"Knowledge Scholar"
An International Peer Reviewed E-Journal Of Multidisciplinary Research
Volume: 02, Issue: 06, Nov.-Dec. 2015 *eISSN NO. 2394-5362*
Impact Factor (IIFS) - 0.776

AstroRef: A RESOURCE DISCOVERY TOOL FOR ASTRONOMICAL WEB RESOURCES DEVELOPED USING GSDL

Md. Nurul Alam
Assistant Professor
Department of Library and Information Services
Jadavpur University
Kolkata, West Bengal, INDIA

ABSTRACT:

This paper is an attempt to provide integrated access to heterogeneous astronomical web resources and a resource discovery tool for astronomical research community using Open Source Software .The system is based on open source software (GSDL, Apache, PERL, GRE). AstroRef can be used both in offline mode -self-installable CD-ROM, and online through www. It allows user to locate heterogeneous web resources in a single user interface and provides different browsing facilities to retrieve different web resources. It supports interactive integration of resources from multiple sources These services are increasingly providing facilities to interlink with the astronomical literature. In this is study very few samples have been considered. This will be investigated further with a wider population which will improve the AstroRef System. It would become an indispensable reference tool for the entire astronomical community. It is also useful for astronomy

librarians who serve a scientific or technical clientele, and any person interested in learning more about astronomy and astronomical information services. The paper describes the application of Open Source Software, GSDL as a form of resource discovery tool , central database of astronomical web resources for researcher, student and scientist. And to show how libraries can use open source as a vehicle for promoting library services.

KEYWORDS: AstroRef, Astronomy, GSDL, Digital Library, Open Source Software, India

1. INTRODUCTION:

In the past decade there has been exponential increase in the quantity of digital information. the same remains true for the number of computers and Internet connections. With increasing availability of information in the e-forms, the access of the same is also increasing considerably in terms of network presence, giving rise to the requirement of information coupling. E-information is scattered globally, it has many means for access and storage (formats and languages).

In spite of its unlimited possibilities in terms of access to information, the Internet is now becoming self-threatening. Because of the Internet's ever-growing diversity, the information overload is about to crush its users (Paepen, Engelen, Schranz and Tscheligi, 2002). Nowadays, users have routine access to a huge number of heterogeneous and

distributed digital libraries. To satisfy an information need, relevant libraries have to be selected, the information need has to be reformulated for every library with respect to its schema and query syntax, and the results have to be fused (Henrik Nottlemann,(n.d)). These are inefficient manual tasks for which accurate tools are desirable. The aims of AstroRef is to provides an end-to-end solution for federated search services for resource discovery.

2. BACKGROUND:

Astronomy studies produce data from various observations, experiments, and simulations at an enormous rate. With proliferation of applications and data formats, the astronomical research community faces many challenges in effectively managing and sharing resources and in efficiently integrating and analyzing the data. In this paper, we discuss how this challenge is being addressed by the AstroRef- a Web based distributed resource management Tool that provides integrated access to web resources and tools needed for knowledge discovery in the astronomy.

3.OPEN SOURCE SOFTWARE AND GSDL:

Computers and the Internet have changed the way of work, study, and interaction, yet there are many things about computers and software which are dissatisfying. Proprietary software

is increasingly expensive and memory-hungry. Bugs, security flaws, and other errors appear in even the most trusted programs. An alternative method of software development exists, called Open Source Software (OSS), which offers a very low cost solution to all of these problems. OSS is an economical alternative to libraries' reliance upon commercially supplied software. That is, despite the real costs involved in the development, maintenance, and use of OSS still these are lower than those associated with commercial ones. OSS is essential if libraries have to develop software and systems that meet their users' needs. **(Alam and Pandey, 2010)**

Digital libraries (DL) are emerging as crucial components of global information infrastructure adopting the latest information on communication technology. DL's offer new levels of access to broader audience of users and new opportunities for Library & Information Science field to advance both theory and practice. Open Source Software has opened new options for DL design and development in the economically inflexible state of today's library systems. GSDL is one of the commonly used OSS for developing DL's, it was promoted by the New Zealand DL project research group at the University of Waikato , led by Dr. Ian H. Witten and is sponsored by UNESCO.It has many good features that meet our requirements, including a powerful search engine (mg) and metadata based browsing facilities **(Sreekumar, M.G., 2009)**

4.SCOPE:

The scope of the AstroRef is to point people to some of the best resources on the web for astronomical research and information. This is by no means comprehensive, and is focused on web sites based resources.

