

Libraries and information centres

Activities; management...

Variations on the theme of “information centres”

- **Many kinds of organisations focus on providing access to information.**
For instance:
 - » Information centres / units / services / departments
 - » Documentation centres / units / services / departments
 - » Libraries
 - » Archives
- **The distinction among these is not always sharp.**

Access to the services of “information centres” (Part 1)

- **Information centres can be accessible by the public to varying degrees:**
 - » Is the catalogue accessible locally, on CD-ROM, or through the Internet?
 - » Are the materials accessible for local consultation?
 - » Are loans allowed?
 - » Is interlibrary lending possible?
- **Great variations exist in the prices that are charged for these services.**

Access to the services of “information centres” (Part 2)

- **Accessibility and prices can depend on the type of users (internal or external users for instance).**

Typical activities in information centres (Part 1)

- **Here an overview is presented first; afterwards, each topic gets more attention.**
- **The typical activities of information centres aim at providing access to information.**
We can distinguish the following activities:
 - » Development of a collection of documents; arranging licenses to access information online.

Typical activities in information centres (Part 2)

- » Storage, organisation and conservation/preservation of collected hard copy documents; cataloguing of documents; classifying documents, adding terms from a thesaurus to document descriptions, to improve retrieval of documents from the collection. (An integrated computerized library management system can be useful here.)
- » Managing the circulation of materials.
(An integrated computerized library management system can be useful here.)

Typical activities in information centres (Part 3)

- » Providing computers to access online information sources.
- » Setting up a web site on the Internet as a gateway to the available information.
Integration of access to information sources in various formats.
- » Training users and potential users of information sources.
- » Collaboration / co-operation with related institutes.

General activities in information centres (Part 1)

- **Many activities can be seen in many organisations, not only in those focusing on providing access to information.**
For instance:
 - » Space planning.
 - » Managing staff.
 - » Applying common, general, horizontal information and communication technology (ICT).
 - » Marketing, promotion, public relations.
 - » Disaster planning.

General activities in information centres (Part 2)

- » Communicating and maintaining good links with senior, higher management.
- » Continuous professional development.

“Collection development” in information centres: introduction

- **We can distinguish 2 classes of activities in collection development:**
 1. Classical, traditional acquisitions of documents in hard copy or on CD-ROM or DVD for local storage (and in many cases conservation) and of course for usage.
 2. Relatively recent activities related to *licensing access* to information available on CD-ROM or DVD or online through the Internet.

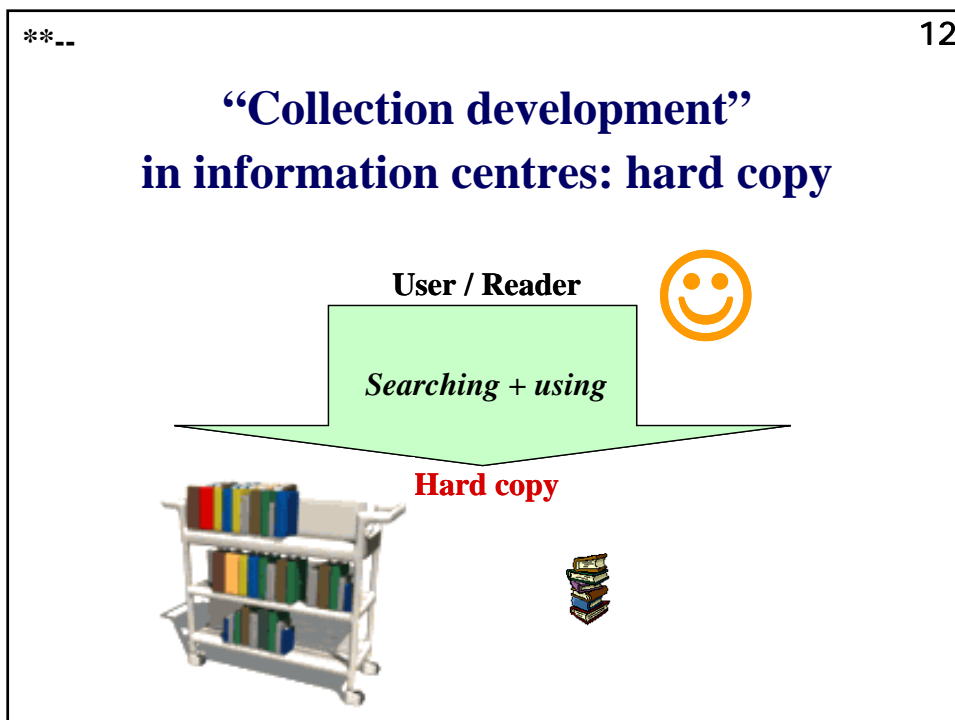
“Collection development” in information centres: hard copy



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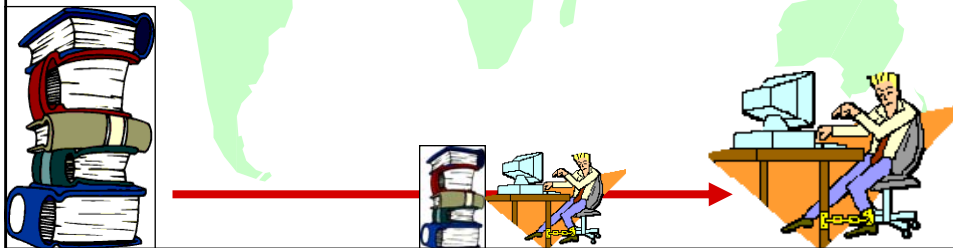
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“Collection development” in information centres: hard copy



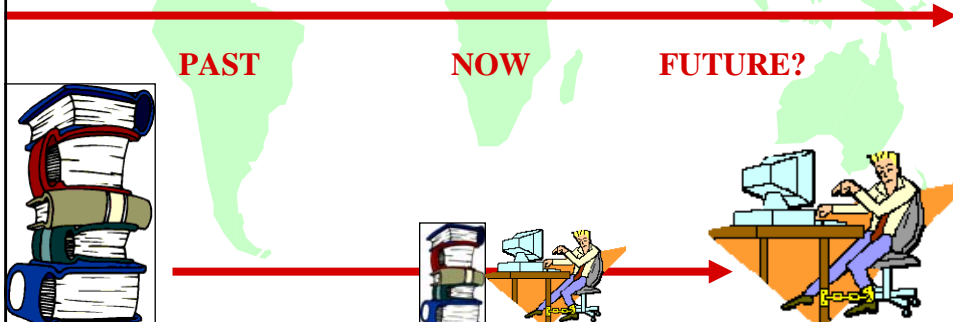
The library as intermediary

- Printed books and journals become relatively less important in libraries, when access to information sources becomes more and more feasible through the Internet and the WWW.



Evolution from classical over hybrid to digital libraries?

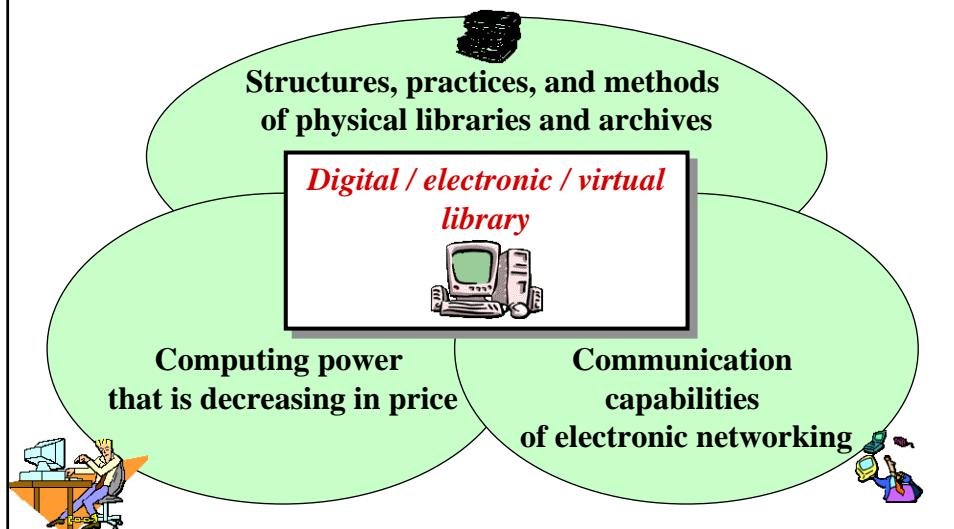
Classical libraries **Hybrid libraries!** *Digital libraries?*
 the librarian acting more as an intermediary



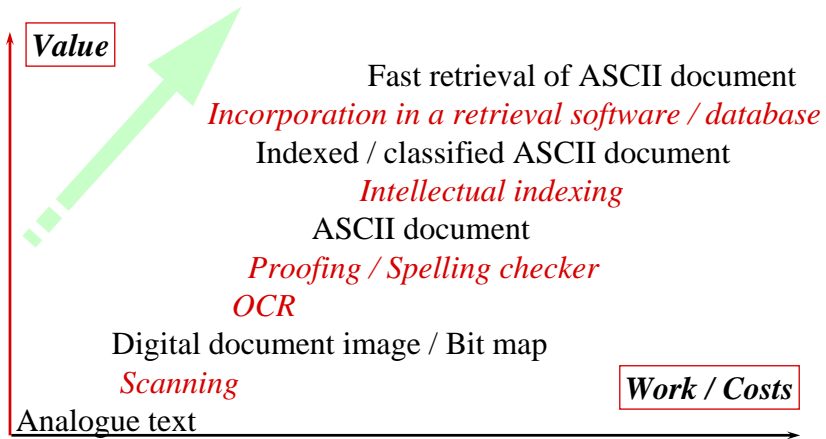
The digital/electronic/virtual library: introduction

- **Access to a growing amount of information is provided by combining**
 - » classical, traditional, standardised methods, practices and structures used in physical libraries and archives,
 - » computers and computing power that is decreasing in price,
 - » the growing communication possibilities of electronic, digital networks like the Internet.
- **This leads to a growing number of so-called “digital (or virtual or electronic) libraries”.**

The digital/electronic/virtual library: scheme



From analogue to digital document



!! Task - Assignment !!

Read the chapter on **digital libraries** by William Saffady in Introduction to automation for librarians Chicago : ALA, 1999.



!! Task - Assignment !!

Read the article
Principles for digital library development
by McCray and Gallagher
Communications of the ACM,
May 2001, Vol. 44, No. 5, pp.49-54.



!! Task - Assignment !!

Read chapter 1:
Libraries, technology and people
by William Y. Arms
In: Digital libraries.
Cambridge, Massachusetts : MIT Press, 2000, 287 pp.



!! Task - Assignment !!

Read
Bearman, David
Digital libraries.
Annual Review of Information Science and Technology,
Vol. 41, 2007.
pp. 223-272.



!! Task - Assignment !!

Read
Chen, C. and Borner, K,
Top ten problems in visual interfaces to digital libraries.
In Borner, K, and Chen, C.,
Visual interfaces to digital libraries,
LNCS 2539,
Berlin, Heidelberg : Springer-Verlag, 2002, pp. 226-232.



!! Task - Assignment !!

Read

Digital preservation. Introductory paper. [online]

Available from:

<http://www.coe.missouri.edu/~DL/iDLR/viewpaper.php?pid=18>

[cited 2005]



!! Task - Assignment !!

Read

FAO and UNESCO

Information Management Resource Kit (IMARK)

Module on Digitization and Digital Libraries.

Unit 1. Conceptual overview. [online]

Available free of charge from:

<http://www.imarkgroup.org/> [cited 2006],

also published free of charge on CD-ROM.

Lesson 1. Why digital collections and libraries?

Lesson 2. Digital collections and libraries in different environments.



!! Task - Assignment !!

Read

FAO and UNESCO

**Information Management Resource Kit (IMARK)
Module on Digitization and Digital Libraries.**

Unit 2. Electronic documents and formats. [online]

Available free of charge from: <http://www.imarkgroup.org/> 2005 [cited 2006],
also published free of charge on CD-ROM.

Lesson 1. Electronic documents and mark-up: introduction

Lesson 2. Character encoding: Latin and non-Latin scripts

Lesson 3. Formats of electronic pictures

Lesson 4. Presentational mark-up: HTML

Lesson 5. Descriptive mark-up: XML

Lesson 6. Procedural mark-up: text processors, style sheets, templates

Lesson 7. Portable document format (PDF)

Lesson 8. Conversion between formats



!! Task - Assignment !!

Read

Lynch, Clifford

Where do we go from here?

The next decade for digital libraries.

[online]

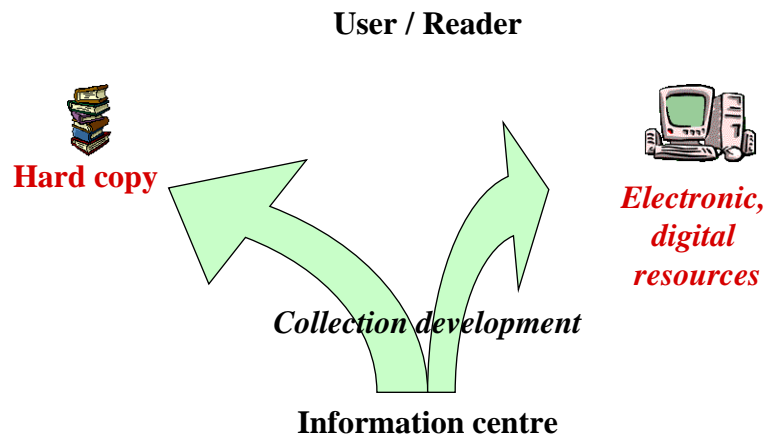
Available free of charge from:

<http://www.dlib.org/dlib/july05/lynch/07lynch.html>

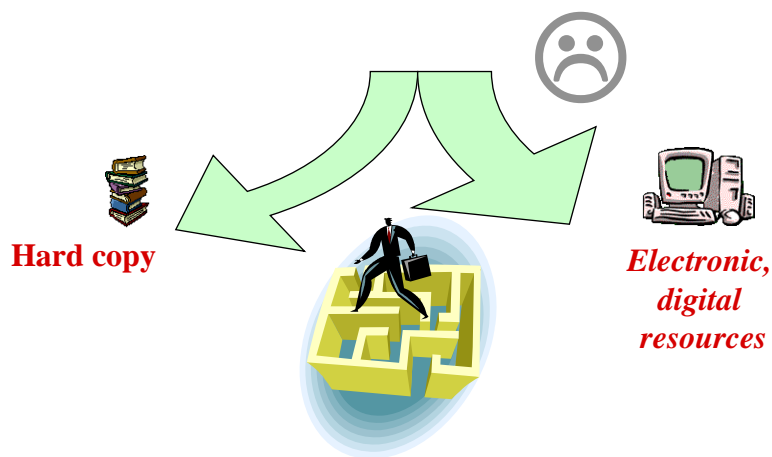
[cited 2006]



“Collection development” in information centres: hard + digital



“Collection development” in information centres: hard + digital



Organizing access to information in information centres: hybrid libraries

User / Reader

Searching + using



Hard copy + *electronic, digital resources*
in an integrated, hybrid library



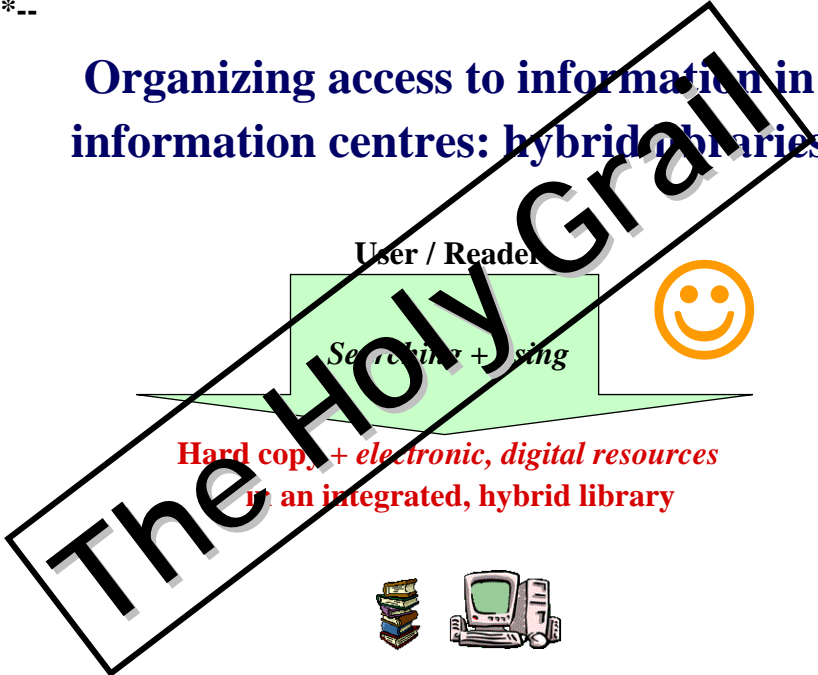
Organizing access to information in information centres: hybrid libraries

User / Reader

Searching + using



Hard copy + *electronic, digital resources*
in an integrated, hybrid library



Organizing access to information in information centres: the problem

- Users should be guided in finding their way through the maze, through the labyrinth that is formed by all available information systems and services.



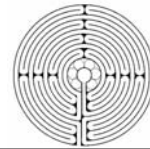
Organizing access to information in information centres: introduction

- **How to organize access depends of course on the type of information source:**
 - » Storage, organisation and conservation/preservation of collected hard-copy documents.
 - » Providing access to online computer-based information sources.
 - » + *Integrating access to all types of information as far as possible in a so-called “hybrid library”.*



Organizing access to hard-copy documents in information centres (1)

- **Several activities focus on organizing access to hard-copy documents:**
 - » Storage, organisation and conservation/preservation of collected hard copy documents.



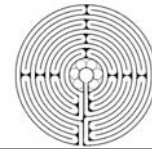
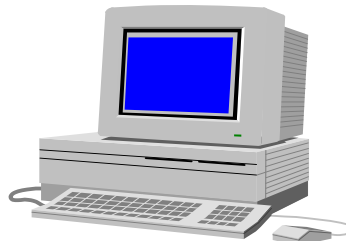
Organizing access to hard-copy documents in information centres (2)

- » To improve the retrieval of documents from the collection:
 - Cataloguing of documents according to an existing standard.
 - Classifying documents according to a classification scheme.
 - Adding terms from a thesaurus to the description of each document.
- » Organizing circulation of documents.



