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Pós-Graduação em Ciências da Informação e da Documentação

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Notas complementares sobre
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Conceitos e definições

digital library

A digital library is a collection of documents in organized electronic form, available on the Internet or on [CD-ROM](#) (compact-disk read-only memory) disks. Depending on the specific library, a user may be able to access magazine articles, books, papers, images, sound files, and videos.

On the Internet, the use of a digital library is enhanced by a [broadband](#) connection such as cable modem or DSL. Dial-up connections can be used to access plain-text documents and some documents containing images, but for complex files and those with animated video content, a downstream data speed of at least several hundred kilobits per second ([Kbps](#)) can make the user's experience less tedious, as well as more informative. Internet-based digital libraries can be updated on a daily basis. This is one of the greatest assets of this emerging technology.

On CD-ROM, the amount of data is limited to several hundred megabytes ([MB](#)) per disk, but access is generally much faster than on an Internet connection. Several CD-ROMs can be combined in a set, and because the disks are small, a large library can be accommodated in a reasonable physical space. The main limitation of CD-ROM is the fact that updating cannot be done as frequently as on the Internet. In addition, producing and distributing CD-ROMs involves overhead costs that are largely nonexistent in Internet-based libraries.

Some institutions have begun the task of converting classic books to electronic format for distribution on the Internet. Some files can be viewed directly in [HTML](#) format; others can be downloaded in [PDF](#) format and printed. Some publishers keep electronic files of books and produce them one unit at a time in printed and bound form on demand.

Electronic distribution of intellectual and artistic property has authors, agents, and publishers concerned about the possibility of copyright infringement. It is much easier to copy a CD-ROM, or to download an electronic book and make unauthorized copies of it, than it is to reproduce bound volumes and distribute them illegitimately. Fundamental changes in copyright law - and/or changes in the way in which the laws are enforced - are likely to occur as digital libraries expand and their use becomes more widespread.

Basics for Document Imaging & Management Systems

Document imaging is the conversion of paper documents into electronic images on your computer. Once on your desktop, these documents can be retrieved effortlessly in seconds.

Thousands of organizations around the world use document imaging every day instead of paper filing systems. The reasons for this change are simple:

Document Imaging:

- ? Prevents lost records
- ? Saves storage space
- ? Manages records easily
- ? Finds documents quickly
- ? Makes images centrally available
- ? Eliminates need for file cabinets

The steps necessary to introduce document imaging are simple: Documents are **scanned** into the system. The document imaging system **stores** them somewhere on a hard drive or optical disk. The documents then get **indexed.** When a person later wants to read a document, they use the **retrieval** tools available in the document imaging system. Which documents can be read and what actions performed on these documents is dependent on the **access** provided by the document imaging system.

A complete document imaging system comprises five elements:

- ? **Scanning**
  Major advancements in scanning technology make paper document conversion fast, inexpensive, and easy. A good scanner will make putting paper files into your computer easy.
- ? **Storage**
  The storage system provides long-term and reliable storage for documents. A good storage system will accommodate changing documents, growing volumes and advancing technology.
- ? **Indexing**
  The index system creates an organized document filing system and makes future retrieval simple and efficient. A good indexing system will make existing procedures and systems more effective.
- ? **Retrieval**
  The retrieval system uses information about the documents, including index and text, to find images stored in the system. A good retrieval system will make finding the right documents fast and easy.
- ? **Access**
  Document viewing should be readily available to those who need it, with the flexibility to control access to system. A good access system will make documents viewable to authorized personnel, whether in the office, at different locations, or over the Internet.

Electronic document management : A research report

Liz Keyes

Abstract

This report presents an introduction to electronic document management, the functions and technologies, benefits, applications and issues which have arisen due to the widespread use of electronic documents.

Keywords : Electronic document management, EDMS, Paperless office, Filing

Introduction to Electronic document management

Document management has being going on for hundreds of years, since pen was first put to paper. Imaging technology has allowed the conversion of paper documents to electronic form and communications software such as email has brought us closer to the 'paperless office'.

The term electronic document management can mean different things to different people. There are many definitions in the literature which can help clarify what exactly it means. Levien (1989) describes a document as a unit of 'recorded information structured for human consumption'.

Sprague (1995).defines EDM as 'the application of technology to save paper, speed up communications, and increase the productivity of business processes'.

Sutton and Lemay (1999) define an Electronic Document Management System (EDMS) as "a system of overseeing an enterprise's official business transactions, decision-making records, and transitory documents of importance. The repository for an EDMS contains representations of an object loosely termed a document. The medium of a business transaction (electronic, photographic, audio, or paper) is irrelevant."

Typical system components include 'PCs and/or workstations used to retrieve documents from systems for viewing, other standard hardware components include a scanner, a storage device and a printer' (Automatic ID News, 1997).

Examples of documents in use today are emails, reports, contracts, memos, news articles, minutes of meetings, letters, drawings, photographs, technical specifications and project plans. Popkin and Cushman (1993) said that 80 – 90 per cent of organizational information is in documents as opposed to data in structured databases and argued in favour of investing in document management systems.

Craig (2000) said that Integrated Document Management (IDM) is poised to take off due to several reasons as follows :

1) The ability to post enterprise documents to the Web

2) Recognition that half the organisation's data are stored in documents and not in relational databases

3) Availability of multimedia repositories

4) Appearance of enterprise portals

Antony Satyadas, business leader, knowledge discovery solutions, IBM Lotus Software said :"Up to 50 per cent of corporate intellectual capital is stored in e-mail messages or attachments. Incorporating this information into a document library not only facilitates the dissemination of knowledge throughout a company, but also helps ensure that organisations can produce these records quickly and easily."

Amami & Beghini (2000) state that "Wherever enterprises select to shorten product development time, document management is a major activity that determines project performance and consequently fast-cycling capabilities to introduce products into the market." They go on to say that "technology capabilities to support workflow management, intra- and interorganizational communication, and internal reporting are proving valuable to link project management and document management.

Koulopoulos & Frappaolo (1995) have identified three types of documents

?   Reference documents with a static source of information requiring text retrieval software

?   Collaboration documents requiring Groupware applications for collective authoring

?   Transaction documents such as invoices which are processed in workflow systems

Document Lifecycle

An EDMS manages documents throughout the document lifecycle (see Figure 1)
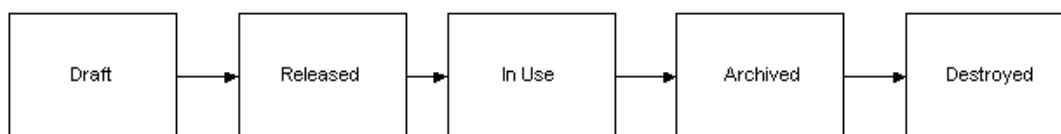
Document LifeCycle

Figure 1 : Document Lifecycle

Draft : Document versions need to be controlled during the drafting of a document. Check in, check out, locking and user access are all a basic requirement where multiple authors are collaborating on a document.

Released : When a document has been approved by the appropriate people it can be released.

In Use : While a document is in use it should be easily available to those people to whom it applies. This can done via enterprise, site, project and team web portals. Documents are normally subject to regular reviews which means draft versions need to be under version control until released to replace the existing version.

Archived : Records retention regulations necessitate that documents are kept for a specific amount of time. During this time documents should be available on request.

Destroyed : After a specified time documents can be destroyed, this applies to both paper and electronic versions.

Technologies used

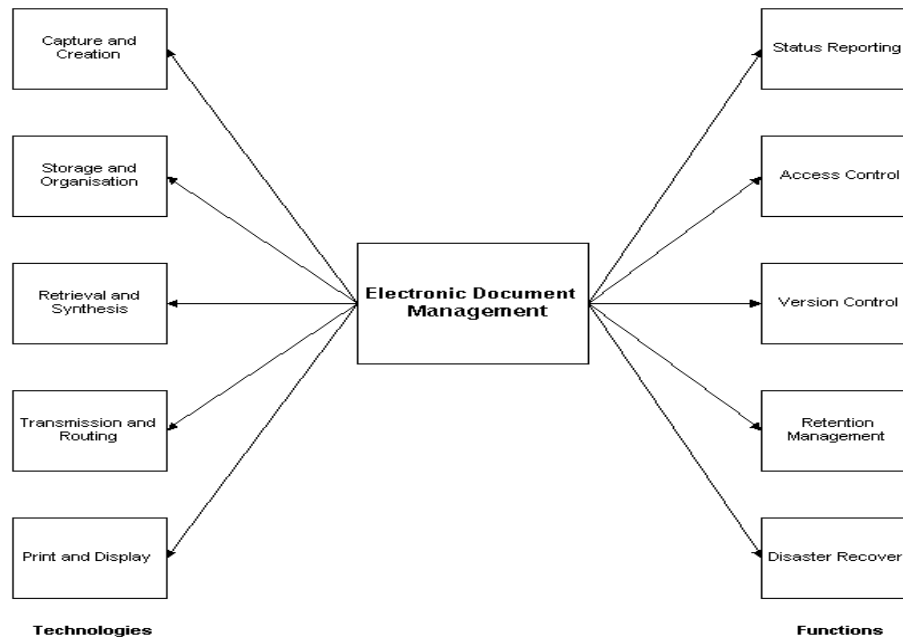Sprague (1995) classfies functions and technologies of document management and processing as shown in Figure 2

Figure 2 : Technologies and functions of electronic document management.

Status Reporting – Who has a document. This is necessary when multiple users are creating or reviewing a document

Access Control – Document management software controls access to all documents, users can be given read/write/delete access.

Version Control – Document management software allows users to check out a copy of a document and lock the original on the server. When the user makes changes he can check the document back in and unlock.

Retention Management – There are often legal requirements for document retention. Gable (1997) discusses the challenge of retention management for electronic records. He says that documents can be held on personal PC's, naming can be inconsistent and responsibilities for storing lie with the IT department not the records department. "In electronic environments, only a record's creator knows : (1) What the record's content is; (2) What the record is called, and (3) In which electronic directory it has been placed." (Gable 1997)

Disaster Recovery – Backups and recovery procedures

Related Technologies

Technologies which are not strictly part of document management but are closely related are workflow and imaging.

Workflow – The ability to route documents from one user to another in a controlled fashion. Workflow products assist through tracking workers' deliverables, so a worker is presented with a document only when his input is required. (Zantout & Marir 1999)

Imaging – Methods for converting paper documents to electronic format e.g. scanning

Benefits of Electronic document management

Some benefits of EMD are :

   ? leveraged organisational memory as so much organisational memory is contained in documents. (Amami & Beghini, 1999) This is particularly important in situations of management turnover.

   ? Revision control

   ? Easy retrieval of documents through keyword searches

   ? Management of a document with multiple authors

   ? Multiple access to single copies of a document

   ? Reduced cost of managing documents

   ? Reduced paper usage

   ? Better customer service as agents have fast access to information

   ? Easy exchange of knowledge enabling cross functional collaboration.

   ? Up to date, relevant news articles increases business intelligence and can influence the strategy of a company

   ? Knowledge can be stored in databases and reused many times saving time and money

   ? Paperless office – paper is unlikely to be eliminated completely. 'It is likely that the primary role of paper will change. Rather than serving mainly as the storage

medium for documents, paper may act primarily as the storage medium' (Sprague, 1995)

Applications of electronic document management.

"In many industries, such as pharmaceuticals, document management solutions are required by government regulators. In others, document management solutions are necessary to ensure that critical information is readily available" (Craig, 2000)

Some examples of applications of EDMS are electronic scanning and processing of cheques, production of manuals for consumer goods, support for compliance with external regulatory bodies.

"Life and health insurance companies are finding that electronic document storage and retrieval eliminates the need for huge amounts of costly real estate for filing cabinets and for thousands of work hours spent searching for, removing and returning their copious records." Thomas (2001). Thomas goes on to describe how claim forms are scanned and stored on CDs which are delivered to the data center daily, this building up a database of claims records.

Customer services across a wide range of industries can benefit from EDMS. Call centre agents with fast and easy access to product and sales information can answer a query in minutes as opposed to days. Customers can have direct access to product information via enterprise websites thus increasing sales.

Information Overload

Zantout & Marir (1999) have advanced the need to move towards intelligent information retrieval. They have defined 2 issues which can arise in todays world of information overload as 'worker finiteness' and 'worker ignorance'. Worker finiteness relates to the overflow of information for the individual worker who spends a lot of time trying to find information he knows is there. Worker ignorance relates to knowledge which is there but the individual is not aware of it's existence. A move towards intelligent systems which automatically present information to individuals would help alleviate this. Research is

already underway to incorporate intelligent agents into workflow management systems (Cichocki et al., 1998)

Conclusions

In today highly competitive world an effective EDMS is essential to gaining an advantage in the marketplace. A great proportion of company information resides in documents and not in structured databases. Organisational learning is facilitated through reuse of information. Developments towards intelligent agents will help combat issues of 'information overload' which can happen as a result of the current information explosion.