5.OBJECTIVES:

- To provide integrated access to heterogeneous astronomical web resources through one interface
- To create a high quality, central database of astronomical web resources
- To identify and consider model for setting up and running AstroRef.
- To make AstroRef internationally known as the source to Astronomical Resources
- To develop a prototype Subject based Information System
- To create a tool which would be easily understood and used by researcher and scholar to support them in their routine task

6.ASTROREF: DESIGN AND DEVELOPMENT PROCESS

The methodology employed for design and development of the AstroRef is outlined as below:

Step 1: Data Collection: A brief survey was conducted and data was collected through keyword search from internet. Content analysis has been done by defining the subject and different Fields and Sub-Fields of Astronomy and Astrophysics using vocabulary device like thesaurus and classification scheme like PACS.

Step 2: Software Installation:

Development of digital library environment by the installation of JRE, Apache, Greenstone and Imagemagick

Step 3: Web access mechanism:

Development of web access mechanism in order to provide access to the collection in networked environment by configuring the system as a server and modification of server configuration file.

Step 4: Building a collection using Greenstone Librarian Interface (GLI):

After successful installation of all the software - Greenstone a window, i.e. GLI is displayed which enables us to create a new collection i.e. "AstroRef". It allows to collect

a set of documents, import or assign metadata and build them into a greenstone collection GLI presents the following tabs viz.

a) Gather b) Enrich c) Design d) Create e) Format

Using gather tab collected data is uploaded into the GSDL system. Bibliographic details are entered via enrich tab which provides metadata fields. The Design tab has been used to customize the search indexes, browsing classifiers like creator, title, institution, year etc.. The Format tab is used to customize the appearance of the AstroRef user interface particularly how documents are displayed in browsing and search result list (fig.6). Finally the bibliographic data is saved along with the above mentioned customization into the GSDL system using the "Create Tab".

Step 5: Offline access mechanism

There are many digital library software that are available in the market but GSDL has unique feature for access of resources through offline mode by exporting the digital library in CD-ROM.

7. AstroRef: FEATURES AND UTILITIES

AstroRef is a centralized distributed information service for the Astronomy and Astrophysics community which covers many different resources of common interest and which will improve the researcher's abilities to locate and use data from a wide variety of on-line resources. It provides homogeneous access to heterogeneous distributed resources in astronomy. The key to implementing such services is the concepts of Information Discovery -which allows user to locate heterogeneous web resources in a single user interface; Information Retrieval – provides different browsing facilities to retrieve different web resources and Information Integration - It supports interactive integration of resources from multiple sources These services are increasingly providing facilities to interlink with the astronomical literature (on-line journals) and the bibliographic reference systems

The AstroRef will be made available via World Wide Web (WWW), a centralized and distributed Internet information system using open source software -GSDL. It will be one of the many WWW services, allowing access to the astronomy related information with a user-friendly interface. It will be available at the uniform resource locator (http://127.0.0.1/cgi-bin/library.exe). It is also available through self-installable CD-ROM.

8.UTILITY OF AstroRef:

8.1 U1: Unique user Interface

Figure 1 provides a single user interface where all the metadata records of A&A resources i.e. Creator, Title, and Description etc along with links for accessing other similar initiatives online.