Organizing access to hard-copy documents in information centres (3)

- An integrated online library management system can be useful for organizing access to available documents.



Software for information centres and libraries

- In contrast with more widespread, general, “horizontal” office software packages, many information centres and libraries use also more specific, “vertical” software packages, such as:
 - » software to create a catalogue of available documents,
 - » software for serials control,or
 - » an integrated library management system!



!! Task - Assignment !!

Learn the basics from
an introduction
to information and communication technology
for librarians and information professionals

<http://www.unescobkk.org/CI/ICTLIP/Module1/>



Integrated library management software packages: introduction

- **ILMS**
= Integrated library management system



Integrated library management software packages: modules

- **Most library management systems offer modules that are integrated more or less with each other:**
 - » for acquisitions of non-serial documents,
 - » for the control of serial publications,
 - » for catalogue management,
 - » for searching the catalogue,
 - » for interlibrary lending,
 - » database of library users,
 - » ...



Integrated library management software packages: evaluation criteria

- **An evaluation or selection procedure can be supported by the many general criteria which are applicable in the evaluation and selection of most types of application software packages.**
- **Furthermore, more specific criteria for library management systems are also applicable.**



Integrated library management software packages: the basic DBMS

- **An important consideration is:**
What is the underlying database management system (DBMS) or retrieval system?
What are the consequences of this basic architecture/structure
 - » from a business point of view and
 - » from a technical point of view?



!! Task - Assignment !!

Read about online catalogs
in the chapter on Integrated Library Systems
by William Saffady
in
Introduction to automation for librarians.
Chicago : ALA, 1999.



!! Task - Assignment !!

Take a look at some OPACs:

<http://www.librarytechnology.org/libwebcats/>



Organizing access to computer-based information in information centres (1)

- **Several activities focus on organizing access to computer-based information: making information accessible**
 - » online via the Internet in the form of databases or web sites or combinations,
 - » locally on hard disks of computers or on CD-ROM disks or on DVD, on stand-alone microcomputers or on a bigger, networked computer.



Organizing access to computer-based information in information centres (2)

- » Providing users and potential users with access to microcomputer workstations, to the local area network of the organization, and to the Internet with the WWW, so that they can easily identify and use online, computer-based information sources.



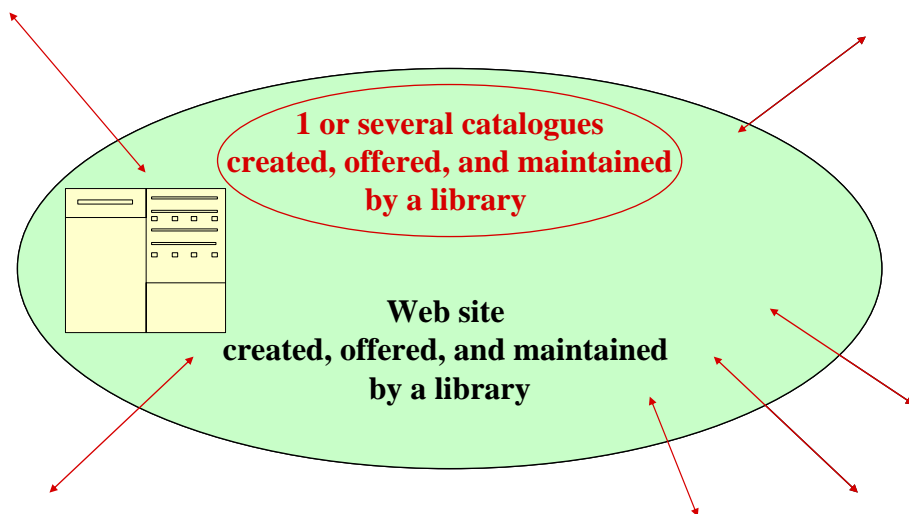
Integrating access to all types of information in information centres (1)

- **Users are in general more interested in the contents of the information carriers (documents) than in the type of information carrier, such as hard copy or computer-based.**
- **Therefore, an information centre should try to offer access in a way that offers all documents nicely integrated, irrespective of the type of document / information carrier.**
In this way the so called “hybrid libraries” are created.

Integrating access to all types of information in information centres (2)

- **However, access to all types of documents cannot be fully integrated in an ideal way.**
- **Some tools can help to integrate access. For instance:**
 - » An integrated library management system that offers a catalogue that points not only to hard-copy documents, but also to online accessible information.
 - » A web site created, offered, and maintained by a library can point out how to access the hard copy documents and can offer hyperlinks to online accessible information (web sites, databases, documents...)

Integrating access to all types of information in information centres (3)



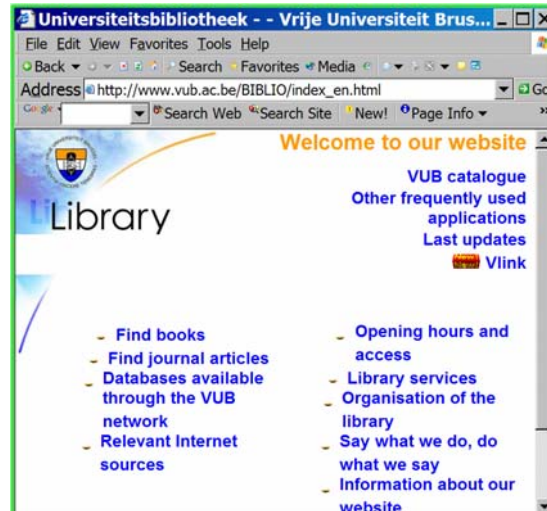
Web sites developed by information centres: introduction

- **Information centres can create a web site on the Internet as a gateway to the available information and to the services offered by the centre.**
- **Through this web site, the information centre can attempt to integrate access to information sources in various formats accessible through various media.**
- **Such a “WWW-based guide” can be interesting for internal as well as well as external users of the services offered by the information centre.**

Web sites developed by information centres: directory

- **WWW sites of libraries and information centers can be found for instance through**
<http://sunsite3.berkeley.edu/Libweb/>

Web sites developed by information centres: example



!! Task - Assignment !!

Have a look online through the Internet
at one or several library WWW sites.



Web sites developed by information centres: *contents*

The contents of such a web site can consist of

- » descriptions of information services offered
(with electronic mail addresses or direct links)
- » one or several catalogues or databases
 - built by the information centre
 - not built by the information centre, but made available
online by the information centre
- » links to information sources and services offered by
external organisations

Web sites developed by information centres: *links*

The links to information sources and services offered by external organisations can bring the user to

- 1. all bibliographic databases and electronic journals, for
which is paid, because not everyone in the world can
have access!!**

Web sites developed by information centres: *links*

2. a selection of Internet-based search tools that are available free of charge to everyone in the world!
(such as directories for browsing and indexes for searching WWW sites, books, journal articles, discussion groups...) !

Web sites developed by information centres: *links*

3. a selection of interesting sources even though they are accessible by anyone free of charge:
 - » WWW sites,
 - » high quality databases
 - » electronic journals(for instance the bibliographic medical database *PubMed* and “open access” scientific research journals)

Web sites developed by information centres: *the limits*

- **Where to stop?**
What should an information centre NOT incorporate in its WWW site?
- **This is a problem mainly for the bigger organisations with users interested in many domains of knowledge.**

Web sites developed by information centres: *integration*

- **The web site made by a library can (and ideally should) integrate several more traditional products like**
 - » links / pointers to information sources (including the traditional catalogue)
 - » the guide to using the library
 - » study material to become information literate
 - » how to contact library staff members?



Web sites developed by information centres: *integration*

- “Integration” of information on a web site means **MORE** than a set of hyperlinks.
For instance:
guidance / help should be offered
in the appropriate context
and not separated from the core activities.

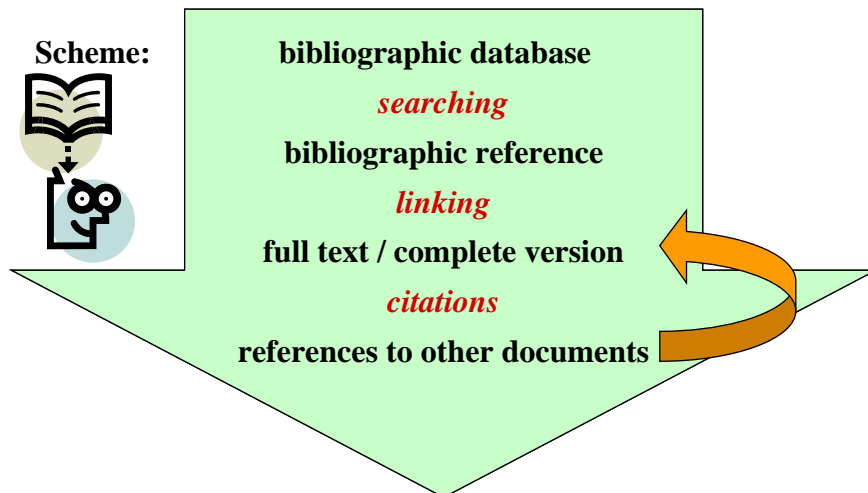


Web sites developed by information centres: *integration*

- Access to bibliographic databases and electronic journals should ideally be integrated, so that a reference found in a database can bring the user as directly as possible to the corresponding article that is published in an electronic journal.



Web sites developed by information centres: *integration*



Web sites developed by information centres: “*portals*”?

- Web sites that bring the user to information sources and services are often named “portals”.
- However, the definition of the word “portal” is not sharply defined.



Organizing access to information in information centres: *personalization*



- **To improve access to digital information sources, the information centre can consider**
 - » to adapt directly the information services that are offered, to some personal characteristics of the user
 - » or to offer the possibility to the user to adapt the services offered to personal preferences
- **This should result in a more “tailor made” information environment.**

Organizing access to information in information centres: *personalization*



- **More concretely, a *direct* adaptation / personalization can be applied on the basis of the location of the user.**
- **For instance, in the case of a library with collections distributed over more than 1 location, the library computer system (such as the library catalogue, web site, appropriate hyperlink generator...) can first show collections or items or services, which are most directly accessible from the location where the client is using the system.**

Organizing access to information in information centres: *personalization*



- The location of the client can be derived by the library system for instance through the IP number of the computer that is used.
- Other characteristics of a user can be obtained through log-in → authentication → authorization. Authentication and authorization to access specific sources and services is a subject on its own and is not always considered as a form of “personalization”.

Organizing access to information: *personalization of what?*



- **the subject domain of the information sources that are presented in the first place**
- **which preferred and often used information sources are presented in the first place**

Organizing access to information: *personalization of what?*



- **the look and feel, format, lay-out, colours of**
 - » the web site,
 - » the catalogue,
 - » the link generator
 - » ...
- **the scope of a current awareness service that is offered (but this classical, well-established kind of information service is generally not considered as a “personalization”)**

Organizing access to information: *personalization or not?*



- **Advanced high-quality personalization**
 - » requires expertise that is not (yet) available in many libraries / information centres
 - » is considered by some experts as too expensive to implement, in view of the limited advantages

Current awareness services **provided by information centres**

- **The incoming flow of new available information is huge.**
- **The potential user/reader has limited time.**
- **So information centres can provide a current awareness service (alerting service).**
- **The information offered should be limited to the interests expressed by the user.**

Current awareness services **provided by information centres**

- **The information centre can send to the user**
 - » **descriptions of books that have been added to the local collection and catalogue!**
 - » descriptions of new published information sources, such as new books or journal articles, plus an explanation of how to obtain the full version (but the information centre is not essential anymore as an intermediary, because this type of service is now offered in a user-friendly way by several book publishers, journal publishers, database producers, bookshops...)

Organizing access to information in information centres: Internet access

- **To allow clients to access to computer-based information resources, information centres**
 - » 1. can provide access to computers (classical pc's or notebook pc's or...) that are
 - connected to the Internet,
 - equipped with suitable software
 - secured against viruses and attacks of users
 - maintained well



Organizing access to information in information centres: Internet access

- **To allow clients to access to computer-based information resources, information centres**
 - » 2. can support and stimulate the use of personal notebook computers of the incoming clients



Organizing access to information in information centres: computer tools

- **To assist the users / clients / readers in their usage and management of digital information, the information centre can provide computer tools such as**
 - » access from everywhere to personal, protected disk space on a central computer
 - » text database management systems; local storage and retrieval systems
 - » annotation software
- **Of course this requires expertise that is not (yet) available in many information centres.**



Education in finding and managing information

- **To make sure that information sources are better appreciated, used, managed and exploited, the users and potential users should receive some education, training, instruction.**
- **This activity can be taken care of by schools, universities, or by the information centres / libraries.**
- **Ideally this should be offered in several formats:**
 - » as stand-alone, separate activities
 - » integrated with the pointers/links to information on the web site

Organizing access to information in information centres: user feedback

- **The system developed by the information centre to organize access to information should be**
 - » adapted regularly to a changing world
 - » improved (within time and budget constraints of course)
- **User feedback can be useful here.**

Users should be stimulated to provide comments on the web site, and these comments should be directed to a person who is responsible for this kind of work.

A suitable method here is the inclusion of feedback forms for email in the web pages.

Organizing access to information in information centres: user studies

- **A few web site users should be selected from various categories of the user community and the way they work with your web site should be studied.**

The observation of their behaviour and the comments by those users can be useful and interesting to improve your web site.

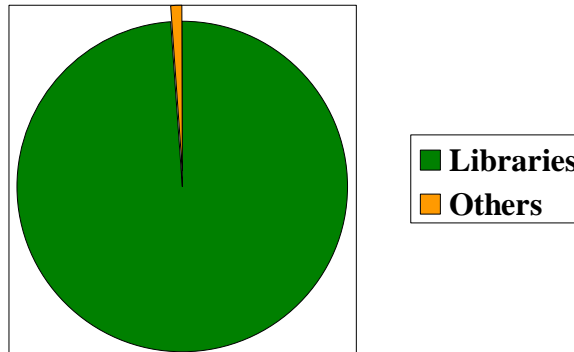
Organizing access to information: co-operation among organizations (1)

- **Co-operation with other organizations in the field of access to digital information may be desirable in**
 - » purchasing access to electronic/digital sources (by forming “consortia”)
 - » development and maintenance of collections of hyperlinks to electronic/digital sources through the WWW
 - » development of study materials in the domain of information literacy
 - » development and maintenance of tools to manage digital sources

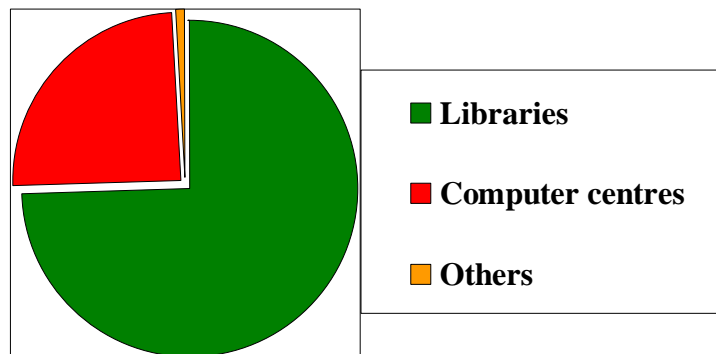
Organizing access to information: co-operation among organizations (2)

- » making agreements on the application of uniform rules for the creation and application of metadata = descriptions of information resources (formal descriptions, classification schemes, controlled keyword systems, ontologies...)
- » making metadata available to other organisations for the creation of integrated, merged information systems, and using standard protocols for this

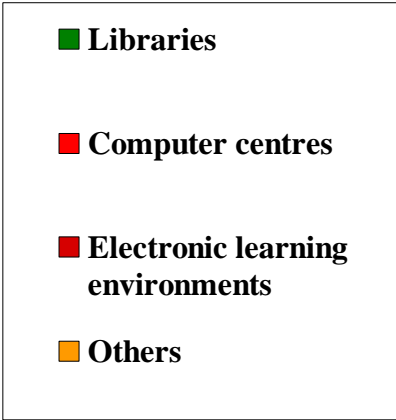
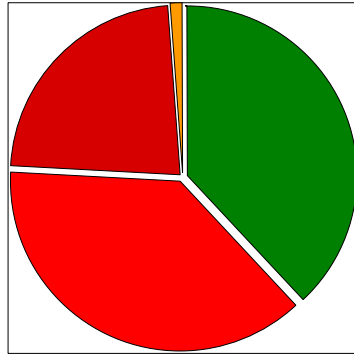
Organizing access to information in organizations: evolution of roles



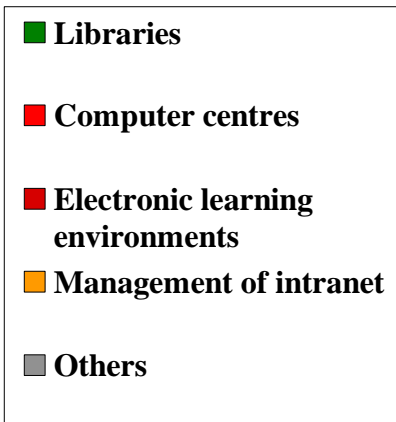
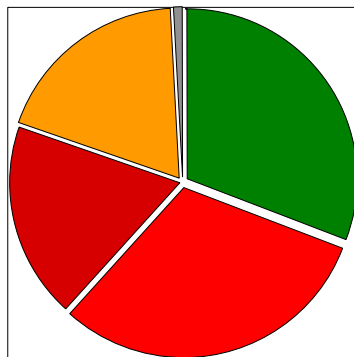
Organizing access to information in organizations: evolution of roles



Organizing access to information in organizations: evolution of roles



Organizing access to information in organizations: evolution of roles



Organizing access to information: co-operation among departments

- **Co-operation with other departments in the organization/institute in the field of access to digital information may be desirable.**
- **For instance with**
 - » the centre for computing & networking
 - » managers of the local central electronic/virtual learning platform
 - » managers of distributed, departmental information centres
 - » managers of the local intranet
 - » ...

Organizing access to information: the value of information?

- *What is the value of information sources?
Which price is reasonable and acceptable for access to information sources?*
- **These are simple questions but the answers are difficult. Debates on these questions by all stakeholders are going on almost continuously.**

Organizing access to information: the value of *structured* information?

- **A related but different question is:**
What is the value of a good guide to information?
Which price is reasonable and acceptable for
ORGANISING / STRUCTURING information sources?

Organizing access to information: the value of *structured* information?

