

BEST PRACTICES FOR BUILDING AN ONLINE eLIBRARY

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▪ Bibliothecarissen, die zoeken elektronische bibliotheken (uit) te bouwen, komen talrijke uitdagingen tegen rond het digitaliseren, organiseren en leveren van inhoud. De hedendaagse bibliothecarissen worden gedwongen om experts te worden in *business process design*, technologie, projectmanagement en meer en dit als een vermeerdering bij hun traditionele werkzaamheden. Een oplossing ontwerpen om online inhoud te leveren vereist van bibliothecarissen dat ze werkelijk de noden van hun (lezers)publiek begrijpen alsook hoe deze interageren met (de) hulpmiddelen. Werkende vanuit deze verstandhouding en (tevens) gebruikersprofielen uitbouwen en gevallen gebruiken, helpt bibliothecarissen hun *eLibrary* (= elektronische bibliotheek) te definiëren. Dit betekent tevens dat bibliothecarissen de technische vereisten dienen te begrijpen en sterke controlelijsten van wat in overweging te nemen dienen te creëren. Dit artikel kijkt naar de sleutelementen die bibliothecarissen dienen te overwegen bij het uitbouwen van een e-bibliotheek en stelt de beste toepassingen betreffende het onderwerp voor.

▪ Les bibliothécaires qui envisagent l'élaboration d'une bibliothèque électronique sont confrontés à de nombreux défis : comment numériser (l'information), l'organiser et distribuer le produit. Le bibliothécaire, aujourd'hui, doit obligatoirement devenir un expert dans la conception d'un processus commercial, la technologie, la gestion de projet et bien plus, en sus de ses compétences traditionnelles. Apporter une solution à la distribution de contenus en ligne requiert du bibliothécaire qu'il comprenne effectivement les besoins de sa clientèle et leur adéquation avec les ressources disponibles. Cette connaissance et l'élaboration de profils des utilisateurs et d'usage-type vont permettre au bibliothécaire de concevoir clairement sa bibliothèque électronique. Cela suppose aussi que le bibliothécaire doit comprendre la technologie utilisée et qu'il doit créer des listes détaillées de tous les points à prendre en considération. Cet article passe en revue les éléments-clés qu'un bibliothécaire doit prendre en considération pour élaborer une bibliothèque électronique et présente les meilleures pratiques pour ce faire.

The face of the library is evolving. Technology is seeping in and causing great changes in the way organizations procure, organize, disseminate and preserve information.

Years ago, if you wanted to find information about your company or industry, you would have contacted your in-house librarian, explained what you were looking for, and asked him or her to conduct a search. After a few calls, you could submit a request to borrow the selected documents and they would be shipped to your office.

Today, this process has been streamlined significantly. Users now often have direct access to a variety of documents and have the skills and knowledge to conduct their own searches. Content is also increasingly being purchased electronically or is being converted for broader access by remote users.

This wealth of new digital content creates challenges for librarians in terms of how to organize, present and deliver information. Libraries have taken many paths to resolve these issues, varying from homegrown web portals, through to elaborate end-to-end platforms that automate the library's complete operations.

In looking at options for an eLibrary solution, many librarians start first with technology options and build their process around what's available. This article will look at the elements that go into planning an eLibrary project, with a strong focus on defining needs, audience and purpose first, and letting the technology follow suit. It will also focus on the concept of leveraging technology building blocks to speed up implementation and reduce overall project costs.

What is an eLibrary?