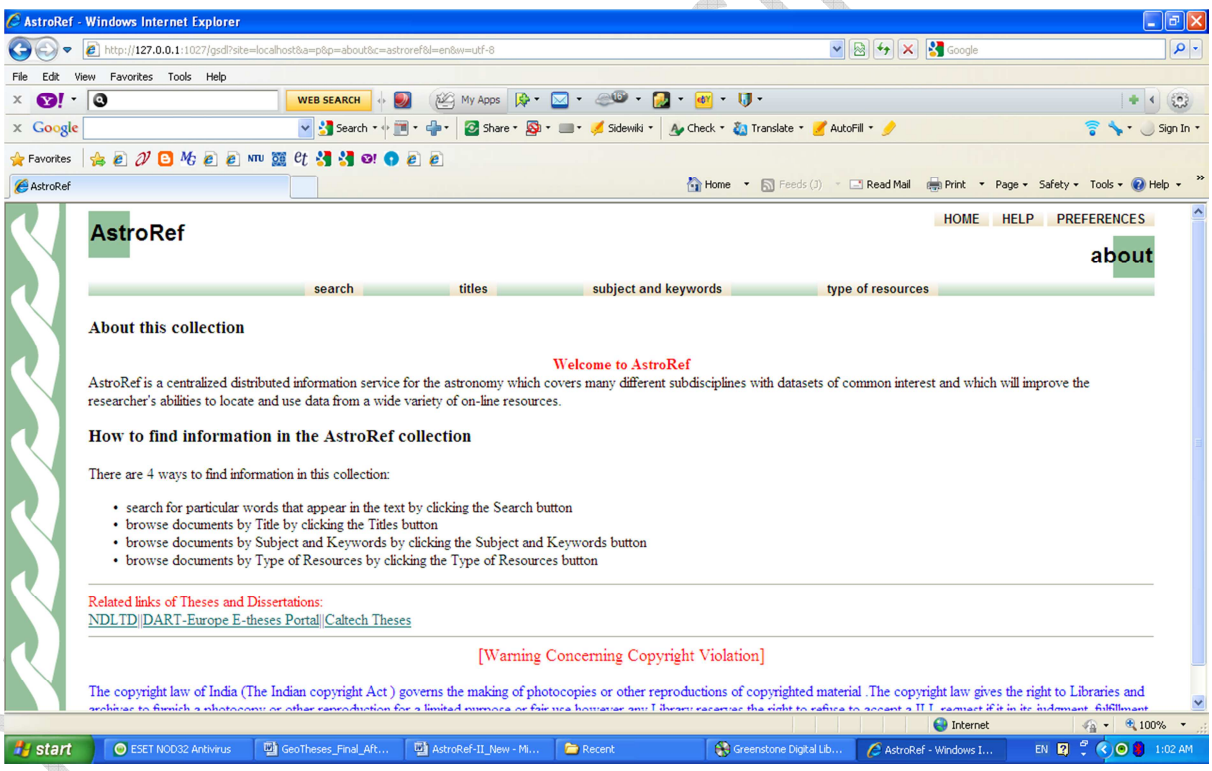


Figure 1: Single user interface of AstroRef

8.2 U2: SEARCH

AstroRef provides both simple and advanced search interface via the web that allows more targeted searching which provides full bibliographic information. The information is available to the user's desktop at any time at the click of the mouse. See Simple Search screen in the Fig. 2 below.

