

Design a Documentation Service of Traditional Medicine through the Application of Open Source Software

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Abstract: From the primitive day of life human being depends on environment to fulfill all of their basic needs, Food, shelter, health and fuel. Dependency on nature, made them to acquire the knowledge of medicinal properties by trial and error process and enrich through generations without any written documents. It is therefore, important that before this rich unwritten knowledge of uses of traditional medicine is lost forever it must be properly documented and preserved. Greenstone is free and open source software for building collection in digital environment. This paper provides a framework for documentation work digitally using Greenstone Digital Library (GSDL) Software.

Keywords: Documentation, Traditional medicine, Medicinal plants, GSDL, Digital collection, Metadata.

1. INTRODUCTION

According to Free Online Dictionary (<http://www.thefreedictionary.com/traditional+medicine>), Traditional medicine is any system of healthcare that has ancient roots, cultural bonds, trained healers and a theoretical construct; traditional systems include ayurvedic medicine, ethnomedicine, shamanism and traditional Chinese medicine. During the last few decades there has been an increasing interest in the study of traditional medicine and their use in different parts of the world. Today according to the World Health Organization (WHO), as many as 80% of the world's people depend on traditional medicine for their primary healthcare needs. Documenting the traditional medicinal knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources. Due to less communication means, poverty, ignorance and unavailability of modern health facilities, most rural people are still forced to practice traditional medicines for their common day ailments. Traditional medicinal knowledge and their use by traditional cultures are not only useful for conservation of cultural knowledge and biodiversity but also for community healthcare and drug development in the present and future.

2. ORGANIZATION OF RESOURCE IN OPEN SOURCE SOFTWARE

The use of open source software for designing web based documentation and also CD-ROM based service includes different process and procedures which may be grouped as -

Group I: Development of Digital Library Environment:

- ✓ Building domain specific collection of digital objects related to the Traditional medicine
- ✓ Incorporation of metadata into the collected digital objects
- ✓ Installation and configuration of Apache web server (which is freely available) in windows platform
- ✓ Installation of JAVA runtime environment in windows platform

✓ Installation of GSDL in windows platform

Group II: Development of Web Access Mechanism:

Configure the system as a server and link server and GSDL through server configuration to provide access to the digital collection in distributed information environment.

Group III: Organizing the digital collection through GSDL:

1. Gather : Gather domain specific information for build up the collection
2. Enrich : Encoding each object in metadata schema
3. Design : Design the digital information, its appearance and the access facilities
4. Format : Customization the appearance of user interface for searching and browsing
5. Create : Building of collection on ethnomedicine

Group IV: Development of off-line access (through CD-ROM) mechanism:

Exporting the digital archive of ethnomedicine service and documentation in CD-ROM for offline retrieval through stand alone PC by using a sub set program of GSDL software, i.e., convert the digital interface to CD-ROM interface.

Steps:

The above mentioned process and procedures provides an anatomic picture of the framework. The details of the framework are crystallized here in the form of successive steps for practical implementation.

Step I: Collection development on traditional medicine:

An important prerequisite for effective search and retrieval from traditional medicine Database and an inventory is the development of metadata schema for organization of medicinal data. Traditional Knowledge Resources Classification (TKRC) developed by the Government of India for providing efficient access to Traditional Knowledge data, is selected for developing such schema for the organization of resources. To prepare digital collection we have to create all data and documents on domain traditional medicine in the digital form. Then incorporate metadata developed for documentation of traditional medicinal knowledge.

Step II: Installation of GSDL software:

As Greenstone Digital Library (GSDL) is available for different platforms (e.g., Windows, Linux), in this research work, GSDL is installed in Windows XP operating system. Steps for install GSDL are as follows:

- The *GSDL 2.86* software download from <http://www.greenstone.org> / or http://greenstonesupport.limk.ac.in/our_mission.htm
- Install Java2 Runtime Environment in our computer as a pre-requisite.
- GSDL 2.86 software is installed in computer by choosing the Local Library mode and just chooses the default options in the installation wizard.
- ImageMagick* (can be had from <http://www.imagemagick.org/>) and *Ghostscript*(can be obtained from <http://www.cs.wisc.edu/~ghost/>) are two required software which are given in build with GSDL 2.86
- After the installation is completed the GSDL has two interfaces; librarian interface and user interface

Step III: Collection Building on GSDL Software:

Collection building done by following steps:

1. Creation of new collection in GSDL:

The simplest way to build a new digital library collection is to use *Greenstone's Librarian Interface 1 (GLI)*, a component of Greenstone Digital Library software (Open the GLI from the Start →Programme→GSDL (version 2.86) → GLI).

