation in the pilot project on the basis of their ability to provide library liaison staff and researchers in these research areas. The selected universities were La Trobe University, Swinburne University of Technology, Victoria University of Technology, Murdoch University, Flinders University and the University of Canberra.

A number of resources have been configured for access via the Metalib/SFX software. These include full text serial databases, indexing and abstracting databases, library catalogues, research information databases, web subject gateways and document delivery services.

Several research information databases are already accessible via AARLIN and it is planned to add more when the portal is fully operational. Research Finder is a database of Australian research, including university research which is maintained by the Australian Commonwealth Government (http://www.industry.gov.au/science/ResearchFinder). The Australian Digital Theses (ADT) service provides access to completed Australian university higher degree theses (http://adt.caul.edu.au/). VOCED is maintained by the National Council for Vocational Education

Research (NCVER) and provides access to information about research projects in the Australian Technical and Further Education (TAFE) sector (http://ww.voced.edu.au).

5 Survey

A survey was conducted of researchers who were participants in the pilot project in order to ascertain their satisfaction with the service and to assist in identifying potential areas for improvement when the operational system is implemented. The survey was conducted at the start of the project. A further survey will be conducted at the end of the project in order to compare researchers' anticipated use of the service with their actual use.

Seventy-four researchers from the six pilot project institutions responded to the prepilot survey. Respondents were asked to indicate their discipline area; 32.9% indicated that they were from medicine or health, 23.3% from humanities; 11% from engineering and 32% were from a variety of other disciplines.

Most respondents (86.1%) indicated that their main reasons for using the portal would include research; 33% included teaching preparation and support and 21% included current awareness.

62% of respondents indicated they expected to use the portal weekly, 70% monthly, 16% daily and 4% other frequencies.

5.1 Frequency

Respondents were asked the frequency with which they expected to use the various portal resources and services. The responses are shown in Table 1.

Table 1: Within AARLIN, how often do you expect that you will use /search the following?

		1 Never	2 Once or twice	3 Fort-nightly	4 Weekly	5 Daily	No response
a	Indexing and abstracting databases	2.9% (2)	30.9% (21)	17.6% (12)	41.2% (28)	7.4% (5)	
b	Searchable e-journal collections		9.7% (7)	31.9% (23)	45.8% (33)	12.5% (9)	
c	Subject Gateways (EEVL, OMNI, BIOME, AVEL)	13.3% (10)	28% (21)	24% (18)	21.3% (16)		13.3% (10)
d	Search engines (Yahoo, Alta Vista	12.5% (9)	15.3% (11)	31.9% (23)	25% (18)	15.3% (11)	
e	Recommended websites (Library web pages and other websites "recommended" by the library)	7% (5)	31% (22)	29.6% (21)	28.2% (20)	4.2% (3)	
f	Own University catalogue	2.8% (2)	9.7% (7)	34.7% (25)	38.9% (28)	13.9% (10)	
g	Other Library catalogues	2.8% (2)	33.3% (24)	47.2% (34)	12.5% (9)	4.2% (3)	

		1	2	3	4	5	
h	Other "combined" library catalogues (e.g Coolcat, Kinetica, Serials in Australian Libraries)	8% (6)	40% (30)	26.7% (20)	13.3% (10)	4% (3)	8% (6)
i	Interlibrary loans/document delivery requesting	11.1% (87)	37.5% (27)	34.7% (25)	13.9% (10)	2.8% (2)	
j	SFX, to find out other services available	13.3% (10)	30.7% (23)	26.7% (20)	14.7% (11)	1.3% (1)	12.3% (10)
k	SFX, to access e-journal articles	8% (5)	16% (12)	32% (24)	30.7% (23)	2.7% (2)	10.7% (8)
l	SFX, to check availability of cited item, in local library catalogue	6.7% (5)	22.7% (17)	32% (24)	26.7% (20)	1.3% (1)	10.7% (8)
m	Other usage (give details)	14.7% (11)	2.7% (2)	10.7% (8)	2.7% (2)	1.3% (1)	68% (51)

The resources and services for the highest anticipated weekly use included searchable e-journal collections (33), indexing and abstracting databases (28) and participants own libraries' catalogues (28). Highest anticipated fortnightly use included use of other libraries' catalogues (34), use of own libraries' catalogue (25), interlibrary loans/document delivery requesting (25), use of SFX to access e-journal articles (24) and use of SFX to check availability of cited items in local library catalogues (24). Overall, use on a daily basis was expected to be lower than weekly or fortnightly use.

