Virtual Union Catalogue for Sri Lankan University Libraries (SLUCat)

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Abstract

This article explains compilation of a virtual union catalogue for Sri Lankan University Libraries. Intention of this project is to facilitate easy access to bibliographic information of individual university libraries. It was developed using PHP, JavaScript and searchable in all key bibliographical access points such as title, author, Subject, publisher, ISBN, Series, Class Number and subject heading.

Currently university libraries of Ruhuna, Rajarata, Wayamba, and South Eastern are contributing to SLUCat.

The system gives the facilities to search in all important fields (title, author, subject, publisher, ISBN, series, Class Number and subject heading), to display newly arrived books in connected Libraries, to view records statistics of each library, etc.

Keywords: *Union Catalogue, Distributed Catalog, SLUCat, OPAC*

Introduction

Libraries are the focus of the academic and research activities of any educational system; however libraries are always in need of recurrent expenditure to maintain even the existing collections and services offered to its users. Libraries, in developing countries like Sri Lanka, have been facing the heat of shrinking budgets and escalating prices for scholarly information (Hettiarachchi, 2001). Due to this problem, Libraries can use resource sharing and document delivery concepts. When using resource sharing facilities, the catalogue plays an important role.

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A library catalog (or library catalogue) is a register of all bibliographic items found in a library or group of libraries, such as a network of libraries at several locations (Encyclopedia of Computer Library Cataloguing, 2008). A bibliographic item can be any information entity (e.g., books, computer files, graphics, cartographic materials, etc.), that is considered library material (e.g., a single novel in an anthology), or a group of library materials (e.g., a trilogy), or linked from the catalog (e.g., a webpage) as far as it is relevant to the catalog and to the users of the library (Wikipedia, Internet).

The card catalog was a familiar sight to library users for generations, but it has been effectively replaced by the online public access catalog (OPAC) (Dhawan, 1997). Some still refer to the online catalog as a "card catalog." Some libraries with OPAC access still have card catalogs on site, but these are now strictly a secondary resource and are seldom updated. Many of the libraries that have retained their physical card catalog post a sign advising the last year that the card catalog was updated. Some libraries have eliminated their card catalog in favor of the OPAC for the purpose of saving space for other use, such as additional shelving (Wikipedia, Internet).

The concept of a Union Catalogue is based on a model of co-operation between groups of libraries wishing to build a common infrastructure. Although library catalogs typically reflect the holdings of a single library, they can also contain the holdings of a group or consortium of libraries. These systems, known as union catalogs (Encyclopedia of Information and Library Science, 1993), are usually designed to aid the borrowing of books and other materials among the member institutions via interlibrary loan (Karen Coyle, 2000). The largest such union catalog is WorldCat, which includes the holdings of over 10,000 libraries worldwide (WorldCat, Internet).

WorldCat is a union catalog which itemizes the collections of 71,000 libraries in 112 countries which participate in the Online Computer Library Center (OCLC) global cooperative. It is built and maintained collectively by the participating libraries (WorldCat, Internet).

Union catalogues have always been a very useful tool for ILL and document delivery. They provide "one-stop shopping," to use a current term, simultaneous access to plural collections, whether the collections be physical, virtual or both. It is important to remember that union catalogues need not only be a "tool" in the sense of being used to implement ILL and document delivery: they can also serve to formulate document delivery requests, and often do (Srinivas, Internet). If it is a library's aim for its document delivery service is to be used as fully as resources permit, then one important means for such utilization is the provision of public access to

the union catalogue, so that not only library staff but also end-users can identify all the more readily potentially valuable interlibrary loans and other interlibrary transactions.

There are several ways to design a union catalogue. The traditional way is to establish a centralized database into which records may be contributed either directly (create records in the central database) or indirectly (local catalogue first, then upload to union catalogue), or both. There is now an alternative, namely, to establish a *distributed* union catalogue. In this model, the local catalogues are linked through their respective servers; client searches each catalogue in turn, creating "on the fly" a virtual union catalogue. The distributed union catalogue has become a popular concept in some library circles in recent years. In some situations, libraries are more likely to participate in the establishment of such catalogues, since the traditional scheme involving a central database can prove a major inconvenience: the library's cataloguing workflow may be hampered by the need to feed records into the union catalogue (Hider, Internet).