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Meta-Design of a Community Digital Library

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Abstract

The community digital library has emerged as a recent evolution in the development of digital libraries. A community digital library is distinct through having a community of potential users define and guide the development of the library. In this article, we present how the geoscience community has worked to develop The Digital Library for Earth System Education (DLESE) in the light of recent work in the area of meta-design, the design of the design process. The development of DLESE is described utilizing a conceptual framework developed from the analysis of a variety of open source projects.

Introduction

Community libraries, more than any other civic institution, are the hallmark of an informed society. Libraries carry powerful symbolic meaning and inference. A library can serve as the communal repository of knowledge, the town meeting place, a touchstone for intellectual discussion and community activism. A community library is a free and accessible place, hospitable to both the learned scholar and the struggling student. A library has the potential to transform the way a community thinks about itself; it provides the conditions and possibilities for intellectual growth, social mobility, and community development and cohesion.

Community libraries are evolving with the information age. The past decade has witnessed the increasing ubiquity of the World Wide Web in homes and schools, the emergence of new kinds of "electronic communities" (Preece 2002), and the widespread creation and distribution of digital educational materials. Digital libraries have emerged as a means for disciplinary communities to share, organize, and assess their intellectual holdings. To date, there are many digital library efforts underway aimed at improving K-12 and undergraduate science education (e.g., NEEDS, iLumina, TeacherLib, DLESE). One prominent example is the NSDL (National Science, Technology, Engineering, and Mathematics Digital Library), a program initiated by the National Science Foundation (NSF) to integrate multiple digital libraries and to serve the needs of the community of science educators and learners at the broadest level (Fulker and Janée 2002).

Over the past three years, the Earth system science community has come together to articulate a vision for, and begin construction of, The Digital Library for Earth System Education (DLESE). DLESE is being designed to support the specific educational needs of the geoscience community within this larger national library network. In the tradition of community libraries, the mission of DLESE is to fundamentally change the way students learn, instructors teach, and researchers interact, by providing new ways of sharing information, tools, and services.

DLESE is a grassroots, community-led project that, among a range of services, provides searchable access to high-quality, online educational resources for K-12, undergraduate, and informal Earth system science education (Marlino, Sumner et al. 2001). These resources include objects such as maps, lesson plans, lab exercises, data sets, virtual field trips, and interactive demonstrations. The holdings of DLESE are created by a wide variety of individual faculty members, agencies, and institutions. These resources are held (stored) on local servers and are accessed through the library via a database of searchable metadata records that describe them.

To date, significant progress has been made on many aspects of the library: the community has been organized, a governance structure has been established, a strategic plan has been developed, a useful collection is available, and a working version of the library is now in use (Figure 1). This operational library was released in August 2001, and contains approximately 2000 carefully selected educational resources. Version 1.0 provides educational discovery features that enable users to search by grade level, educational resource type, and keyword. This version of the library also contains a web-based Resource Cataloger enabling community members to contribute resources to the library. Additional community oriented services are provided such as discussion forums for working groups, and posting tools for geoscience education opportunities and announcements. Future versions of DLESE will offer peer-reviewed teaching and learning resources, interfaces and tools to allow exploration of Earth data, and services to help users effectively create and use educational resources.

Figure 1. Version 1.0 of DLESE (www.dlese.org) was released in August 2001. It enables educators and students to search and browse for educational resources by grade level, keyword, and educational resource type. Every month an educational resource created by a community member is featured.

Designing the Design Process

The uniqueness of community libraries lies not in *whom* they are being built for, but in *how* they are designed, constructed, and managed. A library such as DLESE cannot thrive without the distributed effort and energies of a broadly engaged community. Our experiences to date demonstrate the benefits of adopting a design process where community-building and technical development are tightly integrated: through workshops, working groups, and funded projects, community members are actively participating in the development of library policies, technologies, collections, and peer reviewing services.

DLESE's unique approach to distributed library design and construction is informed by the emerging theoretical perspective of *meta-design* (Fischer 2001; Fischer 2001). Meta-design is a useful perspective for analyzing projects where 'designing the design process' is a first-class activity, i.e., creating the technical and social conditions for broad participation in design activities is as important as creating the artifact itself. Meta-design theory draws on existing design traditions such as user-centered design and participatory design.

Methodologies such as user-centered design (Norman 1986) and task-centered design (Gould, Boies et al. 1991; Lewis and Rieman 1993) emphasize getting systematic user feedback on the evolving design throughout the design process; however, it is largely designers who generate possible solutions, users are mainly in a reactive role. Participatory Design (PD) methods (Greenbaum and Kyung 1991; Schuler and Namioka 1993) seek to involve users more deeply in the process as co-designers; i.e., users also propose and generate design alternatives. An important ideal of PD is industrial

democracy (Ehn 1989), which implies that users should be politically empowered with a broad design remit that includes: co-designing the technology, co-determining the nature of the design process itself (schedules, processes, outcomes), and co-designing the social conditions of technology use (i.e., work practices, organizational structures and responsibilities).

Meta-design is largely an empirically inspired theory, derived from examining success models of *open source* projects, where the design and development of complex software systems is carried out by highly distributed, potentially large groups of people communicating and coordinating activities via the Internet (Raymond 2001). While meta-design shares the industrial democracy ideals of participatory design, the social and technical conditions under which design is performed, as well as the anticipated outcomes, are quite different:

? Design participants are largely volunteers, and the distinctions between user and developer roles are blurred. People step forward to design and develop pieces of interest or importance to them. There can be large numbers of these individual sub-projects proceeding in parallel, in some cases even hundreds or thousands. These diverse activities are coordinated by a smaller team of project leaders, or even a single individual (Fielding 1999; Nakakoji, Yamamoto et al. 2002).

? Participants are distributed, with most project communication and coordination activities taking place over the Internet.

? Design outcomes can have an emergent flavor, in that it is difficult to predict who will step forward to do what, or what new lines of inquiry are being pursued in the broader community of participants.

A detailed analytic framework for meta-design based on an analysis of open source projects was recently developed by Scharff (Scharff 2002). The framework illustrates the collaborative process toward developing an object, in Scharff's case, a piece of software where the participants are a group of software developers (Figure 2). A core principle of the framework is the intertwining of social processes and technical artifacts. The participants use various computer-mediated communication technologies for social interaction (email, news, web forums) and software development tools that support collaboration and coordination (e.g., CVS, or Concurrent Versions System, a tool used to manage changes to software code). The participants use these technologies to support their collaborative process to contribute to the development of the final object, or software. We should note this framework also captures the iterative nature of development: participants can contribute to the object creation process after using interim versions, and where the state of the design is accessible usually by means of a public artifact or standard distribution.
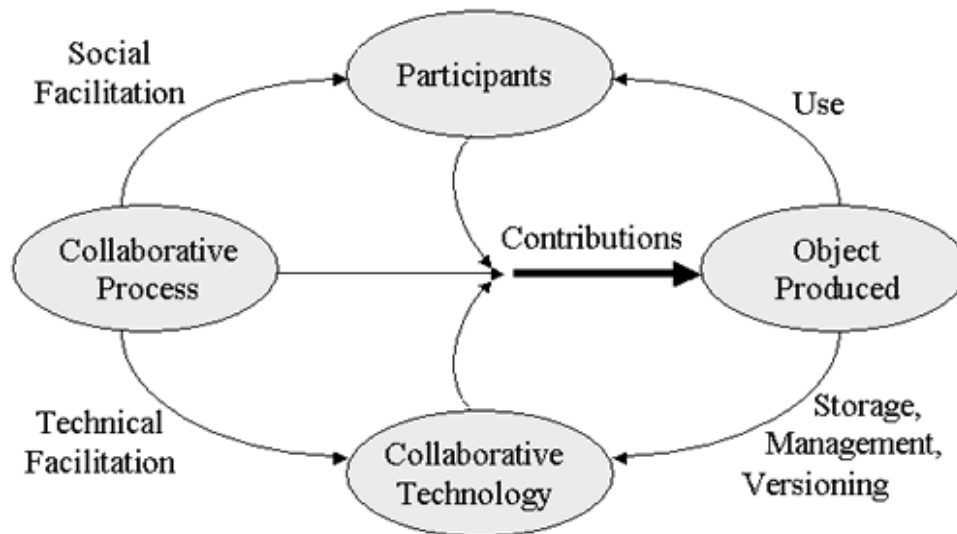
Figure 2. Analytic framework developed by Scharff, derived from examining a variety of successful open source projects.

Collaborative Library Development in DLESE

In the previous section, we describe how meta-design theory has been derived from the examination of open source projects. Some common traits across the projects are that participants are largely volunteers, distinctions between developer and user roles are blurred, participants are numerous and highly distributed, and various sub-projects can emerge and proceed in parallel, coordinated by a small team or an individual. These traits are also evident in DLESE with its highly distributed community, community members being users and developers, and various DLESE sub-projects being developed in the community with policy oversight and coordination through a community-based governance mechanism. This governance mechanism formally adopted open source principles for DLESE in December 2000. Because of these similarities, among others, we believe that Scharff's framework is highly relevant for analyzing the distributed library construction process.

Participants

In the case of DLESE, the participants are a broad collection of engaged individuals from the geoscience community (researchers, educators, and students), K-12 educators, library science specialists, digital library and information sciences specialists. The participants are distributed across the USA. These participants can be arranged into three primary groupings: governance, the DLESE Program Center (DPC) and the community. Governance includes the steering committee responsible for overall policy guidance for the DLESE project, and four standing committees aligned to core facets of the library (services, users, collections and technology). The DPC is responsible for developing and operating the core infrastructure of the library, and provides a coordinating role for the DLESE project. This coordinating role is similar to the coordinating roles of teams in other large open source projects (e.g., the Apache coordinating team on the Apache project (Fielding 1999), or Squeak Central (Kaehler 2002; Scharff 2002)). The community includes the individuals and institutions that have an interest in seeing

DLESE develop, and they are involved through individual action and through structured arrangements such as working groups (reporting to standing committees) discussion groups, and events such as the DLESE Annual Meeting. As noted earlier, individuals contribute as project collaborators or leaders based on their interests and expertise.

Collaborative Process

The collaborative process in DLESE has allowed the community to interact and participate in the design and development of the library. The framework highlights two facilitation mechanisms to support the collaborative process: a social facilitation of participants; and a technical facilitation of communication infrastructure and technical artifacts. The overall process toward developing the library (the object) has involved both these paths.

An important aspect of the DLESE process has been the social facilitation of participants through face-to-face meetings and workshops, as well as through the technical facilitation using mechanisms such as computer mediated interaction, e.g., email, web-based forums, and document sharing. The social facilitation has been very important to the DLESE development in that it helps community members from different backgrounds understand and share a common vision of what DLESE should be. In addition, explicit use of user-centered and participatory design methodologies to support the collaboration process has proved to be very useful. This has included the development of use cases derived from envisioned use scenarios written by educators and from interviews with prospective users (Davis and Dawe 2001; Sumner and Dawe 2001). As a check on library development progress, formative usability testing is done to ensure that the library development is meeting the goals (as expressed through the use cases), and to provide further contributions to the development. The development of use cases and the testing of the library against them is a level of formalization on the contribution and feedback mechanisms beyond those found in the open source projects analyzed by Scharff.

Collaborative Technology

DLESE has taken advantage of various computer mediated communication mechanisms (email, web forums, document versioning, development and discussion of use cases) and human mediated mechanisms (face-to-face meetings, telephone conferencing and workshops). For any given component project within DLESE, a number of these collaborative technology mechanisms have been used, often starting with work group meetings followed by extensive online discussions around shared documents. We have found that support for document versioning is crucial and needs to be available and accessible to all participants. We have found that the versioning systems commonly used in open source projects (e.g., CVS) do not lend themselves to use by our broader, non-software developer community.

Object Produced

The development of DLESE is an ongoing project, but services are already being provided to the geoscience community. Services include the core technical mechanisms of collection building and discovery, plus the community building support such as online groups and human interaction through meetings such as the Annual Meeting. There are projects now under development in the wider DLESE community that are building on this core, e.g., the Community Review System (CRS) under development at Columbia (Kastens 2001) and the Community Issues and Groups area at Carleton College

(Manduca 2002). These projects utilize underlying technical structures developed by the DPC to explicitly support distributed library building.

Each of these developments has evolved from the early stages of the ongoing DLESE collaborative process. The leaders of these developments came forward from the larger DLESE community to lead the development of an identified library component and to coordinate their work with other projects. The subsequent development of the components have themselves elicited a collaborative process in their development through working with specific working groups and committees (e.g., the CRS with the collections committee, the metadata working group and the DPC), so the conceptual framework has applicability at different granularities of our library development process.