- **The question on value is hard to answer,
because the work, the efforts, the results and the benefits
in the case of digital information
are less clearly visible
than in the case of a well organised hard-copy collection
However, it is also a question relevant to libraries,
information centres, that spend more and more efforts in
this area. How do managers and decision makers see this?**
- **Anyway, making visible the services offered by the hybrid
library is an important aspect of management.**

Organizing access to information: some conclusions

- **Organizing access to digital information has become an additional role for libraries and information centers.**
- **Computer technology offers some new tools to integrate access to information in the hybrid library.**
Still in full evolution ← → No standard solutions.
Change is the only constant.

Organizing access to information: some conclusions

- **For the managers:**
Several additional concerns and challenges,
such as the following:
 - » Competitors claim a part of the same role.
 - » Co-operation can be useful in this field.
 - » The contributions and value of the hybrid library should be kept visible.

Organizing access to digital information: **conclusion**

“A good librarian is an invisible librarian” ?

!! Task - Assignment !!

Read the first chapter of the following book
about libraries in the digital age:

Limb, Peter

Digital dilemmas and solutions.

Oxford : Chandos Publishing, 2004, 193 pp.

The impact of a globalising information economy



!! Task - Assignment !!

Read about implementing technology in libraries and information centres:

Mills, Anna

Implement a technology plan. [online]

Available from: <http://www.webjunction.org/do/PrinterFriendlyContent?id=1006>
[cited 2005]

Osten, Marc

Technology leadership. [online]

Available from: <http://www.webjunction.org/do/PrinterFriendlyContent?id=1026>
[cited 2005]



Marketing, promotion, public relations, in information centres

- **Information units should continually assess their products and services to ensure that they are continuously relevant for their users and potential users.**
- **Also, information centres should remind their users as well as their potential users of the traditional and new products and services that are available.**

Marketing in information centres: methods

Feedback from users should be collected informally as well as more systematically.

Public relations in information centres: methods

The information centre

- **can display recently acquired books and other documents, in the centre or during scientific conferences**
- **can make available short texts, guides, lists of recently acquired documents, other announcements, annual reports, articles in the professional literature, etc, in printed format and/or through a local web site**
- **can organize seminars for users and potential users with speakers from the centre or with information experts from other organisations**

Co-operation with library partners

- Any single library cannot cope well with the fast evolution to more digital components.
- Co-operation among organisations should be considered, such as
 - » public libraries ↔ scientific libraries
 - » libraries ↔ computer centers / web designers
 - » libraries ↔ electronic learning centers



Libraries and information centres

Relations between libraries
and electronic learning environments

?? Question ??

What is a suitable definition for
“electronic or virtual learning environment”?



Electronic learning environments: a definition

A system

- based on information and communication technology (computer hardware and software + network)
- to create, develop, maintain and make available learning/study materials to students;
to coach, guide learning/study activities;
to assist evaluation/assessment of the students,
- continuously through time (permanently), and
- independent of the location of teachers and students.

Electronic learning environments: popular, existing software

- **Client-based software that helps a teacher to create web pages and web sites, such as**
 - » *Macromedia Dreamweaver.*
 - » *Microsoft FrontPage*



Electronic learning environments: popular, existing software

- **Server-based, more specialised software that includes authentication, authorization, personalization, group communication facilities, and didactical modules.**



Electronic learning environments: popular, existing software

- **Examples:**

- » *BlackBoard !* (commercial, proprietary)
- » *WebCT* (commercial, proprietary, merged with *BlackBoard*)
- » *Claroline* (non-commercial, open source)
- » *KEWL* (non-commercial, open source)
- » *Moodle !* (non-commercial, open source)



Electronic learning environments: popular, existing software

- **Library catalogue database software can be used as a component of an electronic learning environment:**

- » First, these systems can include links to electronic learning materials that are provided by teachers.
- » Secondly, these systems then allow students to find and use their electronic learning materials, in most cases by using a common web browser.



Electronic learning environments: advantages



Possible advantages:

- **The system is accessible all the time.**
- **It can be used from any location by the teacher, as well as by the student.**
- **It can stimulate the teachers to rethink their pedagogical approach; this can lead to pedagogical innovation.**
- **The new, exciting learning methods can attract new students; this is important in the increasingly competitive field of education.**

Electronic learning environments: difficulties (Part 1)



- **There is a lack of good learning materials that are well adapted to the new pedagogical methodology.**
- **We see a lack of pedagogical innovation, vision and methods that are well adapted to the features of the e-learning environment.**
- **Teachers as well as students require tools and skills in the area of information and communication technology.**

Electronic learning environments: difficulties (Part 2)



- **E-learning system software and contents can be expensive, and some extra computer hardware and expensive technical support is required.**
- **The ideal e-learning system does not exist of course. For instance: which software package offers a good integration of a server-based system for contents creation and management by teachers, with didactical modules for assessment/evaluation and for annotation of contents by users/students?**

?? Question ??

Which relations may be important in organisations and schools, between the local

- **libraries and information centers**
- **electronic learning environments?**



Involvement of the library with the electronic learning environment (1)

- **Library catalogues on the Internet and library web sites can be seen as a part of the broad electronic learning environment for students.**
- **Furthermore, and more specifically, local libraries and information centers can be involved in the following actions:**

Involvement of the library with the electronic learning environment (2)

- **Librarians can select appropriate contents / courseware / full texts / e-books / electronic journal articles for the local e-learning environment.
Collaboration with teachers is of course desirable.**
- **Librarians can take care of licensing access to contents / courseware / full texts / e-books / electronic journal articles for the local e-learning environment.**

Involvement of the library with the electronic learning environment (3)

- **Librarians can improve the access to digital, computer-based contents / courseware / full texts / e-books / electronic journal articles for the local e-learning environment, using methods like**
 - » cataloguing (formal descriptions)
 - » subject description (adding classification codes or subject terms from a controlled vocabulary or thesaurus)
 - » increasing accessibility through the Intranet, the WWW, Open Archives Initiative – Protocol for Metadata Harvesting

Involvement of the library with the electronic learning environment (4)

- **Librarians can increase the accessibility**
***from* the local e-learning environment**
***to* the information resources and services offered by the library, such as**
 - » access to locally available books and journals,
 - » local and external catalogues and other databases,
 - » document delivery; interlibrary lending
 - » guides about how to use, find and manage information resources...

Involvement of the library with the electronic learning environment (5)

- **An electronic learning environment stimulates learning more and more on a distance, away from the library. Therefore, librarians should ensure that the licensed, digital collection can also be accessed from outside the library through an appropriate method for authentication and authorization.**

Involvement of the library with the electronic learning environment (6)

- **Librarians can assist in the development of a one time authentication and authorization system to increase the integration of the services offered by the electronic learning environment with the services offered by the library.**

Involvement of the library with the electronic learning environment (7)

- **Librarians can make contents / study materials / courseware / full texts / e-books of the e-learning environment also accessible through the library web site for potential (local as well as external) users that do not enter the e-learning environment (as far as copyright regulations allow this).**
- **Librarians can use the e-learning environment to offer courses in information literacy (library user instruction/education).**

Involvement of the library with the electronic learning environment (8)

- **Librarians can assist in the digitisation of learning materials that are available only in hard copy for lecturers, so that the resulting electronic, digital documents can be integrated in the electronic learning environment.**
- **Librarians can make available to lecturers a toolkit for digitisation of learning materials that are available only in hard copy, so that the resulting digital documents can be integrated in the electronic learning environment.**

Involvement of the library with the electronic learning environment (9)

- **Librarians can promote library services through the e-learning environment.**
- **Librarians can offer a presence and availability in real time as a reference librarian who can assist the users of an electronic learning system in their searches for information.**

Involvement of the library with the electronic learning environment (10)

- **Librarians can study the usability and applicability of metadata standards for electronic learning materials, that guide people to describe not only the content subject/topic, but also**
 - › target audience level of expertise,
 - › inclusion of assessment system (quiz,...)...

Involvement of the library with the electronic learning environment (11)

- **Librarians can contribute to the development and implementation of a software system that assist the local contributors of e-learning materials in their creation of**
 - » consistently formatted bibliographic references and links
 - » bibliographic references and links formatted according to some standard
 - » direct, classical, absolute hyperlinks to documents in electronic format
 - » hyperlinks to documents in electronic format as OpenURL's, because these are superior to classical links

Agreements between the library and the electronic learning environment

Clear agreements should be made about the possible involvements of the library experts with the managers of the e-learning environment and with the teachers who use the e-learning environment.

Co-operation or competition?

Libraries and information centres

**Collaboration and interaction
among information centres**

Collaboration and interaction among information centres: introduction

- **No information centre can be self-sufficient.**
- **Information professionals share a tradition of co-operation and interaction.**

Collaboration and interaction among information centres: activities (Part 1)

- **Collaboration among information centres can take many forms. For instance**
 - » Developing and maintaining common union catalogues
 - of monographs in the collections
 - of serials available
 - » Avoiding unnecessary overlap in collections.
 - » Resource sharing, interlibrary lending, document supply/delivery to other requesting organizations or persons.

Collaboration and interaction among information centres: activities (Part 2)

- » Forming a consortium of organizations, in order to obtain lower prices when buying hard-copy documents or access to online accessible information sources like electronic journals and databases.
- » Developing standards related to information sources and services.
- » Working in professional organisations related to information.

Organisations for information professionals: introduction

- **Professional organisations that focus on libraries can fulfil some needs:**
 - » continuous learning
 - » exchange of ideas
 - » stimulate co-operation
- **However, take care that the society does not focus only on established practices, so that they do not stimulate but on the contrary hinder adaptation and progress.**



Organisations for information professionals: overview

- **Many organizations for information centres and information professionals stimulate co-operation and interaction.**
- **We see**
 - » International organisations,
regional organisations,
national organisations
 - » Subject-oriented organisations



Organisations for information professionals: at international level

Examples:

- » IFLA, the International Federation of Library Associations and Institutions:
<http://www.ifla.org/>
- » SLA, the Special Libraries Association:
<http://www.sla.org/>
- » IATUL, the International Association of Technological University Libraries:
<http://www.iatul.org/>



Organisations for information professionals: at national level

Example for the USA:

- » ASIS: <http://www.asis.org/>

Examples for Belgium:

- » VVBAD: <http://www.vvbad.be/>
- » BVD/ABD: <http://www.synec-doc.be/abd-bvd/>



Organisations for information professionals: subject oriented

Examples:

- » IAMSILIC, the International Association of Aquatic and Marine Science Libraries and Information Centres:
<http://siolibrary.ucsd.edu/IAMSILIC/>
- » EURASILIC, the European Association of Aquatic Sciences Libraries and Information Centres:
<http://www.euraslic.org/>



Libraries and information centres

Evolution and future trends

Libraries and information centres: evolution to what?

**Let us have a look at important functions
– key functions –
of libraries
and consider how these evolve.**



?? Question ??

**Which future trends do you see
in libraries and information centres?**



Libraries and information centres: which evolution of their roles?

- Collection development (hard copy documents) → ?
- Cataloguing + classification (hard copy documents) → ?
- User services: reference, user education... → ?
- Providing a physical, local meeting place → ?
- Conservation / preservation (hard copy documents) → ?

Libraries and information centres: effects of more ICT

- The fast evolution to powerful and affordable applications of information and communication technology (ICT) has several effects on libraries and information centers.



Libraries and information centres: more applications of ICT

1. More applications of ICT to manage classical, printed, hard-copy books and journals

- ordering of documents; cataloguing of documents;
- online public access catalogue;
- administration concerning users;
- lending;
- interlending;
- financial management;
- communication by email;
- WWW sites of libraries...

Libraries and information centres: more content based on ICT

2. Providing access not only to hard-copy documents, but also to digital, computer- and network-based information sources.



Libraries and information centres: evolution of their roles

- **Collection development
(hard copy documents)**

→ *1. Applying more ICT in collection development of hard copy documents*
2. Acquiring access to digital information
 + *conversion of important local documents to digital format (computer files) and making these accessible through the Internet*

Libraries and information centres: evolution of their roles

- **Organizing access to hard-copy documents:**
 - » cataloguing
 - » classification
 - » physical placement
 - » ...

→ *1. Applying more ICT to organize access and to manage hard copy documents*
 → *2. + Organizing access to digital information, which includes providing access to computers connected to the Internet*

Libraries and information centres: evolution of their roles

- **User services:**

- » reference,
- » user education
- » ...

→ + *Offering services in a computer-network environment:*

- *OPAC through the Internet;*
- *website of the library;*
- *guides to information sources;*
- *contributing to a high level of information literacy;*
- *current awareness services;*
- *virtual reference services;...*

Libraries and information centres: evolution of their roles

- **Providing a physical, local meeting place**

→ + *Presence of the library on the WWW, that is accessible from everywhere at any time!*

Libraries and information centres: evolution of their roles

- **Conservation / preservation (hard copy documents)**

→ + *Conservation of digital documents*
or
ensuring continuous access to digital documents on external computers

Libraries and information centres in evolution

- **Decreasing physical, hard-copy document collections**

<=>

Increasing impact of *online* access information sources

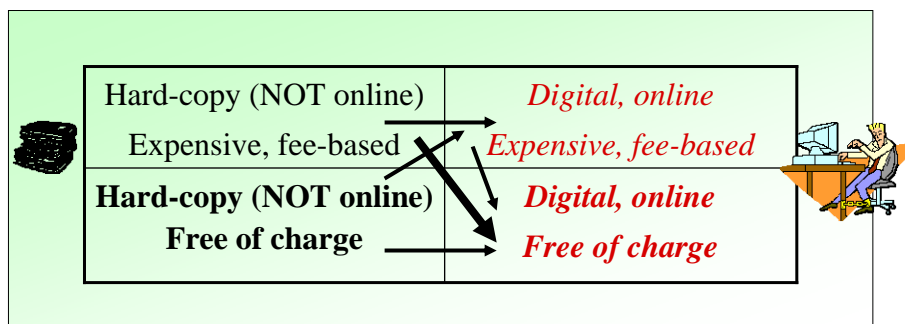
- » Secondary, bibliographic databases
- » WWW sites
- » E-journals
- » (E-books)
- » ...



Libraries and information centres in evolution

- **Increasing availability, usage and impact of information that is available online and *free of charge* (open access) without need for a library or information center.**
- **This is valid for both**
 - » primary information
(for instance WWW sites since about 1992, open access journals since about 2000)
 - » secondary information
(for instance the search engine *Google Scholar* since 2004)

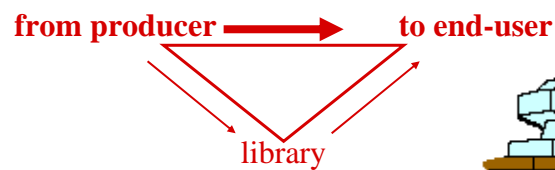
Libraries and information centres in evolution



*If it is not on the Internet, available free of charge,
then it does “not exist”.*

Libraries and information centres in evolution

More information delivery more directly
from producer to end-user
without involvement of a library or information centre
acting as intermediary.



Libraries and information centres in evolution

- Access to computer-based information networks consumes part of the budget of the organisation, so that it is not available anymore to buy access to information sources that are not available free of charge.



Libraries and information centres in evolution

- **Decreasing efforts (budget + time) devoted to taking care of a central, local, physical collection.**
- **This is caused by**
 - » the increasing availability of external digital information sources that are readily accessible through the computer networks
 - » the increasing efforts to store locally created information in the form of digital documents
(for instance electronic theses and dissertations made available through an “ETD server”, electronic study materials made available through an electronic learning environment)
 - » the increasing price of building space



Libraries and information centres in evolution

- **Decreasing efforts (budget + personnel time) devoted to taking care of a physical location/building, the classical “front office”.**
- **This is caused by**
 - » The decreasing importance of the physical library collection in comparison with digital information
 - » Less presence of users in a reading room to use documents, as they get better access to digital information sources from any location at any time



Libraries and information centres in evolution

- **Decreasing efforts (budget + personnel time) devoted to offering a physical location/building where clients use hard-copy documents.**
- **Some library reading rooms are converted into spaces where individuals or groups can come and study/learn/work/sleep more or less independently of the local documents.**

Is this a core function of a “library”?

Should a library offer silence, rest and work space instead of hard-copy documents?



Libraries and information centres in evolution

- **Decreasing power concerning local library collection development (at least for journals in scientific and academic libraries)**
- **This is caused by**
 - » the increasing importance of library consortia that deal with publishers and brokers.
The information professionals and decision makers who work within the consortium make more important decisions than personnel working in the local libraries.
 - » so-called “package deals” offered by publishers, that eliminate decision-making concerning single, individual journals



Libraries and information centres in evolution

- **Decreasing importance of the library and the library manager and less respect for the library.**
- **This is caused by shrinking of the budget devoted to the library,
as a greater part of the required information becomes available free of charge in digital format**

For instance:

- » electronic theses and dissertations and copies of published documents from all kinds of organisations,
- » open access journals,
- » search engines for WWW pages and scientific articles...



Libraries and information centres in evolution

- **Decreasing efforts (budget + personnel time) devoted in physical libraries to reference services, assisting users...**
- **This fits in the more general evolution of “disintermediation” that takes also place in shops, business...**
- **Less service and intermediation is accepted more and more by users.**



Libraries and information centres in evolution

- **Decreasing efforts (budget + personnel time) devoted in libraries to classification or tagging of documents to increase the quality of the retrieval system.**
- **This is due to**
 - » Increasing power of full and free text retrieval systems that work fast enough and that offer relevance ranking that can be based on the contents as well as on citations and links received by the documents
 - » Growing acceptance by users of fast and easy retrieval systems that do not exploit sophisticated classification methods, due to their experience with search engines to find web pages.
 - » Upcoming application of folksonomy = classifying and tagging and annotating by users, instead of by authors/librarians/producers
 - » Upcoming application of external evaluation/assessment systems that can offer added value.



Libraries and information centres in evolution

- **Growing together in many organisations of the library and the computer centre.**
(In some cases, the computer centre takes over the library, creating an information centre.)

Libraries and information centres in evolution

More efforts focused on the following activities:

- » Understanding and coping with copyright and the evolution of copyright laws
- » Implementing and maintaining information technology infrastructure

Libraries and information centres in evolution

- » Training users and potential users of information in “information literacy”, with an emphasis on digital information

Libraries and information centres in evolution

- » Organising access to digital, online information sources, by creating friendly and clear pathways through the Internet
 - = user interfaces to Internet-based information sources and services
- Decreasing importance of back-office activities such as cataloguing, conservation and storing of hard-copy documents,
- and growing importance of front-office activities; this requires good communication skills.

