



Introducing the Greenstone Digital Library Software

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<http://greenstone.org>
<http://nzdl.org>

Tutorial exercises

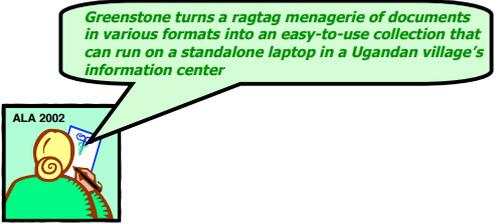
- Installing Greenstone (local library version) (#1)
- Small collection of HTML files (#2)
- Simple image collection (#3)
- Collection of Word and PDF files (#4)
- The Tudor collection of HTML files (#5, 6, 7, 8)
- The Beatles multimedia collection (#9, 10)
- The Niupepa newspaper collection (#11, 12)
- Customizing the appearance of collections (#13)
- A bibliographic collection (#14)
- Open Archives Initiative (OAI) collection (#15, 16)
- Using METS as Greenstone's internal representation (#17)
- Greenstone—DSpace conversion (#18, 19)



Agenda

- Overview**
 - What does Greenstone do?
 - Greenstone facts; standards
 - Reader's Interface: examples of collections
- Librarian interface**
 - Build a collection in 30 sec (Hobbits)
 - Add metadata, classifiers, search indexes (Images)
 - Build a multimedia collection (Beatles)
- Going further**
 - ContentDM, DSpace lookalikes
 - Remote GLI
 - Working with big collections (for masochists only)
 - Under the hood: collection configuration file
- Customizing the look**
 - Different interface languages
 - Customizing with macros
 - Collection-specific macros, styles, stylesheets
 - Personalizing your home page
 - Examples of what others have done
- Reaching out**
 - Serving and acquiring OAI
 - DSpace and METS
 - Greenstone3

What we wanted



Greenstone turns a ragtag menagerie of documents in various formats into an easy-to-use collection that can run on a standalone laptop in a Ugandan village's information center

ALA 2002

What we wanted

- ❖ "Collections" of digital material
- ❖ Individualized, depending on metadata etc
- ❖ Up to several Gb of text ...
- ❖ ... + associated images, movies, whatever
- ❖ Fully searchable
- ❖ Served on WWW, or published on removable media
- ❖ Run anywhere, on any computer
- ❖ Fully internationalized
- ❖ Non-exclusive: documents and metadata in any format
- ❖ Non-prescriptive: standard and non-standard metadata

Tutorial exercise #1

Installing Greenstone (local library version)

- Self-installing CD-ROM
 - Greenstone
 - ImageMagick: **yes**
 - Ghostscript: **yes**
- Copy *sample_files* to desktop
- Try the reader's interface
- Librarian interface
 - Navigate to **Home Folder\Desktop\sample_files**
 - Right-click**

What we got: Greenstone

Access

- ❖ Accessible via any Web browser
- ❖ Server runs on anything (all Windows + Unix + Mac)
- ❖ Collections can be published on CD-ROM/DVD
- ❖ Trivial to install
- ❖ GUI interface for building and publishing collections

Searching/ browsing

- ❖ Collection-specific
- ❖ Full-text and fielded search
- ❖ Flexible browsing facilities
- ❖ Metadata-based (Dublin Core recommended)
- ❖ Creates all access structures automatically

Extensible

- ❖ Plugins — new document, metadata formats
- ❖ Classifiers — new metadata browsers

Multi-*

- ❖ Multilingual: Documents *and* interfaces
- ❖ Multimedia: image, video, audio collections exist
- ❖ Multiformat: Documents *and* metadata

UNESCO: Distributing Greenstone DL software

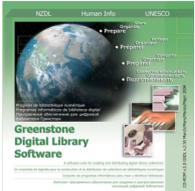
Sustainable development

*"Give a man a fish, feed him for a day
Teach a man to fish, feed him for life"*

Greenstone software on CD-ROM

- ❖ GNU licensed
- ❖ Fully documented ... in English/French/Spanish/Russian
- ❖ Language interfaces ... Arabic Chinese Czech ... Thai Turkish
- ❖ Unix/Windows/Mac OS-X
- ❖ Trivial to install
- ❖ GUI interface for gathering, enriching, building ...
- ❖ Serve collections on Web or write them to CD-ROM
- ❖ Document formats: HTML, Word, PDF, PS, plain text, e-mail
- ❖ Metadata formats: XML, DC, OAI, MARC, ...

download from <http://greenstone.org>



Greenstone facts

Distribution

- ❖ Open source: Gnu GPL
- ❖ Distributed via SourceForge since: Nov 2000
- ❖ Average downloads: 5000/month since Nov 2000
- ❖ Humanitarian CD-ROMs produced: 30
- ❖ Distribution for each one: 5000/year

International

- ❖ Languages for interface: 50
- ❖ Languages for full software + manual: 20
- ❖ Countries represented on email lists: 30
- ❖ UNESCO training courses in: 10

UN Agencies

- ❖ UNESCO, Paris ("Information for All")
- ❖ FAO, Rome (Info Management Resources)
- ❖ UNU, Japan (CD-ROM collections of UN)

Technical centers

- ❖ University of Waikato, New Zealand
- ❖ Indian Institute of Sciences, Bangalore
- ❖ University College, London
- ❖ University of Cape Town, South Africa
- ❖ University of Lethbridge, Canada

Arabic
Armenian
Bosnian
Croatian
Deutsch (German)
English
Español (Spanish)
Farsi
Finnish
Français (French)
Galician
Georgian
Hebrew
Hindi
Indonesian
Italiano
Kannada
Māori
Nederlands (Dutch)
Serbian
Thai
Turkish
Ukrainian
português - BR (Brasil)
português - PT (Portugal)
Česky (Czech)
Ελληνικά (Greek)
Русско (Russian)
Қазақ (Kazakh)
日本語 (Japanese)
汉语 (Chinese)

Sample collections (see greenstone.org)

International

- Argentina Human Rights Commission
- Tasmania State Library
- Peking University Digital Library
- Gresham College, London
- Oxford Digital Library, University of Oxford
- University of Applied Sciences, Stuttgart
- Association of Indian Labour Historians, Delhi
- Indian Institute of Management, Kozhikode
- Indian Institute of Science, Bangalore
- Vimercate Public Library, Milan, Italy
- Netherlands Institute for Scientific Information Services
- Philippine Government Information Network
- Mari El Republic, Russia
- Slavonski Brod Public Library, Slovenia
- Vietnam National University
- Welsh Books Council

U.S.

