

Powerful Utilization of Open Source Software in Digital Preservation, Maintenance and Utilization: An Example of the Creation of Union Catalogue of Serials for Astronomy Libraries in India

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Abstract

This paper describes how open source software can be utilized for managing the e-contents on web. This paper describe the detail process implementing in the creation of union catalogue of scientific serials for astronomy libraries in India with the help of open source software tools such as MySQL and PHP Scripting language.

Keywords: Union Catalogue, PHP, MySQL, Open Source Software

1. Introduction

1.1 Open Source Software

Open source software can be defined as computer software for which the human-readable source code is made available under a copyright license that meets the Open Source Definition. This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. It is very often developed in a public, collaborative manner. Since 1998, the Open Source Software (OSS) movement has become a revolution in software development. OSS software are copyrighted and distributed with license terms designed to ensure that the source code will always be available.

In context with "Library and Information Science" the open source software has changed the conventional way of organizing the contents on web. Free digital repositories like DSpace, Greenstone are widely used by many information centers to maintain their digital contents. Apart from digital repositories, other open source software

like PHP, MySQL, PostgreSQL, PERL etc are also in heavy demand for dynamic websites. In this paper we have used PHP scripting language and MySQL relational database management system and describe the process implementing in the creation of union catalogue of scientific serials for astronomy libraries in India.

Scientific serials are considered as a backbone for research in any field hence it is imperative to know the availability of it. Now a days resource sharing has become increasingly relevant. Budgetary allocations for developing library collections are fast declining and publication costs are escalating. Given this scenario, it has become more and more difficult for libraries and information centers world-wide to sustain their growth. With such financial restraints, libraries and information centers have been forced to reduce their acquisitions and they have to often depend on the resources of other libraries to support their user's needs. In order to access the resources of other libraries and information centers, it is essential to have an appropriate tool to know where resources are available. Addressing this issue particularly in the area of scientific serials, this paper describes possible utilization of Open Source Software.



2. Technologies

Three main technologies are used

Web Server: Internet Information Server, Apache

RDBMS : MySql

Tools : PHP Scripting Language, HTML

PHP and MySql are excellent tools for application development based on the open source model.

2.1 PHP

PHP (recursive acronym for PHP: Hypertext Preprocessor) is an open-source server-side scripting language (Freely downloadable from php.net) for creating dynamic WebPages and other Web applications. PHP belongs to a class of languages known as middleware. These languages work closely with the web server to interpret the request made from the World Wide Web, process this request, interact with other programs on the server to fulfill the request, and then indicate to the web server exactly what to serve to the client's browser.

PHP offers a simple and universal solution for easy-to-program dynamic WebPages. The intuitive interface allows programmers to embed PHP commands right in the HTML page. PHP syntax is similar to that of C and Perl, making it easy to learn for anyone with basic programming skill.

Because of its wide distribution to a large community of users, PHP is very well supported. As an open source product, PHP enjoys the support of a large group of open source developers. The community gives excellent technical support to users. PHP offers excellent connectivity to most of the common databases (including Oracle, Sybase, MySql, ODBC and many others), and offers integration with various external libraries. Another key advantage of PHP, when compared to other scripting languages such as ASP, is that it is open

source and cross-platform, suitable for today's heterogeneous network environment.

PHP is the natural choice for developers on Linux machines running Apache server software, but runs equally well on any other UNIX or Windows platform. PHP also support HTTP session, JAVA connectivity, regular expression, LDAP, SNMP, IMAP, COM (Windows) protocols. It also Supports WDDX complex data exchange between virtually all Web programming languages.

2.2 MYSQL

MySQL (pronounced "my ess cue el") is an open source relational database management system (RDBMS) that uses Structured Query Language (SQL), the most popular language for adding, accessing, and processing data in a database.

It was released in 1995 by the Swedish MySQLAB. It is very often used to support database-driven websites. It adheres to the SQL standard while adding a number of features of its own (as does Oracle and other database vendors). MySQL is known for its speed and stability. Because it is open source, anyone can download MySQL and tailor it to their needs in accordance with the general public license. MySQL is noted mainly for its speed, reliability, and flexibility. MySQL is a relational database application, pure and simple. Billed as "The World's Most Popular Open Source Database" MySQL certainly has a wide support in the Internet community. A part of the LAMP suite, MySQL compiles easily on a multitude of platforms. It comes as a pre-compiled binary for Windows. It has been used to manage millions of records and gigabytes of data. Fast and robust, it supports the majority of people's relational database needs.

2.3 PhpMyAdmin

This is a tool written in PHP intended to handle the administration of MySQL over the Web.

Currently it can create and drop databases, create/drop/alter tables, delete/edit/add fields, execute any SQL statement, manage keys on fields, manage privileges, export data into various formats. It is available in 50 languages.

3. Methodology

3.1 Data Collection and Organization

Data has been collected from twelve astronomy institute libraries. Most of the libraries use LIBSYS Software for serial management. Following is the sample data of journal holdings collected from the astronomy institute libraries which is arranged alphabetically.

Title of the Journal	Vol. No	Year	Less/Missing
Astronomy	1+	1973+	10,14
Astronomy & Astrophysics	38+	1997+	
Astronomy & Geophysics	1+	1969+	

Pattern followed for representing the data is

‘+ ‘ Indicate that the serial is being currently received
 ‘4 – 7’ shows that serial is available from Vol. No 4 to Vol. No 7 Only Less/Missing: Indicate that, institute either has not received the particular issue from publisher or lost by the institute or missing

4. Implementation

4.1 Union Catalogue Web Interface

The Union Catalogue web interface (fig.1) developed has an easy menu driven access and data can be searched through option like “serial title” either by any word in the title or exact title. User

has flexibility to browse the journal by alphabet and by “Institute” also. List of libraries is provided on main page and a specific library can be selected to view its holdings.