Libraries and information centres in evolution

- » Interlibrary lending and document delivery; from “Just in case” to “Just in time”

Libraries and information centres in evolution

- » Publishing the documents created by members of the institute such as reports, dissertations, articles, book; in this area the ideas, protocols and software developed in new frameworks like the Open Archives Initiative and SPARC can be useful

Libraries and information centres in evolution

- » Organizing and making available the documents created in the organisation
= “knowledge management” + “content management”

!! Task - Assignment !!

How effectively can and will computers
be used
for the skilled tasks of professional librarianship?

See

<http://www.dlib.org/dlib/july00/arms/07arms.html>



!! Task - Assignment !!

Read

Banerjee, Sushant

Librarianship in the new technological era: opportunities and challenges.

In Proceedings of

the International Conference on Information Management in a Knowledge Society,
ICIM 2005, in Grand Hyatt Hotel, Mumbai, India, 21-25 February 2005.

2 Volumes.

Editors: D. Kamalavijayan et al.,

New Delhi : Allied Publishers, 2005. ISBN 81-7764-770-9.

Volume II, pp. 831-836.

Also published on CD-R.



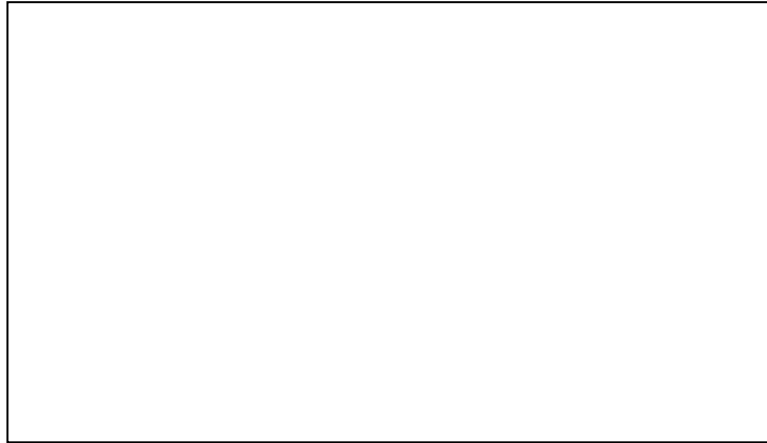
Libraries and information centres

**From physical libraries
to invisible information centers**

Libraries and information centres: future trend = becoming invisible

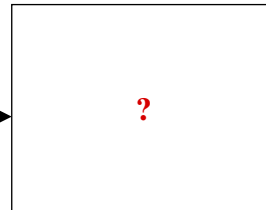
- **Conservation of hard copy documents becomes a smaller task in comparison with other activities in libraries.**
- **Services offered by libraries become more virtual, less clearly visible.**
Is the ideal library invisible?
Who wants to pay for an invisible library?
Who wants to pay for invisible librarians?
- **Classical libraries lose prestige,
but access to information will still be important.**

Picture of the future library and information center?



From local, physical libraries to virtual, digital, invisible libraries

- Besides local, physical libraries, an important role is played by more regional, international, virtual, digital, invisible libraries and information services.
- From physical, human librarians to invisible information managers?





The physical location of the library becomes less important

- The physical location of *documents* is an irrelevant concept when the documents are based on computer-networks and the Internet in particular.
- The physical location of *information intermediaries* of a library is not important anymore, when reference services and guidance is offered by information intermediaries / experts through the Internet, by using an application like WWW or email.
“Virtual reference services”

Local, physical libraries can still be attractive

- **Physical libraries can of course remain attractive when they offer**
 - » many classical documents that are not available through the Internet
 - » an interesting, attractive space for contemplation, study, entertainment, self-development, meetings...
- **Of course the library budget is limited and can be spent only once in a hybrid library:
either on the physical library, either on the digital library**

How to make hybrid libraries attractive “places”?

- *Physical* libraries can be made attractive and usable by good architects / designers.
- *Digital* libraries can be made attractive and usable by good information architects / web designers.

So in any case, creating a good interface

user **↔** **information**
is crucial.

Libraries and information centres

When should information centers adapt to the changing information landscape?



When to adapt to the changing information landscape?

- Yesterday
- Today
- Now
- Tomorrow
- Always
- Permanently
- Continuously



because *“Change is the only constant”*



Libraries and information centres

Providing access to electronic publications:
link generators

Libraries and electronic publications

- **Libraries and information centres are facing challenges caused by the proliferation of heterogeneous electronic publications that are accessible through the Internet and the WWW.**
- **Access to these sources should ideally be offered integrated seamlessly with the more classical access to hard copy materials.**

Libraries including electronic publications in the “collection”

- **Some years ago the main challenge faced by libraries was to adapt their collection development to the evolution towards more electronic publications and services that have become available.**
- **This has led to the first, primitive so-called “hybrid” libraries.**

Libraries including electronic publications in the “collection”

- **A simple way to bring users to electronic publications is to offer links from the web site of the library to the web sites of**
 - » publishers or of
 - » intermediaries (aggregators) that bring together links to publishers and journals.

Libraries integrating access to printed and electronic publications

- **Access to electronic publications should be integrated well with the more classical access to printed materials.**
- **This is important, because users are interested**
 - » less in the technicalities of information carriers, media and systems,
 - » more in the contents of the information sources.

Libraries improving access to printed and electronic publications

- **Methods, techniques and tools for a better access include:**
 - » A “hybrid” catalogue that points not only to printed materials but also to electronic sources
 - » A local online authentication and authorization system allows or blocks access to sources and services, depending on the status of the user
 - » A proxy server or another method can support access to sources and services by legitimate users who are active outside of the computer network of the organization (remote users)

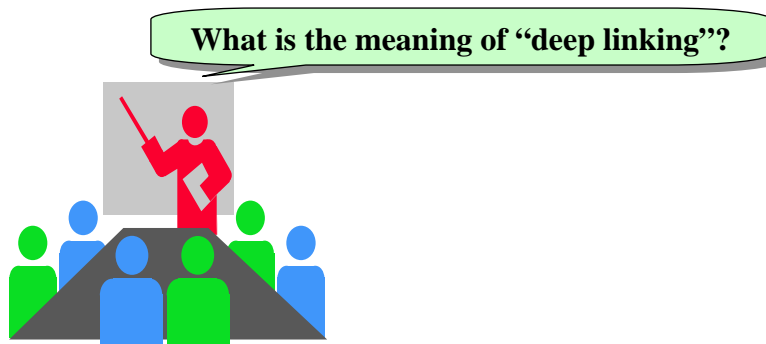
Libraries improving access to printed and electronic publications

- » The web site of the library or information centre can offer links to electronic publications at various levels of granularity and specificity.
From coarse to fine, the following can be mentioned:
 - to an external intermediate organisation that takes care of further linking, as far as made possible
 - to the various publishers of electronic sources
 - to the various e-journals or other e-sources
 - through a bibliographic database directly to electronic journal articles

Libraries linking from secondary to primary electronic publications

- **The most direct, so-called “deep” linking to articles is possible when the library or information centre offers the user a secondary (bibliographic) database of journal articles, that is installed in such a way that a search result offers 1 direct, “deep” link to the corresponding full text of the article, of course only in the case that access is possible.**
- **Such systems can work well, but evolution goes on.**

?? Question ??



Libraries providing access to sources through a link generator

- Another step forward came with (hyper)link generators.
- These systems are based on a knowledge base about the sources and services that can be offered by the organization's library.
- In this way, they can offer the most relevant links from a particular starting point; for instance;
to bring the user
from a brief but interesting bibliographic description of a journal article
to the full-text.

Libraries providing access to sources through a link generator

- These systems are not based anymore on fixed, static URL's,
but on OpenURL
that is resolved to a more specific and concrete URL that is adapted better to the specific user and his/her organisation.

Link generator: terminology / vocabulary / synonyms

context-sensitive (hyper)link generator
= **appropriate (hyper)link generator**
= **(hyper)link “resolver”**
= **OpenURL link system**

Link generator: introduction with examples

Examples of problems to be solved by such a system:

- » How to bring an end-user
from a bibliographic description of a journal article
to the full-text of that article?
- » How to bring an end-user
from an ISBN
to a bibliographic description of the book
(or even to the table of contents of the book)

Link generator: introduction in general terms

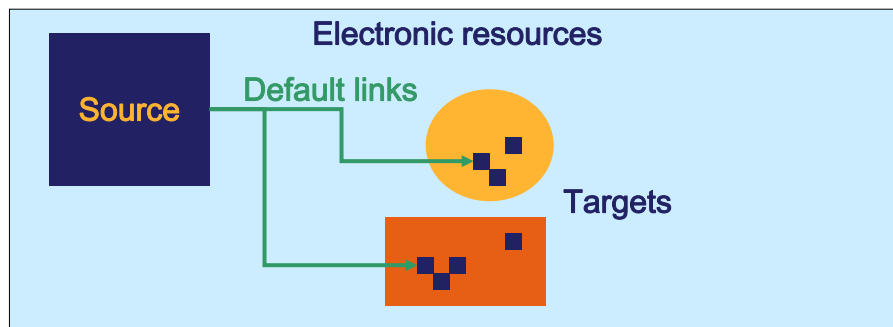
In general and in abstract terms:

Such a system guides the user from a reference
(a bibliographic description)
taken from some source
to the most suitable target source(s) or service(s)
that are appropriate in the particular context
(for the specific library and/or the specific user)

Link generator: introduction

- **Bringing a user from some information source to another information target in a networked environment is of course accomplished these days by linking / hyperlinking.**
- **However: normal, classical, primitive, simple hyperlinks are limited in the sense that they**
 - » are determined/produced/created/written by the producer of the starting information source,
who is in most cases independent and unaware of the final, future users and their specific context and environment

Link generator: introduction



Link generator: introduction

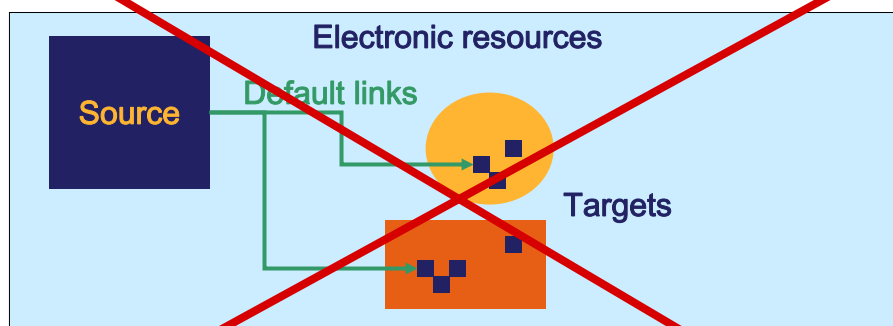
- A “link generator” goes further than what a simple link can offer:
 - » generates *several* links starting from 1 source to several possibly useful targets that are adapted to the user’s context/environment,
 - » allows the user to choose among those links, using a menu of offered targets

Link generator: introduction

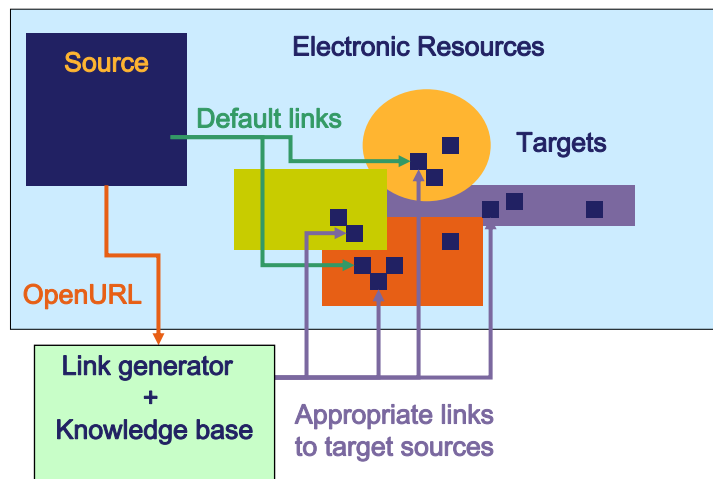
“Context-sensitive” or “appropriate” linking should take into account

- » Which information resources are available in digital format on some server computer?
- » Which of these information resources are available to the user in her/his organisation (licenses)?
- » What is the specific implementation of access to each of these resources? (query and link syntax)
- » Which services are offered by the user’s institution?
- » Which relevant services should be offered related to the initiating source bibliographic description?

Link generator: introduction



Link generator: introduction



Link generator: software products

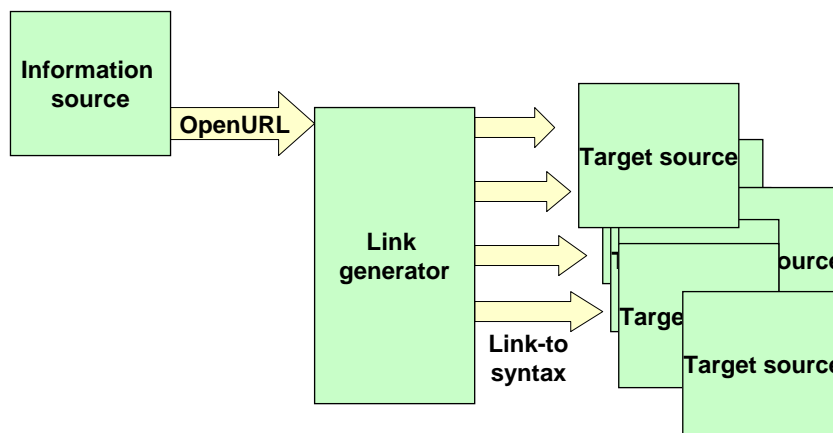
Examples of commercially available software packages to create a hyperlink generator:

<i>EBSCO Publishing</i>	<i>LinkSource</i>
<i>Ex Libris</i>	<i>SFX</i>
<i>Fretwell-Downing Informatics</i>	<i>OL2</i>
<i>infor</i>	<i>VLink</i>
<i>Innovative Interfaces</i>	<i>WebBridge</i>
<i>Openly Informatics</i>	<i>ICate</i>
<i>Ovid Technologies</i>	<i>LinkSolver</i>
<i>Serials Solutions</i>	<i>Article Linker</i>
<i>Sirsi Corp.</i>	<i>Sirsi Resolver</i>
<i>TDNet</i>	<i>TOUR</i>

Link generator: from sources to targets

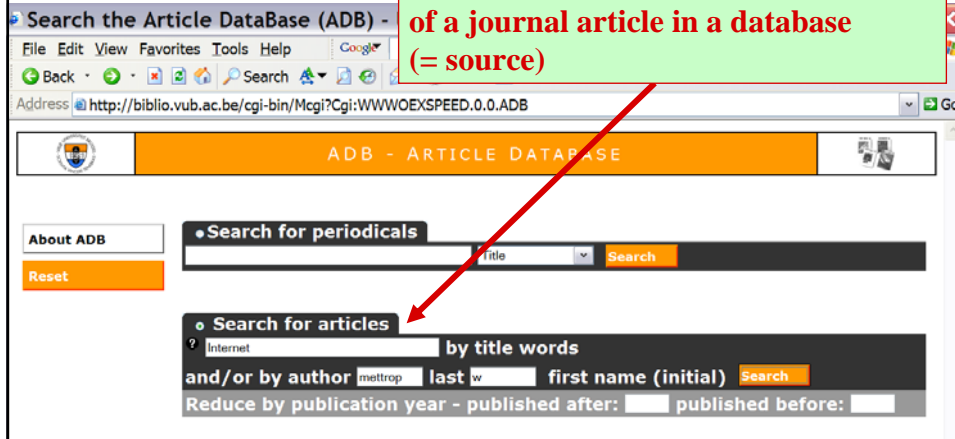
Sources	→	Targets
<p>support OpenURL to enable a link generator to provide services appropriate for the user's organisation / institution; for instance:</p> <ul style="list-style-type: none"> • a library catalogue • a bibliographic database, such as the <i>Web of Science</i> • a federated search system • a form that accepts manual input 		<p>support deep linking, to deliver / provide for instance:</p> <ul style="list-style-type: none"> • full text of an article from a full-text article database, such as <i>Elsevier's ScienceDirect</i>, <i>SwetsNet...</i> • a description of a particular book from a book database • a form of the local interlibrary lending service

Link generator: simple scheme of the information flow



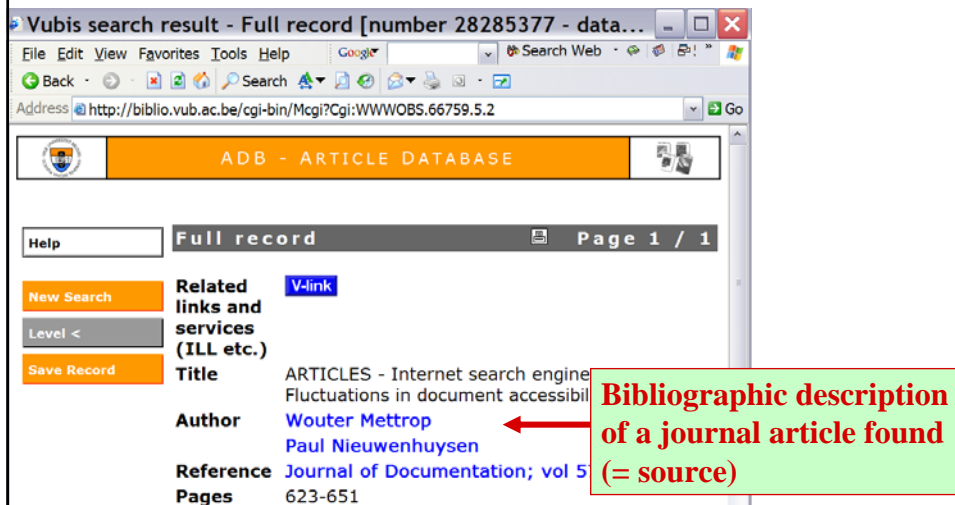
Link generator to offer users appropriate hyperlinks: example

Search for a bibliographic description of a journal article in a database (= source)



Link generator to offer users appropriate hyperlinks: example

Bibliographic description of a journal article found (= source)



***_

Link generator to offer users appropriate hyperlinks: example

Vubis search result - Full record [number 28285377 - data...]