Of the categories of resources and services available, respondents indicated that they expected the indexing and abstracting databases to be most useful (28) followed by e-searchable e-journal collections (47). Resources and services nominated as likely to be the least useful were search engines (Yahoo, Alta Vista) and recommended websites.

Respondents suggested a number of resources and facilities that they would like to see added to the portal. These included improved access to library databases and document delivery services. The addition of other research services, such as links to company research information, news or emails groups for scientists and an interface to Endnote were also suggested.

5.2 Functionality

Researchers were asked how useful they expected to find various aspects of the portal's functionality. The results are given in Table 2.

Table 2: How useful do you expect to find the following functionality?

		1 Useful	2 No opinion	3 Not useful	4 Never used
5a	Can search multiple databases (targets) in parallel (e.g. can search 5 databases at the same time)	94.6% (70)	4.1% (3)	1.4% (1)	
5b	Can search different types of targets in parallel (e.g. 2 Subject Gateways at the same time as 4 abstracting databases)	71.6% (53)	27% (20)	1.4% (1)	
5c	Can save searches between sessions, and re-run searches (using History)	85.1% (63)	9.5% (7)	4.1% (3)	1.4% (1)
5d	Can mark records and add to e-shelf, (and contents of e-shelf are retained between sessions)	83.8% (62)	13.5% (10)	1.4% (1)	1.4% (1)

		1	2	3	4
5e	Can save records in original format, to import into Endnote or Procite	74.3% (55)	12.2% (9)	1.4% (1)	12.2% (9)
5f	Can use the **Locate resources** function, to search for "resources" (targets) by "type", discipline, etc	56.2% (41)	38.4% (28)	1.4% (1)	4.1% (3)
5g	Can use the **Locate resources** function, to add "resources" (searchable or link-to targets) to "My (fave) Resource List"	56.2% (41)	32.9% (24)	5.5% (4)	5.5% (4)
5h	From any "full-record"/citation viewed in Metalib, can link (using SFX) to a list of optional services, such as check local opac for this item, link to full-text of item, request item through Interlending and Document Delivery, etc.	75% (54)	16.7% (12)	4.2% (3)	4.2% (3)
5i	Interlending and Document Delivery requesting form – is populated with details of item to be requested.	67.6% (50)	23% (17)	1.4% (1)	8.1% (6)
5j	Metalib navigation buttons at the top provide easy navigation	66.2% (47)	28.2% (20)	1.4% (1)	4.2% (3)
5k	Metalib provides on-line "HELP"	56.9% (41)	34.7% (25)	2.8% (2)	5.6% (4)

Almost all researchers (70) expected searching multiple targets in parallel to be useful; 63 expected saving searches between sessions to be useful; and 62 expected the ability to mark records and add to an e-shelf to be useful.

The majority of respondents expected all functions to be useful. A relatively large number of respondents stated that they had no opinion on the potential usefulness of aspects of the functionality, probably because of lack of familiarity with these particular functions.

In response to a subsequent question which asked respondents to indicate which function they expected to find most useful, 47 respondents stated that they expected to find the ability to search multiple databases most useful.

5.3 New features

Researchers were asked which of a list of new features they would like to have incorporated into AARLIN. The responses are given in Table 3.

