Status and Prospects of Library Automation in Sri Lankan Universities: A Perspective

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Abstract:

University libraries in Sri Lanka are gradually transforming their functions and services into a status to fit the current electronic era. However, due to the financial constraints, these libraries are deploying automation at various forms and levels, such as partial automation to fully automated, RFID-assisted setups. In this regards, this study surveys the extent of library automation in the university libraries that fall into the governance of UGC, Sri Lanka. The findings reveal that at the juncture of library automation with commercial software, many libraries experiment the potentiality of open-source softwares, which are, nevertheless, varying in their origin, application and integrity. Hence, the authors insist upon and propose to enforce guidelines to execute OSSs in such a manner to connect all bibliographic databases into a cooperative OPAC.

Key words: Library Automation, Integrated Library Systems, Proprietary Software, Open-Source Software, University Libraries, Sri Lanka

Abbreviations: FOSS – Free/ Open Source Software, UGC – University Grants Commission, NSF – National Science Foundation, IUCL – Inter University Committee on Librarians, ILS – Integrated

Library System, NARESA – Natural Resources, Energy and Science Authority of Sri Lanka.

1. Introduction

With emerging technological advancements, life trend of the world is ever changing with more sophisticated tools to perform day to day activities faster and easier. Libraries are no exception to this technological convergence that has brought about an enormous impact on information management and services. Many libraries in the world, especially the developed countries, have automated their functions and expediting into new realms to render services online in virtual environments. This has been yet a challenge to libraries in third world, where financial constraints play obstructive role.

In definition, library automation generally refers to the application of computers and networking technologies to serve the needs of the library and its users. Encyclopedia of Library and Information Sciences defines it as 'use of automatic and semi-automatic data processing machines to perform traditional library activities such as acquisitions, serial control, cataloguing, and circulation and also to library services and networking' (Kent, 1997). Therefore, library automation implies to a high degree of computerization of various routines and tasks that are otherwise to be performed by human beings.

Libraries need to be automated to keep pace with the latest developments taking place in this electronic era. And, it also facilitates accuracy, flexibility and reliability in the library management and services; meanwhile, it reduces the repetitive work, saves time, increases efficiency in technical processing of library materials, and improves the efficiency of library administration (Sangeeta & Sarika 2008). As the user population in almost every university is ever increasing, the computerization of the library management is becoming inevitable.

Over the past two decades, academic libraries have undergone considerable changes in bibliographic utilities, online catalogs, automated circulation systems, and other new technologies and services. These changes have imposed substantial costs for libraries in the time of budgetary constraints, especially, in the area of telecommunications, buildings, furniture, and electronic equipment (Kacena & Carolyn 1994). After ending the war that lasted for three-decade period, the country needed to re-build almost everything that incurs dramatic demand for finance, as a result of which libraries had to face budget cuts. Nevertheless, consortium arrangement to buy integrated library system (ILS) and exploitation of open-source software (OSS) has paved great opportunities for these libraries to enjoy the automated functions.

In this regard, the university libraries in Sri Lanka are engaged at different levels of automation, where few libraries have completed their process and some are still in the initial level. The authors have carried out a survey to study the number of university libraries that are automated, level of automation, type of software used, and auxiliary automation activities. Therefore, following are the presentations on the current status, prospects, challenges and obstacles faced by the university libraries in the process of library automation.

2. Brief History of Library Automation in Sri Lanka

In order to be precise with the history of library automation in Sri Lanka, the introduction of computers into the country should be addressed. It was in 1964 when the first ever computer in Sri Lanka was installed. With that start, there were sixty-five (65) computers operating in the country by 1981, of which seventeen (17) were in institutions with organized libraries. Nevertheless, according to the statistics, computers were not utilized for library operations until the end of 1982

(Gihan & Amaraweera 2002).

It was National Science Foundation (NSF), which was formerly known as Natural Resources, Energy and Science Authority of Sri Lanka (NARESA), that had obtained a computer for the use of the Sri Lanka Scientific and Technical Information Centre (SLSTIC) in 1983, in the path of embarking the library automation in Sri Lankan libraries. Since it was a remarkable event in the library automation history, this was the first computer set up in a library in Sri Lanka (Yapa 1998).

It is noteworthy to mention that transformation of Sri Lanka libraries from conventional and computerized in terms of attitude of librarians and decision-making heads. In this line, Yapa (1998) points out that NSF had to undergo a long process and encounter challenges to procure that computer. It was due to the attitudinal barriers of decision makers, computer scientists, and librarians who did not support the use of computers in libraries.