File Edit View Favorites Tools Help Google Search Web

Address http://biblio.vub.ac.be/cgi-bin/Mcgi?Cgi:WWWOBS.66759.5.2

ADB - ARTICLE DATABASE

Help Full record Page 1 / 1

New Search Related links and services (ILL etc.) V-link

Level < Save Record

Title ARTICLES - Internet search engines - Fluctuations in document accessibility

Author Wouter Mettrop Paul Nieuwenhuysen

Reference Journal of Documentation; vol 57;5(2001)

Pages 623-651

This button links to the local hyperlink resolver

***_

Link generator to offer users appropriate hyperlinks: example

http://biblio.vub.ac.be - V-link: an OpenURL link generator...

V-LINK ARTICLE @ VUB LIBRARY

Title: Internet search engines - Fluctuations in document accessibility
Source: Journal of Documentation (ISSN: 00220418), date: 2001, volume: 57, issue: 5, startpage: 623
On this page we offer links to full text and/or to related information for this article.
Move your mouse over the links to get more information. Enjoy !

GET FULL TEXT

- * e-journal @ Emerald
- * e-article @ SwetsWise

CHECK HOLDINGS

- * Search this journal @ Antlope (by issn)
- * Search this journal @ Antlope (by title)
- * Search this article @ Article Database (by issn)

CHECK CITATION DATABASE

- * Search article @ Web of Science
- * Search articles by first author @ Web of Science

SEARCH ARTICLE

- * Search this article @ Article Database (by article title)
- * Search article @ PubMed
- * Search article @ Entrez (by article title)
- * Search article @ Scirus
- * Search article @ Google Scholar

MAKE AN ILL REQUEST

- * ILL request self service @ VUB

INTERNET SEARCH

- * Search article @ Google
- * Search article @ Yahoo!
- * Search first author @ Google
- * Read comments @ Google Groups
- * Search journal @ Google

Bibliographic description of a journal article (= source)

Menu of possible targets to choose from. For this particular type of source --the grayed out targets are not relevant or available --the intense targets are probably relevant.

Link generator to offer users appropriate hyperlinks: example

Bibliographic description of a journal article (= source)

A good choice to get the full text of the journal article through an intermediate organisation.

The screenshot shows a web browser window titled "http://biblio.vub.ac.be - V-link: an OpenURL link generator...". The page content includes a bibliographic description of an article titled "Internet search engines - Fluctuations in document accessibility" from the "Journal of Documentation". Below this, there are several sections of links: "GET FULL TEXT" (with links to Emerald and SwetsWise), "CHECK HOLDINGS" (with links to Antiope and Article Database), "CHECK CITATION DATABASE" (with links to Web of Science), "SEARCH ARTICLE" (with links to Article Database, PubMed, Entrez, Scirus, and Google Scholar), "MAKE AN ILL REQUEST" (with a link to VUB), and "INTERNET SEARCH" (with links to Google, Yahoo!, and Google Groups).

Link generator to offer users appropriate hyperlinks: example

Link to the full text of the journal article

Abstract of the journal article

The screenshot shows a Microsoft Internet Explorer browser window displaying the SwetsWise website. The page title is "SwetsWise: abstract - Microsoft Internet Expl...". The address bar shows "http://www.swetswise.com/eAccess/viewAbstract.do?articleID=1904...". The page content includes publication details for "Journal of Documentation" (ISSN: 0022-0418) and a link to "full text". Below this, there is an "article" section with the title "Internet search engines - fluctuations in document accessibility" and an "abstract" section containing the beginning of the article's text.

Link generator to offer users appropriate hyperlinks: example

The screenshot shows a web browser window with the URL <http://biblio.vub.ac.be>. The page title is "V-LINK ARTICLE @ VUB LIBRARY". The main content area displays a bibliographic description for the article "Internet search engines - Fluctuations in document accessibility" from the "Journal of Documentation" (ISSN: 00220418), dated 2001, volume 57, issue 5, starting on page 623. Below this description, there are several sections of links:

- GET FULL TEXT:** e-journal @ Emerald, e-article @ SwetsWise
- CHECK HOLDINGS:** Search this journal @ Antiope (by issn), Search this journal @ Antiope (by title), Search this article @ Article Database (by issn)
- CHECK CITATION DATABASE:** Search article @ Web of Science, Search articles by first author @ Web of Science
- SEARCH ARTICLE:** Search this article @ Article Database (by article title), Search article @ PubMed, Search article @ Entrez (by article title), Search article @ Scirus, Search article @ Google Scholar
- MAKE AN ILL REQUEST:** ILL request self service @ VUB
- INTERNET SEARCH:** Search article @ Google, Search article @ Yahoo!, Search first author @ Google, Read comments @ Google Groups, Search journal @ Google

Two red callout boxes highlight specific features:

- A box on the right points to the bibliographic description, stating: "Bibliographic description of a journal article (= source)".
- A box in the middle points to the "Search article @ Web of Science" link, stating: "A good choice to study the citations from and to the journal article."

Link generator to offer users appropriate hyperlinks: example

The screenshot shows the ISI Web of Knowledge search results page in Microsoft Internet Explorer. The browser address bar shows the URL <http://isi15.isiknowledge.com/portal.cgi/?DestApp=WOS&DestParams=%3F%26CustomersID%3D5FX%26CustomersIP%3D134.184.5>. The page title is "Web of Science". The search results are summarized as follows:

Search Results -- Summary
 TS=(Internet search engines - Fluctuations in document accessibility)
 DocType=All document types; Language=All languages; Databases=SCI-EXPANDED, SSCI, A&HCI;
 Timespan=1972-2005

1 result found
 Records 1 -- 1

Use the checkboxes to select individual records:

- 1. Mettrop W, Nieuwenhuisen P
[Internet search engines - Fluctuations in document accessibility](#)
 JOURNAL OF DOCUMENTATION 57 (5): 623-651 SEP 2001
 Times Cited: 13
[V-link](#)

On the right side, there are options for sorting and marking records:

- Sort by:** Source Title
- Mark:** [0 articles marked]
- Selected records
- All records on this page
- Records [] to []

A red callout box highlights the "V-link" text, stating: "Link to citing sources, that is documents with citations to the article."

Link generator to offer users appropriate hyperlinks: example

Bibliographic description of a journal article (= source)

A good choice to obtain information related to the article from the public WWW.

Internet search options:

- GET FULL TEXT
 - e-journal @ Emerald
 - e-article @ SwetsWise
- CHECK HOLDINGS
 - Search this journal @ Antiope (by issn)
 - Search this journal @ Antiope (by title)
 - Search this article @ Article Database (by issn)
- CHECK CITATION DATABASE
 - Search article @ Web of Science
 - Search articles by first author @ Web of Science
- SEARCH ARTICLE
 - Search this article @ Article Database (by article title)
 - Search article @ PubMed
 - Search article @ Entrez (by article title)
 - Search article @ Scirus
 - Search article @ Google Scholar
- MAKE AN ILL REQUEST
 - ILL request self service @ VUB
- INTERNET SEARCH
 - Search article @ Google
 - Search article @ Yahoo!
 - Search first author @ Google
 - Read comments @ Google Groups
 - Search journal @ Google

Link generator to offer users appropriate hyperlinks: example

Full text from the publisher, available but NOT free of charge

Full text from the author, available for all free of charge

Related conference presentation, available for all free of charge

Search results:

- ingentaconnect.com/content/mcb/278/2001/00000057/F0010005/art00003 - Similar pages
- (PDF) INTERNET SEARCH ENGINES - FLUCTUATIONS IN DOCUMENT ACCESSIBILITY
- www.aslib.com/INTERNET SEARCH ENGINES - FLUCTUATIONS IN DOCUMENT ACCESSIBILITY WOUTER METTROP wouter.mettrop@cwi.nl Centrum voor ...
- www.vub.ac.be/BIBLIO/nieuwenhuysen/presentations/2001-mettrop-nieuwenhuysen/2001-mettrop-nieuwenhuysen.pdf - Similar pages
- ILJ2000
- 'Internet search engines: Fluctuations in document accessibility', a presentation at Internet Librarian International 2000 a conference ...

Link generator to offer users appropriate hyperlinks: example

The screenshot shows a web browser window with the URL <http://biblio.vub.ac.be>. The page title is "V-LINK ARTICLE @ VUB LIBRARY". The main content area contains a bibliographic description of a journal article: "Title: Internet search engines - Fluctuations in document accessibility", "Source: Journal of Documentation (ISSN: 00220418), date: 2001, volume: 57, issue: 5, startpage: 623". Below this, there are several sections of links: "GET FULL TEXT" (with links to Emerald and SwetsWise), "CHECK HOLDINGS" (with links to Antiope and Article Database), "CHECK CITATION DATABASE" (with links to Web of Science), "SEARCH ARTICLE" (with links to Article Database, PubMed, Entrez, Scirus, and Google Scholar), "MAKE AN ILL REQUEST" (with a link to VUB), and "INTERNET SEARCH" (with links to Google, Yahoo!, and Google Groups).

Two callout boxes with red borders and arrows point to specific elements:

- A box on the right says: "Bibliographic description of a journal article (= source)". An arrow points to the source information in the main content area.
- A box at the bottom says: "A good choice to obtain information related to the article free of charge.". An arrow points to the "Search article @ Google Scholar" link in the "SEARCH ARTICLE" section.

Link generator to offer users appropriate hyperlinks: example

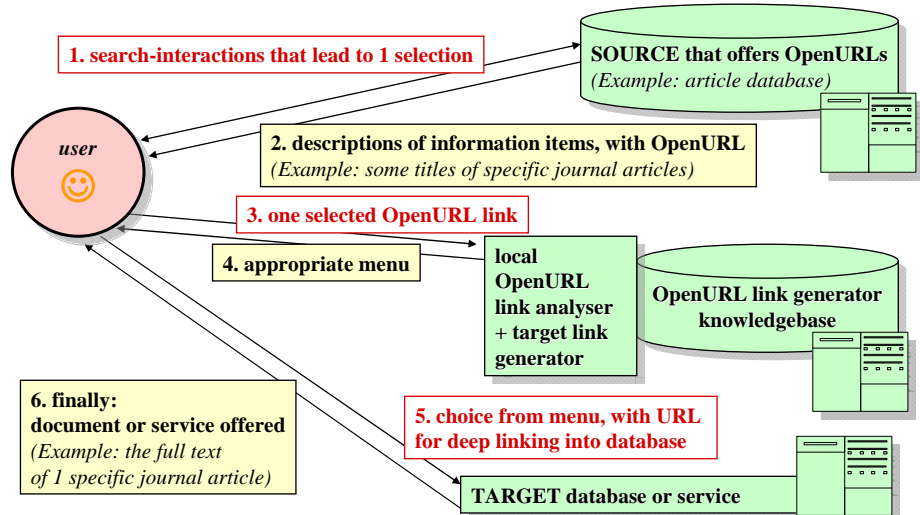
The screenshot shows a Google Scholar search result page. The browser window title is "Google Scholar: author:Mettrop 'Internet search engines - Fluctuations in ...". The address bar shows the URL <http://scholar.google.com/scholar?q=author%3AMettrop+%22Internet+search+engines+-+Fluctuations+in+document+accessibility%22>. The search results show two items:

- Item 1: "[PDF] Internet search engines-fluctuations in document accessibility" by W Mettrop, P Nieuwenhuysen, H Smuders. It is cited by 13. The snippet includes "www.aslib.com. INTERNET SEARCH ENGINES - FLUC... WOUTER METTROP wouter.mettrop@cwi.nl. Centrum voor ... Journal of Documentation, 2001 - ingenta.com - ingenta.com".
- Item 2: "[CITATION] The reliability of Internet search engines: fluctuations in document accessibility - Web Search" by W Mettrop, P Nieuwenhuysen. It is cited by 2. The snippet includes "Proceedings of the 21st National Online Meeting, New York".

Three callout boxes with red borders and arrows point to specific elements:

- A box at the top right says: "Error in the authors field". An arrow points to the author name "author:Mettrop" in the search bar.
- A box on the right says: "Link to citing sources, as known by Google Scholar". An arrow points to the "Cited by 13" link in the first search result.
- A box at the bottom says: "Related conference presentation, available for all free of charge". An arrow points to the second search result, which is a citation from a conference proceedings.

Link generator: scheme of the information flow



Link generator: mechanisms

- Such a system tries to cope for instance with the multiple-copy problem.
- Offers linking as deep as possible into a target database (not only a link to the homepage of the database).
- Is based on the OpenURL standard.

Link generator: OpenURL

- An OpenURL allows transport of metadata over the network (Internet, WWW),
 1. not only about the information object +
 2. also data about the local, context-sensitive link generator that will guide the user to a target database or service.
- OpenURL must be implemented by the information service providers to enable their resource to serve as a source for a link generator at the user's side.

Link generator: OpenURL syntax

Syntax: OpenURL = **BASE-URL ? QUERY**

BASE-URL = Internet address of the OpenURL link generator computer system at the user's side: example:

<http://www.vlink.ac.be/openurl>

QUERY = the metadata about the information object

example: **genre=book&isbn=0123456789**

→ for this example, the OpenURL that is created by the source server and that is sent to the user is the following:

<http://www.vlink.ac.be/openurl?genre=book&isbn=0123456789>

Link generator: resolving an OpenURL

Resolving an incoming OpenURL

=

1. Generating an appropriate, meaningful menu of target information resources for the user, (based on the incoming OpenURL)

+

2. When the user chooses/selects an item from the menu, generating an appropriate, concrete (hyper)link = URL, to contact the chosen/selected target information resource (linking as deeply as possible into that resource)

Link generator knowledgebase

- **The process of resolving an incoming OpenURL is supported by a *knowledgebase* that contains information about target sources and services.**

Link generator knowledgebase: article example

Example 1:

1. In the case that the library has a license to access articles from a particular electronic journal starting from a particular journal volume.
2. In the case that the journal can be accessed from the WWW site of the publisher.
3. Then how to construct a URL that gets the full text of the article from the publisher's database?

Link generator knowledgebase: book example

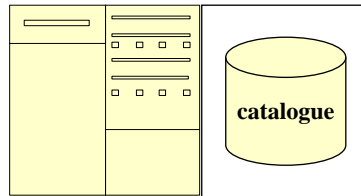
Example 2:

1. The company *Amazon* offers a bookshop catalogue.
2. How to construct a URL that gets the description of a particular book from *Amazon*?

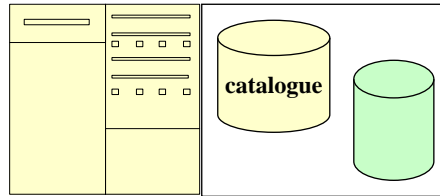
Link generator knowledgebase: scheme

Evolution

» from single catalogue



» to catalogue
+ separate
link generator
knowledgebase

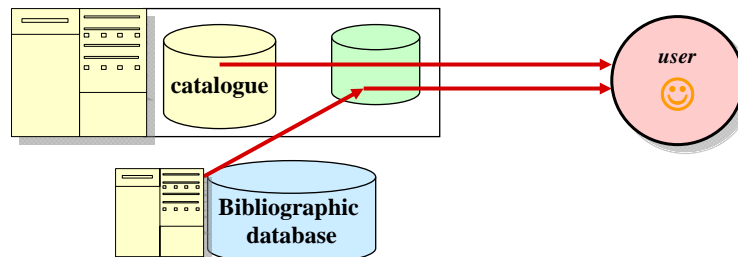


Link generator knowledgebase: scheme

• Advantage: The hyperlink generator knowledgebase

» extends the catalogue

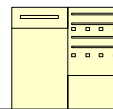
» + also serves searches that start from some other bibliographic database



Link generator: tasks for the library

Some roles/functions/tasks of the library related to a link generator:

- » of course providing a link generator computer system
- » creating and maintaining a list on computer of sources and targets and of the link-to syntax that is required by each target
- » assisting users with a help desk



Link generator: consequences

- **One of the functions/applications of a link generator is to make it easier for users to step**
 - 1. from secondary, bibliographic sources**
 - 2. to primary, full-text sources.**
- **Therefore the implementation of a link generator can stimulate/increase the usage of bibliographic databases as well as of electronic journals.**

Link generator: summary

A link generator

- offers an open, context-sensitive system
- enables the institution to provide localized, extended services using the appropriate links
- is based on the OpenURL standard
- sets up standardization of services across resources, defined by the manager of the link generator (in most cases a librarian)
- can increase usage of sources and services that are offered by the library

!! Task - Assignment !!

Read more

about federated searching and about link generators

Breeding, Marshall

The many facets of managing electronic resources.

Computers in Libraries, 2004, No. 1, pp. 25-28.

- **Back-end management tools for library staff.**
- **Front-end management: delivering access to users**



!! Task - Assignment !!

Read more about link generators:

McDonald, John, and Van de Velde, Eric

The lure of linking.

**(Link resolvers are essential
to getting optimal usage of electronic content.)**

Library Journal, April 1, 2004, pp. 32-34.



Libraries integrating access to fee-based and open access publications

- **As a more recent evolution, efforts are made to integrate**
--on the one hand--
the access to the costly library collection
with
--on the other hand--
the access to information that is freely available through the WWW,
in order to enhance the value of the whole library information system.

Libraries integrating access to fee-based and open access publications

- **Integrating fee-based with freely-available is accomplished by the implementation of an OpenURL link resolving system and by feeding the knowledge base of this generator with information about relevant, present-day information resources that are freely accessible through the Internet and the WWW.**
- **The following are some examples that can be implemented.**

Incorporating open access journals in the knowledge base

- **The local library database of electronic journals forms a part of the knowledge base that supports the link resolving system.**
- **This database can be enlarged and enriched with information about the increasing number of scholarly electronic journals that are accessible free of charge.**

Incorporating open access journals in the knowledge base

- This can be accomplished in an automated way, by computer-supported harvesting of the *Directory of Open Access Journals*. This is a highly structured database that is available free of charge itself as an open access resource.

Incorporating open access journals in the knowledge base

Knowledge base of a particular library

Subscribed journals of the library:

- Data from publishers
- Data from journal intermediaries such as *EBSCO* and *Swets*

Open access journals

- Data from the *Directory of Open Access Journals*

Deep linking from a book title to more information about the book

- **The description of a classical book in the traditional catalogue of the library can be enriched by linking this with more information concerning this book, such as**
 - › the table of contents,
 - › a summary,
 - › reviews,
 - › related book titles,
 - › pictures of the book cover...