Table 3: We are considering incorporating the following features into the AARLIN portal in the future.
Please indicate the extent to which you would expect to find these aspects useful:

		1 Very Useful	2 Useful	3 No opinion	4 Negligible usefulness	5 Never used
a	Capacity for you to add / modify your favourite "bookmarks" (as compared with library-selected resources) within AARLIN	31.1% (23)	54.1% (40)	12.2% (9)	1.4% (1)	1.4% (1)
b	Capacity for you to "personalise" your AARLIN environment	40.5% (30)	41.9% (31)	10.8% (8)	4.1% (3)	2.7% (2)
c	Capacity for you to see an indicator of the "local availability" of items without having to link to local catalogue first.	62.2% (46)	21.6% (16)	13.5% (10)	2.7% (2)	
d	Provide an indicator, while you are viewing citation details, of whether full-text article is available electronically.	81.1% (60)	16.2% (12)	1.4% (1)	1.4% (1)	

e	Capacity for you to use the same authentication, both in your University/library environment and in the AARLIN portal (e.g. removal of need to authenticate more than once)	62.5% (45)	22.2% (16)	12.5% (9)	1.4% (1)	1.4% (1)
f	Capacity for you to view the status of your Interlibrary Loans quota (where relevant)	21.6% (16)	48.6% (36)	16.2% (12)	13.5% (10)	
g	Capacity for you (using e-commerce) to purchase services beyond standard services (e.g. where relevant…to purchase document-delivery when quota has been exceeded, or to request fast-track delivery of items)	17.8% (13)	27.4% (20)	31.5% (23)	16.4% (12)	6.8% (5)
h	Capacity for you to link easily between AARLIN portal and the teaching/learning environment of your institution.	29.7% (22)	37.8% (28)	21.6% (16)	10.8% (8)	
i	Capacity for the library to "push" news to users about new resources and so on (focussing messages so that they are presented only to relevant user-groups), at the time that users log in to the portal.	14.9% (11)	36.5% (27)	28.4% (21)	14.9% (11)	5.4% (4)
j	Capacity for each user to set up "auto-alerts" within the AARLIN portal (Auto-alerts are searches predefined by you, and run regularly against selected databases, with the results emailed to you)	45.9% (34)	41.9% (31)	9.5% (7)	2.7% (2)	
k	Capacity for you to browse and search thesauri of databases from within the AARLIN environment (where the native interface of a database currently offers thesaurus searching/ browsing)	20.3% (15)	44.6% (33)	28.4% (21)	6.8% (5)	
l	Additional options for field searching (e.g. capacity to search within the **Abstract** field, the **Notes** field, etc; or capacity to search within a specific timespan, such as **"after 1997"**)	44.6% (33)	43.2% (32)	8.1% (6)	4.1% (3)	
m	Greater context sensitivity in search interface (eg choice of searchable fields alters when only ONE database has been selected, and when that database can offer additional fields to be searched)	27% (20)	40.5% (30)	25.7% (19)	5.4% (4)	1.4% (1)
n	Greater context sensitivity in SFX-like services offered (eg Interlending and document requesting is only offered when item is not available locally)	28.4% (21)	36.5% (27)	28.4% (21)	4.1% (3)	2.7% (2)

An indication of the availability of full text while using citation details was the most highly ranked possible new feature; 60 responses ranked this as very useful. Other possible new features ranked as very useful included renewal of the need to authenticate more than once and capacity to see the local availability of this without having to link to the local catalogue first (both 62%). The next most important were the ability to receive automatic emails about predefined searches (45%), additional field searching options (44%) and greater capacity to personalise the AARLIN environment (40%).

The ability to "push services to clients was regarded as "very useful" by only 11 respondents, although a further 28 noted it as "useful".

The capacity to link only between AARLIN and the teaching and learning environment of the institution was rated as "very useful" by 22 respondents and "useful" by 28.

5.4 Value

Respondents were asked whether they thought that their information searching and client access processes would be enhanced by AARLIN services. 59 respondents strongly agreed that they expected their research to be enhanced by the AARLIN portal making it easy to access full text; 47 by the AARLIN portal providing a one stop shop; 39 by the AARLIN portal enabling results to be viewed in a standardised format and 34 with the portal offering a list of personal resources. Very few respondents disagreed with the statements and none strongly disagreed; several respondents reported that they had no opinion.