History

Library catalogs originated as manuscript lists, arranged by format (folio, quarto, etc.) or in a rough alphabetical arrangement by author. Printed catalogs, sometimes called *dictionary catalogs* enabled scholars outside a library to gain an idea of its contents. These would sometimes be interleaved with blank leaves on which additions could be recorded, or bound as *guardbooks* in which slips of paper were bound in for new entries. Slips could also be kept loose in cardboard or tin boxes, stored on shelves. The first card_catalogs appeared in the nineteenth century, enabling much more flexibility, and towards the end of the twentieth century the OPAC was developed (see below).

- c. 800: Library catalogues are introduced in the House of Wisdom and other medieval Islamic libraries where books are organized into specific genres and categories.
- 1595: *Nomenclator* of Leiden University Library appears, the first printed catalog of an institutional library.
- 1674: Thomas Hyde's catalog for the Bodleian Library.

More about the early history of library catalogs has been collected in 1956 by Strout. Author catalog: a formal catalog, sorted alphabetically according to the authors' or editors' names of the entries. Title catalog: a formal catalog, sorted alphabetically according to the title of the entries.

Dictionary catalog: a catalog in which all entries (author, title, subject, series) are interfiled in a single alphabetical order. This was the primary form of card catalog in the Anglo-American world just prior to the introduction of the computer-based catalog. Keyword catalog: a subject catalog, sorted alphabetically according to some system of keywords. Mixed alphabetic catalog forms: sometimes, one finds a mixed author / title, or an author / title / keyword catalog. Systematic catalog: a subject catalog, sorted according to some systematic subdivision of subjects. Classified catalog is an arrangement with class numbers. Shelf list catalog: a formal catalog with entries sorted in the same order as bibliographic items are shelved. This catalog may also serve as the primary inventory for the library (Wikipedia, Internet).

Early Online Catalogs

Although a handful of experimental systems existed as early as the 1960s, the first online library system access catalog was developed in 1978 by Alicia Paige, a librarian from the Boston area who started up a computer engineering company to market them The first large-scale online catalogs were developed at Ohio State University in 1975 and the Dallas Public Library in 1978 (Online public access catalog, Internet).

These and other early online catalog systems tended to closely reflect the card catalogs that they were intended to replace. Using a dedicated terminal or telnet client, users could search a handful of pre-coordinate indexes and browse the resulting display in much the same way they had previously navigated the card catalog (Wikipedia, Internet).

Throughout the 1980s, the number and sophistication of online catalogs grew. The first commercial systems appeared, and would by the end of the decade largely replace home-grown systems. Library catalogs began providing improved search mechanisms, such as basic keyword searching, as well as ancillary functions, such as the ability to place holds on items that had been checked-out (Dhawan, 1997).

At the same time, libraries began to develop applications to automate the purchase, cataloging, and circulation of books and other library materials. These applications, collectively known as an integrated library system (ILS) or library management system, often include a library catalog module as the public interface to the system's inventory. Most library catalogs, then, are closely tied to their underlying ILS system (Rao, 1992).

Background of the Study

As a by product, union catalogues were the centre for inter-library loans for the privileged few and were also the base for some cooperative collection management. National Library of Sri Lanka started the Union Catalogue system to conduct the Interlibrary Loan System and Document Delivery Services. At the beginning, they started this service using card catalogues. Currently, they have converted this card catalogue into online system by using ALICE for Windows software (National Library and Documentation Centre, Internet). The workflow in National Library Union Catalogue involves the following steps:

- **Step 1**. The data from universities are exported into the National Library as ISIS format using floppy diskette or CD. While importing the data it searches for duplicate records and creates the authentic records.
- **Step 2**. Editing of specified fields. After one time manual editing in CDS-ISIS software, National Library also revises the few fields which are important to be checked before giving access to the user-name of the publisher, publication place, year of publication and edition of the publication. The fields have been managed as a single string (eliminating space and a, an and the) and spelling mistakes or any typographical error is avoided in these four basic fields – author, title, place, publisher. If a duplicate title occurs then the software selects the record that contains the maximum number of fields as a master record.
- **Step 3**. The software matches the above fields with the union database and eliminates duplicate records after adding the record accession number, the code number of the university and the library code and merges this information with the authenticated record or master record for the same title. This step is also known as the de-duplication checkout step.
- **Step 4**. The final record is added to the union catalogue.

This system was not updated in real times because libraries did not send their bibliographical data on time. And also the data should be sent in ISIS compatible format. Some libraries faced difficulties when trying to convert their bibliographical information into ISIS compatible format because their databases were in different format (eg. MySql, Oracle).

National Science Foundation also compiled another Union Catalogue for the Science and Technology Libraries in Sri Lanka. They also started this service using card catalogues. At this moment, they have converted this

card catalogue into online system by using Web-ISIS software .This system is using the same technique as National Library to upload data to the system (National Science Foundation, Internet).

Sri Lanka Council for Agricultural Research Institute (CARP) compiles a Union Catalogue by collecting bibliographical data from the Agricultural Libraries in Sri Lanka. They also started this service using paper-based catalogue but now they have converted this paper-based catalogue into online system by using Web-ISIS software, also using the same technique as National Library to upload data to the system (Sri Lanka Council for Agricultural Research Policy, Internet).

As given in the website of the University Grant Commission, there are 15 universities in Sri Lanka and all of them have good libraries (University Grant Commission-Sri Lanka, Internet). Only 11 university libraries have web-based online public access catalogue. University library users can borrow books from any university in Sri Lanka using Interlibrary Loan System and Document Delivery Service. Yet, there is no union catalogue for university libraries in Sri Lanka. Therefore, library users should visit separate Library web based online public access catalogue when they want to search books from university libraries.

Problem Statement

Sri Lankan University Libraries are maintaining their own web-based Online Public Access Catalogue (OPAC). There is no one interface to search books from all OPACs in Sri Lankan university libraries. According to the Dr. S. R. Ranganathan's law, this causes waste of time of the reader (Ranganathan, 1989).

Objectives of the Study

- Efficiently and effectively Resource sharing between the University libraries
- Central access point for users
- Platform for service co-operation, such as interlibrary loan
- Platform for agreement of bibliographic standards
- Efficient management

Methodology

The team has adopted the latest tools for the development of a new retrieval interface and system to retrieve data from the *University Library* Catalogues. The expert team has decided to use HTML and PHP as a basic programming language and MySql as the database server.

HTML or "Hyper Text Markup Language" refers to a system for communicating to a Web browser how the contents of a page will be displayed. HyperText is a concept that goes back to the mid-1940s when Vannevar Bush1 envisioned a system for linking together concepts within and among documents. A markup language includes text and information about how the text should be displayed (VanSlyke, Internet).

PHP is one of the projects of the Apache Software Foundation (The Apache Software Foundation, Internet). PHP (recursive acronym for "Hypertext Preprocessor") is free and offered under an open source license. This means that you can use it as you wish. PHP is use for creating dynamic web pages. Its presence is completely transparent to the end user. A web page containing PHP code is "preprocessed" by the PHP engine, called an interpreter, and the results of this processing are passed back to the web server and on to the visitor's web browser. As only the results of the PHP processing are sent to the browser, the code that generated them remains hidden, and is therefore much more secure. This kind of pre-processing is called server-side scripting (Green, Internet).

MySQL is a powerful database management system. Many of the applications that a Web developer wants to use can be made easier by the use of a standardized database to store, organize, and access information. MySQL is an Open Source (GPL) Standard Query Language (SQL) database that is fast, reliable, secure, easy to use, can run on many operating systems, technical support is widely available, and suitable for applications of any size (mysql, Internet).