- Auburn University, Alabama
- Detroit Public Library
- Hawaiian Electronic Library
- Ibiblio project, University of North Carolina
- Illinois Wesleyan University
- Lehigh University, Pennsylvania
- New York Botanical Garden
- University of California at Riverside
- University of Chicago Library
- University of Illinois
- Texas A&M University
- Washington Research Library Consortium

Argentina

- Australia
- China
- England
- Germany
- India
- India
- Italy
- Netherlands
- Philippines
- Russia
- Slovenia
- Vietnam
- Wales

Standards

Metadata

- ❖ Can use any metadata set, Dublin Core supplied
- ❖ Plugins for

XML	Refer
MARC	OAI
CDS/ISIS	METS
ProCite	DSpace
BibTex	

❖ METS can be used as Greenstone's internal representation

Serving

- ❖ Web
- ❖ Can publish Greenstone collections on CD-ROM
- ❖ Can publish Greenstone collections on OAI
- ❖ Export collections to METS
- ❖ Export collections to DSpace (*ready for DSpace's batch import program*)

Documents

- ❖ Plugins for

PDF	ZIP	Images (GIF, JPEG, TIFF ...)
PostScript	Excel	MP3
Word, RTF	PPT	Ogg Vorbis
HTML	Email	MediaWiki
Plain text	Source code	UnknownPlug
Latex	RealMedia	(e.g. for audio, MPEG, Midi)

Greenstone: Platforms

- ❖ Operating system:
 - Windows (any version)
 - Linux (any version)
 - Unix (most versions, e.g. Solaris)
 - Mac OS X
- ❖ Restrictions:
 - No longer runs under Windows 3.1/3.11
 - For Librarian interface (GLI), need Java— which is no longer supported on Windows 95

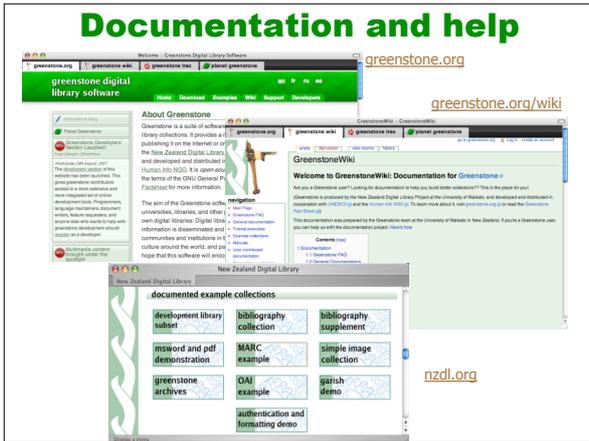
Local library vs Web library

- ❖ **Local library: stand-alone**
 - Serves collections on a standalone PC ...
 - And on others on the same network
 - Includes built-in Web server
- ❖ **Web library: uses external web server**
 - Apache, Microsoft PWS/IIIS
 - Need to configure web server (geeky job?)
- ❖ **Windows: Both local library and web library**
 - Normally use local library (else must set up server)
 - Web library works with Microsoft PWS, IIIS
- ❖ **Unix, Mac OS/10: Web library only**
 - Use Apache (or other web server)
 - Linux binaries supplied
 - Tested on SUN Solaris, Mac OS/10
 - Need GDBM (standard on Linux)
- ❖ **Greenstone developed on Linux**

Documentation and help

- Manuals on the CD-ROM (gsdl/docs)
- **From Paper To Collection** (30pp)
 - Scanners and scanning, OCR, 3 examples – from 1,000 to 100,000 pages, Creating an electronic collection
 - **Installer's Guide** (36pp)
 - Versions of Greenstone, installation procedure, Greenstone collections, setting up the web server, configuring your site, personalizing your installation
 - **User's Guide** (90pp)
 - Overview of Greenstone, using Greenstone collections, the collector, administration, software features, glossary of terms
 - **Developer's Guide** (113pp)
 - Understanding the collection building process, getting the most out of your collections, the Greenstone runtime systems, configuring your Greenstone site

Documentation and help



Example collections

- development library subset** The DLS collection has the same structure as the Greenstone demo collection. It's fairly complex, and if you're just starting out you might prefer to look at some other collections first (e.g. [msword and pdf demonstration](#), or the [greenstone archives](#), or the [simple image collection](#)).
- msword and pdf demonstration** This contains a few documents in PDF, MSWord, RTF, and Postscript formats, demonstrating the ability to build collections from documents in different formats. The collection configuration file is very simple.
- greenstone archives** A collection of email messages from the Greenstone mailing list archives. This uses the Email plugin, which parses files in email formats. The collection configuration file is very simple.
- bibliography collection** With about 4,000 bibliography entries, this collection incorporates a form-based search interface that allows fielded searching. It is fairly complex.
- bibliography supplement** This tiny collection of 10 bibliography entries illustrates the "supercollection" facility which searches several collections together, seamlessly. It operates together with the [Bibliography collection](#), and its configuration file is almost the same.
- MARC example** Based on some MARC records from the Library of Congress, this is a simple collection (and does not allow form-based searching).

Example collections

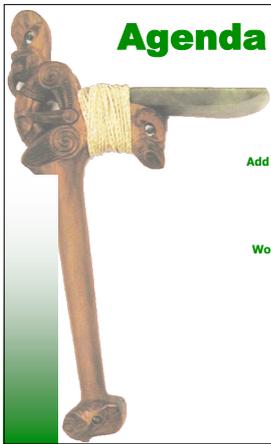
- OAI example** Using the Open Archive Protocol and the Import-From feature, this retrieves metadata from an archive and builds a collection from the records. In this case they are images, so both the OAI and Image plugins are used.
- simple image collection** This very basic image collection contains no text and no explicit metadata -- which makes it rather unrealistic. The configuration file is about as simple as you can get.
- authentication and formatting demo** With the same material as the original Greenstone demo collection, this shows off two independent features: non-standard document formatting, and controlled access to the documents via user authentication.
- garish demo** This collection also contains the same material as the Greenstone demo. Its appearance has been altered to show how the pages generated can be set out differently. It relies on a non-standard macro file that is supplied with Greenstone.
- CDS/ISIS example** This collection is built from a CDS/ISIS database of about 150 bibliography entries. It uses the ISISPlug plugin, which reads the standard ISIS .mst and .jdt files and converts them to Greenstone metadata.