Conclusion

DLESE is a partnership between the National Science Foundation (NSF), the DLESE community, the Steering Committee, and the DLESE Program Center. The success so far in developing DLESE has been based on the effective collaboration of the DLESE participants to date. The framework developed by Scharff has given us a tool on which to build the description of DLESE development and to illustrate how the collaborative process has been important to DLESE development. While Scharff's work looked at distributed software developers on open source software development projects, we have found that the framework is useful in the context of a broader participant pool such as that found in DLESE. One major factor that other digital library developers heading down the community library path should consider is the large amount of work required to support the social facilitation of a diverse set of participants beyond core digital library technologists to allow all participants to have a shared vision, and allow them to participate fully in the design and development. In DLESE, the structure and use of meetings, committees, governance, and DPC has provided a framework (the meta-design) to support the distributed library building process.

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First Steps in an Information Commerce Economy

Digital Rights Management in the Emerging EBook Environment
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Introduction

The delivery of digital content to consumers in a trusted manner allows business models to be tried that are different from existing forms of publishing. Thus rights management technologies take a central place in the development of the eBook ecology by providing the ability to enforce and negotiate usage restrictions. This emphasis on the control of usage rather than access is critical in distinguishing eBook publishing from other types of publishing that have gone before it.

Press coverage of the eBook marketplace could lead readers to believe that an explosion is imminent in this new method of publishing [1]. However, there are outstanding issues that need to be addressed for the current hype to bear some semblance to reality. All stakeholders will need to become active in informing how the eBook evolves as an economically viable resource type.

What is an eBook?

This question can be asked from a variety of perspectives. Many considering this question are concerned with the properties of an eBook, and whether they infer any rights to the consumer of the eBook. But any definition of an eBook must accommodate the role of many players other than just the publisher (rights representative) and the consumer (rights exploiter). The term eBook is really just a misnomer used to represent a new model of electronic publishing -- one where technology has a more pervasive role to play than within the previous electronic publishing genres such as online databases, electronic journals or syndication models. An eBook can be any type of electronic content that is packaged as a discrete unit and can be used with eBook technology.

eBooks are different from other types of electronic publishing because the commodity that is being considered is finite. The established models of electronic publishing rely on the continuing need of the purchaser for access to a changing corpus of information. The means of establishing and enforcing business relationships are known and easily understood – should a recipient of an electronic journal abuse their access, the publisher will likely take remedial action in the form of discontinuing access to the publication. eBooks are different because they do not rely on centralized control of access.

eBooks are important because they will establish new principles for the commerce of information commodities. What happens with eBooks will have profound implications for the use of information packets. It is unlikely that eBooks will accommodate existing practices (such as the right to return books to a distributor) if such uses would make it easier to abuse a consumer right that is intended to be fair to both parties. eBooks are

about usage controls rather than access controls. The business models that can then be built for eBooks will affect how we write, publish, purchase and consume certain types of information resources.

What is digital rights management?

The ability to make perfect electronic copies of digital files and effortlessly distribute those copies in a networked environment is an acknowledged threat to the content exploitation industry. The extent to which this problem is recognized is apparent in the reconsideration of the implementation of the copyright law as enshrined in the WIPO Copyright Directive [1]. Technology ignores the social imperative that exists in the principle of copyright and instead provides tools to build new models. Existing notions of sales and licenses take on renewed importance in providing clarity to questions such as who owns a copy of content and what privileges are conferred to the recipient of a piece of content. The technical means by which content is dynamically licensed for, or protected against, a particular use is known as digital rights management.

The tools of digital rights management (DRM) do not define how commerce must be conducted. Rather, they allow business models to be defined and support their implementations. Stakeholders in the supply chain thus need to actively ensure that their interests are recognized and incorporated into the models that prevail. DRM is a large field with applications in such areas as the automated degradation of broadcast video signals as they move between systems with different levels of trust. The basic premise behind DRM is that the rights-holder should determine how their rights are enforced. DRM vendors boast a broad spectrum of technologies and applications some of which are hoping to become a core component in the eBook market.

Digital rights management and eBooks

DRM vendors have been actively participating in two industry groups: the Open eBook Forum (OeBF)[2] and the Electronic Book Exchange (EBX)[3]. The DRM vendors see eBooks as a new market ripe for the use of protection technologies. Their interests are primarily in establishing principles from which actual business implementations can be established. Within these groups there is an emphasis on the expression of rights and the enforcement of expressed rights.

eBooks present two interesting problems to rights management systems. These can be simply stated as how to:

?   Express the conditions and usages that are permitted by the rights-holder -- while respecting the pre-existing entitlements of the consumer;

?   Enforce those usage conditions in a range of environments that have different levels of trust -- and are not necessarily connected to an online authority.

The enforcement of rights requires a consistent expression of rights to allow different systems to consistently interpret what is required. Two candidate languages have been promoted as means to achieve a universal means of expressing what is conferred in a sale or license of content. ContentGuard's eXtensible Rights Markup Language (XrML)[4] is a licensable specification for expressing rights in XML based on work conducted at Xerox PARC [2]. XrML has been criticized for its lack of process for developing the language, and there have been concerns about the terms under which the specification may be licensed. Open Digital Rights Language (ODRL)[5] is an alternative rights expression language, still in its infancy, which is being proposed by IPR Systems to the World Wide

Web Consortium as an open standard to be developed within the established process of the W3C.

Agreeing on a language to express rights is only one half of the eBooks rights management problem. Systems that enforce the expressed usage privileges are the other component. The key enforcement issue is the basis on which trust is achieved between parties trading content. Different parties and content have different needs for certainty in their transactions. It is therefore attractive to be able to reflect the need for assurance in particular circumstances. This can be provided by establishing a trust model, which provides for a range of relationships between any two parties exchanging content.

Identification of the parties involved in a content exchange is essential at high trust requirement levels. But a public key infrastructure, required for verification of identities, is expensive using the solutions available today. The cost associated with establishing a trust system is considerable, and this is proving an issue in moving the eBook market forward.

Current situation

Several problems exist with the two existing options for rights languages. There are no strong conceptual models supporting either language, and both languages have unclear development processes. These problems are the focus of ongoing work within OeBF since a recent announcement of a merger in the activities of the EBX Working Group into OeBF. The World Wide Web Consortium has also shown an interest in how rights should be expressed and is organizing a seminar in Nice on this topic[6].

The Association of American Publishers commissioned a major investigation of eBook requirements and relevant standards during 2000. Working with Andersen Consulting, several AAP member organizations considered requirements for identification, metadata and digital rights management and looked at whether available standards and product offerings met the requirements. The findings of this activity were released in November 2000 [3]. The report recommends the use of the DOI/ISBN[7] for identifying content, ONIX/indecs[8] for metadata and was inconclusive on digital rights management.

Conclusions

New business models, such as peer-to-peer super-distribution, could change the way we access and use content. The future role of current participants in the information supply chain will be affected by how the emerging eBook environment is defined -- something in which those participants can take an active role in shaping. The commercial framework for eBooks will force us to address fundamental issues such as what it is to publish and who can publish.

Digital rights management is often promoted on the basis of how it can protect content from copyright infringement. But digital rights management can do more than simply stop certain activities from taking place – it can also be used to allow new uses of existing content. The creative use of this technology can reduce the need for protection and increase the reward to intellectual property holders by allowing the incremental licensing of content depending on a user's requirement.

Existing eBooks are an evolutionary step – for many purposes access to online databases will prove a better solution. Yet distributing content in the form of eBooks is a useful device for exploring how to build sustainable models for creating and consuming packets

of content. Interested parties are encouraged to get involved in these developments to help shape the future of what will be one of our primary means of communication.

Notes

(1) The WIPO Copyright Treaty directive generally addresses issues of copyright in collections of works (such as in databases) but the important parts for eBooks are those sections relating to the circumvention of copyright protection mechanisms. Legal protection is required as the means of protecting the copyright itself, with certain exceptions such as fair use and research into cryptography. In the United States the WIPO directive has been enacted in law as the Digital Millennium Copyright Act.

(2) The Open eBook Forum (OeBF) is an association of organizations who share a goal to establish specifications for electronic book systems, applications and products. Known for its work in producing a publication framework, the forum is now engaged in all aspects of eBook development from technical specifications to market evangelism.

(3) The Electronic Book Exchange (EBX) Working Group is an organization of companies developing a standard for protecting copyright in electronic books and for distributing electronic books among publishers, distributors, retailers, libraries, and consumers. The EBX specification is content format agnostic.

(4) The eXtensible rights Markup Language (XrML) provides a method for specifying rights and issuing conditions associated with the use and protection of content. XrML is a specification licensed on a royalty-free basis to encourage inter-operability. XrML facilitates the creation of architectures for rights management of digital content in all media.

(5) Open Digital Rights Language (ODRL) provides the semantics for rights management expressions pertaining to digital assets. ODRL is a vocabulary for the expression of terms and conditions over assets. It is intended that ODRL will be standardised via an appropriate, open, and non-competitive organisation with a public process for the future maintenance of the standard. ODRL has no license requirements.

(6) The W3C Nice Workshop will explore existing technologies and new approaches for Digital Rights Management on the Web. The workshop will consider DRM issues across multiple sectors and communities with a view to enabling the Internet to deliver trusted rights management services. The intent is to find and highlight expressions, processes and methods for DRM applications that could be the subject of a W3C Activity Proposal.

(7) The new standards specify a numbering system based on the IDF's Digital Object Identifier, an internationally supported system ideally suited for identifying digital content and discovering it through network services. The numbering recommendations allow for identification of eBooks in multiple formats and facilitate the sale of parts of eBooks, and they also work with existing systems such as the ISBN to allow publishers to migrate to the new system.

(8) The metadata standard recommends extending ONIX, the existing standard for printed book supply chain metadata, to include information needed to support the new numbering system and eBook-specific fields.

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An E-book Primer

Sarah Ormes, UKOLN, on behalf of EARL, the Library Association and UKOLN

An issue paper from the Networked Services Policy Taskgroup Series Editor: Sarah Ormes, UKOLN

Introduction

In early 2000 Stephen King published a novella called *Riding the Bullet* [1] in electronic format. Readers could access the book only via the Internet and had to read it using either their computer, handheld computer or dedicated e-book reader. The novella was sold for $2 and over 500,000 people tried to download it within the first week of its availability.

The publication of *Riding the Bullet* presented libraries with a problem. Here was a book for which there was great public demand and yet how could libraries add it to their collections and circulate it to their readers? Libraries are organised around the acquisition and management of physical items and *Riding the Bullet* did not fit into this model.

Integrating e-books into library services looks like being one of the biggest challenges libraries have to face in the next few years.

What is an e-book?

E-book is a vague term which is used to describe a text or monograph which is available in an electronic form. An e-book could be a novel published on a Web site, a short story available to be downloaded as a word processing file or even a diary in a very long e-mail! Increasingly though the term e-book is used specifically to describe a text which requires the use of e-book software or hardware to be read. This software or hardware reproduces the text in a high-quality, easy-to-read digital format which aims to replicate the text quality available in a paper-based book.

The term e-book is also used to describe the dedicated electronic reading equipment which can be used to read e-books. To avoid confusion these devices are referred to as 'e-book readers' in this paper.

E-book Availability

Who's publishing them?

E-books are being published by a wide range of organisations. Established publishers like Simon & Schuster are making available e-book versions of some of their new mainstream publications [2]. Small e-book publishers are also becoming common. These organisations specialise in publishing new or emerging authors electronically only [3]. Authors, ranging from famous authors like Stephen King to previously unpublished wannabes, are also publishing their own work themselves

How much do they cost?

At present an e-book version of a current bestseller is only slightly (a few pounds) cheaper than its hardback equivalent. Books available in e-book format only range from being free, to a few pounds, to the equivalent of a print book.

Who's selling them?

E-books can be bought from major online booksellers like Amazon [4] and Barnes & Noble [5] and specialised e-book sellers like Ebookcity [6] and Ibooks [7].

What is an e-book reader?

E-book readers are the electronic devices used to read e-books. There are currently three types available:

- ? Handheld
- ? Dedicated
- ? Desktop.

Handheld readers

Some handheld computers, personal digital assistants (PDAs) and palmtops can be used to read e-books e.g. Palm Pilots [8], Pocket PCs [9] and Handsprings [10]. These devices are very small, lightweight computers which fit into a shirt pocket. They are mainly used as diaries, e-mail readers and note takers.

Penetration of such handheld devices into the UK is still relatively low but they are extremely popular elsewhere in the world. Palm Pilot is the market leader and is currently selling one million units every 11 weeks. It is highly probable that this success will soon be repeated in the UK.