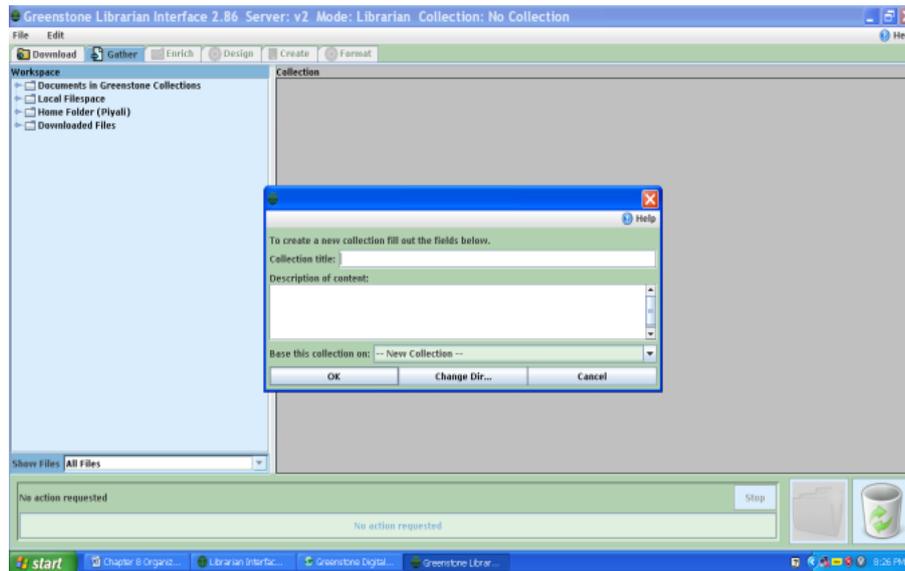


Fig. 1: Creation of new collection in GSDL

To create a new collection click on Librarian Interface (GLI) in windows (or in LINUX) operating system and choose new from the file menu.

Click on GSDL Administrator →File→New →Put the name of the collection against *collection title* (e.g., Traditional medicine) and a brief description about the collection against *description of content* (e.g., Documentation of Traditional medicine) →Choose New Collection in the *Base this collection on* dialogue box and click “Ok”.

2. Gather:

Now the ‘gather’ panel become active and it allow the user to collect the require information by exploring the entire computer. After that, select the directory (e.g., Records on Traditional medicine) → Select the files (e.g., record1, record2, etc.) → Drag and drop the collection into right hand panel.

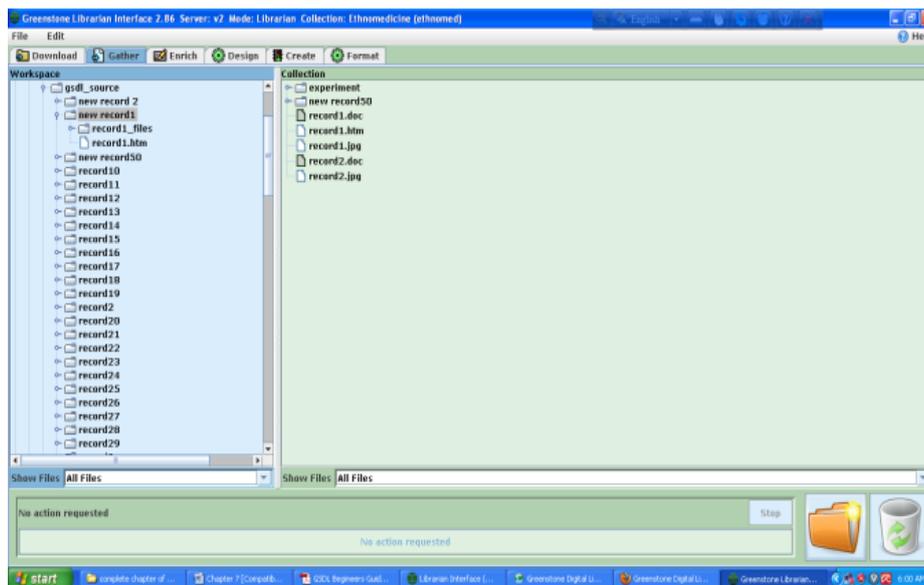


Fig.2: Gathering document by exploring the computer

When researcher assemble the documents, the software usually prompts to select the Plug-in, if the suitable Plug-inis not included. In such cases, must click the ‘Add plugin’button.