On executing the search, user will be able to get full details of a serial and list of libraries accompanying the particular

serial as shown in fig.2. Information retrieved include name of the serial, available volumes and missing or less volumes if any.

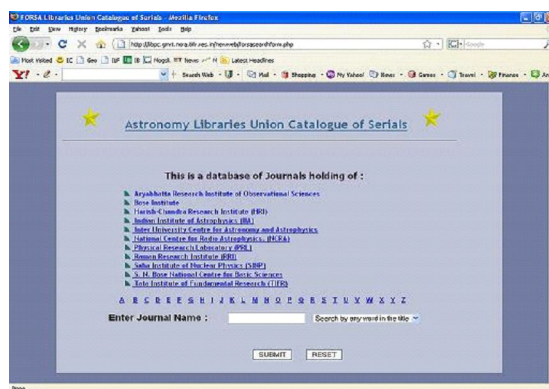


Figure 1. Union Catalogue Web Interface

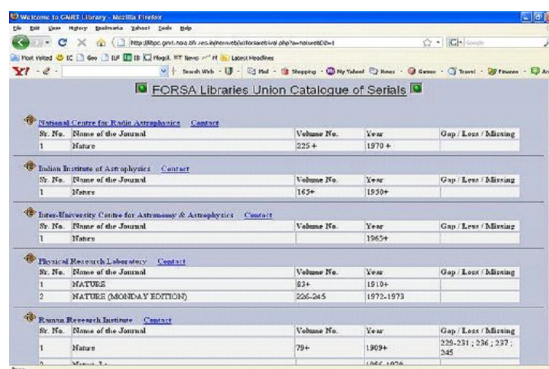


Figure 2. Search Result

4.2 Upgradation

This process not only included to making the existing information update, but also adding new holdings information. A simple data entry from has

been made in HTML as shown in figure-4 to enter the data into the database. A secure login script (fig.3) has been made so that authenticate persons can only input the data.

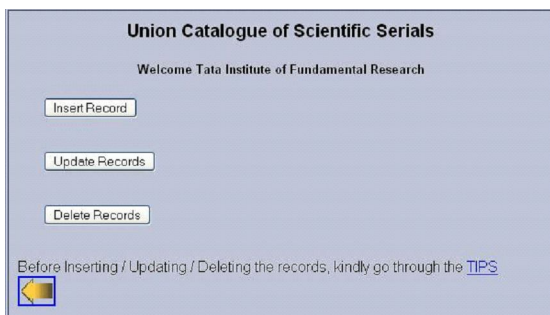


Figure 3. Secure Login Script

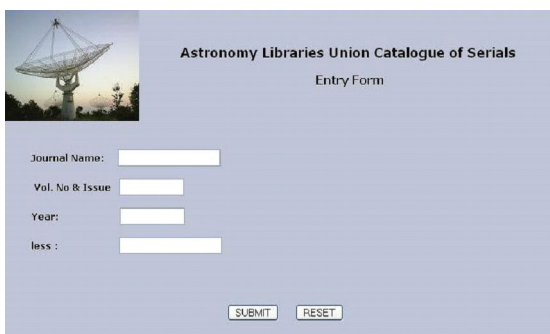


Figure 4 Data Entry Form

4. 2.1 Database Management Interface Screens

Every year libraries may add new serials in their holding and on the other hand may discontinue subscription of few serials. So up gradation is important. Here we have developed few programs through which we can make new entries or change old entries or delete some of the entries which are not necessary.

Below are some of the screen shots which show the process of up gradation of database. In this database management interface screen, we have provided the entire list of institute for the selection through which particular institute holdings can be selected for up gradation. Three options have been provided on the

screen i.e. Insert, Update and Delete. In "Update" option a unique number has been given to each serial, so that a particular serial can be selected. (fig.5 & 6)

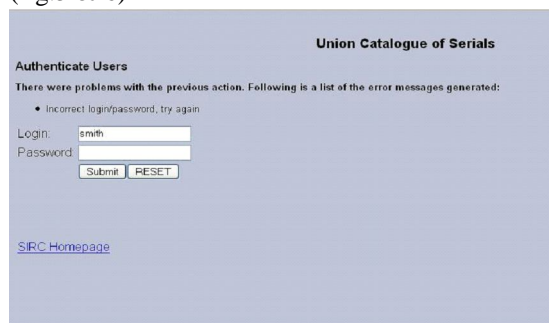


Figure 5. Up gradation forms



Figure 6. Up gradation forms 2

Since the utility of a Union Catalogue depends on the currency of the information contained in it, it was necessary to explore ways in which the information can be kept up to date. With limited professional, updating the data at a single Center is difficult. Even though each library is willing to send current holdings information, consolidating and incorporating the same into the database is again a time-consuming exercise. In order to overcome this problem, we have developed a sophisticated online data entry & update form, which could be integrated with the system so that the authenticate person could input the data from their own location as well as update it as and when required. In this way we can extend this project

which gives flexibility to every institute to enter the data in to the system that willing to participate in this database.

5. Conclusion

While in a limited way the Union Catalogue fulfills the objectives for which it was developed. A greater number of organizations need to participate in order to make it more effective. With increased participation, further serials information will be available and the source would become more comprehensive. This paper of the Union Catalogue brought to light the fact about open source software and their possible utilization in managing the e-contents on web.

6. References

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