Example

Humanity Development Library for sustainable development and basic human needs

- ❖ 160,000 pages
- ❖ 30,000 images
- ❖ 800 books
- ❖ 430 magazines
- ❖ 340 kg
- ❖ US\$20,000
- ❖ CD-ROM
- ❖ US\$1
- ❖ Win3.1x upward
- ❖ Stand-alone
- ❖ and intranet server
- ❖ Web browser user interface

Global Help Project, Antwerp (+ UN agencies)



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←

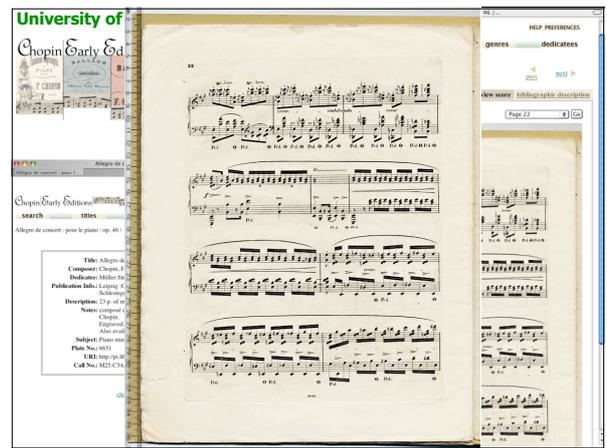
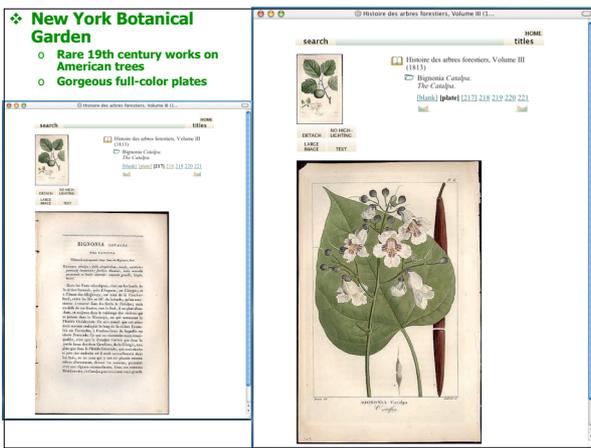
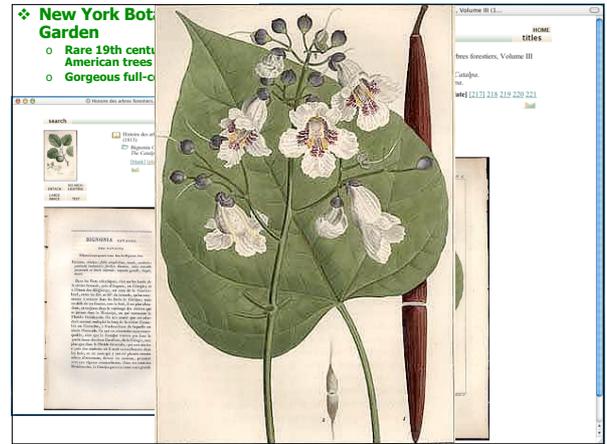
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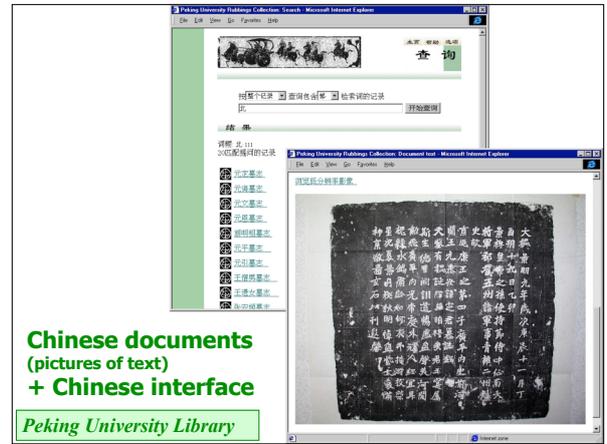
44 KO TE KARERE O NUI TIRENI.

rongo mai, Kahore he poaka? kahore he ringaringa hei mahi i etahi moni hei hoko i etahi kakahu? he tini ra o koutou mea hei hoko kakahu mo koutou.

HE TUTAKINGA TANGATA.

Ka taea tawhiti te rerenga o Tawera, ka ngaro e tahi o nga whetu maori, ka oti te hura te kaha mangu o te po, ka kitea nga kapua ma i te marangai (te ita) ka mea te tangata "ka takiri te ata" me reira ka ara kororia mai i runga i tona totou whero, te rangatira o te ao; na, ka haere pai ratou i tenei ao, kia tae atu hoki ki te okiokinga tapu i te rangi. Otiia aua ahau e poka ke.— Na, ka moiri te ra i runga kau o te pae, ka mea toku whakaaro ka maranga i te moe te tahi tangata, a haere mai ana tetahi i te huarahi, tutaki pu raua, a ka noho ki raro.

Ko "Pai-Maori" tetahi o taua hongu, he tangata poto, he moko tukupu, tu-a kaumatua, he mawhatu te mpoko, i pararahi te ihu, takataka ana nga kanohi, e tokii ana nga paparinga, matotoru ana nga ngutu, keokeo ana nga tukimata, a i hua nui nga wae—



Chinese documents (pictures of text) + Chinese interface
Peking University Library



Classic Chinese literature



French
UNESCO, Paris

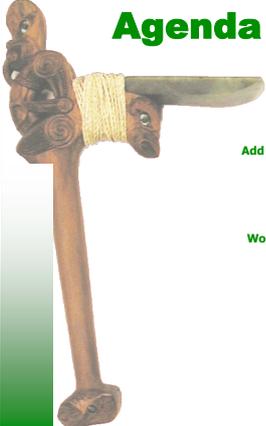


Spanish
PAHO, WHO



Russian
Mari El Republic
http://gov.mari.ru/gsd/

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The Greenstone Librarian Interface (GLI)

- ❖ Building collections
- ❖ Interactive Java program
- ❖ Runs on anything
- ❖ Build a collection on the computer you are on
- ❖ ... plus new applet version
- ❖ Includes metadata editor

Caveat: cannot deal with such huge metadata collections as Greenstone can

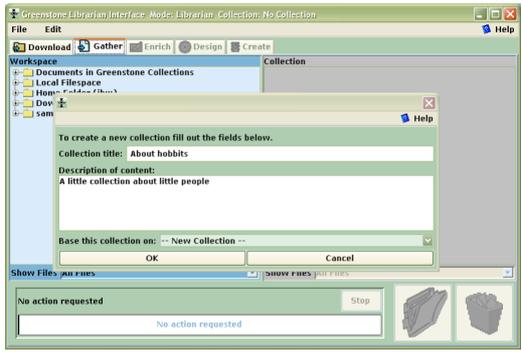
Download
Gather
Enrich
Design
Create
Format

(Tutorial exercise: small collection of HTML files)