University of Ruhuna Library is managing a central hub for maintaining union catalogue system and the databases are maintained by the individual university libraries. Therefore, maintaining bibliographical information for union catalogue is not necessary.

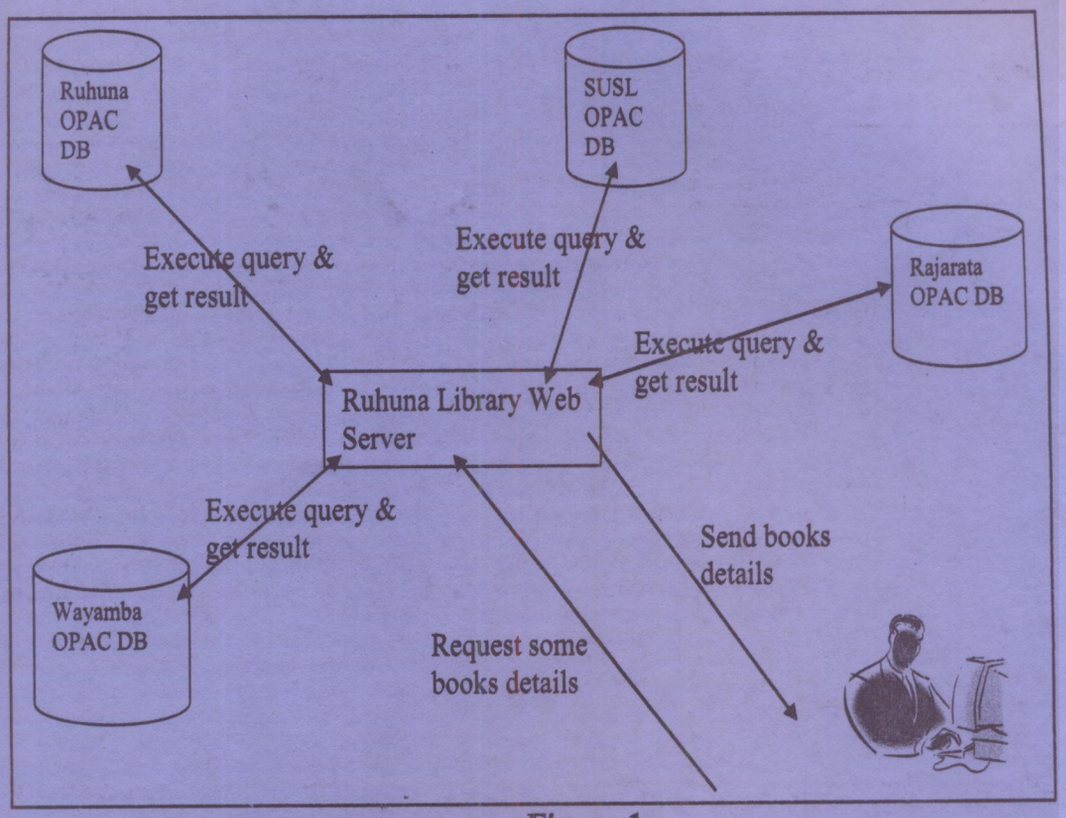

Figure 1

Observations

The SLUCat system has many features. Some of them are listed below:

- Displaying newly arrived books.
- Downloading of searched records according to library standards (copy cataloguing).
- Searching in all important fields (title, author, Subject, publisher, ISBN, Series, Class Number and subject heading).
- Join as a member.
- Generating an ILL request form from the web.
- Displaying the location (name of universities) of searched records.
- Efficiency in the search term with user friendly help messages.
- Provision for individual library OPAC search.
- Navigation of records with various display formats.
- Records statistics of each library.
- Help message.