A digital library, also referred to as an eLibrary, refers to a portal, intranet, extranet or internet site that replicates the resources of a physical

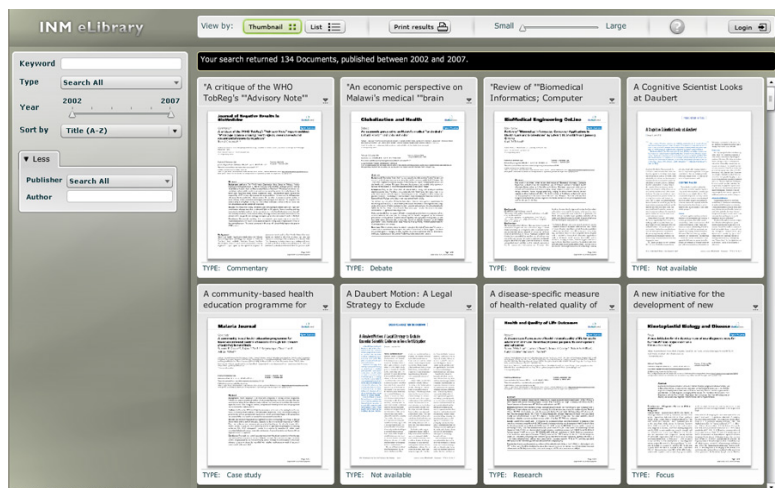


Fig. 1: Example of an eLibrary application for medical journal articles

library in an electronic format, while improving access and search capabilities. An eLibrary can provide resources and documentation, or can combine internal documents with external resources to provide a full collection of pertinent information for distribution to retailers, partners, students, association members, patients, and more.

Some examples of eLibraries include:

- A customer or partner resource center for products and services where users can access product specs, support documents, data sheets, presentations and other materials.
- A collection of back-issues of an organization's journals or magazines that are packaged and made searchable.
- A company-wide resource library with a variety of corporate materials such as annual reports, standard operating procedures, guidelines, style guides, etc.
- A collection of industry or topic-specific reference materials, including analyst reports, studies, articles, journals, and other reference works.
- A collection of music, video or image files in a searchable catalog format.

In the library or resource center context, eLibrary content can include:

- electronically acquired documents such as journals, magazines and eBooks
- digitized content (originally in print format but has been converted to digital format)
- digital content that's available on the web (in content repositories)
- links to free and open content that exists in web page format
- electronically published original works

This mix of original documents, digitized content and third-party resources creates a challenge in how to package information efficiently for a wide span of users with different needs, often in different locations.

How does an eLibrary differ from the Internet?

One important distinction to make is that an eLibrary is not the same as the Internet. While both of these channels contain electronic documents in a highly searchable environment, there is a clear distinction between the two. The Internet is primarily comprised of materials that are unpub-

lished. They may be produced by credible individuals or organizations, but they are not vetted by anyone. By contrast, an eLibrary is built using credible, chosen materials that have been selected for inclusion by a professional. These materials – which often include books, journals, reports, magazines, newspapers, etc... – may or may not be freely published online. In some cases the user may require a subscription or a login for access, in other cases, the materials may be available under open access, but the content is controlled by an organization or individual.

What to Consider when Building an eLibrary?

Before developing your plan to create your eLibrary it is important to ask a few key questions:

- Who will be using the eLibrary?
- When will they access it?
- From which locations?
- How will it be used?
- What types of content will it include?

Addressing these key questions before planning any development will help you better understand the needs of your audience and create an eLibrary that will be valued and used for years.

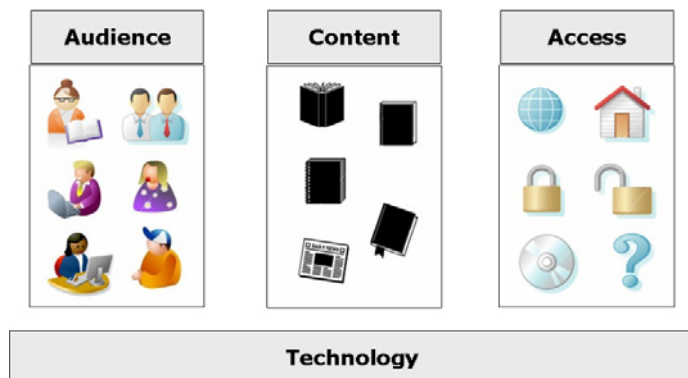


Fig. 2: The audience, content and access requirements drive the technology decisions.