Invoke GLI: build a small collection of HTML files

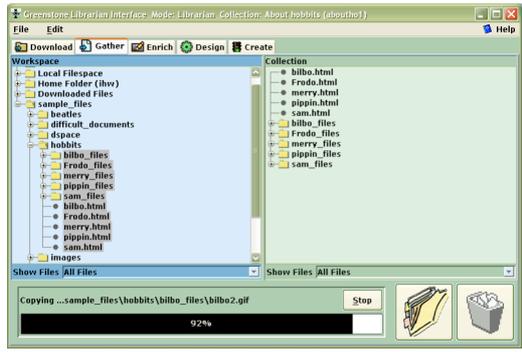
- ❖ Gather
- ❖ Create
- ❖ Look at extracted metadata
- ❖ Set up shortcut in the Librarian interface

Create a new collection



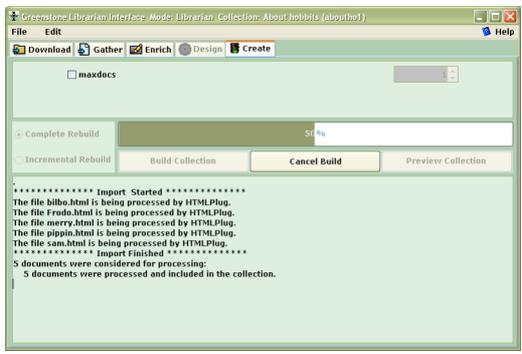
The screenshot shows a dialog box titled 'Create a new collection'. It has two text input fields: 'Collection title: About hobbits' and 'Description of content: A little collection about little people'. Below these is a dropdown menu set to 'New Collection'. At the bottom are 'OK' and 'Cancel' buttons. A progress bar at the very bottom shows 'No action requested'.

Gather: Gather the files together



The screenshot shows the 'Gather' window with a file tree on the left and a list of files on the right. The file tree includes folders like 'Local Filespace', 'Home Folder', 'sample_files', 'beattles', 'difficult_documents', 'dspace', 'hobbits', 'bilbo_files', 'Frodo_files', 'merry_files', 'pippin_files', 'sam_files', 'Frodo.html', 'merry.html', 'pippin.html', and 'sam.html'. The file list on the right shows 'bilbo.html', 'Frodo.html', 'merry.html', 'pippin.html', 'sam.html', 'bilbo_files', 'Frodo_files', 'merry_files', 'pippin_files', and 'sam_files'. A progress bar at the bottom shows 'Copying ...sample_files\hobbits\bilbo_files\bilbo2.gif' at 92%.

Create: Build the collection

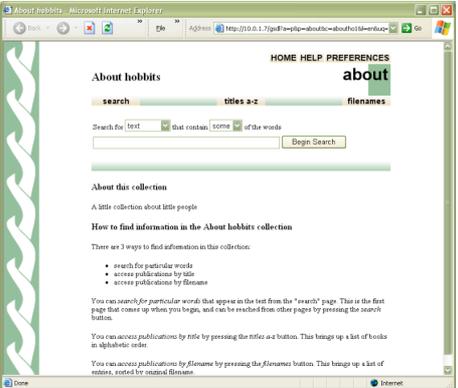


The screenshot shows the 'Create' window with a progress bar for 'Complete Rebuild' at 51%. Below the progress bar are buttons for 'Incremental Rebuild', 'Build Collection', 'Cancel Build', and 'Preview Collection'. A log window at the bottom shows the following text:

```

***** import Started *****
The file Frodo.html is being processed by HTMLPlug.
The file merry.html is being processed by HTMLPlug.
The file pippin.html is being processed by HTMLPlug.
The file sam.html is being processed by HTMLPlug.
***** import Finished *****
5 documents were considered for processing:
5 documents were processed and included in the collection.
    
```

Preview: admire the result



The screenshot shows a web browser displaying the 'About hobbits' collection page. The page has a green and white theme. It includes a search bar with the text 'Search for text that contain some of the words' and a 'Begin Search' button. Below the search bar, there are links for 'HOME HELP PREFERENCES' and 'about'. The page also contains a section titled 'About this collection' and 'How to find information in the About hobbits collection'.



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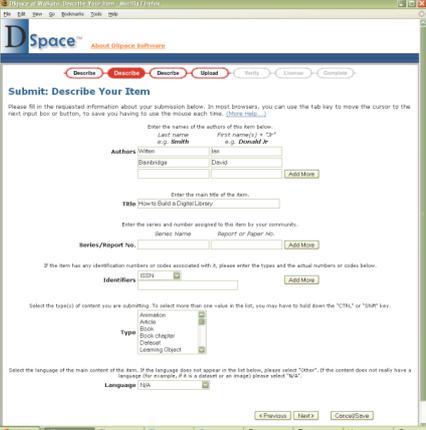
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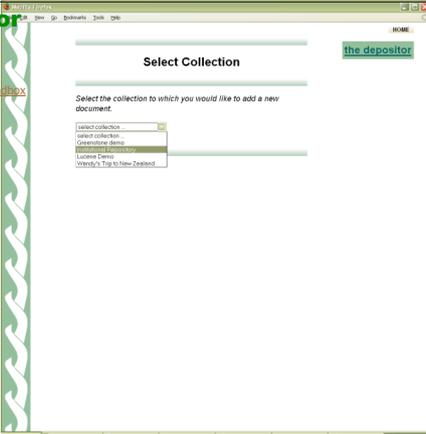
DSpace



The Depositor

Try this out at
www.greenstone.org/ir-sandbox

1. Select The Depositor
2. Log in (admin/admin)
3. Select collection
 DSpace Repository Clone



The Depositor

Institutional Repository

DSpace > Describe > Upload > Verify > Verify > License > Build collection > View collection

Submit: Describe Your Item

Please fill in the requested information about your submission below. In most browsers, you can use the tab key to move the cursor to the next input box or button, to save you having to use the mouse each time. [Click here...](#)

Enter the names of the authors of this item below.
 Last name First name(s) * * * * *
 e.g. Smith David e.g. Donald J

Author Written Jan
 David Add More

Enter the main title of the item.
Title How to Build a Digital Library

Enter the series and number assigned to this item by your community.
 Series Name Report or Paper No. Add More

If the item has any identification numbers or codes associated with it, please enter the types and the actual numbers or codes below.
Identifiers ISSN Add More

Select the topic(s) of content you are submitting. To select more than one value in the list, you may have to hold down the "CTRL" or "SHIFT" key.
Type Acquisition Article Book Book chapter Dataset Learning Object

Select the language of the main content of the item. If the language does not appear in the list below, please select "Other". If the content does not really have a language (for example, if it is a dataset or an image) please select "N/A".
Language English Add More