Screen shots of Web version of Union Catalog

Home Page (URL: http://www.lib.ruh.ac.lk/UnionOPAC/)

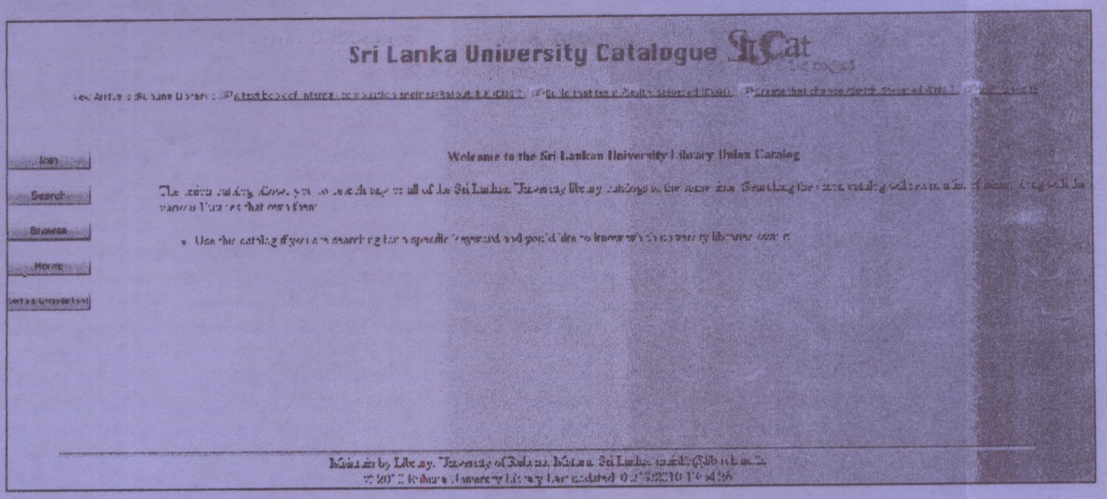

Figure 2

Search for Records

Searching is the process of retrieving bibliographic records from a university libraries databases. As shown in the following figure, databases can be searched from the chosen site. All the databases are linked from the main web page. Bibliographic information about an item is entered in a search statement at an appropriate place and sent to the system. The system matches this information with connected databases in the union catalogue and displays the search results.

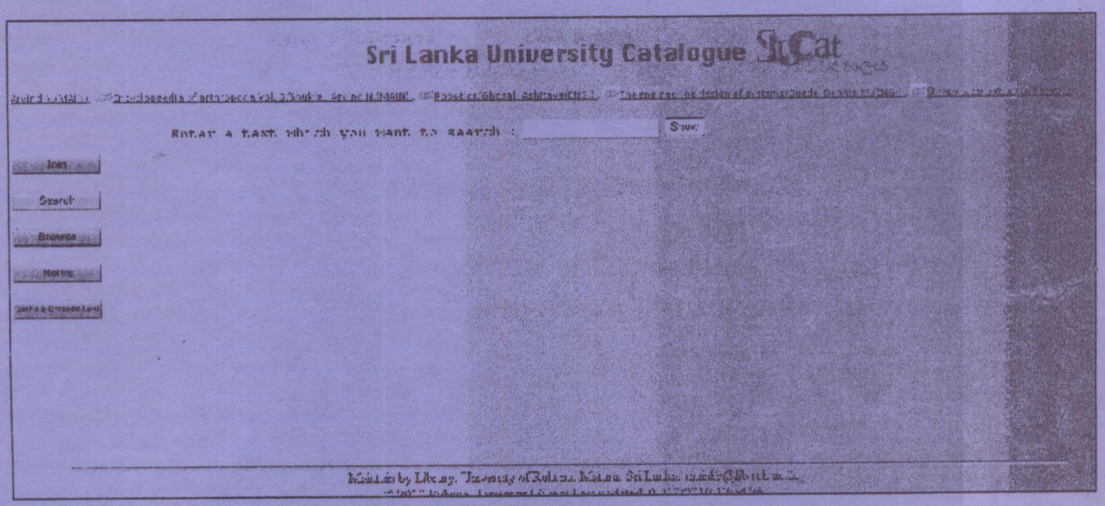

Figure 3

Display Records

The system will display a list of records statistics of each library and the results with default display fields and link the title to location information. By selecting the title, the system will display the detailed information about the title and its availability. Clicking on the location information, the system will display detailed information of the contact person with the full address.