For a handheld device to be able to read e-books special software is required. This software may be already installed or can be downloaded from the Internet for free.

Peanutpress [11] and Mobipocket [12] are two companies which sell e-books over the Internet for use on such devices. The books are purchased via the company's Web site and then downloaded to the hard drive of a PC or to a virtual bookshelf facilitated by the bookseller. When a user wishes to read an e-book they then download a copy of it to the handheld device via a PC. When the user has finished reading the e-book it can be deleted from the handheld device in order to make space for another text. A copy of the book is retained on the PC's hard drive or the virtual online bookshelf.

Using a handheld computer as an e-book reader has a number of advantages. It makes use of technology/equipment that people may already have and carry around with them. Handheld computers are lightweight, allow the user to make fonts larger and smaller as they wish and can provide keyword searching. However, handheld computers have a small screen (making reading large amounts of text difficult) and can only store a very limited number of e-books at any one time (due to small memory space).

Dedicated readers

Dedicated e-book readers have been designed solely for reading e-books. They do not have the range of functionality available in handheld devices. They have larger screens than handhelds (around the size of a page of a paperback book), typically have more memory and are more intuitive to use. The leading brand in the dedicated reader market is Gemstar [13] which produces the REB 1100 and the REB 1200 (previously known as the Rocket eBook and the Softbook). Typically the dedicated readers are light (the REB 1100 is 21 ounces), allow the user to alter the font size, change the back-lighting, underline passages, perform keyword searches and make annotations. They can store up

to 10 full-length novels at any one time and have battery lives of up to 40 hours. The REB 1100 has a greyscale screen whereas the REB 1200 has a full colour display.

E-books for dedicated readers are purchased online and downloaded to the reader. This can be done via a PC or through the e-book reader itself. If using a PC, books are bought via the Internet and are stored long term on the PC which acts as a bookshelf. Books which the user then wishes to read must be downloaded to the reader, a process which takes a few seconds. These books can be deleted from the reader to make room for other books when necessary. A copy of the book is retained on the PC. Each purchased book can only be read on the reading device it has been registered for. This prevents the user from buying one copy of a book and then copying it to many different readers.

Alternatively the reader plugs directly into a telephone line and the purchase of the e-book is mediated by the reader itself. Purchased books are stored online by the e-book company in a personalised virtual bookshelf. All purchased books remain in this virtual bookshelf but can be added and deleted from the reader as and when required.

At the time of writing dedicated e-book readers were not available for direct sale in the UK. Previously the Rocket eBooks had been possible to purchase online through an American Web site [14] however, since the launch of the REB 1100 and REB 1200 this service has been withdrawn. It is now expected that e-book readers will be available for sale in the UK late in 2001.

Dedicated readers range in cost – the REB 1100 is, at the time of writing, available for £160 and the REB 1200 for £400. These costs are expected to decrease as market penetration increases. Microsoft predicts that e-book readers will cost £100 by 2003 [15].

Desktop readers

A desktop reader is software which has been installed on a standard PC or laptop. This software converts the PC or laptop into an e-book reader. The software uses special fonts to make text easier on the eye and encrypts the book so it can't be copied or printed. The two market leaders currently are Glassbook [16] and Microsoft Reader [17].

Glassbook is based on Adobe Acrobat (a popular Web browser plug-in for reading documents) [18] and requires a minimum of Internet Explorer 4 to be installed on a computer before it will work. Glassbook presents e-books in colour, allows the user to zoom in and out, highlight text and view images. Currently it cannot be used on dedicated e-book readers or handheld computers.

Microsoft Reader is very similar but uses ClearType font. ClearType has been developed by Microsoft and promoted as bringing the look and feel of high-resolution printing to on-screen reading. Microsoft Reader presents e-books in colour and provides the option to zoom in and out, increase the sharpness of the text, highlight the text, add notes, add diagrams and change the font size. Microsoft Reader is also available on the PocketPC, the Microsoft version of a handheld computer.

The advantages of desktop e-book readers are that they do not require the purchase of additional equipment (presuming the user already has a PC or laptop) and have comparatively large screens. However, PCs and laptops are heavier and far less portable than handheld and dedicated readers. They do not provide back-lighting and are less comfortable to use over long periods of time.

Standards

It is important to note that currently each of the different types of e-book readers use different technical standards. Consequently e-books are now being published in a number of different formats. These different formats mean that a copy of an e-book bought for use on a Palm Pilot will not be accessible on a REB 1100. The Open e-Book Forum [19] is addressing this issue and attempting to develop a universal e-book standard.

Visions of the Future: One

Maria works shifts and has just got home at 2am. She's not yet tired and wants to read a book. She logs onto the library's Web site and searches the OPAC for something to read. She's pleased to see that it has got the latest Louis De Bernieres book in and available in e-book form too! She clicks on borrow me and downloads the book to her PC. A message on the screen reminds her that the book's loan period is two weeks and unless she renews it after that time the book will be automatically deleted from her reader. She also wants to borrow the e-book version of Nick Hornby's new book, but all the library's electronic copies are already on loan.

Integrating e-books into libraries

The challenge for libraries is how to integrate this new format of texts into the traditional library service model. E-books are not physical items and so do not fit into existing acquisition or circulation models. However, judging from the millions being spent on the development of the e-book market by mainstream publishers like Simon & Schuster, Random House and Time Warner, e-books are a challenge that libraries cannot afford to ignore.

Circulating e-book readers

The initial response to providing library users with access to e-books has been to circulate e-book readers. The e-book readers are loaded with a number of texts, for example *Riding the Bullet*. These texts are catalogued as usual and included in the OPAC. If a library user wishes to read *Riding the Bullet* the catalogue record will direct the user to the enquiry desk where an e-book reader will be issued. The e-book reader will have a loan period like any other item borrowed from the library and the library user must return the e-book reader at the end of the period. The library user cannot personally download books to the e-book reader or read the library's e-books on his or her own reader. Algonquin Area Public Library, USA is an example of a public library already providing this service. A useful FAQ about how it manages this service is available on its Web site [20].

Circulating pre-loaded e-book readers may just be a short-term solution to the issue of how to integrate e-books into the library. By circulating the e-book readers the libraries are providing both text and the equipment to read it. This would be equivalent to a library circulating both a video cassette and a video player. However, as the penetration of e-book readers into the market is still very low the circulation of readers is still required.

Circulating e-books

In the longer term libraries will simply circulate e-books for users to read on their own e-book readers. As e-books are electronic files, library users will be able to download them directly from the library's catalogue. They may choose to do this in the library itself or

most probably via the library's Web site. This will mean that the library user will no longer have to physically visit a service point to borrow or return library books.

Each e-book borrowed will be automatically issued with an encrypted certificate. As well as including information about how long the book is available for loan, the certificate will also prevent it from being copied to another reader. At the end of the loan period this certificate will become invalid and the e-book will automatically delete itself from the library user's e-book reader. The library catalogue will then automatically make a copy of this e-book available for loan again. No overdue notices need to be sent out, no fines need to be collected and the library does not need to be visited.

The integration of e-books into circulation systems is likely to be managed in one of two ways:

1. Existing systems suppliers will develop new modules for current library management systems which allow the integration of e-books into the acquisition and circulation process. In this model traditional book suppliers will expand their services to include e-books.

2. New organisations which specialise in supplying e-books to libraries will manage the administration of the e-books on the library's behalf. These suppliers will manage the acquisition and record management for the texts. They will provide MARC records for insertion into the library's traditional OPAC and support the integration of the library's current acquisition system into their service. Authentication procedures will be put in place to enable the library's users to access this online library either from within the library or through its Web site. The actual e-books files will be managed and maintained on this organisation's server and so freeing the library was most of the technical development of the service. NetLibrary [21] is an example of a company already offering this service. Currently its e-books can only be read via a PC or laptop but dedicated reader and handheld versions are due soon.

Publisher Restrictions

The developing model e-book publishers are creating for libraries is that each individual copy of an e-book bought can only be issued to one reader at any one time. One purchase, one loan. The e-book can be reissued many times but only one reader can borrow it at any one time. If a library wishes to issue two copies in parallel, then they must pay for two copies of the same book. This service model is still in development.

Stock selection models

The e-book gives the library the potential to provide its readers with any book within minutes. At present library users can only immediately borrow what is physically he ld in the library. If the library doesn't hold the required book the user will have to wait for it either to be sent from another library in that authority or request it via Inter Library Loan. In an e-book environment if a user requests a book the library does not hold, the library can purchase it immediately and provide the reader with it within minutes. The librarian will simply need to log on to its book supplier's site, purchase the relevant e-book, download it straight to the library's catalogue and then issue it to the library user. This process is likely to take only a few minutes.

The instant access of e-books therefore has strong implications for the traditional collection development model. Public libraries tend to buy most books using the just-in-case model. Books are bought in expectation of demand. The librarians choose what they think their public wants to or even should be reading. Developing an e-book collection could mean moving to a just-in-time model – with the readers' demands being met within minutes of their requests. This would mean that the library more accurately buys books which its users want but not necessarily which librarians think they should have!

The development of workable e-book acquisition policies may be a time-consuming issue. Possibly, libraries may still pre-select a large percentage of their e-book collection for their users (based on traditional selection criteria) with a smaller percentage of the stock selected as a direct result of reader requests

Visions of the Future: Two

David works in a small branch library which only stocks 15,000 books. The library authority has recently started purchasing e-books in addition to traditional print books. A library user comes into the library and asks if the library has the latest travel guide to Prague. David checks the catalogue and finds that his branch doesn't stock it and the only print version is out on loan in another library. He checks the authority's e-book acquisition policy and budget. The Prague guide is an acceptable purchase according to the policy and there is plenty of money in the e-book travel budget. He logs onto the library's e-book supplier's Web site and purchases the Prague guide in e-book form. The supplier downloads it straight into the library's catalogue along with a catalogue record. David then issues it to the library user and downloads it onto the library user's handheld computer. The whole interaction, from asking for the book to downloading it to the user's e-book reader, takes less than seven minutes.

E-book benefits for libraries

Savings

E-books offer libraries the potential to make considerable savings. Currently e-book bestsellers cost only slightly less than their paper equivalents. This is expected to change as the savings for publishers in distribution and material costs increase. Microsoft predicts that the cost of e-books will be substantially less than current books [22].

The e-book does not need to be bought in both paperback and hardback format; it will not wear out; it won't need to be replaced; and it will not require a large print version to be bought in addition. In the long term there may be additional savings in the reduction of processing costs and acquisition staff time and, of course, no shelving costs!

These savings will of course be dependent upon how the library provides access to the e-books. If the library is required to purchase e-book readers then there will be no savings in the short term. There will be additional costs in the management of the e-book readers, staff training costs, reader training costs and the integration of the new format into the library catalogue

Instant delivery to readers

E-books allow public libraries to provide distant users with instant access to their stock. Library catalogues will no longer simply tell readers what is available in the library but

will also allow them to instantly download the e-books they wish to borrow. This would mean that readers could borrow and return books from anywhere with Internet access and at any time of the day or night. This kind of service would have a huge impact on housebound and mobile library services.

Expanding the collection

The development of an e-book collection also means that the library can expand its collection with little impact on the shelving space it requires. The purchase of 10,000 e-books takes up computer storage space only and does not require the purchase or use of any additional physical space.

E-book disadvantages for libraries

Technical and management problems

The integration of e-books into services will be a time-consuming and resource-intensive procedure. Developing new acquisition and circulation models will be complex and probably expensive. All staff will require additional training and new resource management models will need to be developed.

Developing model

E-books are still very much a new service for libraries and publishers. Although agreements about the Public Lending Right have been in place for print-based books for years, e-book lending models are still to be finalised. When *Riding the Bullet* was first published publishers and e-book vendors told libraries that either they couldn't circulate it or they had to buy a new copy each time it was borrowed. After much complaint from librarians, the publishers and e-book vendors retreated to the one purchase, one loan at any one time model. However, this model is based on goodwill alone and, though it is unlikely to be changed, there are no guarantees it will be maintained.

Rationalising

If e-books are successful the library may find that increasingly its users are no longer visiting service points or interacting with staff. A large percentage of borrowing services may become automated and take place through the catalogue only. Like banks, libraries may find that such automation brings rationalisation, and staffing cuts may result.

Resistance to change

The idea of the print-based book being replaced by an electronic version is one which many people find very threatening. Print-based books are a familiar part of our society and something people are comfortable with. A library may find that there is resistance from some staff and library users to the introduction of e-books. This resistance may become a particular problem when an ever increasing percentage of the book fund is spent on e-books instead of print-based books.

Other issues for consideration

Other media

The next generation of e-book readers are likely to support both sound and video. As film and audio move to digital formats (DVD and MPG) the library will be able to loan items from its audio/visual collection digitally too. Again users won't need to visit the library to

borrow the latest album or video, they can just access them through the library's online catalogue.