Deep linking from a book title to more information about the book

- **This additional information can be retrieved from online bookshops web sites.**
- **The online shop *Amazon* allows fast deep linking and offers interesting information about books.**

Deep linking from a book title to more information about the book

- **Evolution is fast in this domain; for instance, some providers of secondary information like *Amazon* and *Google* have started to make the contents of a selected, limited number of books full-text searchable.**

Linking from a journal article title to an open access database

- **Analogous to the linking described for books, many journal article titles (bibliographic descriptions) can be linked to some journal article database that can provide more information about this journal article, such as**
 - » subject descriptors and
 - » a summary.
- **A famous example is the great bibliographic database for the literature in medicine and life sciences, that comes in various versions named *Medline*, *PubMed*, *Entrez*.**

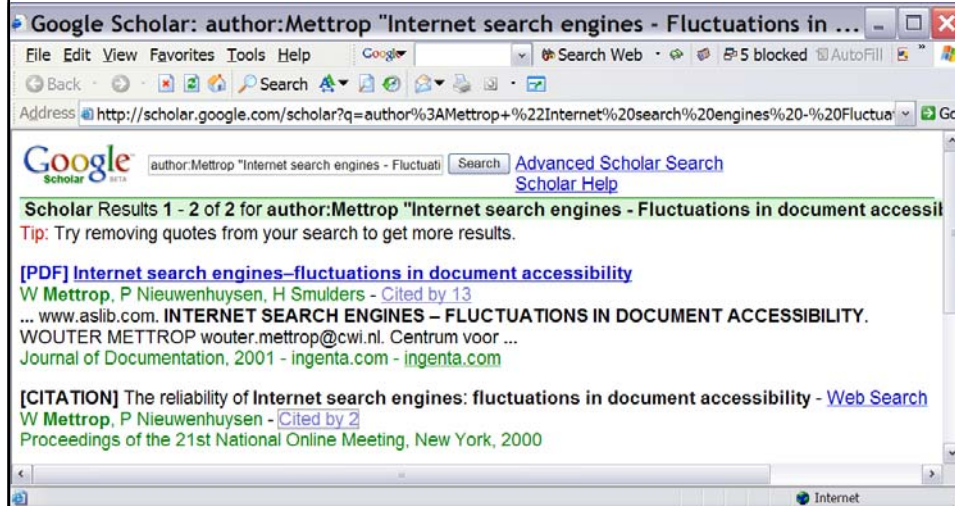
Deep linking from an article title to selected WWW search engines

- **The description of a journal article that is found by a user and that is considered as interesting, but which is not available in full text directly through “normal” deep linking, can be transferred directly in the form of a query to a freely accessible WWW search engine, hoping that**
 - » the full text can be located in this way
 - » related or similar documents can be found

Deep linking from an article title to selected WWW search engines

- **Interesting search engines nowadays include the following:**
 - » the general *Google* or *Yahoo* WWW search systems that offer a high coverage, fast response, and efficient ranking systems, or
 - » *Scirus* or *Google Scholar* that are specialized in academic, scientific, scholarly information sources.
- **This approach is successful in many cases as more and more publications are made available also freely through the WWW on personal or institutional WWW sites.**

Example of the results obtained from an open access secondary source



Deep linking from an article title to a database of article citations

- Besides deep linking from an article title to one of the selected WWW search engines, deep linking from an article type to the specialised WWW search engine *Google Scholar* can bring the user to the number of citations received by that article, as discovered by *Google Scholar*.
- This number of citations is shown in the user interface and is further linked to the citing documents, so that the user can explore these.

Deep linking from an article title to a database of article citations

- At the time of writing this, *Google Scholar* is still in beta version and its database is growing.
- This forms an open access system similar to fee-based, commercial, general bibliographic databases that offer also information about received citations, like the *Web of Science* from ISI-Thompson and the new, challenging *Scopus* by Elsevier.

Example of the results obtained from an open access citation database

Google Scholar: author:Mettrop "Internet search engines - Fluctuations in ...

File Edit View Favorites Tools Help Google Search Web 5 blocked AutoFill

Address <http://scholar.google.com/scholar?q=author%3AMettrop+%22Internet%20search%20Engines%20-%20Fluctua>

Google Scholar author:Mettrop "Internet search engines - Fluctuat Search Advanced Scholar Search Scholar Help

Scholar Results 1 - 2 of 2 for author:Mettrop "Internet search engines - Fluctuations in document accessil
Tip: Try removing quotes from your search to get more results.

[PDF] [Internet search engines-fluctuations in document accessibility](#)
W Mettrop, P Nieuwenhuysen, H Smulders - Cited by 13
... www.aslib.com. INTERNET SEARCH ENGINES - FLUCTUAT
WOUTER METTROP wouter.mettrop@cwi.nl. Centrum voor ...
Journal of Documentation, 2001 - ingenta.com - ingenta.com

[CITATION] The reliability of Internet search engines: fluctuations in document accessibility - Web Search
W Mettrop, P Nieuwenhuysen - Cited by 2
Proceedings of the 21st National Online Meeting, New York, 2000

Internet

Link to citing sources,
as known by Google Scholar

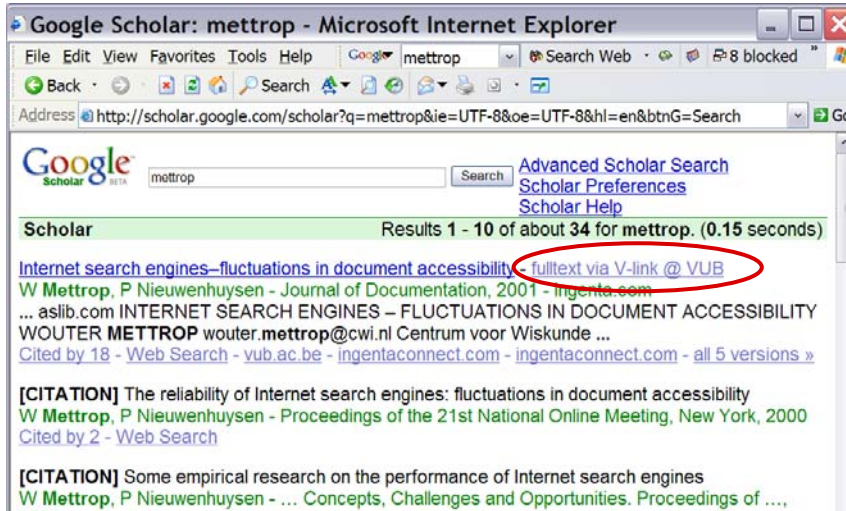
Linking not only TO but also FROM open access sources

- Besides offering deep linking TO open access targets, libraries can even co-operate with open access sources, so that OpenURL links in the results from such a source can link the user to other sources, again open access or licensed by the library.
- In this way “the circle is closed”.

Linking not only TO but also FROM open access sources

- Examples are
 - » open archives repositories,
 - » the bibliographic database for biomedical science *PubMed*,
 - » *Google Scholar*

Example of linking FROM an open access source



?? Question ??

Which shortcomings of traditional, classical hyperlinking does an OpenURL and link generator system try to solve?

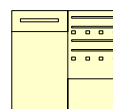


Libraries and information centres

**Providing access to electronic publications:
Federated searching**

Federated searching: terminology / vocabulary / synonyms

- federated searching**
- = **meta-searching**
- = **cross-database searching**
- = **multi-database searching**
- = **multi-threaded searching**
- = **one-stop searching**
- = **polysearching**
- = **broadcast searching**
- = **searching through a portal** (but the term “portal” is used also with other meanings)

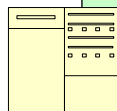


Libraries and information centres

Providing access to electronic publications: Federated searching

Federated searching: definition

An ideal federated search system



1. allows a user to formulate a query,
2. it adapts/transforms this query, so that it can be sent with a proper syntax to each database of a chosen set/group of disparate databases,
3. it broadcasts this query to those databases,
4. it collects results from each database,
5. merges / consolidates these results into 1 result set,
6. shows this to the user, in a unified format with minimal duplication, and allows the user to sort the results by various criteria

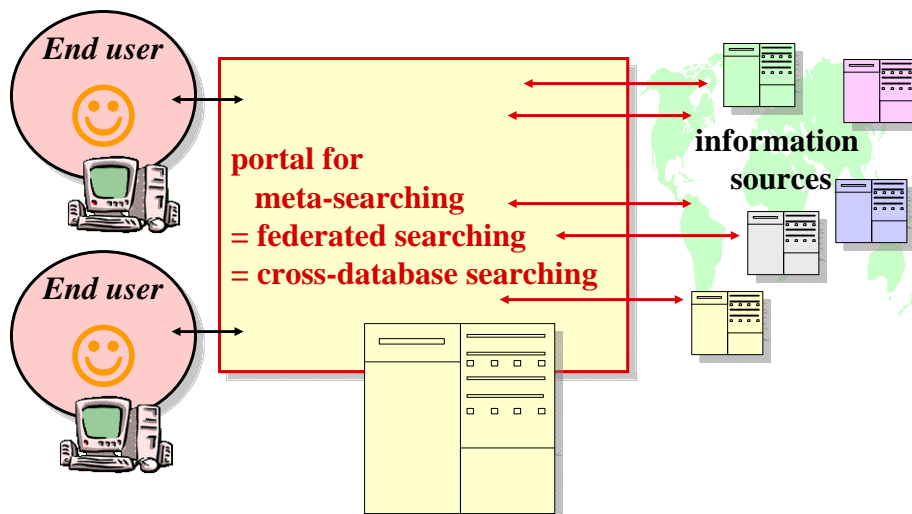


Federated searching: introduction

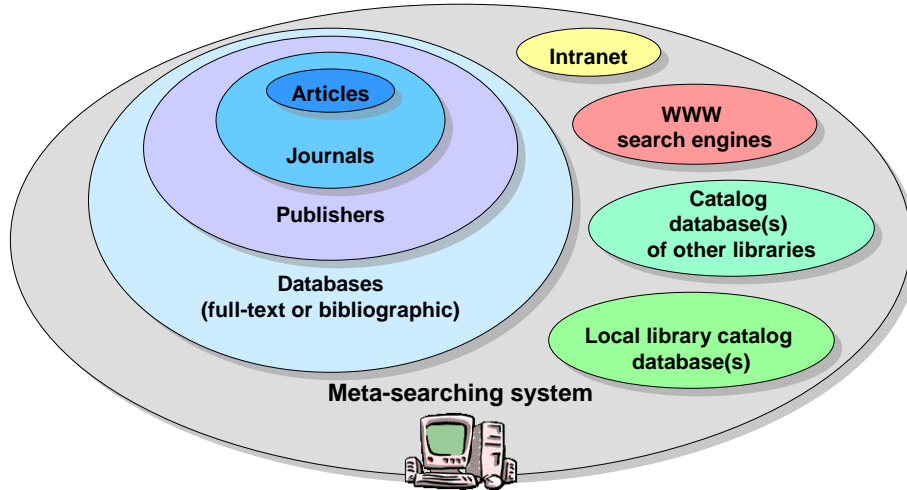
- This type of computer systems helps to integrate access to distributed databases in one search action, as far as possible.
- The catalogue of local library holdings can be one of the target databases.



Federated searching: scheme



Federated searching: integrating access



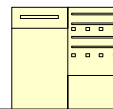
Federated searching: software products

**This category of computer software packages
includes the following major products:**

Company	<i>Product name</i>
<i>Ex Libris</i>	<i>MetaLib</i>
<i>Fretwell-Downing</i>	<i>Zportal</i>
<i>MuseGlobal</i>	<i>MuseSearch (the basis for several other systems with another name, including the CSA system)</i>
<i>WebFeat</i>	<i>Prism</i>
<i>Infotrieve</i>	<i>ArticleFinder eXtreme (AFX)</i>
<i>Infor (was GEAC)</i>	

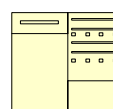
Federated searching: benefits for the users

- + The system can help the user to select appropriate sources.
- + The system can help in the process of authentication and authorization when this involves not only a simple recognition of IP-address of the user's client computer, but when it involves user-id's and passwords.



Federated searching: benefits for the users

- + The need to know which particular database is suitable for a particular search is reduced, because several ones can be searched in one action.
- + **The users have to learn only 1 user interface for searching and only 1 search syntax, instead of a user interface and a search syntax for each database!**



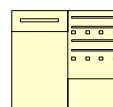
Federated searching: benefits for the users

- + Saves the users time executing queries to various servers!
- + Can make users search and exploit databases that they would never use otherwise, that is without federated search system!



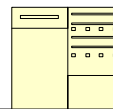
Federated searching: benefits for the users

- + Useful, relevant, interesting items/references can be found/uncovered from unexpected, unknown, unfamiliar databases!
This is mainly beneficial in the case of interdisciplinary subjects/topics.



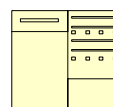
Federated searching: benefits for the users

- + Offers a consistent display of results in the output phase.
- + Some systems offer tools to refine display of the results;
for instance
 - » to dedupe very similar items in the result set,
 - » to sort the results,
 - » to rank the results,
 - » to search within the result set,
 - » ...



Federated searching: difficulties / challenges / problems

- Portal software tries to cope with several difficulties/challenges/problems/pitfalls that hinder the application of the “good idea”:
- The user does not notice most of these problems and shortcomings, because results from various databases are merged by the federated search system.



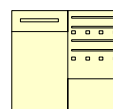
?? Question ??

Federated searching suffers from several difficulties.
Which difficulties/pitfalls do you see?



Federated searching: difficulties / challenges / problems

- Differences among target sources in the Internet application *protocols* that are applied normally, by default, for connection/communication and retrieval, such as
 - » telnet
 - » HTTP
 - » proprietary, non-standard protocols
 - » Z39.50, ISO239.50, and related protocols that are developed for federated-searching!



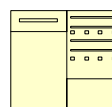
Federated searching: difficulties / challenges / problems

- Even when the target is compatible with a suitable protocol for standardised retrieval
Z39.50, ISO239.50
then difficulties can arise due to
 - » poor implementations
 - » incomplete implementations
(the target may lack features supported by the protocol and by the software for federated searching)
 - » variations in implementations



Federated searching: difficulties / challenges / problems

- When HTTP must be used for connection to the target source, and when HTML is used by the target source to present results, then the capture and analysis of the results by the federating search system can be hindered by *changes with time* in the method of the presentation of results.



Federated searching: difficulties / challenges / problems

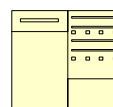
- Differences among target sources in the *formatting/structuring of their database records* in fields hinders
 - searching limited to a field
 - displaying selected fields only (such as title)
 - sorting of the displayed records on the contents of a particular selected field (such as author or date)



Federated searching: difficulties / challenges / problems

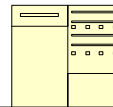
- Differences among target sources in the applied *metadata* schemes in the databases to improve retrieval, such as
 - » classifications
 - » taxonomies
 - » thesaurus systems
 - » ontologies

This hinders the exploitation of the added value of such metadata.



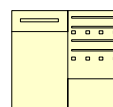
Federated searching: difficulties / challenges / problems

- When some special, non-standard, *dedicated retrieval software* is made available by a specific target source databases to offer special features to the user to exploit the database better than with a standard retrieval interface, then the source can probably not be exploited as well by the federated search system.
Searches are reduced to the lowest common denominator.



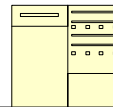
Federated searching: difficulties / challenges / problems

- A query with several words and without explicit *Boolean operators* can be interpreted in various ways by the various database retrieval systems.
For instance, the retrieval software may apply the Boolean operator AND to combine all the query words, but it may also use OR.
In the case that the federated search system does not take care of this well, then this may lead to lower recall and precision.



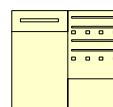
Federated searching: difficulties / challenges / problems

- Differences in *response time* among the target sources.
A slow response of a target source can hinder the final analysis and presentation of the results to the user.



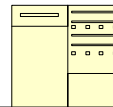
Federated searching: difficulties / challenges / problems

- Users may be less impressed by a federated searching system than by the simple, common, familiar, famous Internet / WWW search engines, as response time is in most cases less impressive, due to differences as follows:
 - The computer hardware used by the systems
 - Slower distributed searching through several computer systems, versus faster searching through a more centralised computer database of a priori compiled records



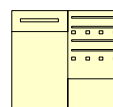
Federated searching: difficulties / challenges / problems

- How to deduplicate/dedupe/cluster
very similar entries/results/items
= near-duplicates,
from various target sources?
When is similar similar enough?
Which entry/result/item
to choose/select
as the representative of a cluster of similar entries?



Federated searching: difficulties / challenges / problems

- How to provide some useful *relevance ranking* of search results/entries,
even when the target databases can be quite different in type and quality, and
even when no index is created in advance, just-in-case, well before the search action, like *Google* and other Internet search engines do.



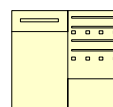
Federated searching: difficulties / challenges / problems

- The *evaluation of the quality* of each search result from a federated search action may be more difficult than when each database is searched separately, because the user may be less aware of the limitations, strengths, selection criteria and aims of the individual, separate databases that offer each result.
For instance, peer-reviewed articles from reputable scientific journals may be mixed with more popular and more biased, unscientific texts from trade literature.



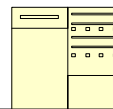
Federated searching: difficulties / challenges / problems

- A user of a federated search system may perhaps incorrectly assume that ALL relevant databases are covered simply in 1 action, or that if a database is not included, then it must not be relevant/important.
However, even a federated search system can only search a limited number of databases, so that perhaps some *relevant databases are NOT covered.*



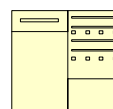
Federated searching: difficulties / challenges / problems

- Students who rely on a federated search system may perhaps not *learn about the important subject-specific databases* in their field, so that when they have no access anymore to the same federated search system, they still do not know which database may help them in their research and how to use it well.



Federated searching: difficulties / challenges / problems

- Some databases are accessible only by a *limited number* of concurrent/simultaneous users from one organisation, as agreed in the licence and controlled by the authorization software of the database. When such a database would be included automatically in all or in many federated searches, then some users who really require access to that particular database may perhaps not be able to use that database.



!! Task - Assignment !!

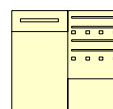
Read about benefits and pitfalls of federated searching:

Baer, William
Federated searching: friend or foe?
College & Research Libraries News,
October 2004, pp. 518-519.

