Implementation of Integrated Library System: The Case of Academic Libraries in Ethiopia

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Abstract

This paper aims to implement an Integrated Library System (ILS) and digitization for academic libraries in Ethiopia to improve quality of education. ILS is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed. Integrated refers to the ability of the system to manage library operations with separate modules which interact and share a central database of records. Academic libraries need ILS to improve the services they provide to their patrons to avoid traditional models of performing functions, which are the major problems that hinder efficient services. ILS helps to achieve maximum results with minimum input.

Quantitative and qualitative approach is adopted in the research and it was guided by five objectives and three research questions. The instruments used to generate data are interview and questionnaire and the data generated was analyzed using frequency tables and percentages. Six chief librarians and 30 students were randomly selected from 6 academic libraries.

It was found that 50% of the academic libraries are fully automated and 33.3% have taken initiatives for the creation of digitization of their libraries and 80% of the users of the implemented Koha ILS are satisfied.

Keywords: Integrated Library System; Digitization; Resource Sharing and Academic Libraries

1. Introduction

Libraries in developing countries have an important role to play in the development and maintenance of a democratic society. They provide the conditions by which people achieve free access to information and knowledge. They provide opportunities to participate actively in the country's further development into a democratic society. The strengthening of libraries in developing countries forms the most efficient weapon in the struggle against the digital divide. Libraries can provide access to global information via Internet. at all levels. They are tools for people to obtain better living conditions. Reading print and digital documents, whether for business or pleasure, is fundamental for any society in the modern world. It is the foundation of democracy, capacity building, and modernization. It is an important method for development as it offers visions and dreams, learning, skills and a creative impetus to the individual. In order to protect the world against ignorance, disease and poverty, access to information via libraries is essential [1].

The problem of information storage and retrieval has become progressively more serious in recent years, especially in the areas of technology and science, where the volume of data and information is increasing at an unprecedented, nearly exponential rate. Keeping in view the tremendous flow of information, to organize information and to disseminate in systematic way automation and digitization are the answers. Computer aided system is more convenient, more flexible and more comprehensive and in the long run more economical.

According to Waters [2] "Library automation is beneficial to students, librarians, faculty members, and administrators for various reasons. The library is the resource center that supports and enhances the curriculum for the college. Students can expand their

horizons more effectively with an automated library. Instructors can reinforce their instruction with assignments that guide students to research opportunities within the library".

The term library automation was generally used in the past for housekeeping operations of a library. Today it has expanded its scope and includes all those technologies which libraries and information centers use for collection, processing, storage, retrieval, dissemination, and transmission of all types of information.

We observed that the process of inquiring books and retrieving borrowed and returned books were done manually in academic libraries. Patrons spend more time in every process of retrieval and circulation of books. The activities of a library (cataloguing, circulation, acquisition, etc.) are manual and it is time consuming. Thus, it is interesting to study ILS candidate models to automate the activities to substantially improve satisfaction of the staff and users.

The research is guided by the following research questions:

- What are the problems encountered in implementing library automation?
- Why the need for an integrated library system for academic library automation?
- What are the possible solutions to these problems?

The hypothesis of this research is that the open source Koha integrated library system is the best solution for academic libraries in Ethiopia.

2. Related Work

An ILS usually comprises of a relational database, software to interact with that database, and two graphical user interfaces (one for patrons, one for staff) [3]. Most Integrated Library Systems separate software functions into discrete programs called modules, each of them integrated with a unified interface. Examples of modules might include:

- Acquisitions (ordering, receiving, and invoicing),
- Cataloging (classifying and indexing),
- Circulation (lending to patrons and receiving them back),
- Serials (tracking magazine and newspaper holdings), and
- The OPAC (public interface for users).

Each patron and item has a unique ID in the database that allows the ILS to track its activity.

Academic libraries should have the best software for fulfilling the entire activity and to satisfy users. Besides storage and retrieval, there are also other housekeeping functions. Computerization of operation requires procurement of hardware and software. The first step towards this will be the automation of individual libraries and information centers and for this each organization has to follow and maintain certain standards. Several options are available for acquiring or upgrading a library integrated system [4]:

1. Buy or license a commercial software package,
2. Join or make use of open source software package, and
3. Develop own system.

A software package used for library services should have at least the following qualities [5]: Database Management System (DBMS) features, high level integration, data entry facility, data updating/editing, search/inquiries, report/display/ print, menu driven and user friendly, compatibility, reputation of the sponsoring and scope for local variation.