Meanwhile, NARESA has profoundly contributed to the Sri Lankan library community by promoting the software package, providing training and introducing the upgrades (Wijayaratne 2005). That encouraged the library professionals and technical staff to embark on the computerization of library functions.

In 1982, UNESCO designed an integrated software package for library operations and operated under the name CDS/ISIS (Computerized Documentation System/Integrated Set of Information Systems)Ver.1.03, with which there was a rapid progress of computerization activities in libraries after the introduction of CDS/ISIS in Sri Lanka in 1987 (Yapa 1995; Gihan & Amaraweera 2002). That had been the onset of open-source software in the country.

3. Current Status of Automation of University Libraries

After the independence, University of Ceylon library was the

only university library in Sri Lanka till 1959. However, establishment of new universities commenced and they had libraries with small collections. At present, there have been seventeen (17) university libraries established in Sri Lanka (Gamage 2013). Out of this fifteen university libraries are govern by UGC. These libraries have their branches and substantial number of voracious users, for which automation is essential.

In the line of history of library automation, in 1986, for the first time, a meeting of university librarians, vice chancellors and the Chairman of University Grants Commission (UGC) was held to probe into the possibility of automating university libraries (IUCL 1987).

In the light of technological advancements and development taking place worldwide, the Inter University Committee on Librarians (IUCL) insisted upon the importance of automating university libraries and threw beam on issues such as inadequate funds to purchase computers, software, and training the staff. In 1991, UGC managed to offer one microcomputer to each of eight university libraries namely: Peradeniya, Colombo, Moratuwa, Sri Jayawardenapura, Kelaniya, Jaffna, Ruhuna and Open University (Dissanayake, 1995).

On similar line, the university library system entered the process of automation in 1991 and determined to adopt CDS/ISIS with MIBIS (Microcomputer Based Bibliographic Information Systems) data structure developed by International Development Research Centre (IDRC) for their databases (Perera 1994).

It was a remarkable decision in the history of library automation in Sri Lankan universities. In the initial phase, appropriate software or system had to be chosen, where three different softwares were selected against certain criteria, by decision-makers, they are namely: *Alice for Windows* (University of Peradeniya, University of Colombo, University of

Sri Jayawardenapura, and Open University of Sri Lanka), *LibSys* (University of Moratuwa), *Libsuite* (University of Kelaniya). The University of Ruhuna has developed its system using an open-source called *KOHA* (Wijayaratne 2005).

Later, more university libraries started automation using proprietary software, *LibSys4*, which was provided to university libraries, by UGC, Sri Lanka, on a special fund basis. Those libraries that needed a system were: Open University of Sri Lanka, Eastern University, Sri Lanka, University of Jaffna, Sabbaragamuwa University, and Rajarata University. However, declining financial allocation and complete budgetary cuts drive some of these libraries to experiment OSSs (Ramanan & Ravikumar 2013).

In Sri Lanka, until last decade, CDS/ISIS was used widely as finance was not available to acquire proprietary software. However, later on the track of automation few commercial types of software crawled into the scene. Those are LibSys, Lib Suite, and Alice for Windows. With the popularity of open-source software, KOHA, NGL, PMP have been used by university libraries to automate the functions and services. Ramanan and Ravikumar (2013) emphasize, there should be centralized stipulations and by-laws for using FOSS to regulate their usage when it comes to networking and resource-sharing.

4. Facets of Library Automation

There has been a steady and gradual transition from conventional to computerized functions and services in university libraries across the country, however, finance, human resource and patron size are the prime factors that rationalize their attempt to fully automate the library operation.

4.1 Status of Library Automation
At present all fifteen university libraries are on track to

automate their functions using ILS software. Figure 1 depicts the length of period of library automation process in the libraries since its commencement.

As shown in the Figure below, almost all the university libraries are enjoying the automation, either fully or partially. Many of them are experimenting different types of systems, both commercial and open-source, since there has not yet been any accord drawn by the UGC with respect to using software and systems.
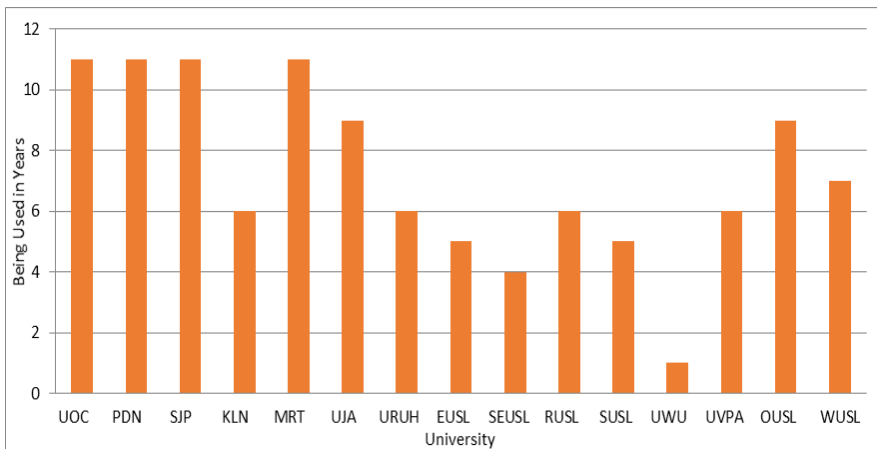