3. Enrich:

The next stage is to enrich the documents by adding metadata. Here one select the individual document and add metadata such as, Scientific Name, Family Name, Vernacular Name, etc., manually. Click on ‘Enrich’ tab and it will bring up a panel. Left side of the panel under Collection tab shows the files. The right side, on clicking, allows adding metadata for each document on each metadata field in the Value box against the Element.

Choose the appropriate file to enter records→ Put value against the every metadata element.

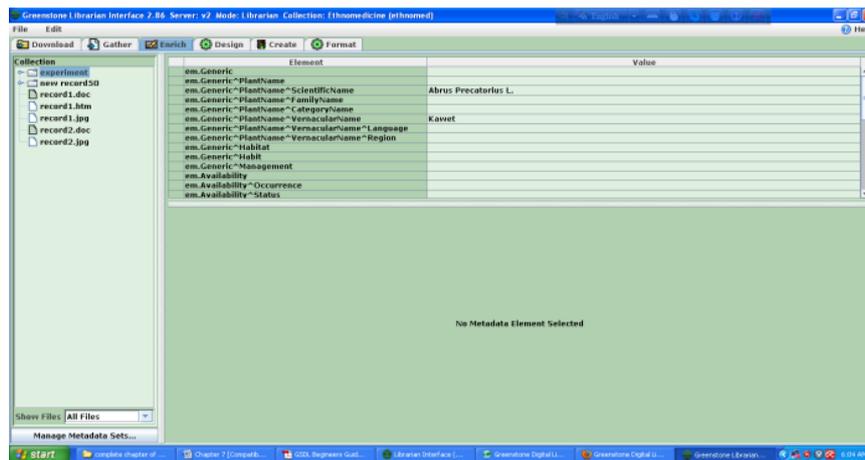


Fig.3: Assigning Metadata Using the Enrich View

Type the Scientific name of the species against em.Generic.PlantName.ScientificName, type the Vernacular name (Local name of plant) of the species against em.Generic.PlantName.LocalNameName, and type the Locality name (region) against em.Generic.PlantName.LocalName.Region for each selected species shown as in the above figure.

4. Design:

Then design the collection by choosing the needed features given under the Design menu. Collection design consists of many facets which are given in the left side panel.

4.1 Document Plug-ins:

Click on **Document Plug-ins** to add the required Plug-ins needed to convert the document into the document format (greenstone archive format) required for Greenstone. All plug-ins, needed for handling common documents, will be loaded by default at the time of installation. It is noted that if proper Plug-in not loaded, the software cannot build the digital library collection.

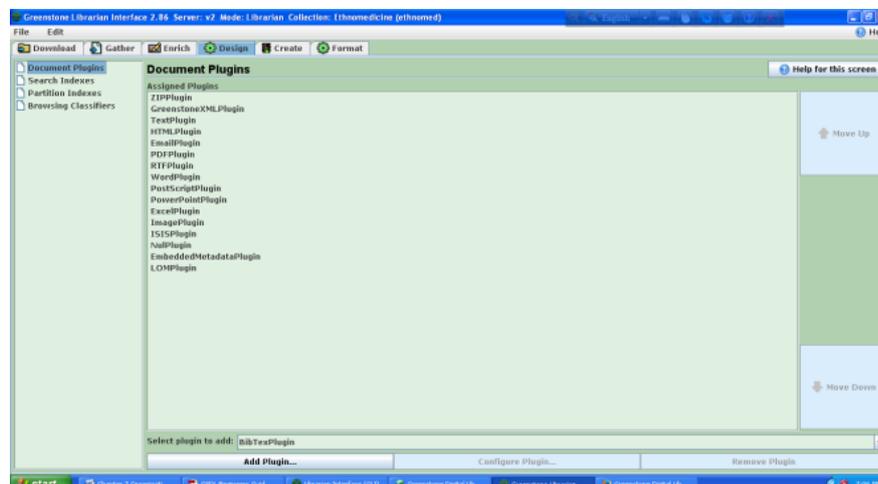


Fig.4: Document plug-ins

4.2 Create Search Indexes:

Choose the **Search Indexes**, shown next below on the Document Plug-in, for creating *Search Indexes*. Search Indexes determine whether to confine the search to paragraph, chapter or the entire text of the document.