Software is the program that runs on a computer to produce the required results. "A computer without software is similar to a man without his brain, or a library with neither books nor librarians" [5]. Therefore, in principle, the selection of software comes before hardware. Hence, selection of a suitable software to use within an academic library is critical for overall success of a project. The key

issues to consider in selecting software include [6]: cost, availability of technical support, collaborative tools, ease of use, functionality, security, clarity, interoperability, scalability, integration and file-sharing features and administrator tools. It is also emphasized that issues such as hardware connections, right with respect to software, history of the supplier, possibility of preview or demonstration, pricing structure, level of sophistication, support issues, references sites, parameterization, teaching aids, system administration, and needs for documentation should be critically examined when selecting a software.

Based on the analyses Koha passed all the required criteria. It is a very mature ILS system with a very strong user community and presents similar features like commercial systems. The adoption of Koha represents significant license cost saving and the possibility to adapt the system to institutional needs.

3. The Proposed Solution

The objective of the paper is to select and implement integrated library system and digitization in academic libraries in Ethiopia to improve the services they provide for quality education. To achieve the stated objectives, we proposes Koha ILS.

Koha is integrated with all the modules of the library management system. In administration module there is an option to generate barcodes, import and export BD (Bibliographic Descriptions) records, MARC (Machine readable catalog) Structure, Z39.50 servers and many more options. Statistics can be generated in Accounts and Reports module to see how the system will work effectively. The system consists of two interfaces which comprise the modules as shown in Figure 1 [10].
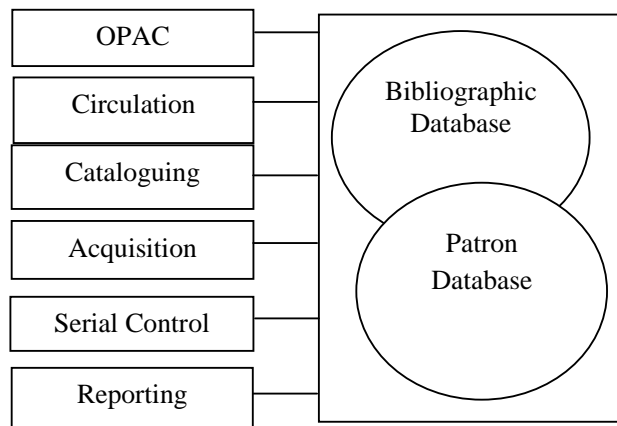

Figure 1: Koha Modules

Apache web server is required to serve Koha on the Web. The data entered in Koha are stored in MYSQL database backend with cataloguing data stored in MARC and accessible via Z39.50. Koha uses a dual database design that utilizes the strengths of the two major industry-standard database types (text-based and RDBMS). This design feature ensures that Koha is scalable enough to meet the transaction load of any library, no matter what the size. Perl is the programming language used in Koha. It is built using library standards and protocols that ensure interoperability between Koha and other systems and technologies, while supporting existing workflows and tools. The user interface is configurable and adaptable and has been translated into many languages. Koha's OPAC, circ, management and self-checkout interfaces are all based on standards-compliant Web technologies – XHTML, CSS and Javascript – making Koha a truly platform-independent solution. It is web-based ILS and the integration of the powerful Zebra indexing engine supports the software to become a viable and scalable solution and increased the speed of searches for libraries of all kinds [7].

The implemented prototype creates the complete single database for the library, collection search is made simple through OPAC, easy to handle circulation services (check-out and check-in), made effective control over the collection and resource sharing is simplified and data entry can be done using Z39.50 (import bibliographic description).

4. Methodology

In the introductory part of this research project, several reasons for computerizing the library activities were given. The major factor for computerization as compared with manual processing is the considerable saving in effort, time and resource. Basically, research is described as an active diligent and systematic process of inquiry aimed at discovering, interpreting and revising facts. The term research is also used to describe a collection of information about a particular subject. So, the application of procedure for research is known to be research methodology. One can also define research as a scientific and systematic search for pertinent information on a specific topic. The various functions and routines of research project section of HiLCoE Library operations have been studied and observed. Accordingly, the appropriate steps were followed to create an automated library system.

Research design is a plan, structure and strategy of investigation conceived so as to obtain answer to research questions. This paper used mainly two aspects, qualitative and quantitative. This design of study helps to improve an evaluation by ensuring that the limitations of one type of data are balanced by the strengths of another which ensure that understanding is improved by integrating different ways of knowing. The outline interviews for chief librarians and focus group discussion for student users are geared to collect both quantitative and qualitative data.

We first consulted secondary literature to find out what had been written on ILS and problems encountered in implementing it, (conducted between April and July 2016). Relevant primary data has been collected using interviews with librarians, focus group discussion with students and observation of the libraries.

The data from interview and focus group discussion was edited, coded, tabulated and classified for analysis. The data from both respondents was analyzed. The results of the analyzed data were presented in the different form of tabulation. Qualitative data has been analyzed descriptively. Both qualitative and quantitative data collected during the field work and obtained from other secondary sources has been used to interpret the data. The data has been broadly categorized according to the research objectives. Collected data were analyzed and interpreted in a systematic way, mainly characterizing in various headings and sub-headings for the fulfillment of the research goal.