[Previous] [Next]

The Depositor

Institutional Repository

DSpace > Describe > Upload > Verify > Verify > License > Build collection > View collection

Submit: Describe Your Item

Please fill further information about your submission below. [Click here...](#)

Subject Keywords
 Enter appropriate subject keywords or phrases below. Add More

Enter the abstract of the item below.
Abstract

Enter the names of any sponsors and/or funding bodies in the box below.
Sponsors

Enter any other description or comments in this box.
Description

[Previous] [Next]

The Depositor

Institutional Repository

DSpace > Describe > Upload > Verify > Verify > License > Build collection > View collection

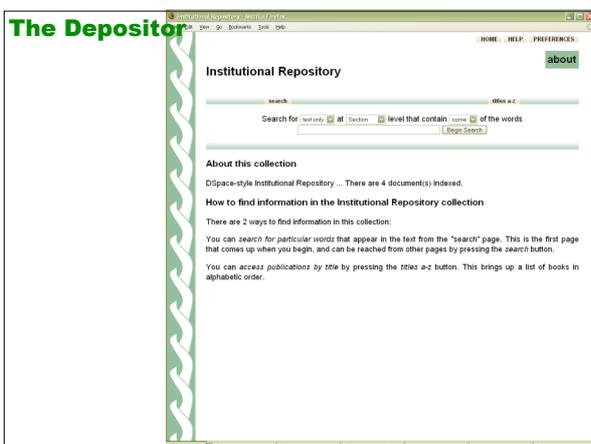
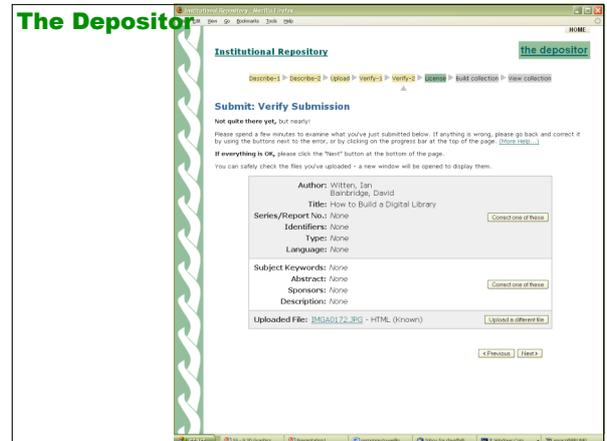
Submit: Upload a File

Please enter the name of the file in your local hard drive corresponding to your item. If you click "Browse...", a new window will appear in which you can locate and select the file on your local hard drive. [Click here...](#)

Notes: you may prefer to upload the content through our existing 'Forms' - this only applies files of type HTML. If the file uses embedded HTML files, you will need to select the option to display files of other types. [Click here for details on HTML files.](#)

Document File [C:\temp\IMG4172.JPG] Add More

[Previous] [Next]



Remote GLI/Applet version

- ❖ Collection on remote Greenstone server
- ❖ Edit it locally
 - gather
 - enrich
 - design
 - create
- ❖ Authentication
 - uses admin facility
- ❖ Locking

Remote GLI/Applet version

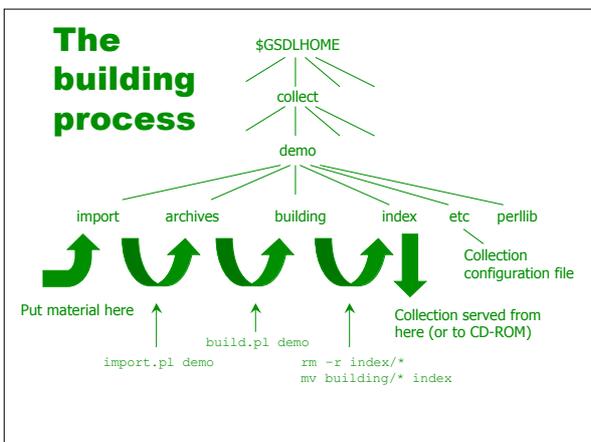
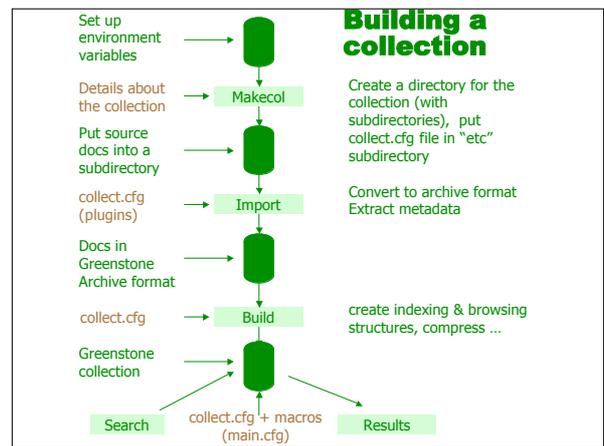
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- ❖ Locking

Remote GLI/Applet version

- ❖ Collection on remote Greenstone server
- ❖ Edit it locally
 - gather
 - enrich
 - design
 - create
- ❖ Authentication uses admin facility
- ❖ Locking

Agenda

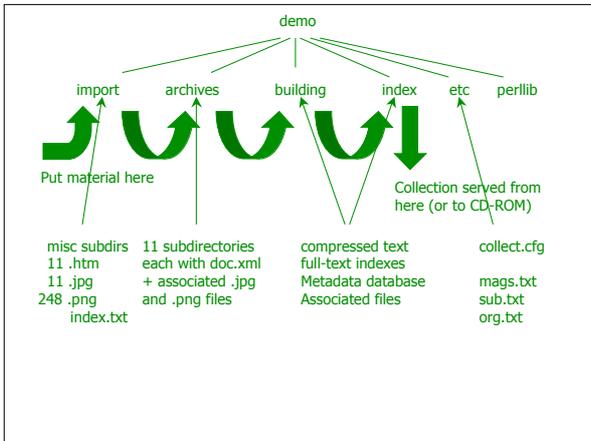
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The building process

```

C:\> cd "C:\Program files\gsdl"
C:\Program files\gsdl> setup
C:\Program files\gsdl>perl -S mkcol.pl -creator me@here colname
Copy source into collect\colname\import
C:\>perl -S import.pl -removeold colname
C:\>perl -S buildcol.pl colname
Rename the "building" directory to "index"
  