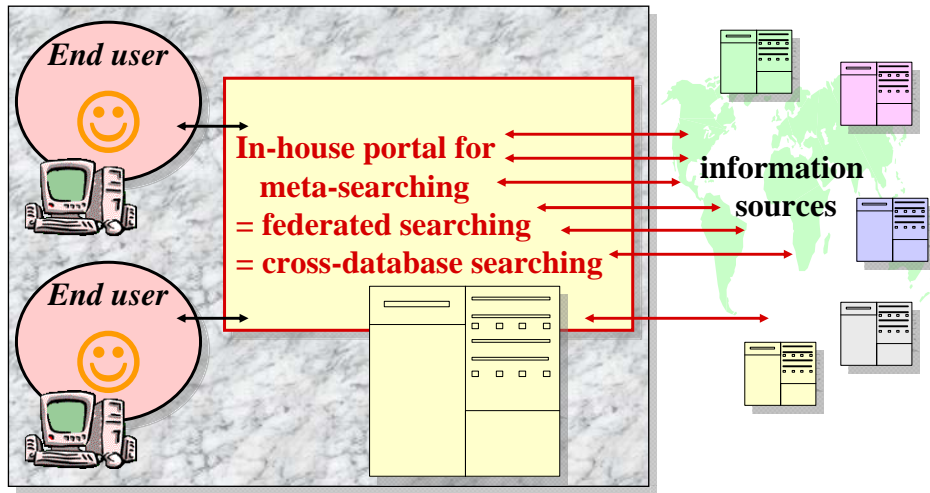


Federated searching: local or remote hosting

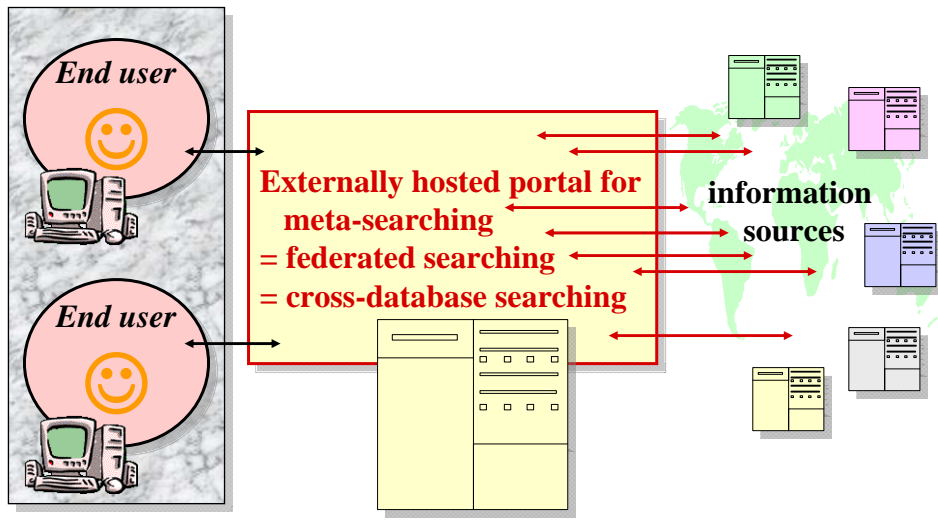
- **The federated searching system can be developed and maintained**
 - » on a local computer in-house, or
 - » hosted on a more distant, external, remote computer; this service is offered by some vendors of software for federated searching; partly outsourcing



Federated searching: local hosting: scheme

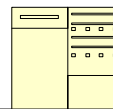


Federated searching: remote hosting: scheme



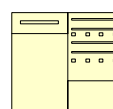
Federated searching: local versus remote hosting

- **Remote hosting requires perhaps**
 - » a smaller initial investment in computer hardware and skilled personnel
 - » less time investment in installation and maintenance of equipment and software



Federated searching: impact on database distributors

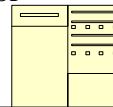
The increasing availability and application of federated searching decreases the importance of the classical design and further development of the user interfaces by the distributors of databases.



Federated searching: tasks for the library

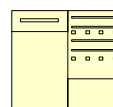
Some roles/functions/tasks of the library related to federated searching:

- » of course providing a computer system for meta-searching
- » maintaining a list of target information sources that are appropriate in the framework of the particular library:
 - subjects covered by the target databases should be relevant
 - subscriptions must have been made by the library for access to the targets



Federated searching: tasks for the library

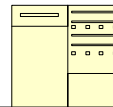
- » grouping databases in groups that correspond to subject fields and offer these as preselections in the user interface of the federated search system
- » ...



Federated searching: conclusion

Federated searching

- *is a continuous challenge*
for developers of the sophisticated software and
for the implementers in libraries and information centers
- *offers benefits* for those end-users
who are not enthusiastic to work with separate target
source databases
- does not eliminate the need for access to individual
databases

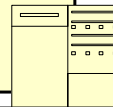


Libraries and information centres

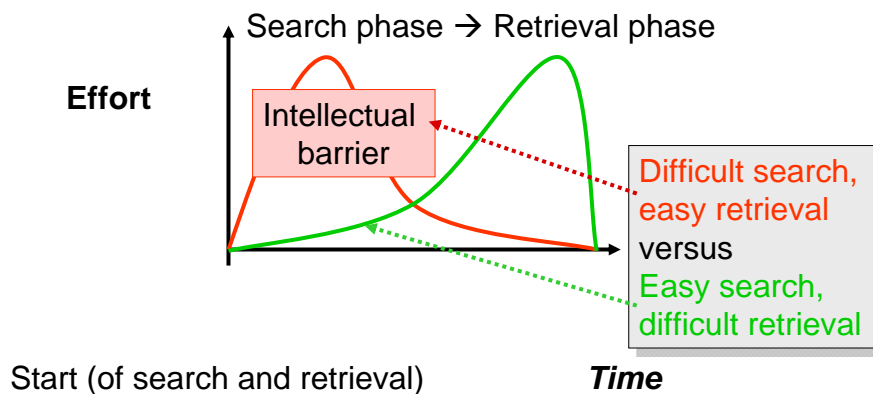
Providing access to electronic publications:
putting it all together

The search and retrieval phases in information retrieval

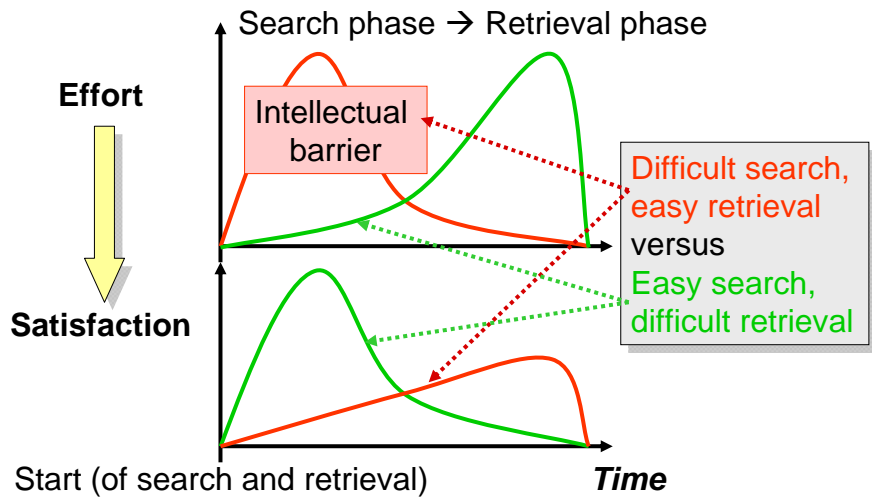
Search phase	<ul style="list-style-type: none"> • Selecting a database • Learn the user interface • Learn the metadata systems (Classification? Thesaurus? Controlled vocabulary? Records structured in fields?...) • Formulate query • ...
Retrieval phase	<ul style="list-style-type: none"> • Inspect results in the results set • Evaluate and select or discard results • ...



Efforts required in search and retrieval systems



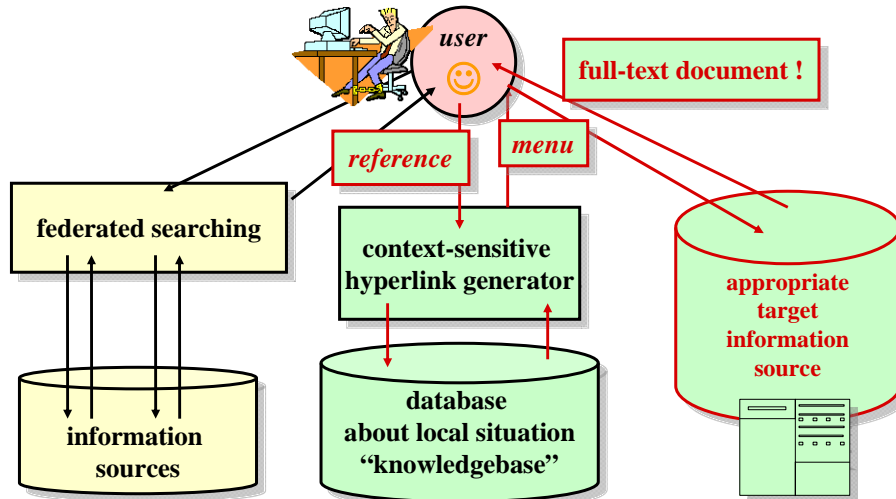
User's efforts and satisfaction in search and retrieval systems



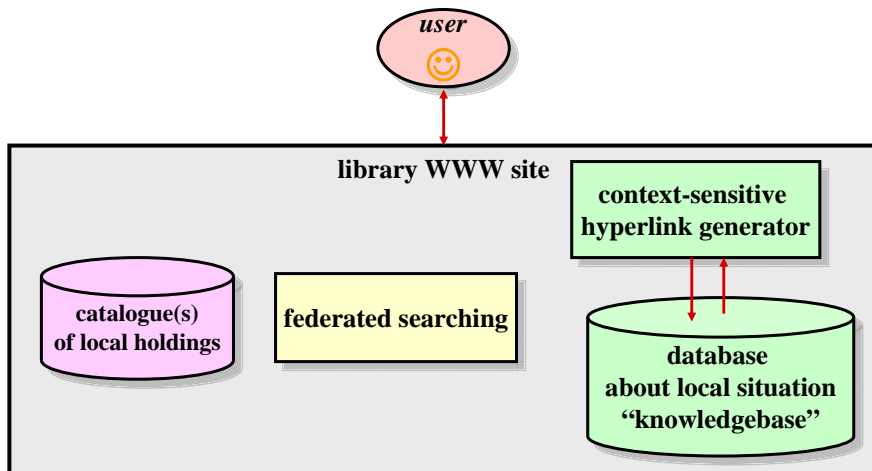
User satisfaction in online information retrieval

	<i>Examples</i>	Total, integrated user satisfaction?
Difficult search, easy retrieval	<ul style="list-style-type: none"> • <i>Most online library catalogues</i> • <i>Most bibliographic databases</i> 	<ul style="list-style-type: none"> • Lower? due to high intellectual barriers and the feeling of loosing time
Easy search, difficult retrieval	<ul style="list-style-type: none"> • <i>Most Internet search engines</i> • <i>Most systems for federated searching</i> 	<ul style="list-style-type: none"> • Higher? due to low intellectual barriers and the feeling of being active and constructive during the whole process

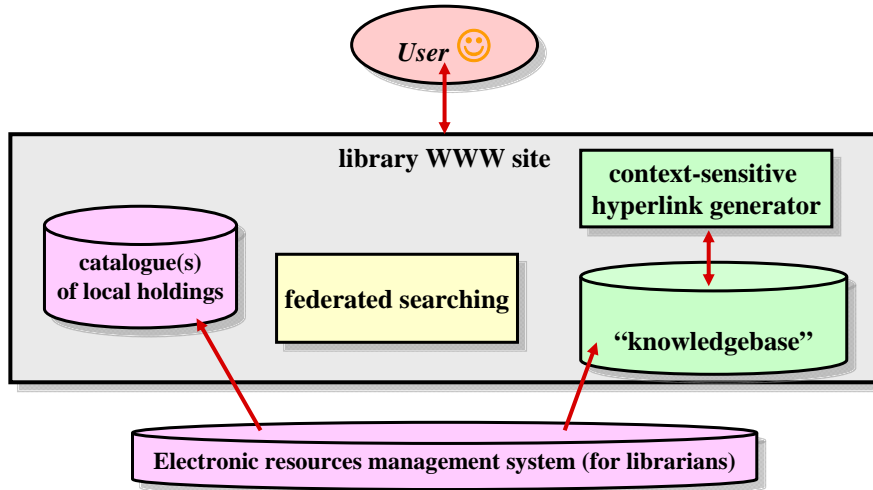
Federated searching + link generator



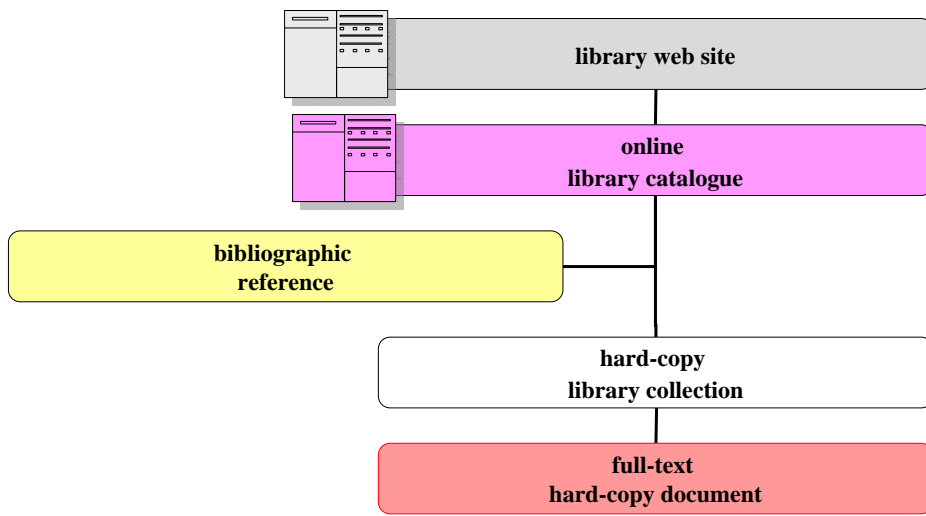
Putting the digital tools together in a library system



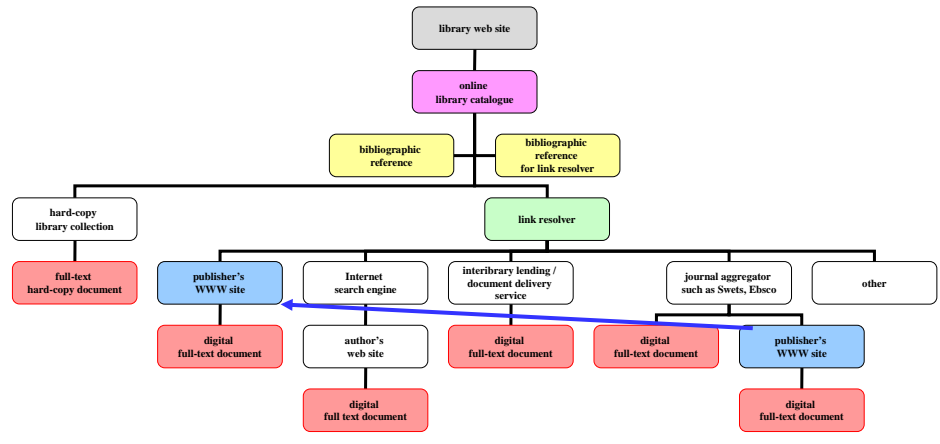
Putting the digital tools together in a library system



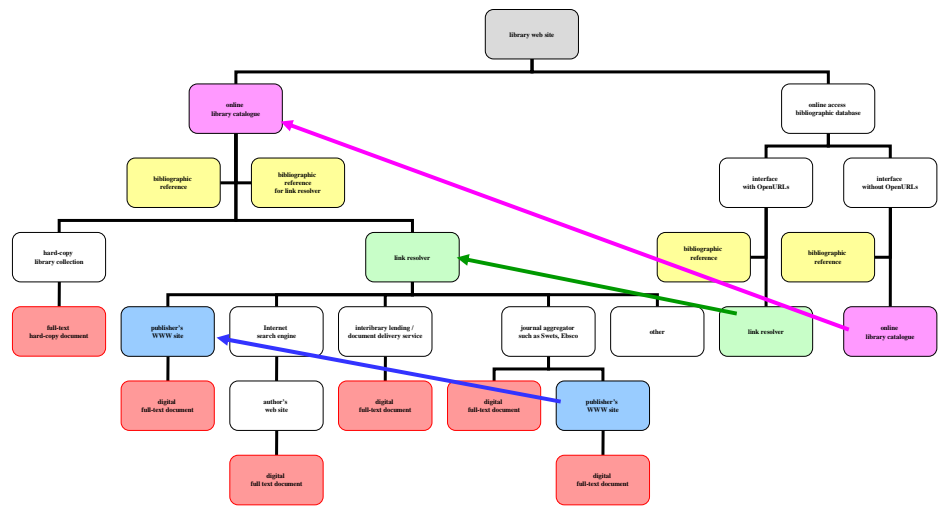
Searching for a document in the library system



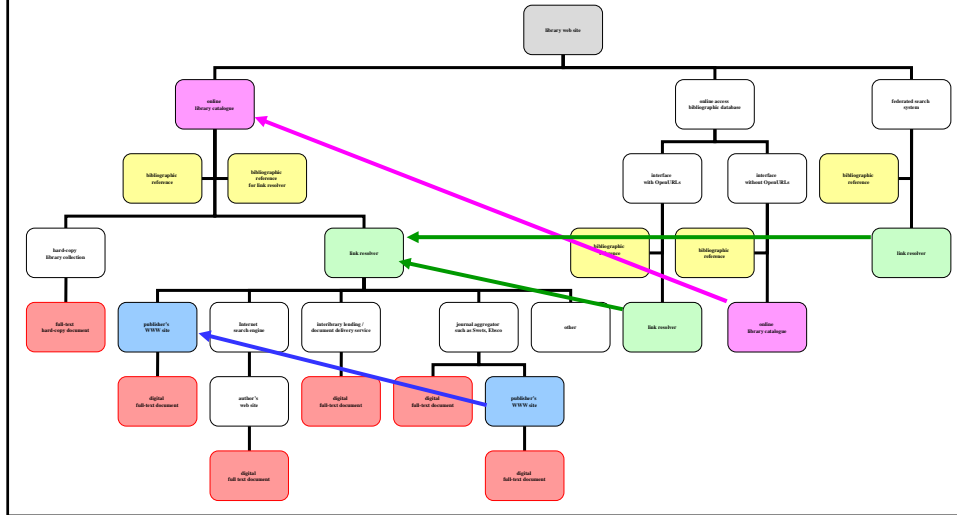
Searching for a document in the library system



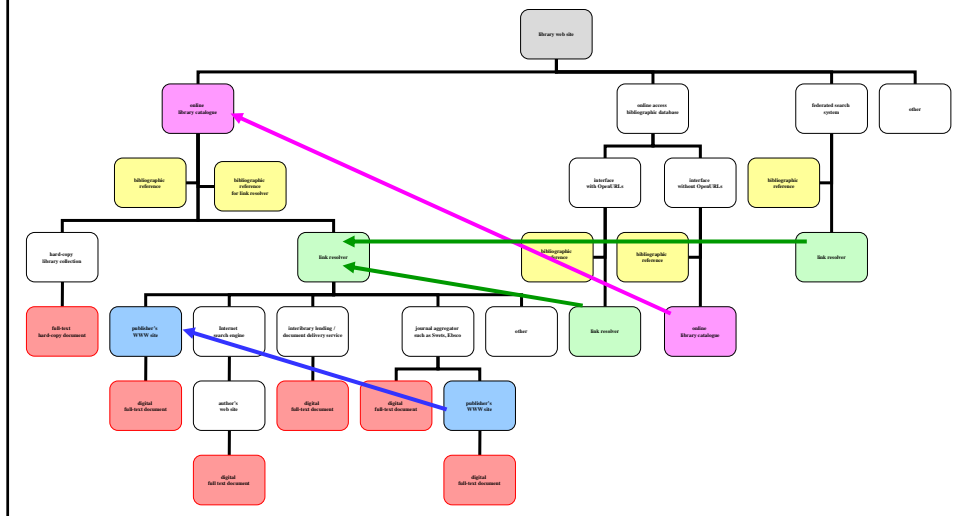
Searching for a document in the library system



Searching for a document in the library system



Searching for a document in the library system



Federated search system and link resolver compared

<i>Problem to be solved</i>	Federated search system	Link resolver
How to bring a user to many information sources in 1 action?	!	-
How to bring a user from some information to related information?	-	!