To charge or not to charge

As with all new services libraries may wish to explore whether e-books can be developed as an income generation service. Library authorities will need to decide whether e-books are a value added service or simply the same service in a new format. It is worth considering that, if e-books do prove to be the success that some technologists are predicting, it would be dangerous for libraries to set a precedent now for charging for e-book services. As e-books become an ever more important part of library services and the number of books only available in e-book format increases, the free public library will depend on e-books also being available for free. What may seem a valued added service now may soon be the library's core service. Whether that core service remains free may depend on decisions libraries make now.

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Exemplos de Software para Gestão documental, de bibliotecas e serviços de documentação:

- ? **Aleph**
- ? **Library Tracker**
- ? **Readerware**
- ? **Book organizer deluxe**

Ex Libris - Aleph

http://www.aleph.co.il/intro1.html

The Ex Libris group is a worldwide supplier of software solutions and related services for libraries and information centers. The Company's flagship product, ALEPH 500, is a market leader in the field of library automation for higher education as well as for public, national, and research libraries, consortia and national networks, and large corporations.

Ex Libris has recently announced three new products: MetaLib, a front-end portal to scholarly resources, SFX, a reference linking system supporting hybrid library environments, and DigiTool, a solution for constructing digital collections as components of an overall digital strategy.

Based in Israel, Ex Libris has six fully-owned subsidiaries--in the United States, the United Kingdom, Germany, France, Australia, and Luxembourg. Its staff consists of 217 employees worldwide (as of August 2002), with a core development team that includes both highly qualified librarians and expert software engineers. Local offices and distributors in Brasil, Chile, China, Colombia, Denmark, Hong Kong, Hungary, Italy, Korea, Mexico, Norway, Poland, Portugal, Singapore, South Africa, Spain, Taiwan, and Thailand provide sales, project management, and support operations. In addition, the Company offers analysis, data conversion, project management, and training services as part of its policy to tailor the solution to the specific institution and to help the local staff learn how to use the system to its fullest capabilities.

The initial version of ALEPH (Automated Library Expandable Program) was developed 20 years ago at the Hebrew University in Jerusalem, Israel, and became the first automated academic library system in the country. Since then, the product has undergone several generations and continues to be driven by the needs of libraries and librarians worldwide.

The Ex Libris ALEPH system is currently installed at over 700 sites in 50 countries (as of August 2002). Customized for each library's language and culture, the system offers 20 interface languages that use many character sets,

and interfaces in additional languages and character sets are under development.

ALEPH 500 is a complete, integrated system that manages all aspects of local libraries of any size and structure, for both staff and patrons. **ALEPH Cluster** provides the complex functionality and services needed to manage modern consortia and multisite libraries.

MetaLib is an information portal that provides libraries, institutions and consortia with a standardized user interface for managing today's hybrid information systems. MetaLib permits the organization, dissemination, and retrieval of scholarly information in a heterogeneous environment of library catalogs and electronic databases.

SFX permits context-sensitive linking among all parts of an electronic collection, including full-text repositories; abstracting, indexing, and citation databases; on-line library catalogs; and citations appearing in research articles and other Web resources.

DigiTool provides facilities for managing the numerous digital collections that together constitute an emerging global digital library.

Library Tracker

Corona Technology Arts, Inc. is the home of Library Tracker and Enterprise Tracker. If there is any kind of data you need to keep track of, we have software that can do it.

What is Library Tracker? Library Tracker "LT" is a complete Library Automation System

Flexible, Customizable, and Well-Designed
LT is so flexible, so customizable, and so well-designed that it can be used for many more purposes such as the management of documents, files, parts, multimedia resources, and anything else you can imagine. These additional features are offered without

compromising or confusing the basic features that you need to **effectively manage a typical library.**

Web-Browser and Windows enabled
LT can run in a **web browser** (internet or intranet), and as a **traditional Windows** application.

Library Tracker can connect to any kind of database, and can track any type of item. It is highly extensible (you can add to it) and scalable (you can grow the system to be as large as you need.)

? It is also [Client Server](#) or [non-client-server](#) based system.

Straight out of the box, Library Tracker has it's own database plugged right in. This database is based on Microsoft Access (you don't need to own a copy of Access.) and can handle up to 5 concurrent users easily. (For more than 5 concurrent users, we recommend moving to a Client Server database.)

Client-Server databases are typically used for larger libraries. They include a SQL database and can handle over 20,000 items and any number of concurrent users (restricted only by hardware limitations.)

? Library Tracker is based on [Microsoft's .NET Framework](#) technology. **Why .NET?**

The .NET (pronounced "dot net") framework is the most stable and reliable development and deployment environment Microsoft has ever made.

? Library Tracker is incredibly simple to use, and amazingly powerful.

What types of organizations use Library Tracker?

? Traditional libraries	? Video stores	? Records management centers
? Genealogical libraries	? Circulation centers	? US Navy Ship libraries
? Private libraries	? Hospital libraries	? Family History Centers
? Vocational libraries	? Multimedia Libraries	? Material Control Centers
? Pharmaceutical libraries	? Book stores	? Materials Management Centers
? Video libraries	? Medical libraries	? Private School Libraries
? Military libraries	? County libraries	? Church Libraries
? Home libraries	? Public libraries	? Church School Libraries
? Film libraries	? CD libraries	? Document Management Centers
? File Libraries	? Parts control centers	? Multimedia Libraries

How can Library Tracker be used?

- ? Material Management Software
- ? Parts Control Software
- ? Library Automation Software
- ? Document Management Software
- ? Medical Supplies Software
- ? Records Management Software
- ? Library Management Software
- ? Public Library Software
- ? Multimedia Center Software
- ? Church School Software

Features Overview

Library Tracker features are divided into the following categories:

Common Tasks:

Daily operational tasks are immediately accessible as soon as you bring up Library Tracker.

Other Tasks:

Besides daily operational tasks, a well-run library needs to perform a variety of other tasks in order to stay efficient. These other tasks are found in Library Tracker's Other Tasks menu.

Reservations:

Reservations is a New Library Tracker feature that allows you to reserve items if they are already checked out. The tools shown below make it easy to maintain your reservations with up-to-the-minute accuracy. The Reservations feature is an add-on to the normal Library Tracker functionality. There is a one-time fee to activate reservations.

Supplies:

Library Tracker is partnered with The Library Store, Inc., to provide you with one-stop shopping for library supplies and equipment. Now it's easy to get all the supplies you need to run an efficient, state-of-the art library.
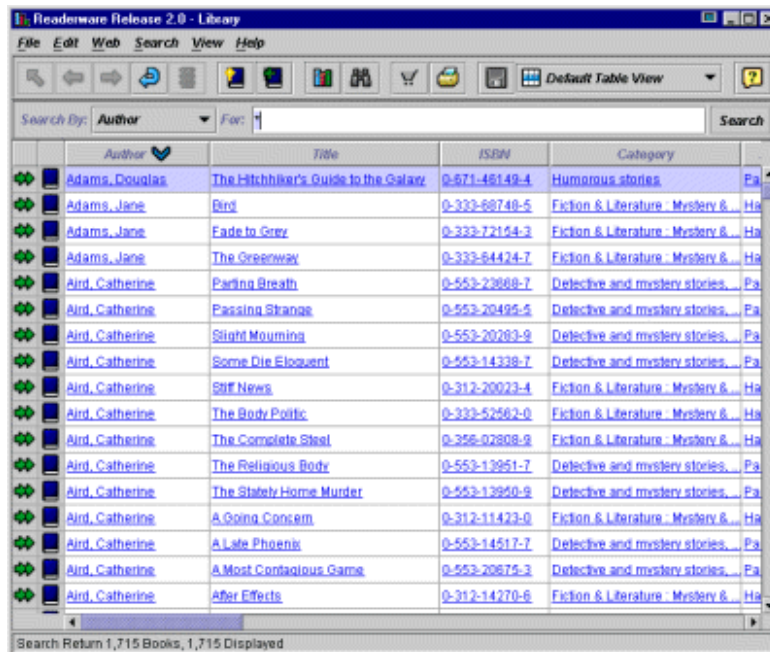
Readerware

Auto Catalog
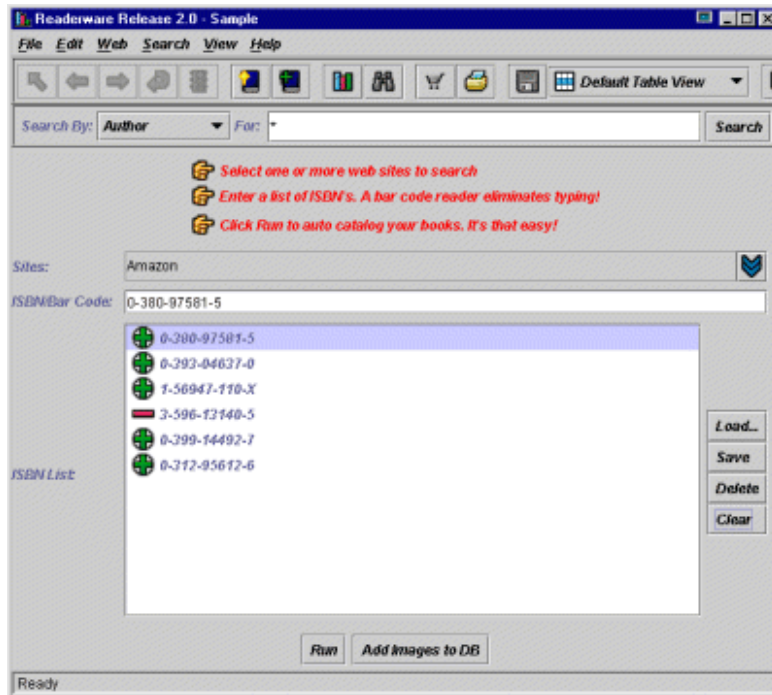
Simply enter a list of ISBN numbers, select the web sites you want to search and hit *Run*. Readerware does the rest, it will search the sites, extract the data and import it into your local database. It gets even easier, with Readerware bar code reader support, you don't even have to enter the ISBN. Just simply scan the bar code and Readerware automatically enters the ISBN for you. Includes support for the [CueCat®](#) bar code reader Forget about spending days or weeks to manually enter your collection into a database. There is no easier way to catalog your collection.

Simple Yet Powerful Searching

Searching your local database couldn't be easier. Simply select the type of search, Author, Title, ISBN, Category, etc., and enter your search criteria. The search results are displayed in an easy to read, configurable table view. Just drag columns around, show/hide columns, sort on any column. Create as many table views as you want, each with a different layout. Table cells are links, just like in a browser. Want to refine your search? Click on a field in the table. For example you can easily search for all books by a favorite author, then click on hard cover and then first edition to produce a list of all hardcover first editions by the selected author. Simple yet very powerful search capabilities are built right into Readerware. You don't have to understand complex database languages. Yet behind Readerware there is a powerful, full featured SQL database. This means that Readerware can easily store your full collection, literally thousands of titles are no trouble for Readerware.