Audience

The first step in looking at the requirements of your eLibrary is assessing your target audience. This helps identify any special needs and defines the profile of the users in terms of technical competency, age, social demographics, familiarity with the subject matter and more.

The profile of the audience will also later help in your choice of technology. If your users are exclusively employees of your organization that are

accessing the eLibrary from set locations, there is a certain level of control over the environment. This control means an increased freedom to set standard hardware and software requirements. A captive and controlled audience also allows you to provide more context and training on how to use the eLibrary, a luxury you don't have when your audience is unknown.

If your library is open to users that will access it from external locations then you must ensure that it supports the broadest scope of users, without requiring special hardware, software or knowledge. It must have a very low barrier to entry and must be completely self-explanatory in terms of use.

Another consideration for a publicly accessed eLibrary is support for users with special needs, including support for accessibility devices such as audio screen readers, Braille devices, and screen magnifiers.

As a whole, the audience composition will also have a significant impact on the user interface, including the:

1. **Look and feel of the application** – The choice of colors, fonts and the entire mood of the application will depend on the type of users. If the audience is younger and more technology savvy, then the use of brighter colors with smaller fonts may be more in line with their expectations. If your audience also includes older users then it may be necessary to choose more subdued colors and slightly larger fonts. The type of users also affects the design choices, as home users will expect one type of application and business users a different one.
2. **Information density** – The way in which information is presented and displayed is also affected by the audience. First time users will often react better to less information, while more seasoned users will come to expect denser delivery of content on-screen.
3. **Features** – Keep in mind that more is not necessarily better. Visual and functional clutter can be an impediment to your users.

Content

The type of content that your eLibrary will include also dictates many elements of project design. Ask yourself:

- Is the content mainly text-based?
- What format is it in today?

If your content is primarily available today in print format, it may be necessary to digitize it before building your eLibrary. This brings up many ques-

tions about how it will be converted. Will you hire resources to do this internally, engage a conversion company to digitize your full back catalog, or will you start with selected resources and then gradually fill in your back catalog as time and resources permit? These are all viable options and the right choice depends on the budget and timelines for the project.

If your content is primarily available electronically today, it's important to look at how it's formatted and presented, and what type of file format it is. If you have a mix of formats, it will be important to either choose a solution that can support this variety of file types, or to choose a common format that most files can be converted to easily, such as PDF or XML.

It is also important to look beyond immediate needs to think about the types of content that may need to be supported in the future. Although you may not need to support unique file formats such as PowerPoint or CAD today, it is still important to assess all of the file types your organization produces so the limitations are identified up front. The same rule rings true for different types of media, as the need for supporting MP3 files and video files is becoming increasingly popular.

Beyond just the physical file type, it's also important to consider the type of content that your library contains. Are the documents primarily long publications that users will need to search through for specific information, or are they shorter, magazine type publications that they will flip through to find content. Will users need to be able to print documents to read later? Will they need to download a copy of the file? Answering these content-related questions early on will dictate the workflow that users will follow in terms of searching and selecting information.

Access

After defining what content your users are accessing, it's important to look at how they will access the eLibrary. Will the eLibrary be an open resource where all users can freely search and read content, or will it be limited to registered users? If you are limiting access to those with a registration or account, how will users be provided with their credentials to login?

Identifying the way users will access information is critical for making decisions about how the library will be built and what other enterprise software it needs to talk to. An eLibrary can be designed to pull data from, and to communicate with a company's existing systems and technology to validate credentials, issue usernames and passwords, and even log activity of specified users. For example, if the eLibrary is designed to be

rolled into a partner portal or website, then it may be advantageous to connect the eLibrary to both the website and to the customer relationship management (CRM) system so that partners that who are already online can seamlessly access this new area of the site without having to re-login or create a separate account. In this example, it would then also be possible to log data in the CRM about which resources a partner accessed or which materials they downloaded.