Design → Search indexes → remove all index → New indexes → Check full text → Choose metadata element individually in several times until satisfy → Add index.

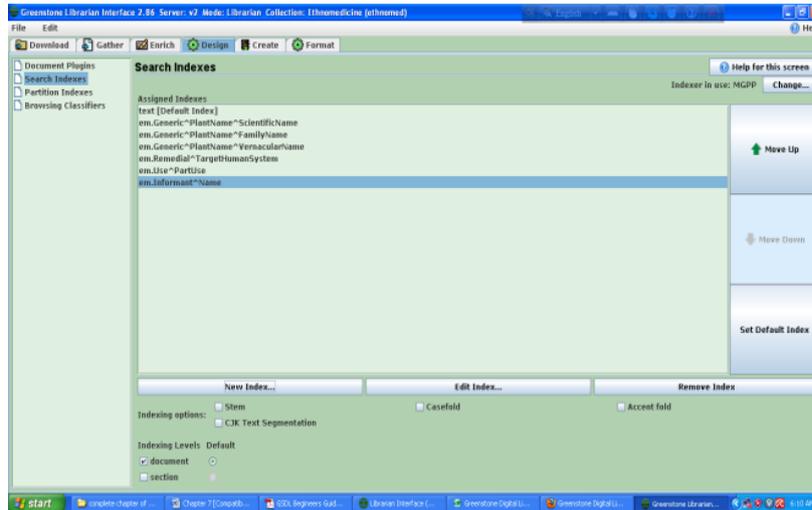


Fig.5 : Create search indexes

Remove the default indexes by selecting the index description under *Assigned Indexes* and then by clicking on the **Remove Index** button. Do not remove the *search index* for **text** (i.e., **Default Index** because if one doesn't provide the search index for text, cannot search the entire text of the document. Make it default, preferably). In the same way we add index, by clicking on **new index** button. Select index, by tick marking on text box and click on add index button.

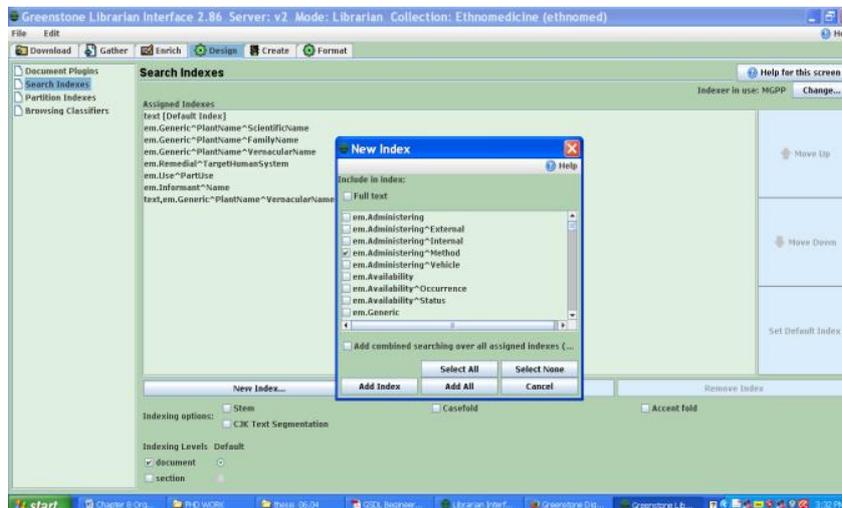


Fig. 6 : Adding Indexes

Click on the **New Index** button. Select the fields by tick marking on the check box one by one, and add them one by one by clicking on the **Add Index** button. i.e., select *em.ScientificName* first and add it, then select *em.FamilyName* and add it and so on.

4.3 Browsing classifier:

Browsing Classifiers for example vernacular name, Disease treated, Family Name, so as on help to browse the collection. In order to browse must set up a Browsing Classifier, independently of creating an index on this metadata element.