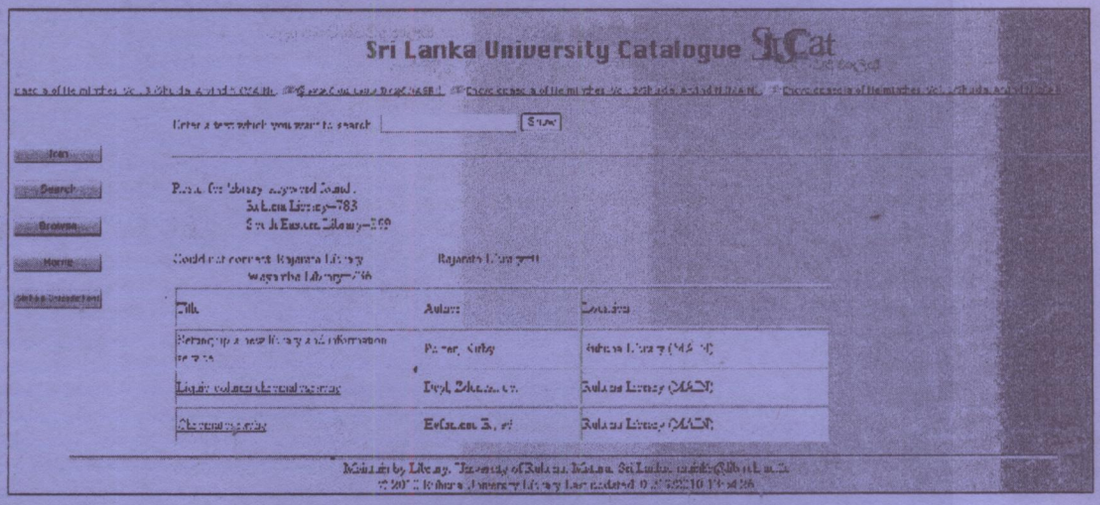

Figure 3

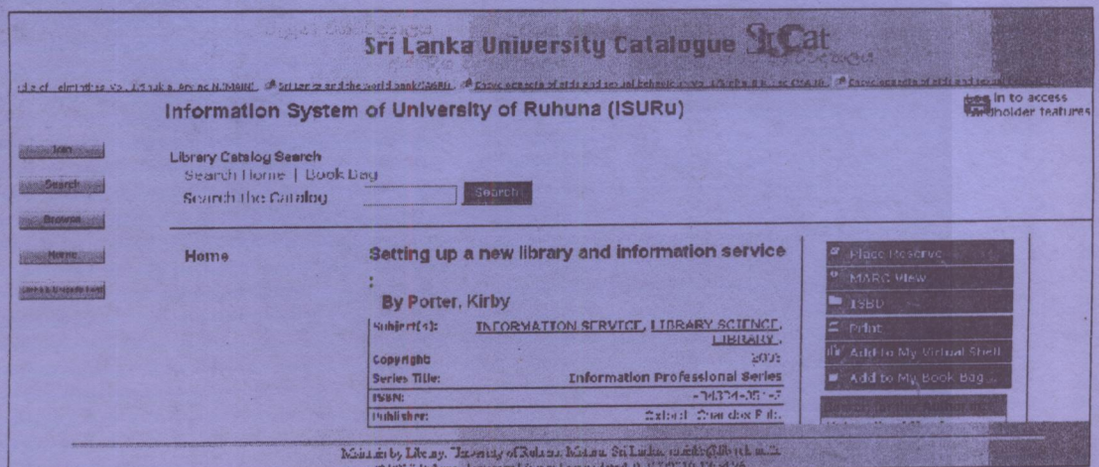

Figure 4

Browse for Records

Browsing is the process of retrieving bibliographic records from one university library databases. As shown in the following figure, databases

can be searched from the chosen site. The system matches this information in the relevant catalogue and displays the search results.