```



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Under the hood: Collection configuration file

```

creator      sjboddie@cs.waikato.ac.nz
maintainer  sjboddie@cs.waikato.ac.nz
public      true
beta        true

indexes     section:text section:title document:text
defaultindex section:text

plugin      GAPlug
plugin      AirPlug
plugin      PdfPlug

classify    Hierarchy -hfile sub.txt -metadata Subject -sort Title
classify    SOLList -metadata Title
classify    Hierarchy -hfile org.txt -metadata Organization -sort Title
classify    List -metadata Howto

format      SearchList "<td valign=top>[[link]][icon][link]</td>
<td>[[{parent(All: ' '):Title},{parent(All: ' '):Title}]]
[[link]][Title][link]</td>"
format      CLAVList "<tr>[[link]][Howto][link]"
format      DocumentImages true
format      DocumentText "<h3>[[Title]]</h3>\n\n<pre>[[Text]]"

collectionmeta collectionname "greenstone demo"
collectionmeta collectionextra "This is a demonstration collection for the
Greenstone digital library software.\nIt contains a small
subset (11 books) of the Humanity Development Library"
collectionmeta iconcollectionmall "/gsdl/collect/demo/images/demosm.gif"
collectionmeta iconcollection "/gsdl/collect/demo/images/demosm.gif"
collectionmeta section:title "section titles"
collectionmeta document:text "entire books"
collectionmeta section:text "chapters"
    
```

❖ name, icon, etc
❖ description
❖ email of creator
❖ search indexes
❖ plugins
❖ classifiers

how to format

- ❖ documents
- ❖ query results
- ❖ classifiers

Alter configuration

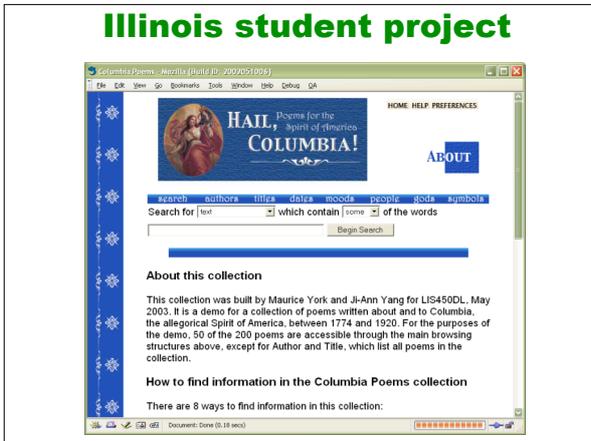
- ❖ Add full-text index of titles
- ❖ ... or authors
- ❖ Add alphabetic author browser
- ❖ Include Word documents
- ❖ Include PDF documents
- ❖ Separate index for each language
- ❖ Extract acronyms and add list
- ❖ Import OAI metadata
- ❖ Extract phrase hierarchy and add browser
- ❖ Alter the format of any of the above
- ❖ Restrict collection's interface langs
- ❖ Change default interface language

indexes	document:Title
indexes	document:Creator
classify	AZList -metadata Creator
plugin	WordPlug
plugin	PDFPlug
languages	en fr es
plugin	PDFPlug -extract_acronyms
plugin	OAIPlug
classify	Phind
format ...	
format	PreferenceLangs en fr es
cgiarg	shortcode=1 argdefault =fr

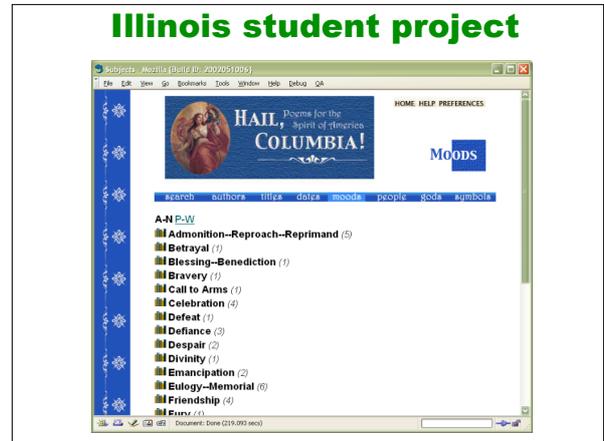
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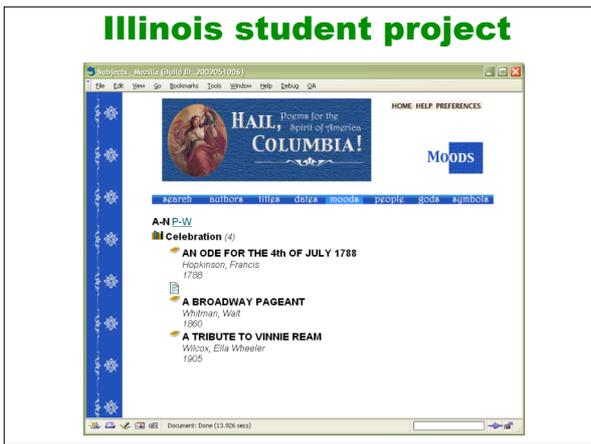
Illinois student project