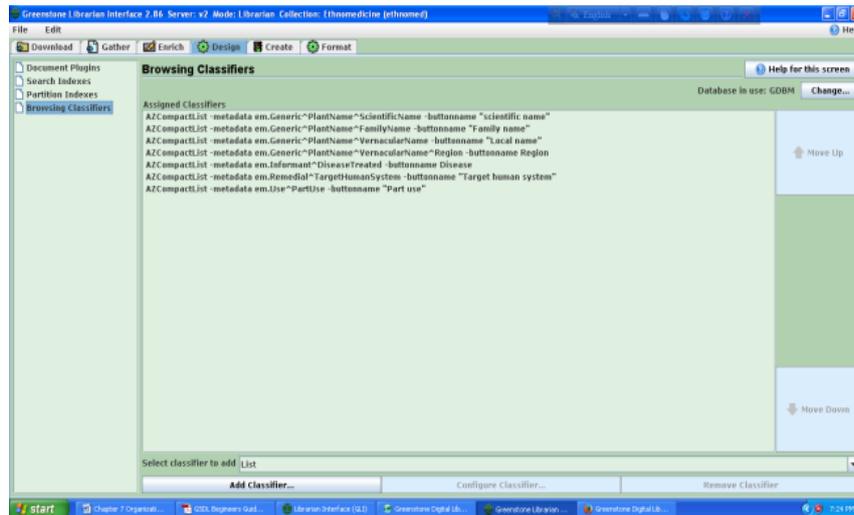


Fig. 7: Browsing Classifiers

Browsing classifier → Remove all classifier → Add classifier → Choose metadata → Check button name and put the value → Ok. (Choose browsing classifier as per researcher need, e.g., Scientific name, Family name, Disease treated, etc.).

When one click Browsing classifier button, one will get the option for choosing the add Classifier, configure classifier and remove classifier button.

5. Format:

Format Features allow unlimited choices in adapting the appearance of the collection. The page-display of the resultant collection including the display-page that appears on clicking the browsing classifiers or on making a search, are governed by the features provided by the **Format** tab.

In the format tab select **general** to provide general information about the collection. Choose a small picture which you wish to appear as a collection icon in the homepage by clicking on the browse button. On choosing the picture, the full path of the picture will appear in the address box lying against the **Browse** button.

If anyone want to change any format feature, select the appropriate feature from the choose feature option and add the format string to the **Format Features** by clicking on the **Add Format** button. For changing the appearance one can also use appropriate **Format Features**. One can select any feature appropriate for changing the appearance of the digital library.

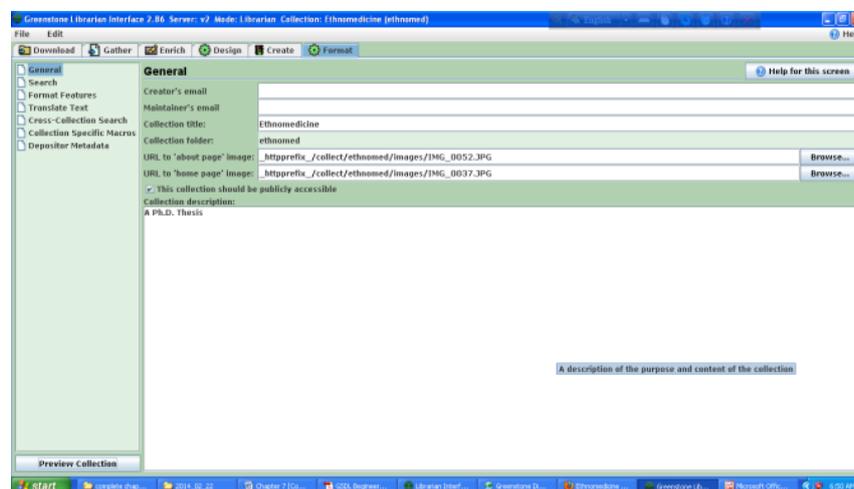


Fig.8: Designing the collection – General information

6. Create:

In create panel, click on the build collection button and the progress bar will show the progress in building the collection. At the end of the building process, Click on the Preview Collection button to view the collection built.