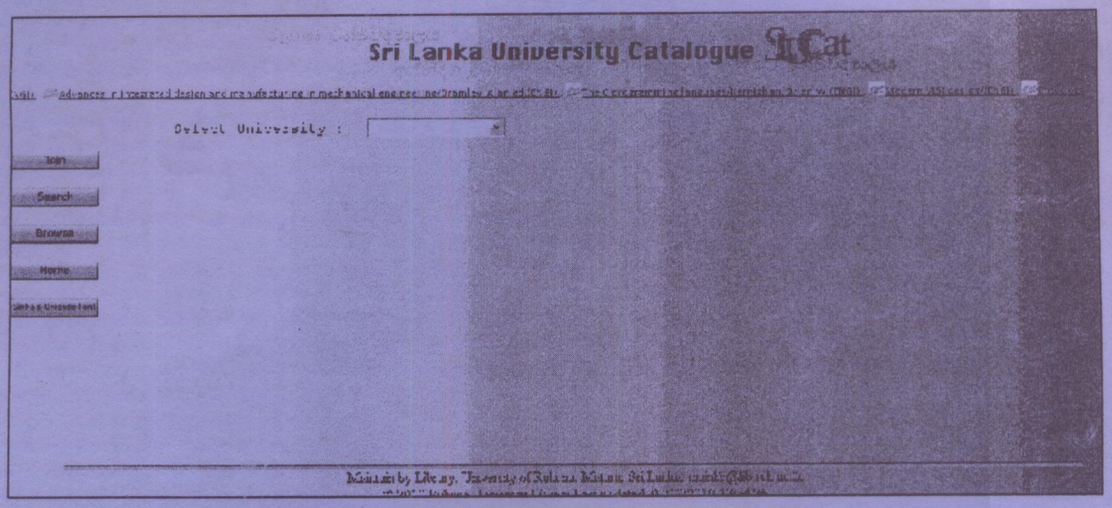

Figure 5

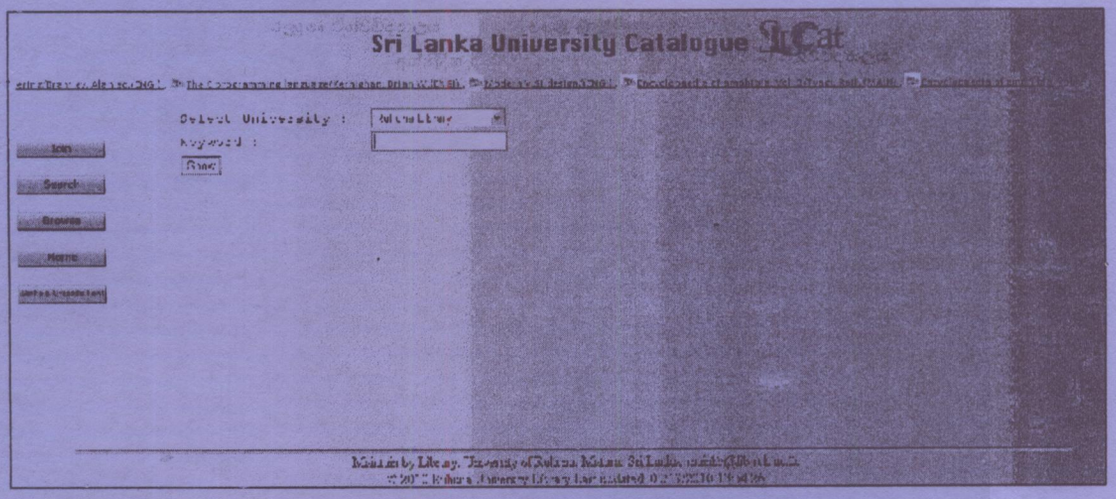

Figure 6

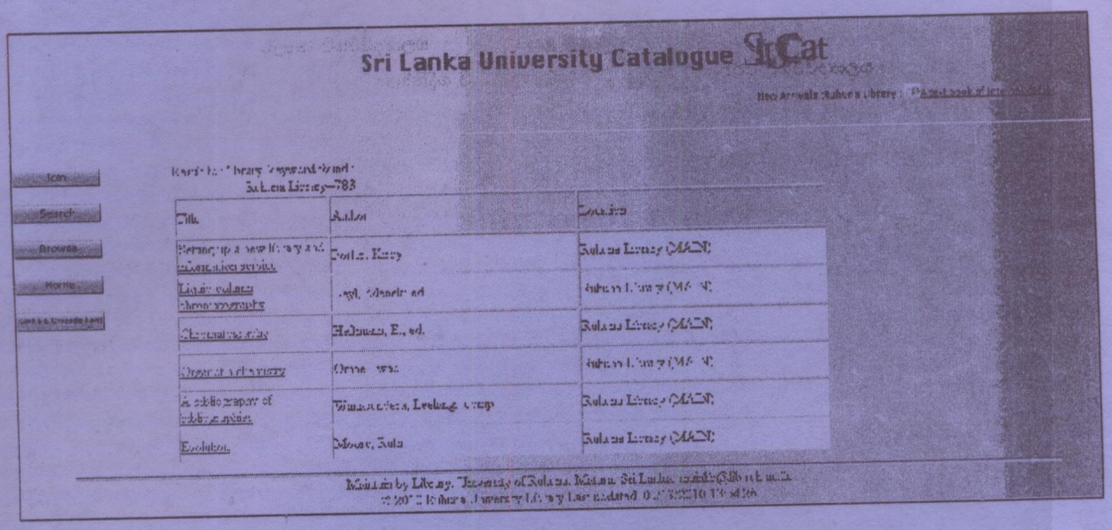

Figure 7

Save or Download File

The system has a provision to save files in various formats. These saved records can be loaded onto a local system, which is known as copy cataloguing.

Request for Document Supply

The union catalogue search enables the user to send a document supply request from the web. Thus to improve user satisfaction and library services, libraries can create a web based document supply service; in the case of copies they can send these direct to the end user. After performing the search, users can find the location and send an email for a document supply request to the librarian.

Limitations

Because of different software being used in Sri Lankan University Libraries and because of the different database management systems, the rendering of bibliographic information with items in their respective fields such as author, publisher, series, and edition etc. lack consistency. And also because of some universities use commercial software systems for their OPAC, these systems do not allow to retrieve their bibliographic information from outside. Therefore, the team decided to connect libraries that use MySql databases (Ruhuna, Rajarata, Wayamba, and South Eastern) as a first step implementation.

Conclusion

Union catalogues have evolved to perform a central role between libraries' local systems and the Internet at large.

Results of this project is useful to both users and the participating libraries to know about the availability of a materials, in the particular library and its collection details, by searching through the title of the material or by putting the keyword of the subject. For the union catalogue of Sri Lankan University Libraries to serve as a gateway to library holdings, it must contain not only the locations of documents but also information of ability of a particular library to provide a particular service in the range from the classical ILL to the most advanced EDD (Electronic Document Delivery), it allows to request for the delivery of documents (copies of materials or book chapters) electronically in PDF format. Interlibrary loans (ILL) are transactions in which library materials are made available by one library to another. For the purpose of this, they also include the provision of copies as substitutes for loans of the original materials within applicable copyright restrictions. Interlibrary loans are transactions solely between libraries and not between libraries and individual patrons. Document Delivery Service (DDS) is one of the most important services in the library.

The Future Development

In future our team hopes to find the ways to add the library holdings of the remaining university libraries and other academic libraries in Sri Lanka to the union catalogue system.

Union catalogue hopes to extend its membership to other libraries in future. Union Catalogue should provide access to major resource centers and document suppliers via on-line requests. Conventional methods of building library collections should change, establishing regional document and information service centres should be considered as its novel objective each individual library and the collection of document should be in accordance with its specialized subjects, key disciplines. The better way for this is to co-operatively establish a networking system for resource sharing among libraries through joint acquisition and cataloguing, as well as inter library loan.

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