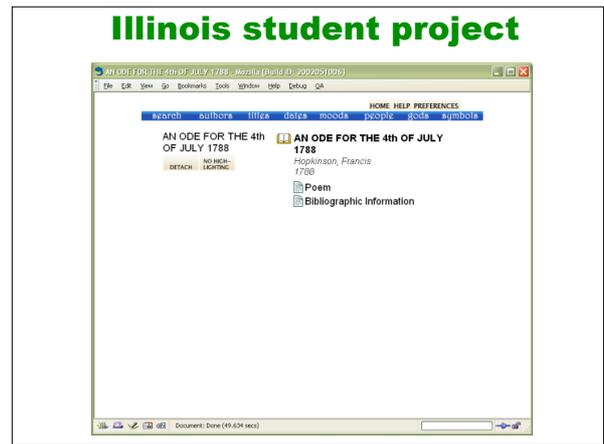
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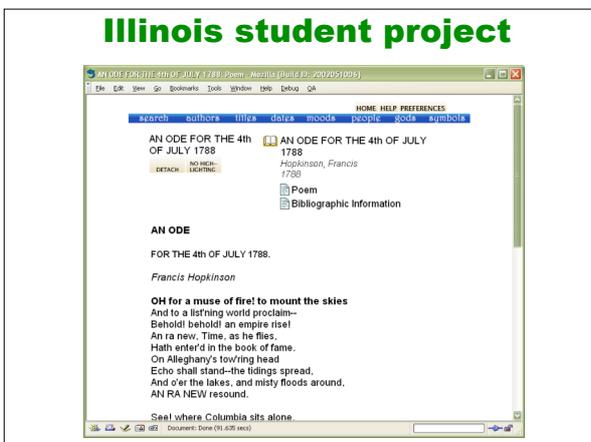
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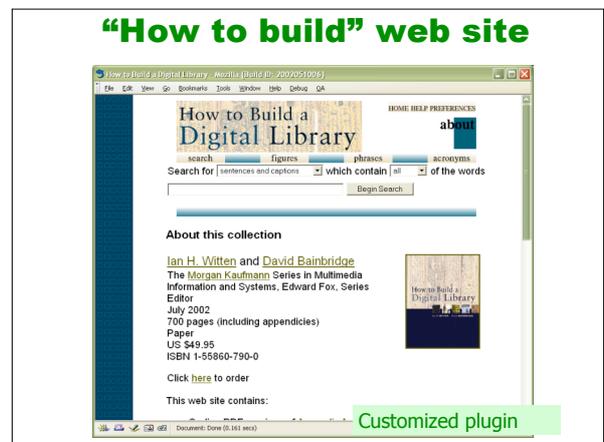
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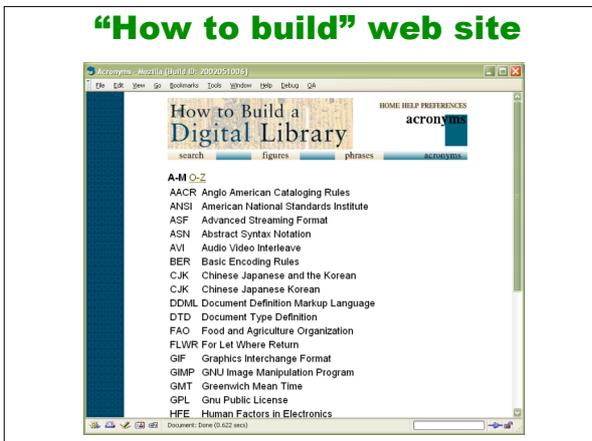
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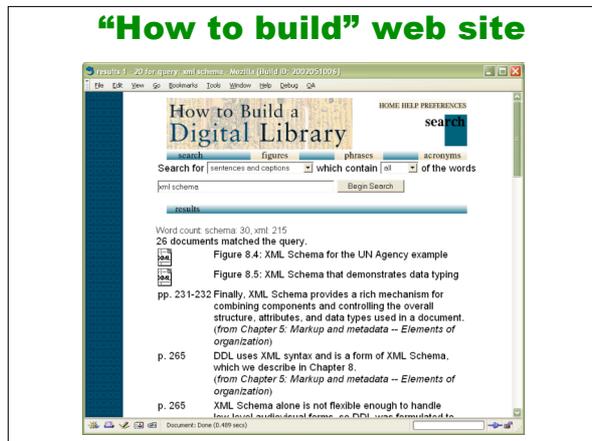
"How to build" web site



“How to build” web site



“How to build” web site



Zespri innovation library



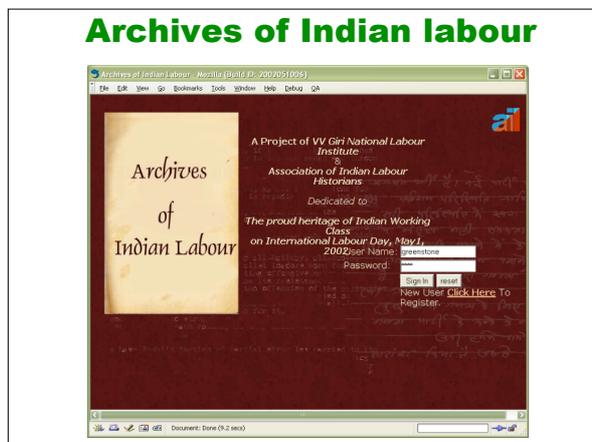
Zespri innovation library



Zespri innovation library



Archives of Indian labour



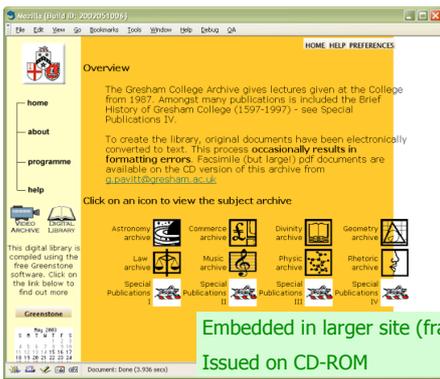
Archives of Indian labour



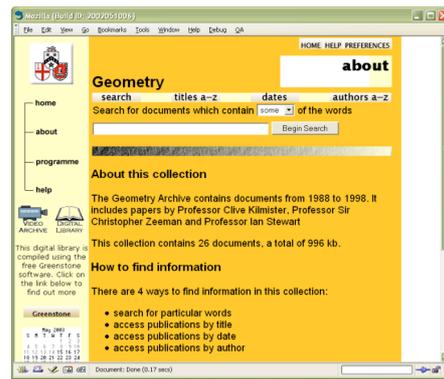
Archives of Indian labour



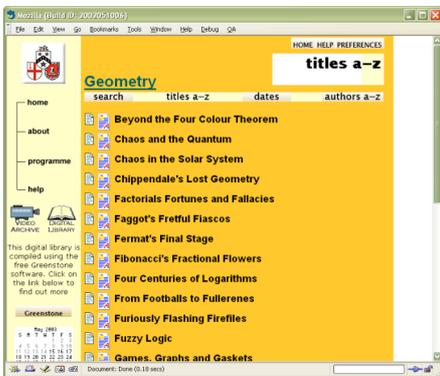
Gresham College archive



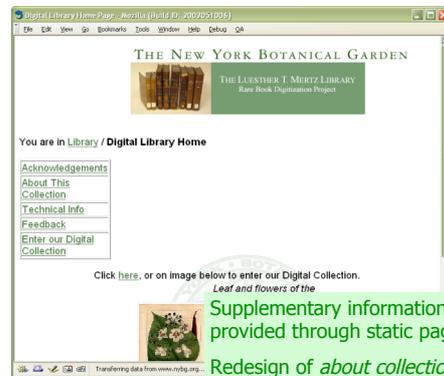
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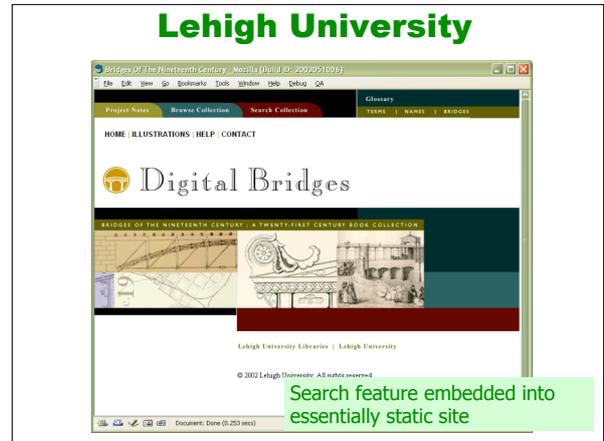
The NY Botanical Gardens