?? Question ??

Federated searching as well as hyperlink resolving are important methods used by libraries to bring their users to relevant information through the Internet. Which method suffers least from frustrating fundamental difficulties that are hard or impossible to overcome? Motivate your answer.



Access to information sources: tools / methods / systems

In sequence of priority:

- 1. Online library catalogue
(for hard copy and digital documents)**
- 2. Library web site**
- 3. Link generator + “knowledgebase”**
- 4. Federated search system**
- 5. ...**

Access to information sources: tools / methods / systems: conclusion

- In an ideal resource management system of a library, the same information should NOT have to be maintained in multiple ways in multiple databases for multiple access systems.**
- In other words, access should be offered through a set of interconnected modules that work together and that share common data files.**

The Internet and applications

- **Internet**
+ applications of the Internet,
such as the WWW and electronic mail



Public access computers

- **Computers for access by the public to Internet-based information resources.**
- **Essential is securing these against**
 - » theft,
 - » viruses,
 - » hackers,
 - » modifications of the user interface and the programs



Tools and methods: filtering information

- **Filtering software to protect the user from low-quality or inappropriate sources?**
- Of course here we come close to the sensitive subject of censorship with all its advantages and disadvantages.
- Deciding on what is low quality or inappropriate for a particular user is not easy.



Tools and methods: personalisation of access

- **Personalisation software to create in a more or less automatic way a more personal interface to the information services that are offered through the Internet and the WWW.**

Personalisation may depend on the user's address, age, expressed interests, previous activities related to the library services.



Tools and methods: studies of information system users

- A few users of the library web site should be selected from various categories of the user community and the way they work with your web site should be studied.
- The observation of their behaviour and the comments by those users can be useful and interesting to improve your web site.



!! Task - Assignment !!

Read

Corrado, Edward M.

The importance of open access, open source, and open standards for libraries.

[online]

Issues in Science and Technology Librarianship, Spring 2005.

Available free of charge from: <http://www.istl.org/05-spring/article2.html>

[cited 2005]

Abstract:

The open access, open source software, and open standards concepts have been garnering increased attention in the field of librarianship and elsewhere. These concepts and their benefits and importance to libraries are examined.

Benefits include lower costs, greater accessibility, and better prospects for long-term preservation of scholarly works.



The effects of *Google* on users of information systems

- ***Google* and similar competing retrieval systems have raised the expectations of many users of information retrieval systems, so that they expect**
 - » Very easy interfaces
(that do not ask the user to study first the manual)
 - » Forgiving interfaces
(that can cope with spelling errors for instance)

The effects of *Google* on users of information systems

- » Assisting interfaces (that help the user when a spelling error is made in a query for instance)
- » Very fast presentation of results
- » Accessibility at any time from any place
- » Great contents
- » ...

?? Question ??

How can libraries and librarians react, change and adapt to take into account the “*Google effects*”?



!! Assignment !!

Read

Murray, Robin

Library systems: synthesise, specialise, mobilise. [online]

Ariadne, Issue 48, 2006.

Available free of charge from:

<http://www.ariadne.ac.uk/issue48/murray/>

[cited 2006]



Libraries and information centres

Desirable skills of today's
librarians and information managers

Classical character of librarians: *“no computers please”*

The classical, typical character of librarians and
information managers:

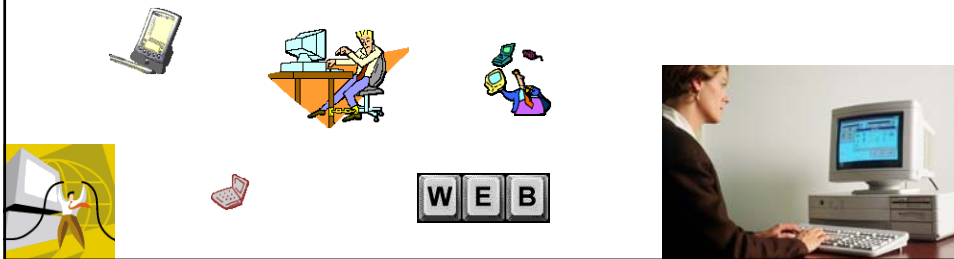
- interest and background in human sciences;
less interested in computers and technology



Skills of today's librarians: *“more computers please”*

Desirable skills of librarians and information managers include more and more:

- computer usage skills;
information and communication technology skills



Classical character of librarians: **document-oriented**

The classical, typical character of librarians and information managers:

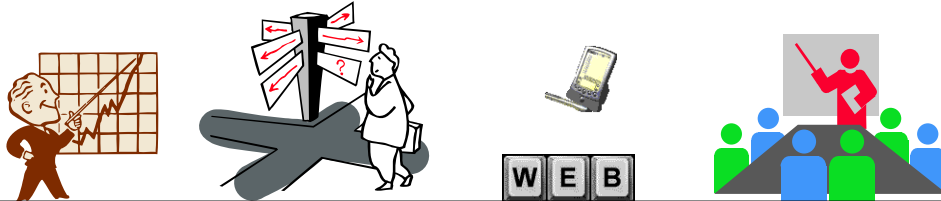
- focused on static documents, cataloguing, conservation of hard copy documents; less on relations and communication with users



Skills of today's librarians: people-oriented

Desirable skills of librarians and information managers include more and more:

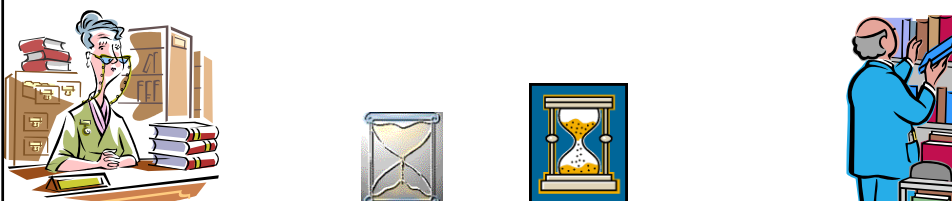
- **communication skills:** to communicate with users/clients and with higher management
- **teaching skills:** to guide users/clients to today's information sources and services



Classical character of librarians: static

The classical, typical character of librarians and information managers:

- attracted by a static, constant, conservative, “valuable” working environment;
less interested in more dynamic, “fashionable” systems with a short life



Skills of today's librarians: dynamic

Desirable skills of librarians and information managers include more and more:

- ability to adapt to continuous change; willingness to work in a dynamic environment and to learn continuously;
- working methods that are always “under construction”
- from collecting information “just in case” to offering appropriate information “just in time”



Classical character of librarians: passive

The classical, typical character of librarians and information managers:

- focusing on static documents leads to static, passive views and behaviour;
collecting information just in case someone may need it



Skills of today's librarians: **pro-active**

Desirable skills of librarians and information managers include more and more:

- focusing on users means acting in a pro-active way:
anticipating needs and developing appropriate services well in time;
acting flexible



Libraries and information centres

Costs, budgets and marketing

How much does it cost to evolve towards digital libraries?

- **Clearly ICT applications cost money for**
 - » hardware
 - » software
 - » skilled personnel
 - » personnel development
 - » maintenance
 - » user guidance
 - » ...
- **However, budgets normally do NOT grow.**

What is the value of information that can be offered by a library?

- *What is the value of information sources?
Which price is reasonable and acceptable for access to
information sources?*
- **These are simple questions,
but the answers are difficult to give.**
- **These are classical questions.
Debates on these questions by all stakeholders are going
on continuously.**

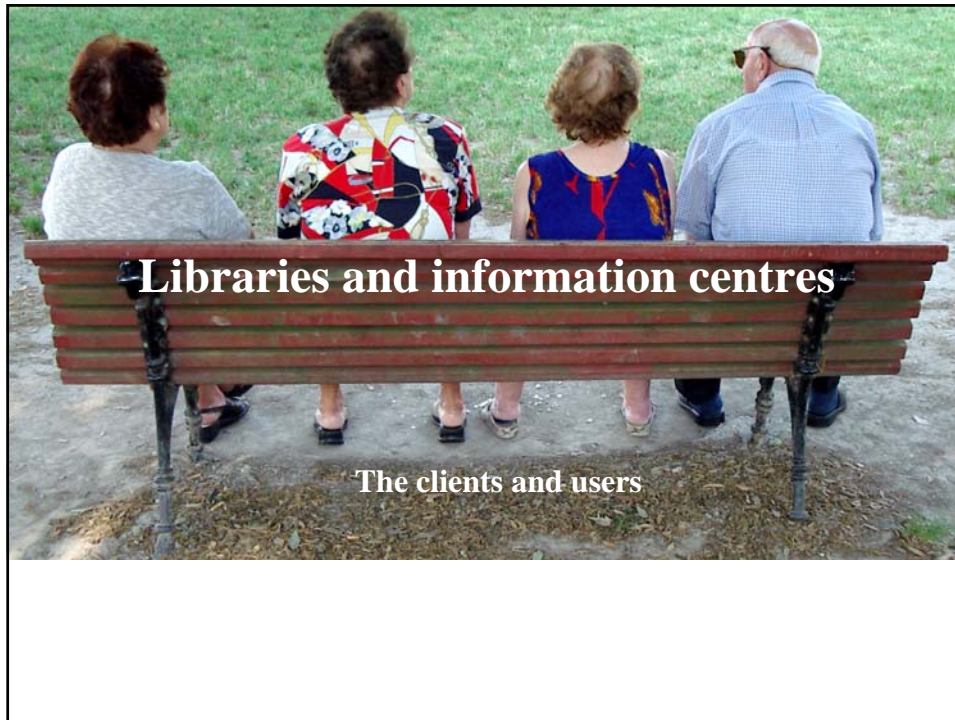
What is the value of a well-structured access to information?

- **Related but different questions are:**
 - What is the added value of*
 - » *a good guide to information?*
 - » *a well organised and well structured access path to information sources?*
- **How do decision makers see this?**

Hybrid libraries should make their digital components well visible

- **Most decision makers do NOT want to pay for *invisible* libraries and for *invisible* librarians.**
- **Therefore, it is important that hybrid libraries make their digital library components clearly visible and attractive, not only for users, but also for decision makers.**
- **Marketing and branding can help here.**

????? → ?!?!? → !!!!!



**--

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The clients and users of hybrid and digital libraries

- **Not all potential users**
 - » can “see” an “invisible digital library”
 - » have access to the required technology
 - » can use the required technology



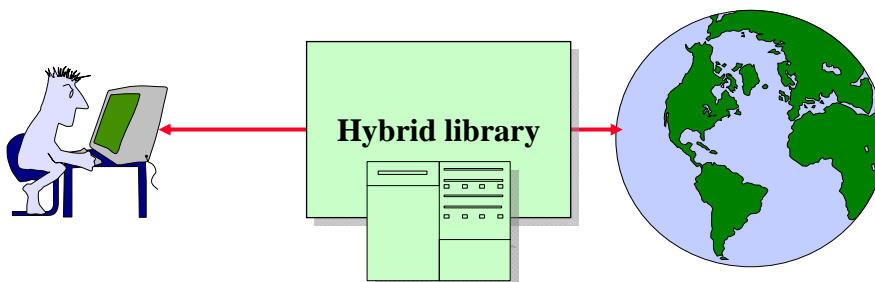
The clients and users of hybrid and digital libraries

- **To reach and to serve people with digital library components, the library should offer more than ever**
 - » equipment and software to access information
 - » user guidance
 - » good user interfaces



The clients and users of hybrid and digital libraries

- **A growing number of clients use their hybrid library from a distance through their digital components. This is for instance the case in universities.**



Libraries and information centres

**Information sources
about library and information science
(LIS)**

Information sources about LIS: introduction

Like in any subject domain, information can be found in:

- **Books**
- **Journals**

- **Abstracts**

- **Internet-based sites and documents**
- **Online interest groups**

Information sources about LIS: a dictionary

Online accessible and free of charge:

<http://www.wcsu.ctstateu.edu/library/odlis.html>

= <http://www.wcsu.edu/library/odlis.html>

= <http://vax.wcsu.edu/library/odlis.html>

Bibliographic databases covering LIS

Bibliographic databases that cover library and information science are available online free of charge from

• <http://sunsite.berkeley.edu/CurrentCites/>

• <http://www.libraryresearch.com/>

Information sources about LIS: abstracts

Abstracts of publications in library and information science are produced in printed format, on CD-ROM, and online accessible, but not free of charge, by several competitors such as

- *Library and Information Science Abstracts = LISA*, and
- *Information Science Abstracts = ISA*.

Information sources about LIS: full texts

- **Searchable full text of some computer-based journals; accessible free of charge:**
 - » <http://dois.mimas.ac.uk/>
 - » <http://sunsite.berkeley.edu/CurrentCites/>
 - » <http://sunsite.berkeley.edu/~emorgan/morganagus/index.html>
- **List of journals and searchable full text of computer-based journals; accessible free of charge:**
 - » <http://www.bubl.ac.uk/journals/>
- **About information technology in libraries:**
 - » <http://staffweb.library.vanderbilt.edu/breeding/ltg.html>

Information sources about LIS: current awareness service

- **The following system offers a current awareness service after subscription free of charge :**

<http://www.informedlibrarian.com/index.cfm>

Information sources about library and information science: portals

Some WWW sites are vertical portals (“vortals”) for librarians and information professionals; they offer access to professional information, free of charge.

Information sources about library and information science: portals

» <http://staffweb.library.vanderbilt.edu/breeding/ltg.html>
[cited 2002]

“The Library Technology Guides website aims to provide comprehensive and objective information related to the field of library automation. This site has no affiliation with any library automation company. Whether you are in the process of selecting a library automation system, or just want to keep up with developments in the field, Library Technology Guide is the place to start.”

Information sources about library and information science: portals

» <http://www.bib.kuleuven.ac.be/bibc/leeszalen/vakbib/bvakweb.htm> [cited 2002]
in Dutch/Nederlands

» <http://www.biblio-tech.com/> [cited 2002]
focusing on library automation

Information sources about library and information science: portals

- » <http://www.informatieprofessional.nl> [cited 2002]
in Dutch/Nederlands; see under Links
- » <http://www.itcompany.com/inforetriever/> [cited 2002]
- » <http://www.librariansyellowpages.com/> [cited 2001]
a buyer's guide for librarians

Information sources about library and information science: portals

- » <http://www.libraryhq.com/> [cited 2004]
- » <http://www.libraryspot.com/> [cited 2002]
a commercially developed information portal developed by
StartSpot Mediaworks, Inc.; this company develops portals
for a variety of consumer groups, or vertical markets.

Information sources about library and information science: portals

» <http://www.researchinglibrarian.com/>

[cited 2004]

good; maintained by an individual

Information sources about library and information science: portals

» http://www.unesco.org/webworld/portal_bib/ [cited 2004]

offers links to WWW sites of national libraries, government information services, library associations and on-line resources, with special emphasis placed on activities in UNESCO's fields of competence namely education, sciences, culture, communication and information.

Special sections regularly feature news and articles of interest to librarians and highlight the activities of a selected library and/or collection.

Information sources about library and information science: portals

» <http://www.sla.org/chapter/ctor/toolbox/resource/>
[cited 2002]

Information sources about library and information science: portals

- **Focused on water-related information:**

» <http://www.wco.com/~rteeter/waterlib.html> [cited 2001]

Information sources about library and information science: groups

- An overview of library-related computer-based discussion / interest groups has been made available:

<http://www.aladin.wrlc.org/gsd/cgi-bin/library?p=about&c=liblists>

[cited 2003]

!! Task - Assignment !!

**Read about how to make contributions
to the literature on library and information science:**

Johnson, Ian M.

Writing for the profession: an editor's perspective.

IFLA Journal, Vol. 30, No. 4, 2004, pp. 319-322.



Information sources about library and information science: conferences

**On the WWW, you can find a list of
overviews on the WWW
of conferences, workshops, meetings, seminars, symposia,
and events,
related to libraries, librarianship, information storage
and retrieval, information science, Internet, WWW,
digital libraries...
for librarians, information intermediaries, information
scientists, information experts:**

<http://www.vub.ac.be/BIBLIO/nieuwenhuysen/professional/conferences-information.htm>

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