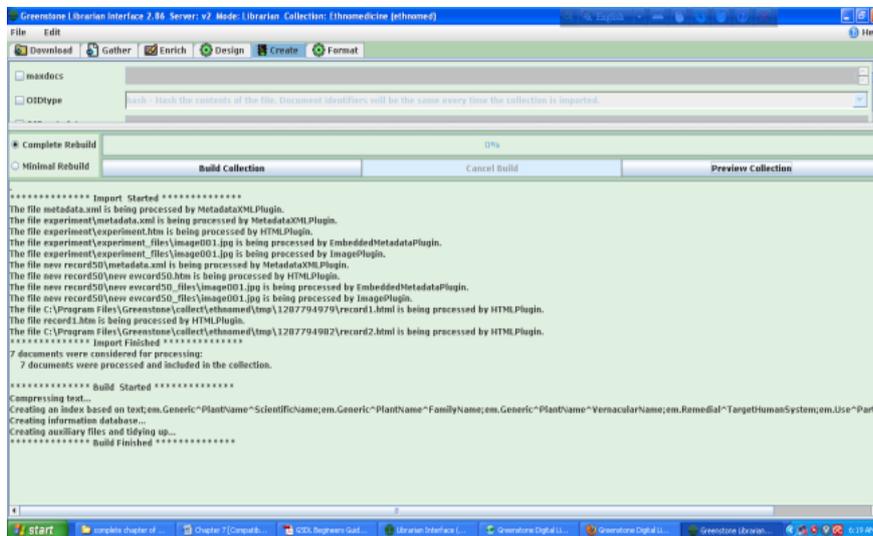


Fig.9: Building a collection

At the end of the building process, Click on the **Preview Collection** button to view the collection built.

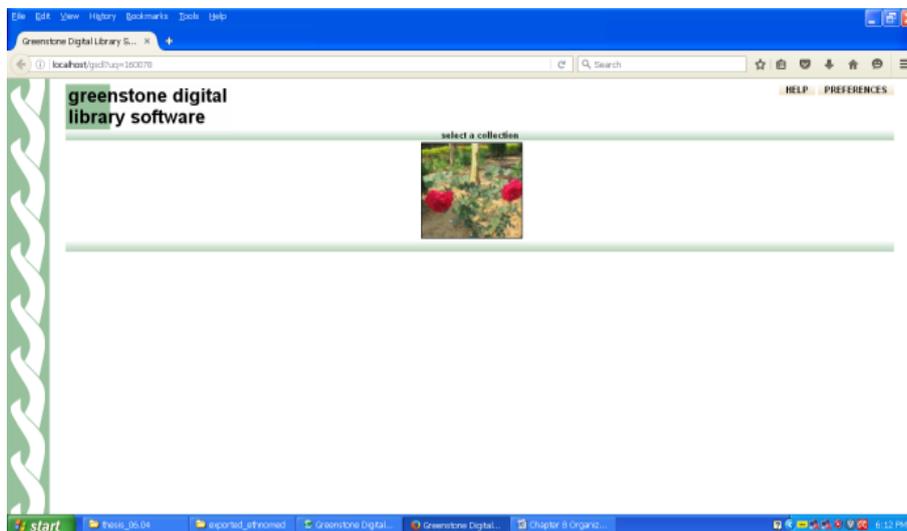


Fig. 10: Homepage of Ethnomedicine Collection

Step IV: Converting the collection into a CD-ROM:

The Greenstone software can be used to serve collections over the WWW. GSDL software allows converting the collection to a CD-ROM, if you want to convert your Greenstone application into an installable CD-ROM for distribution among wider audience. The CD-ROMs run under all versions of the windows operating system. The main feature of my research work is to make a CD-ROM compatible which is searchable or accessible from any PC in any platform of operating system. It requires the zip file which is a collection of 108 files and is about 18 MB in size. This zip file is to be extracted from *C:\Program Files\gsdl\bin\windows*. Now to export the collection into a CD-ROM provide a name for your CD-ROM, mark the check box pertaining to the collection to be exported and click Write CD/DVD image button and finally click close button. Now write the content of the folder (*C:\ProgramFiles\Greenstone\ tmp\ "traditionalKnowledge"*) into a blank CD-ROM for creating self-installing windows CD-ROM.

3. CONCLUSION

The information retrieval features of Greenstone software is quite wide-ranging and carry lot of advanced search options through “preference option”. GSDL allow hyperlinks also to access full text of the required digital objects from the result set against user queries and it is regulated through configuration file of the digital collection. The display of the search result may be modified as per the user requirement through modification of configuration file. The appearance of digital library may also be changed through customization process. The creation of basic greenstone collection is easy and takes few times. General-purpose open source software like greenstone is a useful tool to provide information services to mankind. As a library professional, an effort has been made to document traditional knowledge with the help of GSDL software and use them for managing knowledge resources.

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