Tree View
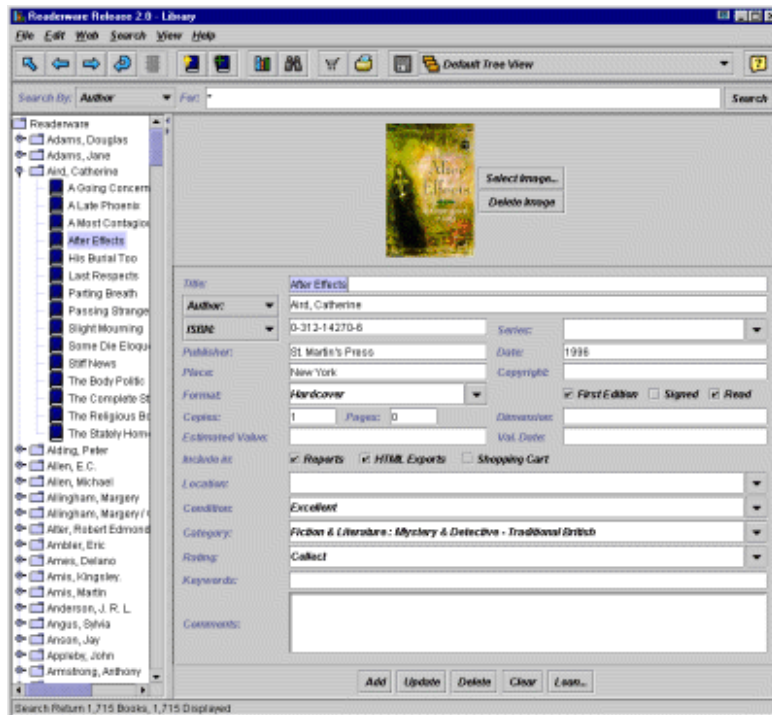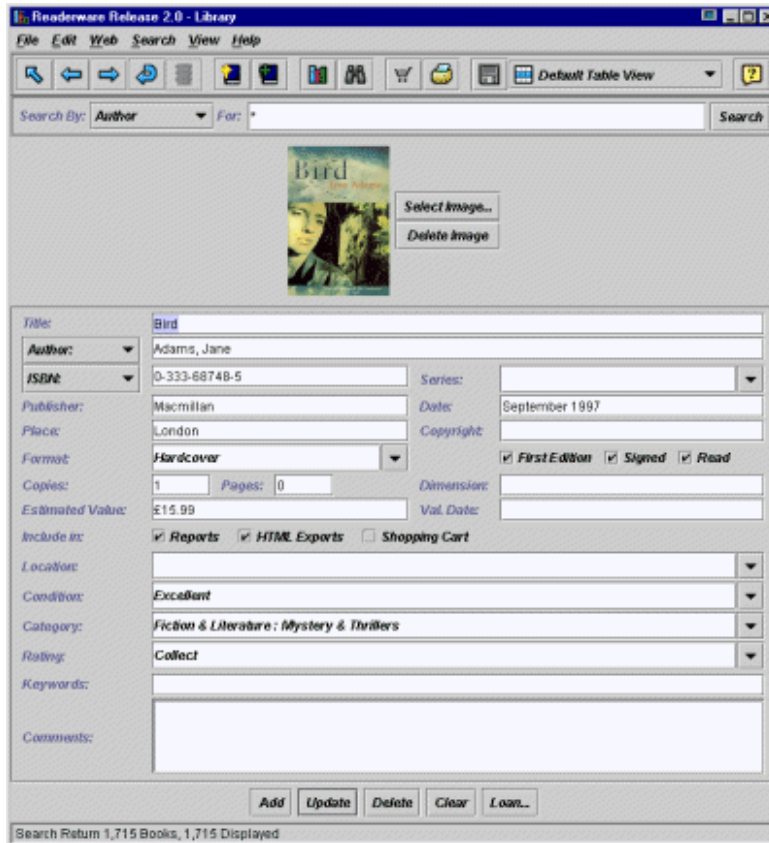
Prefer a familiar explorer like tree view? Readerware has that too, again easily configurable.

Revolutionary Fish Eye Viewer
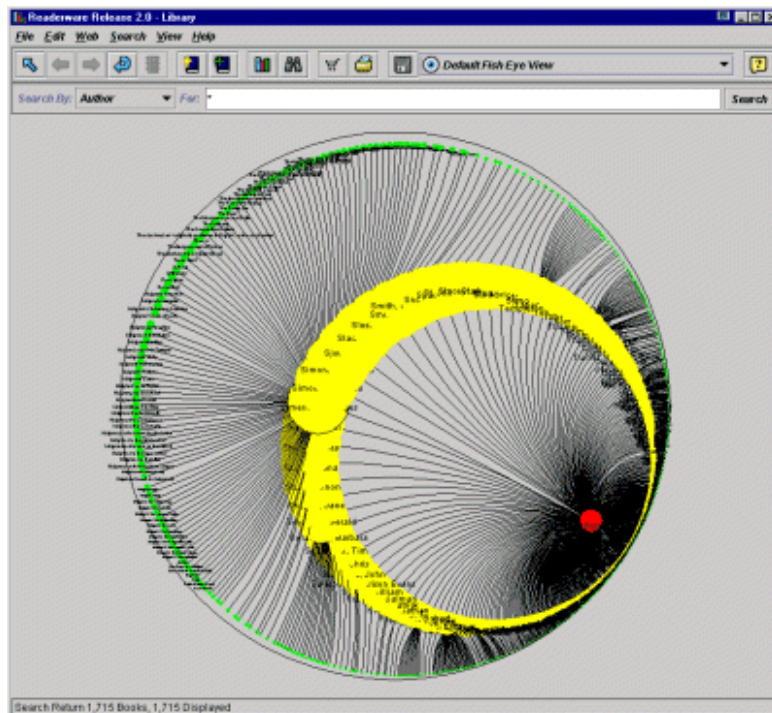
The Readerware Fish Eye or Hyperbolic Tree Viewer is a revolutionary new way to display and navigate even the largest collections. Find any title by simply dragging it into view. You have to try it to really see the power of the Fish Eye.

Easy Maintenance

You can easily maintain your database, categorize your collection, assign ratings etc. You can record virtually anything you want about each title, even define your own database fields. Support for cover art is included. Readerware can automatically add the cover art for each book by extracting images from web sites, or you can scan in your own images. You can add your own categories, right from the easy to use data entry window. Copy, paste, popup menus, automatic text selection, full keyboard navigation, everything has been done to make maintaining your collection as quick and easy as possible.

Easy to Use Wizards
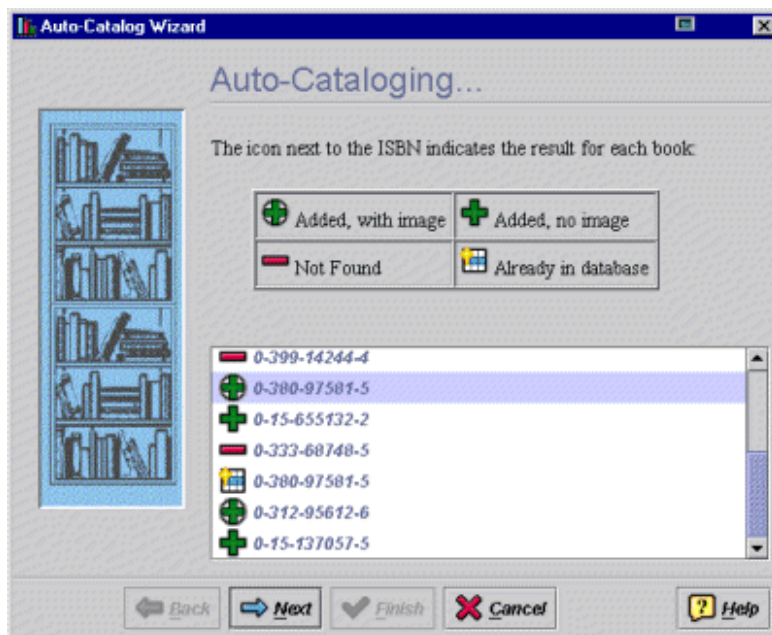
Readerware now includes wizards to guide you step by step through Readerware Auto-Catalog, import and export. Now Readerware is even easier to use.
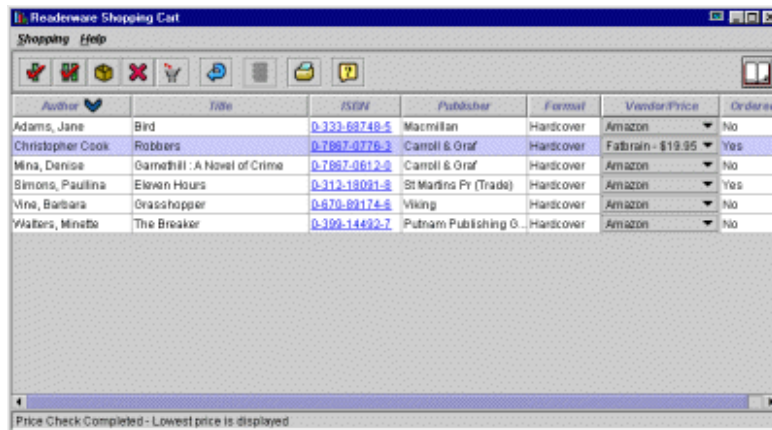
Available for Palm Handhelds

Readerware is also available for Palm Handhelds! Easily transfer your database to the Palm. You can search for books, display book details, display your Readerware shopping

cart or want list. The perfect companion for your next trip to your favorite brick and mortar bookstores.

Integrated Shopping Cart

Add books to the Readerware database and your shopping cart as you surf. Items are maintained in your shopping cart for as long as you want. Comparison shop, get the prices from all the major online vendors at the click of a button. Order online from you favorite vendor, safely and securely. Built in order tracking. You can even print out your shopping cart for trips to brick and mortar bookstores!

Built in Browser

Readerware has built in internet access including a full web browser. You can import data from web sites right into your database as you surf. Easily search all the major online retailers, plus the major databases such as The Library of Congress and The British

Library. You can effortlessly build your catalog, search internet sites, order online, safely and securely.

Online Publishing

Publish all or parts of your catalog online. Readerware automatically converts the selected entries to HTML. Instant online publishing! Your catalog can be viewed by any web browser anywhere. A great way to sell extra titles, publish want lists etc. Click here to view a sample in your browser. You caneasily customize the contents and formatting.

Readerware can also import from and export to, standard Comma Separated Value, (CSV), files and TAB delimited files If you already have a database but want to upgrade to the power of Readerware, import it directly into Readerware for a fast start. Readerware can also create UIEE, (Universal Information Exchange Environment), files for uploading to online services.

Printing

Print all or parts of your catalog. You can easily build your own reports using drag and drop, printing from Readerware couldn't be simpler. You can customize the formatting, fonts etc. Use to print out want lists, inventories etc. to take with you on your next trip to your favorite bookstore.

Custom Reports
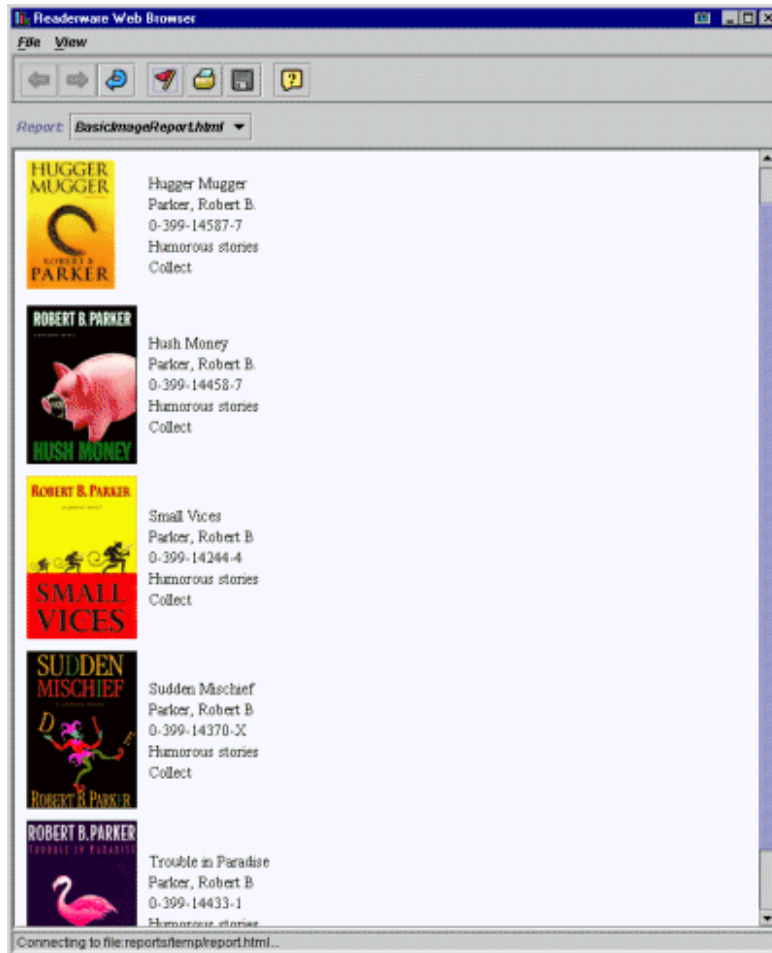
Create custom reports or web pages, tables, labels, detail etc. Include cover art! Print the report or save as HTML for use on your web site.

Loan Tracker
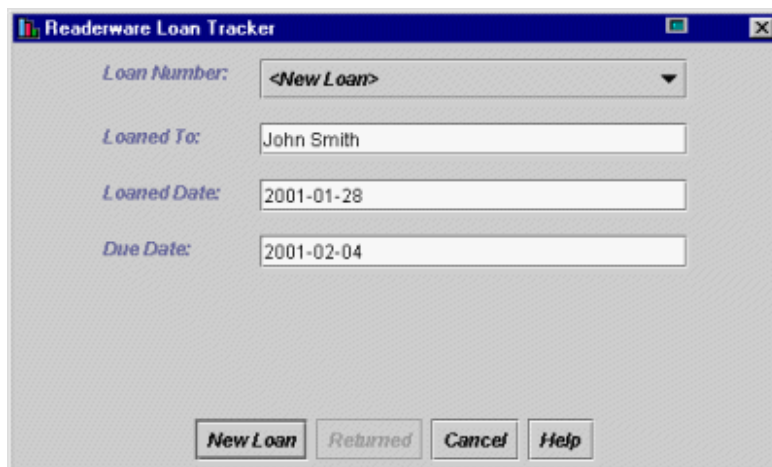
Track your books out on loan, includes overdue reporting.