If your eLibrary is only open to employees, it may make sense to tie the employee's login to the network login for single-system access. These decisions around access are critical for ensuring a seamless flow with other business processes and systems.

Adding & Managing Content

Another key component in building an eLibrary is the process of adding content. If your eLibrary is a dynamic resource that will grow over time with new additions, it's very important that you consider the various sources of content and how they will be input into the system, such as:

- Will one person be responsible for converting documents and uploading them into the eLibrary?
- What skills and knowledge does this individual have?
- Will he/she benefit from administrative tools to streamline the process?

Adding content to an existing system means that it needs to be indexed in order to appear in the eLibrary's search. This may mean assigning keywords or launching a process to automatically index the full-text of the documents.

With the addition of back-end administrative tools, the process of uploading and indexing content can be significantly automated, making it possible for content to be kept up-to-date.

The Importance of the User Interface

A key mistake in the design of many libraries is the lack of focus on the users' interaction with the application. The eLibrary's interface must be extremely clear and should cater to first-time and oc-

casional users, with very limited instruction needed to get up and running. The layout of the screens must be clear and behaviors should be consistent across the application.

For first-time or occasional users, it's important to provide guidance through the application. It can be very daunting to login and immediately be presented with a blank screen with no hint about what to do next. The application should be very simple to navigate and should provide a "quick-start" tutorial or user guide.

The application must provide relevant and immediate feedback through rollovers and highlights so that users can predict what will happen when an action is taken. The addition of halo effects on buttons, and tooltips on fields help the user interface act in a predictable fashion.

Once an action is taken, the user should be provided with feedback that shows the progress for the action, as well as an option to cancel the request if it takes too long. The user should be able to continue to interact with the user interface while the action is in progress.

If your eLibrary will also have frequent users, it's equally important to enable the advanced features that power users would come to expect in an application. From the small, but important elements like keyboard shortcuts that allow users to navigate across the screen and tab between actions, through to zooming in and out with your scroll wheel, these small additions allow power users to not break their patterns of use. Some additional functions for power users include:

- Cut/copy/paste functionality

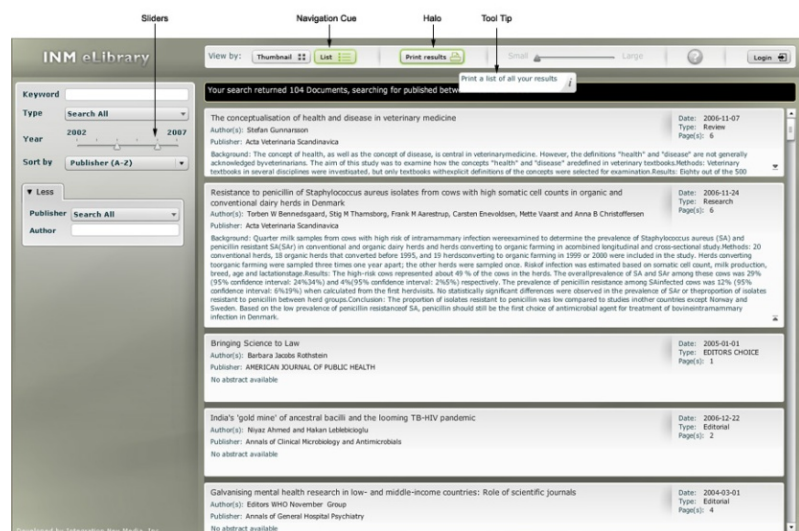


Fig. 3: Visual elements in the user interface provide clearer feedback to first-time users.

- Undo
- Drag & drop
- Right-click menu options on Windows and CTRL-click on Mac

Leveraging elements of rich Internet applications (RIAs) can help to improve usability significantly. Not only are RIAs fully cross-platform, they also provide more options for users to visualize what they are doing. Traditional HTML check boxes and drop downs are replaced with dynamic sliders and graphs to more accurately and interactively show users what they are searching. In addition, clear visual effects and transitions provide continuity when users drill down into information to narrow down their results.