The NY Botanical Gardens



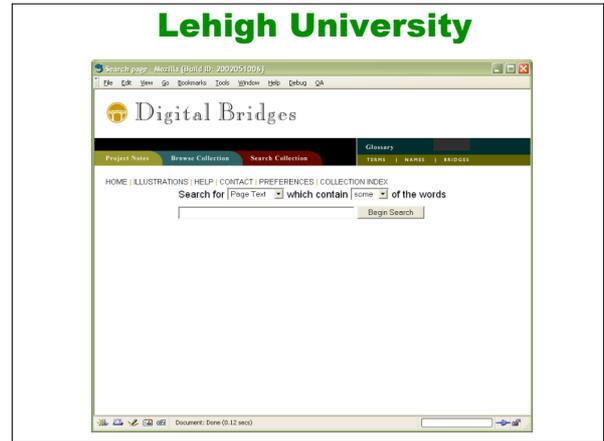
Lehigh University



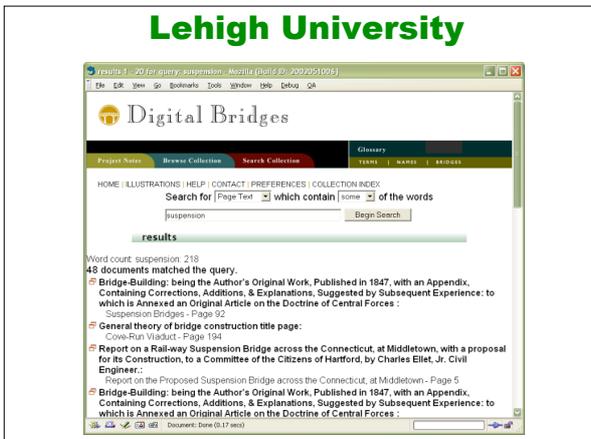
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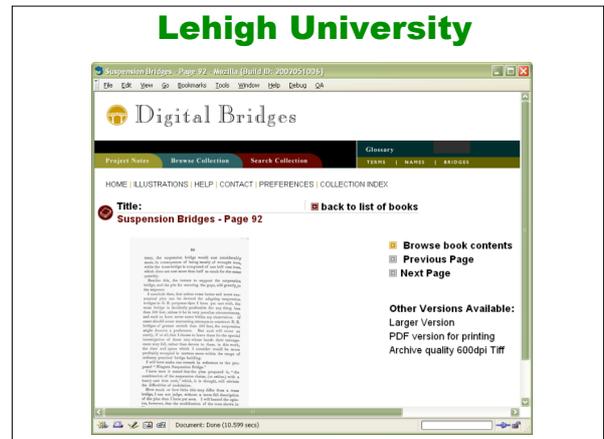
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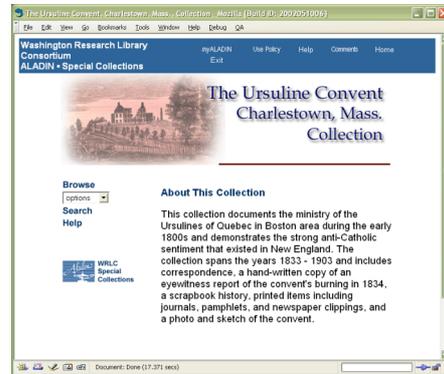
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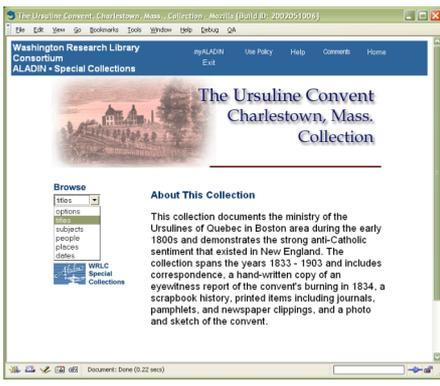
Aladin digital library system



Aladin digital library system



Aladin digital library system



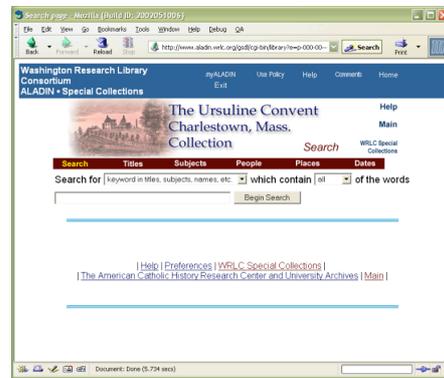
Aladin digital library system



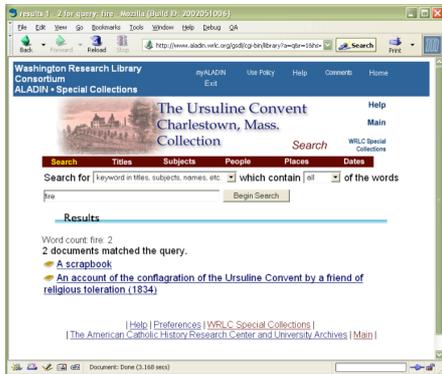
Aladin digital library system



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Aladin digital library system



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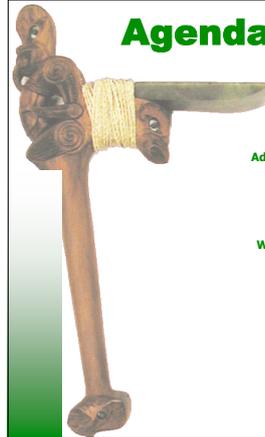


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The Greenstone documentation wiki

❖ go to greenstone.org

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Greenstone 3

Greenstone 2 was designed about 7 years ago. Since then, new software and library standards have emerged ...

- ❖ **Easier to modify interface: generates data (XML) rather than presentation (HTML)**
 - XML can be transformed using XSLT, rather than HTML via macro files
- ❖ **More dynamic: more can be done at runtime**
 - e.g. sort search results on the fly, generate new classifiers at runtime
- ❖ **METS foundation: multiple hierarchies possible**
 - e.g. chapter-section-subsection hierarchy can coexist with page header-contents-footer hierarchy
- ❖ **Distributed modules, using SOAP**
 - Interface can be on different computer to collection, can talk to several different Greenstone sites
- ❖ **Java basis: platform independent**
 - Greenstone2 operates on different platforms, but at a high cost to implementors
- ❖ **Better software technology**
 - easier for people (e.g. our students!) to modify the software to make it do radically different things