Readerware Client/Server Edition
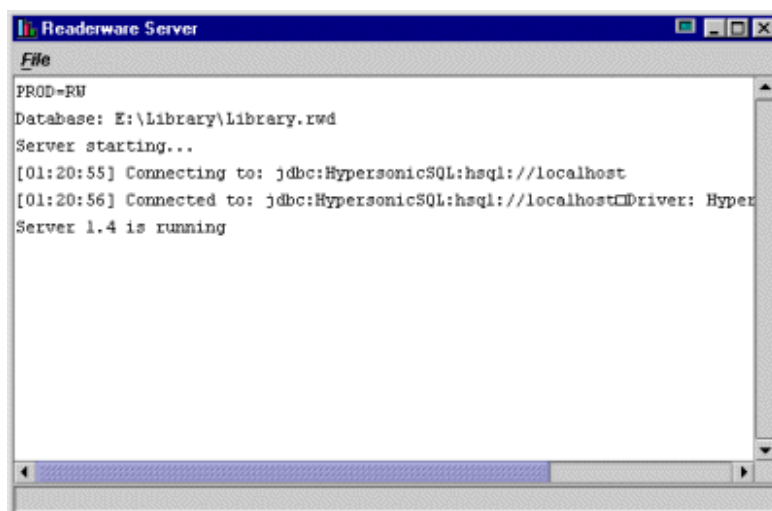
Readerware Client/Server Edition lets multiple users connect to a Readerware server and view and maintain the Readerware database. Available in Home and Enterprise editions. Perfect for libraries, schools, churches and corporations.

Book Organizer Deluxe

Organize Your Private or Business Library:features

View, Retrieve Information
The program organizes and displays the data efficiently, so that the information is readily accessible in a variety of ways. You can arrange information any way you want to view it. Flexible search, powerful filter,

and multilevel sort functions allow you to find and retrieve information easily.

Report, Label Wizards
You can quickly define and print a variety of reports, labels directly from the program. A detailed set of wizard dialogs let you define the report characteristic (color, size, margins, graphics,..), report layout , report sections (header, footer, ...). You can save settings to a template for future reuse. There are already templates for all American/European Avery label formats.

Flexible Templates
Results of time consuming tasks or repetitive processes can be saved into templates. You can save the following settings to templates: data displays, report settings, label settings, html report settings, new records, ...You can switch to different layout, sort, filter, record's display, or create a new record just by selecting the previously saved template from a popup menu.

Organizer Deluxe Designer
This feature alone makes Organizer Deluxe one of the most flexible, end-user-oriented database products on the market. Using a helper program called Designer you can define or modify structures for your databases. This allows you to specify the data fields that you need for your application. Therefore, one Organizer Deluxe is like many Organizers in one program - you can use it for all your database needs.

Customize Display, Data
You can set any size of the data display windows (data fields are self-adjusting). You can select font type, color, and size for various interface elements of the organizer. You can change the meaning of the data entry controls by defining "your" labels. Our customers from about 70 non-English countries can translate them to their languages.

Data Maintenance
There is a set of useful functions that allow you to protect your data. Their purpose is to backup, restore, and repair data files. There is no need to use external software. You can even backup your database to multiple diskettes.

Specialized Data Fields/Controls
This group of data entry elements will not only speed up the entry process, but also allow you to generate some commands related to the data. **Graphical Field** with powerful capture function and support for direct entries from scanners. **Combo/List Box** with auto-fill option (automatically picks up an element based on the first typed-in characters). **Numeric Data Field** with calculator. **Date Field** with calendar. **E-mail Field** integrated with e -mail programs. **Internet Address Field** integrated with a Web browser. **Phone Field** with dial function. **External Graphic Fields** this field type is very useful for applications that use many large images stored in JPEG or GIF format. Instead of storing them internally in the database this field stores only the file names. This field is more reliable and more efficient than the Internal Graphic Field. **Table Data Field** this field allows you to enter and display information in a table (spreadsheet-like) format. **Calcula ted Field** with User-Definable Formula: Calculated fields allow you to specify a simple arithmetic formula. **HTML Field** is like a regular multi-line text field except that it has a popup menu with most useful HTML commands. **Graphical Fields** support the most important image file formats (GIF, JPEG, PNG, BMP..).

Web Ready
View Page : You do not have to switch among the data pages to check all fields of the selected record! Click on the View Tab displays the whole record in the form of the WEB page (all text fields together with images). Browser Page: You can view WEB Pages of the selected records directly in the Organizer's Browser Page. Pressing on the Browser Tab sets the Organizer's browser to activate the World Wide Web page address from the selected record.

Handy Email function : you can create and send quickly e -mail messages to anyone on the Internet directly from the Organizer. It's easy to use and fast. At once you can send email messages to one, all, or

selected e-mail addresses listed in the Organizer.

HTML Wizard : You can easily convert your data (text and graphics) to HTML pages. Without any additional HTML editor you can create a set of linked web pages that can be put immediately on your web server or viewed with your favorite browser. HTML Wizard creates Web pages or reports in plain or tabular form, one page or grouped reports split into separate pages. A powerful set of HTML formatting functions let you easily create quality, professionally looking WEB catalogs, online stores, inventory reports with color, graphics, hyperlinks and different fonts.

Additional Features
Flexible search/replace functions. Summary/Graph functions. Export/Import to/from text, dBase files. Organizers are network aware and can easily be used on multi-user systems.

Biliografia comentada e guias de referência sobre concepção e produção de recursos digitais

Open Source Software and Libraries Bibliography
(version 0.5)

This bibliography has been compiled by Brenda Chawner, School of Information Management, Victoria University of Wellington, New Zealand, as part of her Ph.D. studies. This is the first version, and it includes announcements, journal articles, and web documents that are about open source software development in libraries. It also includes articles that describe specific open source applications used in libraries, in particular Koha, Greenstone, and MyLibrary.

She welcomes suggestions for other items to include in the bibliography, and would particularly like to hear about papers delivered at conferences and seminars. Her future plans for the bibliography include arranging it in a more useable format, as well as adding new material she comes across. Please let her know if you have references you think she should add to the file (brenda.chawner@vuw.ac.nz).

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Resources for Designing Library Electronic Classrooms

Lisa Janicke Hinchliffe

The more electronic resources libraries acquire and make available to users, the greater the demand for instruction in how to access and use those resources effectively and efficiently. As library instruction programs adapt to meet the demand, a need arises to create a space in the library specifically designed for instructional purposes and hands-on learning. The need for such a space is especially apparent if the library is responsible for Internet training or is canceling print resources in order to fund electronic ones. Librarians are often called upon to assist in planning such electronic classrooms.

Electronic classrooms are also called computer classrooms, media-equipped classrooms, or media laboratories, and can refer to any number of classroom configurations. Regardless of name or configuration, these spaces are complex environments. The needs of library instructors, students, computer technology, computer technicians and the electronic resources themselves must all be taken into account as the spaces are planned and built.

The librarian planning an electronic classroom or communicating the needs of the library instruction program to architects and administrators must develop an understanding of general design issues and their implications for teaching and learning. The challenge of classroom design is not only in identifying what is best but also what is the best design within given constraints (e.g. budget limitations, remodeling difficulties, and time limitations). The following annotated bibliography identifies resources for librarians who are designing instructional classrooms. The starred works are especially recommended.

GENERAL DESIGN GUIDANCE

?   ** Allen, R.L., Bowen, J.T., Clabaugh, S, DeWitt, B. B., Francis, J., Kerstetter, J.P., and Reick, D.A. 1996. *Classroom design manual (3rd Edition)*. College Park, MD: Academic Information Technology Services, University of Maryland.

Growing out of a shared need for guidelines to use when improving higher education instructional facilities, this multi-authored document is based on the premise that "students have a fundamental right to a classroom learning environment that allows them to see anything presented visually, to hear any audible presentation free from noises and distortions, and to be physically comfortable" (p. 1). The manual defines and describes general purpose classrooms, lecture halls, seminar rooms and specialized classrooms (including computer classrooms). Particular design characteristics are discussed for each type of room. Practical in orientation, the handbook contains very detailed and specific recommendations easily accessed through the well-organized table of contents. Sections on planning, facility design elements, technology considerations, accessibility issues, and classroom management are included as are a number of appendices listing references and professional organizations. A must-read for all library classroom designers. If only one general work is consulted, this should be it.

?   Blackett, A. and Stanfield, B. 1994. **A planner's guide to tomorrow's classrooms.** *Planning for Higher Education*. 22(3): 25-31.

Reflecting on current and expected changes in pedagogy and technology, Blackett and Stanfield advocate remembering three principles for general classroom planning: (1) plan for the full range of teaching methods, (2) plan for change and flexibility, and (3) focus on the exchange of ideas and acquisition of knowledge. Examines the classroom design needs of various teaching methods including lecture, discussion, audio-visual delivery of lecture, computer-based group instruction and self-paced learning. Discusses the design of large lecture halls, tiered classrooms and camera-equipped classroom suites. Does not provide specific guidelines; however, the discussion of the three principles is valuable.

? Clabaugh, S. 1992. **Classroom design: upgrading aging classrooms and building new ones right.** *Ohio Media Spectrum*. 44(3): 46-49.

Arguing that educational facilities are not hospitable to changing instructional needs, Clabaugh gives examples of poor classroom design and furnishings. Institutions need to develop design guidelines that address issues affecting instructional space, as well as furnishings and equipment, to guide both renovations and new construction. The author makes recommendations for ensuring proper implementation of design guidelines. The recommended process will prove useful for library classroom planners.

? Conway, K., Epstein, S.L., Griffin, S., Luttell, D.R., and Wilson, J. (Panelists). 1994. *Classroom design with technology in mind* [Satellite Broadcast, Videocassette Recording]. Raleigh, NC: Institute for Academic Technology. [Information available online at http://www.iat.unc.edu/publications/broadcasts/archive/feb94.html]

Beginning with the concept of the classroom as an "information environment," Conway identifies current educational trends and paradigm changes, including the view of students as producers of information rather than solely as receivers, the changes in the way technology is used, and the growing emphasis on team work. Griffin details a variety of media equipment issues followed by an overview of networking issues by Luttell. After an explanation of an interactive classroom student response system by Epstein, Conway describes the Master Classrooms at the University of North Carolina at Chapel Hill. A question and answer period completes the broadcast. Supplemental reading packets include a number of publications including "Master Classrooms: Classroom Design With Technology in Mind" by Conway (updated online at http://www.iat.unc.edu/publications/conway/conway1.html) and "Computer Classroom and Laboratory Design: Bibliography" by Carolyn Kotlas (updated online at http://www.iat.unc.edu/guides/irg-03.html) as well as lists of equipment vendors. An excellent source for designers who want to receive information in a medium other than print; however, the broadcast is not comprehensive in issue coverage so it should only be used in combination with other sources.

? *Designing a computer classroom: getting started*. 1992. Research Triangle Park, NC: Institute for Academic Technology.

Operated by the University of North Carolina at Chapel Hill, the Institute for Academic Technology (IAT) is funded by IBM to "develop and share ways to use technology to enrich higher education" (p. 1). Written to describe how other

institutions of higher education can design spaces similar to the IAT Computer Classroom, the document presents a succinct overview of IAT facilities, focusing on the 670 square foot computer classroom, providing an inventory of equipment and a diagram of the room layout. Considerations for computer classroom design are discussed including hardware, wiring, floors, lighting, windows, room traffic and security. As a basic primer, this document is very easy to read; however, the recommendations are somewhat over-simplified. A good beginning source for becoming familiar with basic design issues .

?   Dickens, J.L. and Tanza, D.J. 1996. ***Classroom guidelines for the design and construction of classrooms at the University of California, Santa Cruz.*** Santa Cruz: University of California, Santa Cruz.

These guidelines for building new or remodeling existing classrooms are based on the classroom design goal of delivering "information from instructor to student and from student to instructor in the most efficient, effective, and simple manner" (p. iii). Discusses general classroom characteristics and then presents guidelines for classroom surfaces and finishes, fixtures and furniture, mechanical and electrical systems, audio-visual systems, projection booths, media equipment packages, the faculty workstation podium, cabling and wiring, and accessibility. Appendices include a "Designer Checklist for Classrooms" which could be easily adapted for library electronic classrooms as well as classroom and equipment diagrams and standard specifications. Reprints "Design criteria for effective classrooms" by W. Brase (Planning for Higher Education. 1988-1989. 17(1): 81-91) which had previously articulated many of the design guidelines.