Delivering Content

Once your users have logged into your eLibrary and found the content that they are interested in reviewing, the next issue becomes how to deliver the content in a way that respects current processes, reduces barriers, and respects copyright.

Reducing barriers

Many eLibraries today leverage existing third-party technology to deliver content. This can vary from repurposing content into a simple HTML page, through to pushing users to install or launch proprietary technology to view content. The use of proprietary technology can inject unforeseen barriers into the process, and can prevent some users from accessing content, particularly when your library supports a variety of external users.

For example, if your eLibrary leverages third-party software to deliver or display documents, then the user must break his/her flow of research to find and then install the application. This can cause further issues if the user is on a work computer, as some organizations have policies that limit software installs to just the system administrators. A simple document search can result in a lengthy process that involves a request to install software.

By choosing industry standard applications and limiting the use of proprietary software, you will reduce the barriers for accessing content.

Respecting processes

Another important element of delivering content comes with respecting the processes of an organization and the workflow that users are accustomed to. The goal of implementing an eLibrary solution is not for it to replace other existing

technologies that are already deployed, rather it is intended to fit smoothly with existing solutions and leverage these investments.

An eLibrary that is designed to leverage in-house solutions for managing customers (such as a customer relationship management, or CRM solution), managing the content creation process (such as document management and collaboration tools), and protecting copyrighted or controlled content (such as a document rights management, or DRM system), will deliver faster ROI than an all-in-one offering. This is partially due to that fact that the original cost to implement is lower as you are not replacing existing functionality, and partially due to the fact that current processes are not re-engineered which can trigger a steep learning curve for users.

Respecting copyright

Today, there are large volumes of content already digitized and significant initiatives in place by large entities like Google to digitize millions of books. However it is still highly unlikely that the authors and publishers of these works will allow the free distribution of their content over the web. Current United States Copyright Law, Title 17 of the United States Code, protects works created in or after 1978 for 70 years beyond the death of the author. This term was extended under the Sonny Bono Copyright Term Extension Act for works created by an employee or contractor, with copyright extending to 120 years from creation or 95 years from publication, whichever is shorter.

It is likely that digitization efforts will make small previews or abstracts of these materials available for searching and that eLibraries with a valid, licensed copy of the digitized work will provide access to those with the proper credentials, licenses and subscriptions.

Similarly, if you subscribe to a digital edition of an industry journal it's very important to both understand and respect the publication's copyright laws. For example, it may be within your rights to make electronic copies of the journal articles available to your employees, but not okay to make these same documents available to partners or customers. Opting for a flexible eLibrary solution can help you deliver different content options to different audiences depending on their role and specific permissions.

Choosing Technology

Now that we've addressed many of the issues around the user experience, it's time to look at how the defined user needs can be pulled to-

gether to drive the choice of technology. In evaluating eLibrary technology it's important to consider your typical workflow within your organization, including how processes work today. There are several elements related to the content production, organization and delivery process:

- **Content Creation:** tools to write, edit, collaborate, design and produce content.
- **Content Distribution:** tools to manage the delivery and distribution content.
- **User & Access Management:** tools to manage users, access, delivery and processes.

The eLibrary should be a natural extension to existing solutions and should strive to collaborate with them, and not replace them. The eLibrary should be able to take content that is created and prepared for sharing, and deliver it in a way that it's searchable, organized, and deliverable to a wide audience. It should also leverage user management and access control systems to determine user rights and logins.

It's also important to consider the elements that go into an eLibrary and the components that may be included in a solution. For example, if your application leverages non-standard technology, the support and maintenance issues around this choice may be higher than if industry-standard solutions are chosen. Also, some components may have license limitations or restrictions that prevent you from distributing the technology. This can cause a break in the process as users may need to go to a third-party site to download plugins or other components.