Researchers were asked to describe their current information searching and document access processes. 9.3% reported them as highly satisfactory, 60% is acceptable and 26.7% is unsatisfactory.

Researchers were asked whether their research endeavors would be enhanced by increased awareness of delivery of resources. The majority of respondents strongly agreed that their research would be enhanced. Researchers were then asked whether the AARLIN portal would increase their awareness. Responses to this were mixed with a substantial number having no opinion; comments made under this response suggest that respondents were not yet familiar enough with the AARLIN functionality to respond.

Participants were asked whether they currently used any other portal sites. Eleven reported use of Google, 8 of Yahoo and 3 of Alta Vista.

6 Conclusions

The results of the AARLIN pilot project participant researchers survey suggest that the concept of a library portal for researchers is a viable one. Researchers were generally positive about the portal service and saw it as having significant potential for improving their information searching. The survey results also provide some areas for consideration in the future development of the portals.

Development of improved database search and delivery features should be a high priority. The survey results suggest that the main value of the portal to researchers will be in improved searching of library subscription databases and library catalogues.

Particular attention should be paid to delivery of full text direct to the desk top with transparency between service providers.

The survey results suggest that an authentication system which is based on participants' university authentication systems is desirable.

Although AARLIN was designed as a research portal, there could be value in developing links to teaching and learning systems. A significant number of participants indicated that they expected to use the portal to assist in teaching as well as in research. A significant number also viewed improvements in this area to be of value.

It would appear undesirable to commit substantial resources into the development of e-commerce services for library research portals without further investigation of the market. Respondents expressed little interest in this, possibly because access to information resources of this type is

currently charged library funds. The potential to develop specialised services for charging to departmental or research centre funds could be considered.

Consideration could also be given to expanding the resources in the portal beyond traditional library information. Comments included in the survey suggest that it could be useful to have links to other types of tools such as news and email groups and to more non-bibliographic research databases.

The grouping of resources by subject area needs to be reviewed. When AARLIN was first conceived it was planned to start with a few key subject areas. The researchers who are participating in the pilot project are from a wider range of areas than originally planned and a larger list of subject areas has been developed. Given the cross disciplinary-nature of much research and of many information resources it may be appropriate to give further consideration to the most useful grouping of resources.

The findings of the AARLIN pilot project must be regarded as tentative at this stage, pending the results of the second participant survey which will be carried out at the end of the pilot project. It will be important to compare the results of the two surveys and to ascertain the impact of familiarity with the service on participants' views.

7 Contact information

Doreen Parker, University Librarian, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, Victoria, 8001, Australia, Telephone 61 3 9688 5097, Facsimile 61 3 9688 4117, Email doreen.parker@vu.edu.au.

Earle Gow, University Librarian, La Trobe University, Bundoora, 3086, Victoria, Australia, Telephone 61 3 9479 2920, Facsimile 61 3 9479 3018, Email e.gow@latrobe.edu.au.

Edward Lim, Assistant Project Director AARLIN, Library, La Trobe University, Bundoora, 3086, Victoria Australia, Telephone 61 3 9479 2805, Facsimile 61 3 9479 3018, Email e.lim@latrobe.edu.au.

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User
interaction
layer

User
community
layer

Broker/
Mediator
layer

Communication
layer

Service
Provider
layer

My.Library PORTAL
with Web browser

Secure payments,
Chat, Videoconferencing

Local Authentication
systems and
User profiles

Middleware: search, locate, browse, request, use

Analogue and Digital Resources

Z39.50

ILL

HTTP/WebZ

National Bibliographic Database
(Kinetica), Online Library
Catalogues

National Metadata
repository
(e.g. CORC)

Commercial
DocDel
Suppliers, eg
INFORMIT

Library
Document
Delivery
LIDDAS,
READS etc.