?   Hart, I. 1996. **Building the perfect classroom, or the labors of Sisyphus.** *College and University Media Review*. 2(2): 11-21.

Describes a survey of University of Hong Kong faculty members which investigated preferences for classroom features. Results indicated that little agreement exists as to the "perfect" classroom. Presents design requirements that were decided upon and discusses problems with implementation. Useful for librarians designing classrooms that will be used by multiple instructors.

?   ***How to design training rooms.*** 1989. (INFO-LINE Series No. 8912). Alexandria, VA: American Society for Training and Development.

The design of the training environment should be determined by the purpose of the training which will take place in it. Discusses shape, size, lighting, heating and air conditioning, walls, and furniture as well as auditorium, classroom, "U" shape, conference, and round table seating styles. Sidebars include "Seven Common Errors in Facilities Design," "Color Codes" and "Computer Training Tips." A good summary of a wide variety of issues.

?   ** Knirk, F.G. 1987. ***Instructional facilities for the information age***. Syracuse, NY: ERIC Clearinghouse on Information Resources. (ERIC Reproduction Service No. ED 296 734)

In order to inform educators so that they in turn can communicate effectively with architects and school administrators about necessary educational facilities design requirements, Knirk summarizes the research on six design issues relating to the optimization of a technology-rich teaching/learning environment: (1) light and

color, (2) heating, ventilation and air conditioning, (3) acoustical and background noise, (4) furniture and ergonomics, (5) electrical wiring and conduit requirements, and (6) computer requirements. Additional sections discuss grouped and individualized learning environments and audiovisual media. Many specific measurements and recommendations are given, including viewing angles, light levels, workstation requirements and classroom space configurations. Although the focus is on elementary and secondary educational buildings, the majority of the content is applicable to higher education settings as well.

? Presenters University Courses.

http://www.presentersuniversity.com/listing/all.html
Presenters University is a resource center sponsored by Proxima that provides practical information for developing and presenting effective multimedia presentations. Free online training includes "The Presentation Environment" and "Presentation Environment Rules of Thumb" -- both of which include guidelines for creating effective multimedia instructional spaces. Calculation formulas for viewing angle and distance, image and screen size, and lighting are given.

? Stewart, G.K. 1993. **Avoiding negative physical environment impact from budget limitations.** *Educational Facility Planner*. 31(3): 19-21.

Budget limitations can restrict the implementation of construction plans. The author suggests a process for working to minimize the negative impact of budget limitations. Discusses the implications of deferring equipment purchases, compromising the acoustical-visual-thermal environment, recycling furniture, and reducing the total amount of space. Though written for K-12 planners, provides useful information for anyone needing to resist budget cuts or to justify expenses.

? ** Terlaga, K.L. 1990. ***Training room solutions: a guide to planning the learning environment***. Trumbull, CT: Howe Furniture Corporation.

A comprehensive and practical guide for designing and developing training rooms. Recommends developing a planning team and describes the general planning process, including needs and resources assessments. Discusses 15 training room arrangements, furniture, audio-visual capabilities, computer-based training, lighting, mechanical and electrical systems, and architectural and interior design. The final chapter presents an analysis of training room elements checklist which is easily adaptable to library electronic classrooms. Sections on room arrangements and furniture are particularly recommended.

? Wilson, D.L. 1993. **Universities wrestle with the design of tomorrow's high-tech classroom.** *The Chronicle of Higher Education*. 39(28): A19-A20.

Reports the thoughts and projects of higher education professionals exploring the issue of high-tech classrooms and describes the current state of uncertainty and ambiguity that exists with respect to classroom design. Identifies difficulties and frustrations as well as possible classroom design solutions. Though a bit dated, the quandaries identified are still current. Library classroom designers will find a contemporary context within all of higher education for the library trend of constructing electronic classrooms.

? WorkSpace Resources.
http://www.workspace-resources.com/
The WorkSpace Resources website aims to be "a comprehensive resource index of commercial and institutional furniture and accessory resources" and indeed the resources provided by and linked from the website are impressive. Includes information on vendors and consultants, furniture, ergonomics, and space planning for business, industry and education. The Computer Classroom Design FAQ (http://www.workspace-resources.com/education/cicdesi1.htm) and the resources listed under The Learning Environment (http://www.workspace-resources.com/education/2electr.htm) are particularly recommended for library electronic classroom designers.

LIBRARY-SPECIFIC DESIGN GUIDANCE

? Adams, L. 1995. **Designing the electronic classroom.** In D. Barclay (Ed.), *Teaching electronic information literacy: a how-to-do-it manual* (pp. 147-162). New York: Neal-Schuman.

Presents a rationale for building electronic classrooms and recommends beginning the design process by assessing instructional needs and considering building codes and standards. Discusses furniture, white board and projection screens, lighting, walls, acoustics, and electronic equipment. Software, security, expenses, and management are also considered. Similar information to that in the general design guidebooks but placed in a library context. Essentially the same information is presented in: Adams, L.L. 1995. Designing the electronic classroom. (ERIC Reproduction Service No. ED 296 734)

? Bazillian, R.J. and Braun, C. 1995. *Academic libraries as high-tech gateways: a guide to design and space decisions.* Chicago: American Library Association.

A general guide to planning library spaces that considers traditional library services and resources as well as current and future technologies. One chapter focuses on the library as a teaching space and includes photographs and diagrams of library classrooms. Integrates design suggestions with recommendations for teaching electronic research skills. Particularly useful for librarians designing classrooms for new library buildings.

? Farber, E.I. 1984. **BI and library instruction: some observations.** *Reference Librarian.* 10: 5-13.

Contending that "there has been no attention by designers or building consultants to either the impact of a building on a BI program or the impact of a BI program on the design of a building" (p. 5), Farber identifies three potential instructional areas within a library building: the classroom, the reference area, and the reference desk, and provides suggestions for building design and equipment for each area. Mentions the necessity of having additional work space for the day to day operations of an instruction program and speculates about the impact of new technologies. Although the article is somewhat dated and seems to assume a lecture/demonstration model of instruction instead of a hands-on approach, the emphasis on flexibility given the uncertainties of the future is still good advice.

Provides a historical contextual view of the design of bibliographic instruction facilities.

? Feinmann, V.J. 1994. **Library instruction: what is our classroom?** *Computers in Libraries.* 14(2): 33-36.

Reflections on providing library instruction in the reference area and in a library classroom. Discusses the location of library classrooms, characteristics of classroom space, equipment, and the advantages and disadvantages of sharing classroom space with other campus units. Recommends teaching activities for the library computer classroom as well as strategies for dealing with technical problems. Though Feinmann does not give specific design recommendations her reflections as a practicing instruction librarian are valuable.

? ** LaGuardia, C., Blake, M., Farwell, L., Kent, C. and Tallent, E. 1996. **Classrooms in the library: electronic and otherwise.** In: *Teaching the new library: a how-to-do-it manual for planning and designing instructional programs* (pp. 113-129). New York: Neal-Schuman

Begins with the observation that the new library, as a more technological library, necessitates a library classroom for teaching. Discusses the learning climate and describes three types of teaching rooms: lecture rooms, computer laboratories and electronic classrooms. The authors recommend a classroom needs assessment including consideration of how much technology is necessary. They raise equipment considerations including projection options, screens, white boards, instructor and student workstations, and furniture. The article discusses design issues including electrical outlets, network connections, cables, lighting, temperature, number of workstations, and additional seating. Concludes with a comment on funding. Provides two diagrams of electronic library classrooms. Considers many general design issues within a library-specific context.

? McDermott, I.E. 1998. **Solitaire confinement: the impact of the physical environment on computer training.** *Computers in Libraries.* 18(1): 22-27. [Also available online at http://www.infotoday.com/cilmag/jan/story1.htm]

Asserts that adults who play Solitaire during computer training may be responding to a physical environment that is not conducive to learning. Discusses examples to show how poor design and room arrangement can impede successful training. Describes possible remedies for design problems including changing the furniture, controlling monitor displays, and redesigning the room. Provides contact information for furniture and monitor control software vendors. Useful for librarians wanting to find monitor control software.

? ** Ring, D.M. and Vander Meer, P.F. 1994. **Designing a computerized instructional training room for the library.** *Special Libraries.* 85(3): 154-161.

Discusses the increasing demand for library instruction in using electronic resources and the desirability of providing hands-on learning for students. Recommends beginning the design process by determining instructional goals and objectives and selecting teaching methods that will be used in the classroom. Discusses room arrangement, color, lighting, climate, wiring, acoustics, furniture, software and hardware, accessibility, and storage and security. An excellent

summary of design recommendations for library classrooms with a useful list of items for further reading.

? Wright, C. and Friend, L. 1992. **Ergonomics for online searching.** *Online*. 16(3): 13-15, 17-20, 22-27.

Defining ergonomics as "the scientific, interdisciplinary study of individuals and their physical relationship to the work environment" (p. 13), Wright and Friend identify potential obstacles to the creation of ergonomically correct workstations. Detailed suggestions are given on a number of topics including visual factors (task lighting, light levels, and screen glare), acoustical factors, radiation and visual display terminals, screen flicker, screen image characteristics, hardware and equipment, workstation configuration (work surface, leg space, and monitor), chairs, and keyboards. Concludes with summary suggestions for creating an ergonomic workstation environment, emphasizing flexible and quality furnishings. Includes two sidebars - "How to Recognize a Good Chair" and "Common Sense Health Tips for VDT Users" - and a line figure of an ergonomically correct workstation, as well as a list of organizations and institutes that will provide additional information about ergonomic issues. Although the focus is on staff workstations, this comprehensive overview of ergonomic principles and measurements is equally applicable to classroom workstations. Highly recommended for those designing with attention to ergonomics.

LIBRARY ELECTRONIC CLASSROOM DESCRIPTIONS

? Butler, H.J. 1993. **Library instruction in an electronic classroom.** In: L. Shirato (Ed.), *What is good instruction now? Library instruction for the 90s* (pp. 123-126). Ann Arbor, MI: Pierian Press.

A poster session from the 1992 LOEX Conference, Butler's description of the electronic classroom at the Harold B. Lee Library, Brigham Young University, is one of the earliest published descriptions of a computer classroom in a library. Describes how the room is used and the various roles of students, librarians and proctors during instruction. Includes a list of equipment as well as vendor contact information. A room configuration diagram is not provided.

? Glogoff, S. 1995. **Library instruction in the electronic library: the University of Arizona's electronic library education centers.** *Reference Services Review*. 23(2): 7-12, 39.

Recognizing the need for students to have hands-on learning experiences with electronic resources, University of Arizona librarians developed two Electronic Library Education Centers (ELECs). Glogoff describes the equipment and network configurations of the ELECs, discusses ways to maximize the utility of the ELECs, and shares observations about how the spaces are used. Includes initial budget information for both the Mac and PC ELEC as well as estimates of ongoing expenses. Supplemented by a sidebar by A.J. Basile which lists additional resources for planning electronic classrooms. A room configuration diagram is not provided.

? Vasi, J. and LaGuardia, C. 1994. **Creating a library electronic classroom.** *Online*. 18(5): 75-84.

When the Electronic Information Arcade was created in the University of California Library, Santa Barbara, an electronic classroom for teaching electronic resources became necessary. The classroom was designed to provide hands-on experience, provide access to current and future electronic resources, and minimize the role of the technology itself. Describes the room layout, furniture, cabling, and projection system. Discusses the different uses of the classroom and then reflects on lessons learned about the value of team teaching and the problems with computer connectivity, daily maintenance, and noise. Vasi and LaGuardia present a table of major classroom costs and include photographs of the classroom. Similar information is presented in: LaGuardia, C. and Bentley, S. 1994. "We teach the networks electric: the networked library classroom." In 15th National Online Meeting proceedings -- 1994: New York, May 10-12, 1994 (pp. 319-327). Medford, NJ: Learned Information.

?   Pask, J.M. 1995. *Purdue University Libraries electronic classroom.* Poster session. ACRL 1995 National Conference. http://thorplus.lib.purdue.edu/library_info/departments/ugrl/lec/index.html

An overview of the Purdue University Libraries electronic classroom. Includes costs associated with the workstations and room preparation, contact information for vendors, descriptions of computer equipment and software, and reflections on classroom use. Particularly nice is a diagram of the classroom layout and a link to "Guidelines."

?   Wittkopf, B. 1995. **Planning an electronic classroom.** *Research Strategies.* 13(2): 66-68.

This editorial describes the Louisiana State University Library approach to designing their electronic classrooms. Includes considerations of instructor and student workstations, computer operating systems, projection systems, lighting, cabling, and funding the project budget. A website describing the classrooms, including a map and policies and procedures, is available at http://www.lib.lsu.edu/classroom/schedule/.

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