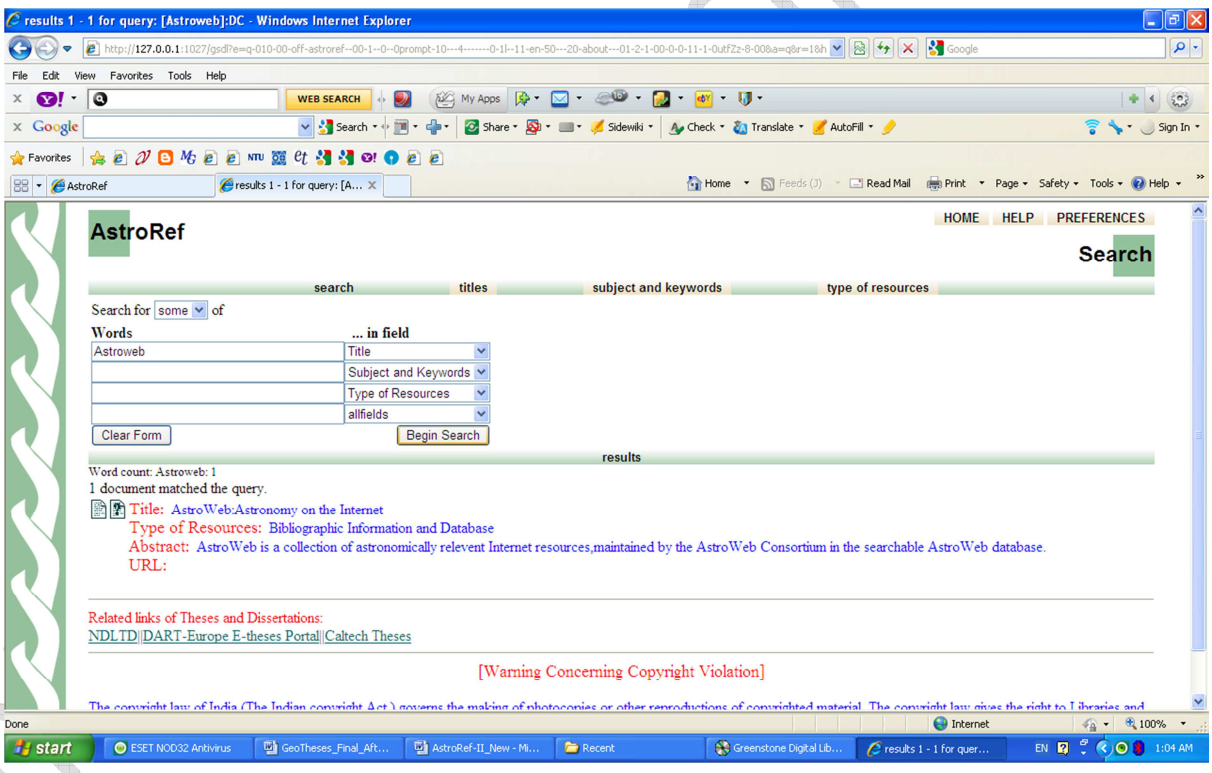


Fig. 2: Simple Search Screen for AstroRef

For advanced search – different search field (like Creator, title, institution, etc) can be combined with each other and linked with logical operators AND, OR, NOT. See Simple Search screen in the Fig. 3 below.

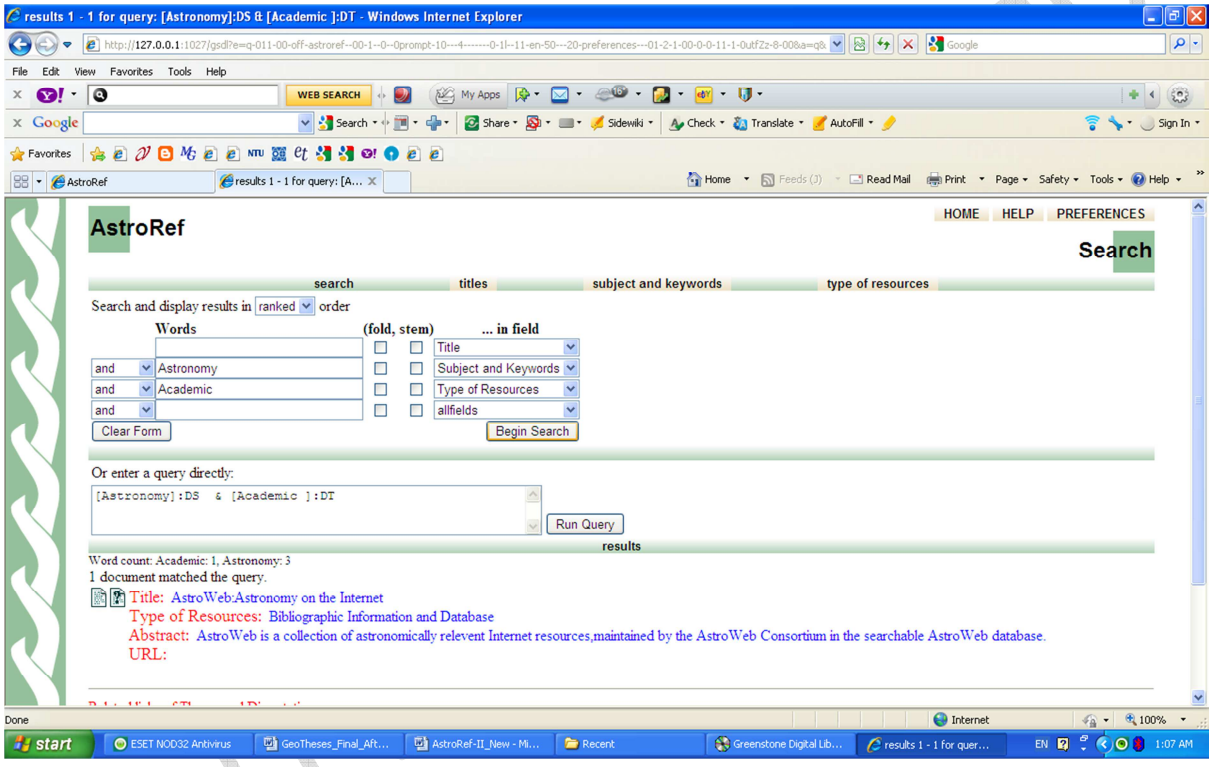
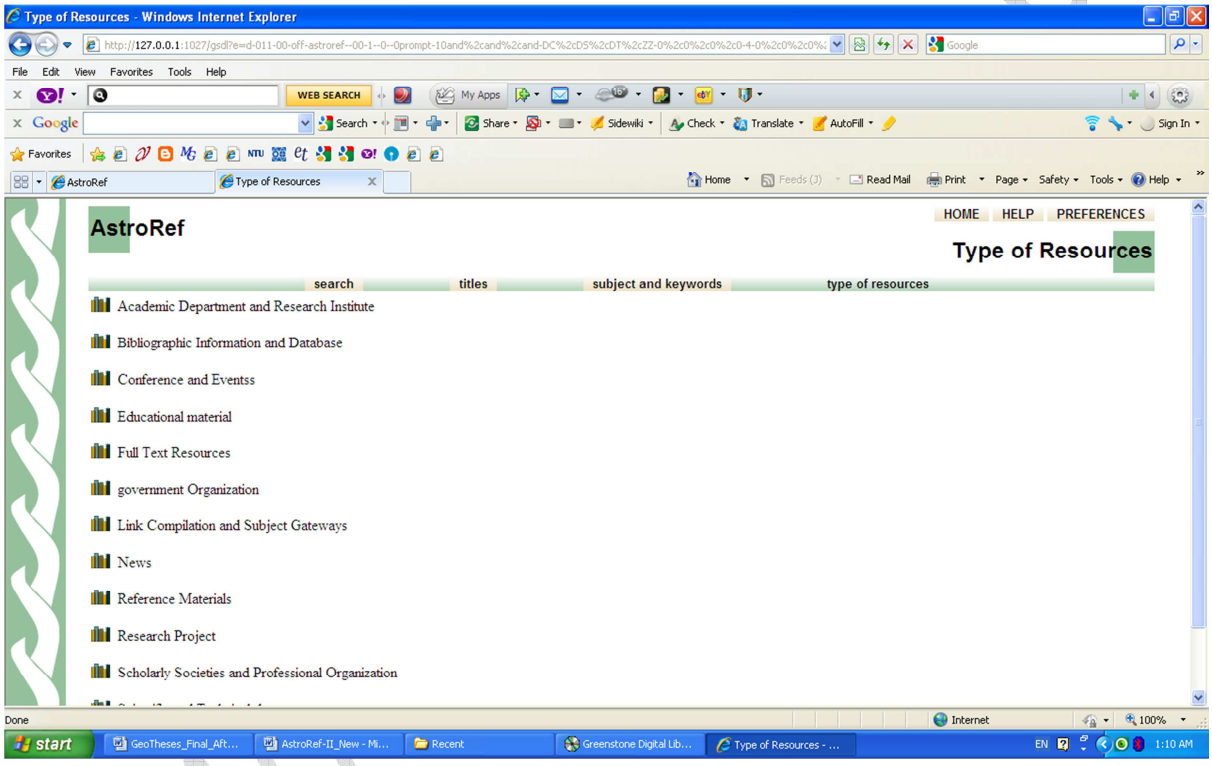