Percentage and thematic interpretation of collected data is applied and finally by way of conclusion, the major findings of the project research are included and based on it, recommendations and future work are forwarded.

5. Discussion

Based on the findings we selected Koha ILS which is an open source software to automate academic libraries in Ethiopia and implement it as a case study among the three options available: commercial ILS, open source ILS, and from scratch.

It is described in [8] that open source ILSs were more cost-effective than commercial ILSs. Libraries using open source ILSs choose them mainly for affordability, and they cost less than commercial ILSs. Although users of open source ILSs experience difficulties with installation and complete documentation, they were modestly more satisfied than users of commercial ILSs.

ILSs are multifunctional and adaptable software applications that allow libraries to manage, catalog and circulate their materials to patrons. In choosing ILS software, libraries must base their decision not only on the performance and efficiency of the system, but also on its fundamental flexibility to readily adapt to the future demands and needs of their patrons [6]. In the meantime, libraries are showing a growing interest in open source software solutions due to dissatisfaction with commercial library systems and the restriction of budget.

In [9] an integrated library system is described as "a library system that uses a common machine-readable database and has two or more subsystems operational and accessible online for increased efficiency." ILS provides academic libraries with efficient and user-friendly tools and workflow support they need to meet the increasing requirements of the library patrons. It also enables deliverance of excellent services as well as an enhanced patron experience.

For library staff, ILSs are very welcome and was approved by the users of our implementation (the librarians and the students). This type of application improves the efficiency of all the operations in a library. This kind of software has many advantages because it permits not only the control of library operations such as loans and requests, but it provides also an excellent set of tools to manage books and borrowers. The usage of an ILS requires only a single time entry of data (bibliographic and users).

6. Conclusion

There are many challenges ahead which should be solved in academic libraries in Ethiopia to attain quality education. The status of automation in academic libraries seen in Addis Ababa is expected to be similar throughout Ethiopia. Libraries, librarians, and academic library administrations must initiate automation and digitization of academic libraries in order to provide effective and efficient services to users and improve quality of education by facilitating resource sharing among them.

Library and Information Science professionals should keep eyes on development in order to choose appropriate technology depending upon the institution's needs. Many libraries worldwide are using open source software for managing their library systems more economically and effectively. Librarians and programmers should work together in order to implement open source integrated library systems and at the same time, library professionals are also required to acquire new skills for developing and managing a library using open source Library Management System (LMS). For taking benefit from open source software additional technology, education, and training of the professionals is required.

The academic library is an important component of any educational institution, which is the hub of the teaching and learning activities where students, instructors and researchers can explore the vast resources of information. In traditional libraries, patrons have to spend more time for searching a small piece of information and for that they have to depend mainly on the library professional or library staff. But in automated and digitized academic libraries, information retrieval is easy, which saves the time of the end users, and library professionals also and at the same time avoid duplication of work and make the library service smooth and effective.

Our study confirmed that borrowing time was short and the OPAC has made library resources accessible from different angles. Automation and digitization enables easy access; that is users are able to search for materials within the library and from remote locations via search items such as author, title, subject, call number and keyword and allows staff to better serve users and facilitate a multitude of tasks.

The advent of computers and other information technologies has brought new era in library and information services. The use of these new technologies has tackled the century long problems of libraries and improved the quality and diversity of services. In the developed countries all its functional areas are automated and automation turned academic libraries into upgraded user friendliness. Some of the academic libraries in Ethiopia began automating their activities recently.

From proper analysis and evaluation of Koha ILS it can be safely concluded that the system is an efficient, usable and reliable LMS. The system proved to give benefits to users and librarians in terms of efficiency in the usage of a library system.

In this period of digitization, however, an effective information service is unthinkable without digital library. Due to the increasing cost of printing most of the paper based information sources are appearing in converted digital format and accessed at the time of need directly from a computer networked with a digital library.

Resource sharing is one of the distinct features of academic libraries and this is facilitated by automation and digitization of a library which ultimately helps to achieve maximum results with minimum input.

Digital technology has raised the hopes and expectations of the academic community to face the challenges of not only bridging the gap between the information rich and the information poor in the country, but also uplifting the level of development in all its different facets. Major responsibility now rests on decision makers, technological experts, librarians, educationists, the publishing industry as well as the local institutions to play their respective roles in bringing digital information in need-based comprehensible form and language to the diverse clientele of the academic community. No academic library can work in isolation to reach the expected goal in the right manner. Library professionals must upgrade their skills in order to meet the growing expectations of users from libraries.

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