- Digital collections
(full text & citation databases)
- Lectures Online
- E-reserve

- Subject gateways (e.g. MetaChem Agrigate
AVEL, Literature Gateway, EdNA Online)
- Directories (e.g. Australian Libraries Gateway)
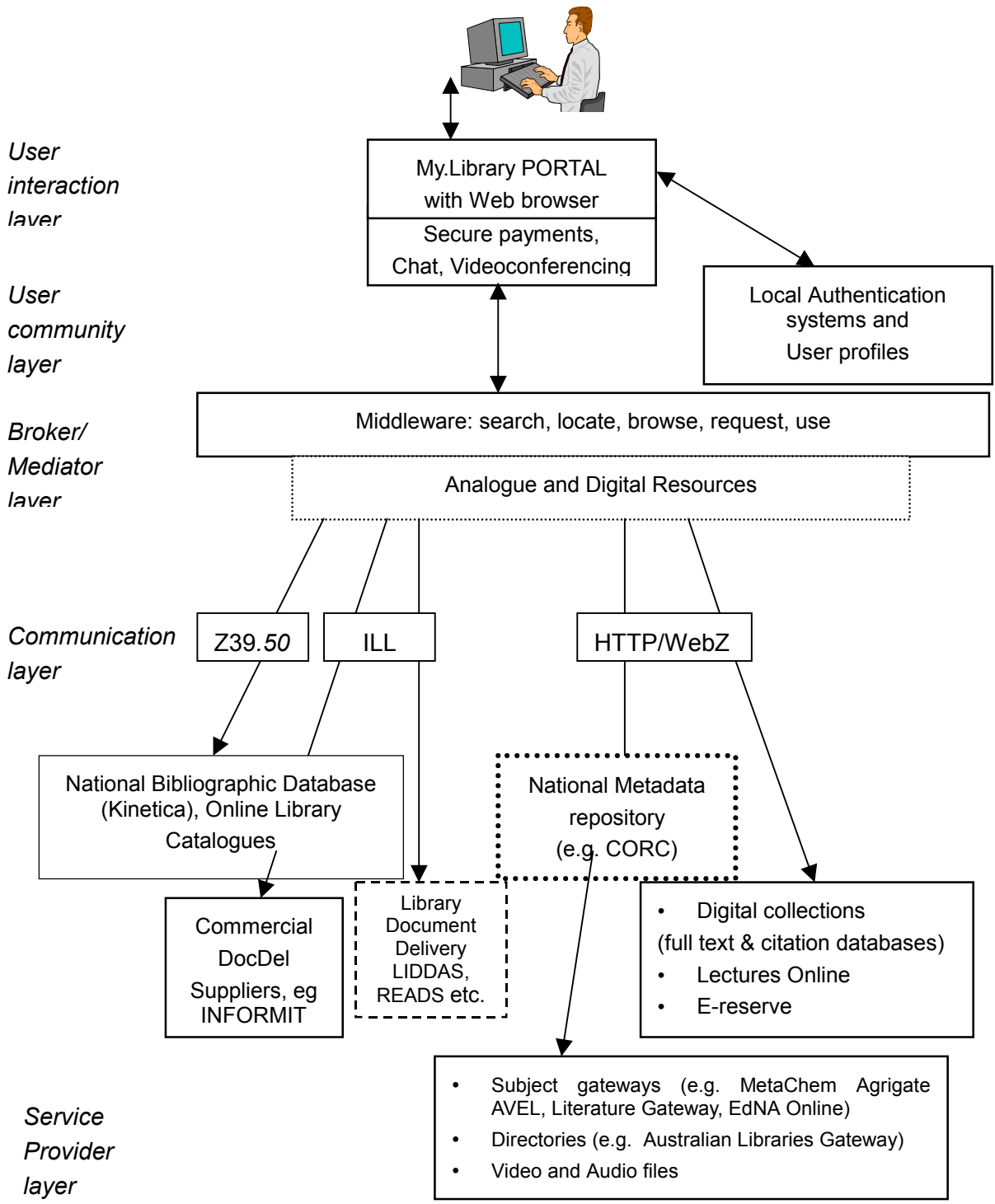- Video and Audio files

Diagram 1: Australian Library Research Network Information Infrastructure