Figure 3: Advanced Search Screen for AstroRef

8.3 U3: BROWSE

Service of browsing through subject and keywords is also made available so as to facilitate easy retrieval even when the search terms are not known specifically



9. CONCLUSION:

AsrtroRef is a pilot study developed using open source software – GSDL to provide a heterogeneous web resource into a single user interface. The application of GSDL as a open source Digital Library software in the form of a resource discovery tool . This tool allows users to Information Discovery, Information Retrieval, and Information of Integration of Astronomy and Astrophysics web resources. Being a pilot study very few sample has been considered but it be investigated further with a wider population, which will improve the AstroRef that can be regarded as an excellent tool for the Astronomy Astrophysics community.

REFERENCES

- Paepen, B., Engelen, J., Schranz, M. and Tscheligi, M. (2002). OmniPaper Bringing Electronic News Publishing to a next level using XML and Artificial intelligence. Proceedings of the elpub2002 (287-296). Berlin. Retrieved from http://elpub.scix.net/data/works/att/02-29.content.pdf
- Nottlemann, H. and Fuhr, N. Retrieved from https://www.researchgate.net/publication/2382078_MIND_An_architecture_for_multimedia_information_retrieval_in_federated_digital_libraries
- Md. Nurul Alam, & Pragya Pandey. (2012). GeoTheses: development of union catalogue of Indian geoscience theses using GSDL. *The Electronic Library*, *30*(4), 456–468. http://doi.org/10.1108/02640471211252175
- Sreekumar, M.G. (2009), "Open source web content management technologies for libraries", paper presented at the 7th International Convention on Automation of Libraries in Education and Research, February 25-27, Pondicherry University, India, available at:www.inflibnet.ac.in/caliber2009/program.html