Technology factors to consider

As each organization's needs are different, it's impossible that one product or solution will fill all the gaps. That is why there are a variety of options on the market. Solutions vary from a seemingly simple web portal that contains links to a variety of external resources, to a fully populated library that allows users full text indexing of documents and immediate access to the local digital files.

Tab. 1: Technology factors to consider

If you need...	Then you need to consider...
To support external users with limited access or rights to install software.	<ul style="list-style-type: none"> • Cross-platform support (Windows, Mac, Linux) • Quick searching and document retrieval to support multiple connection speeds. • Use of 100% industry standard software and plug-ins.
To manage users with different permissions.	<ul style="list-style-type: none"> • A secure login mechanism (username/password, key card, biometrics, etc...). • Tie in to and external database (ERP or CRM).
To deliver content with controlled access.	<ul style="list-style-type: none"> • A secure login mechanism. • Tie-in with a digital rights management (DRM) system. • Reporting and stats collection to show document access.
To choose a system with minimal technical upkeep.	<ul style="list-style-type: none"> • A fully deployed and hosted eLibrary solution. • A solution that leverages industry-standard technology.

The best technology solution for an eLibrary depends heavily on an organization's needs and philosophy. There are a number of packaged solutions, as well as custom built options and some hybrid solutions that use "building block" components that simply need to be configured and integrated.

In addition there is the option to either have the eLibrary hosted as a turnkey solution (where a supplier provides the eLibrary as a service) or to host the technology in-house. The best option depends on the resources available and the skills of your in-house technology team in terms of maintenance and support.

There are also more modular, custom solutions that vary in cost and complexity, depending on a number of factors such as the size and complexity of the database, delivery model of the library (DVD/Web/Network/Kiosk), tie-in with other systems, and the depth of tools required for administration, reporting and management.

Some key features to look for in any solution include:

- A powerful back-end built on proven technology components.

- A fully customizable front-end interface built to match your custom branding and unique user needs.
- Powerful search capabilities (suited to the needs of the users, including: keyword, phrase, publication name, date, or date range to name a few).
- Seamless document delivery with no need for special plug-ins or client-side software.
- Easy document navigation (thumbnails, bookmarks, zoom in/out, keyword highlighting, 2-up page view)
- Document control functions (limited access, watermarked content, print limitations).
- Support for powerful usability tools can be added (bookmarks, notes/annotations, saved search history, etc...).
- A multi-channel delivery model (online/offline support, delivery of content to PCs, Macs, internet enabled kiosks, and mobile devices).

Working with a Partner

One way to collapse development cycles and quickly deploy a flexible eLibrary solution is by working with a partner. Since designing an eLibrary can require specific skills to transform your defined use cases into the right solution for your organization, working with a trusted advisor who has a strong history of software and application development will help ensure that your solution is properly architected. The right partner can help you with:

- Use case analysis
- Access method selection
- Technology choices
- User Interface (UI) development

Additional Resources

If you are interested in learning more about this topic, INM offers a number of free webinars on the subject of digital libraries. For our webinar schedule, and to register, please visit <<http://www.INM.com/webinars/>>

The right partner can be instrumental in helping you choose the best technology to fit your needs. There are a number of ways you can build an eLibrary and dozens of development paths you could follow. Choosing a partner with a broad cross-section of expertise and knowledge and a history of successfully delivering searchable, electronic libraries, ensures that you're working with the best option to meet your business requirements, not simply the technology that your in-house team or an individual freelancer knows best.

Conclusion

While the task of creating a online eLibrary seems daunting, it can become less so with a little pre-project analysis and planning. By following the recommended best practices of letting user, content, and access needs define your technology choices and environment you can streamline your project plan and avoid pitfalls. Also, by planning for post-deployment updates and maintenance, and working with an experienced technology partner, you can maximize project budgets and minimize deployment timelines.

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