Figure 1: ILS being used by university libraries in Sri Lanka

With the introduction of different ILSs and initiation of library automation, university libraries started adopting the benefits library management systems on a slow pace as they had problems that will be addressed later in this work. Of the automated libraries, profound levels of computerization are found, such as fully-automated with RFID, automated with barcodes, partially automated, and less computerized. A considerable number of university libraries still maintain physical catalogues and operate manual circulation in parallel to automated lending services.

4.2 Sources of Fund for Automation
Figure 2 exhibits, majority of the university libraries utilized

the fund allocated by the UGC for their automation process. In addition, these libraries have received monies from special IT fund allocation, individual donors, foreign organizations and their regular annual allocation.
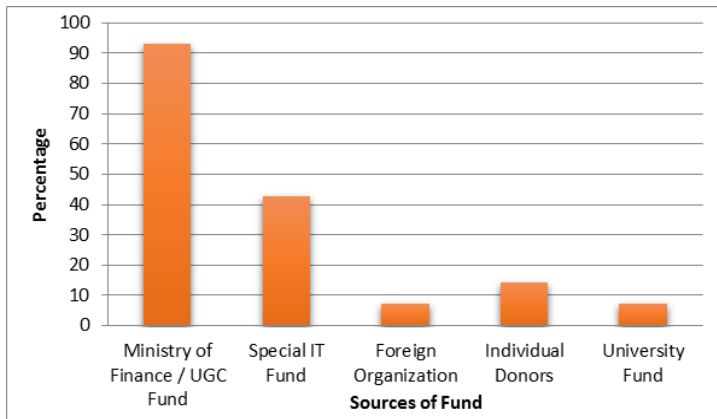

Figure 2: Sources of fund for Library Automation

As shown above in Figure 2, support to initiate library automation was granted by Ministry of Finance channeled through UGC, Sri Lanka, and from regular university funds. Meanwhile, few universities managed to have foreign sources funding their library automation project. Certain level of individual agents and organizations had extended their support in establishing university libraries' computerization processes.

4.3 Adaptation of Commercial and FOSS

University libraries in Sri Lanka first started their functions using open-source means, such as CDS/ ISIS, though its full-fledged execution was very much inconsequential compared to how few other government and private institutions exploited the free software.

On the source code and platform of CDS/ ISIS, an integrated information system was customized and named after *PURNA*. This product supported all major library operations such as acquisition, accessioning, cataloguing, article indexing,

membership registration, circulation, serials control, OPAC, current awareness, and SDI services. *PURNA* is used by more than 85 libraries in Sri Lanka, which are school, public and university libraries (Yapa 2005).

4.4 Software Used for Automation

Depending on their resource strength, university libraries have employed different types of Library Management Systems (LMS). It is observed that open-source ILS is taking up the place of proprietary systems since these libraries are striving to sustain their annual budgetary allocations.
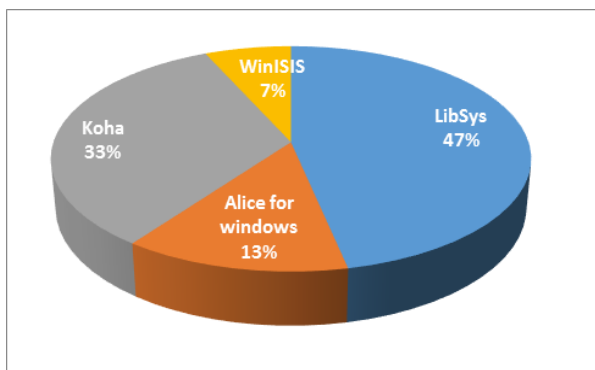

Figure 3: Usage of Different ILSs softwares

The results reveal that university libraries have utilized both commercial and open-source software (OSS) for the automation. Figure 3 shows *LibSys, Koha, Alice for windows* and W*inISIS* were the ILS softwares used in the university libraries. In the beginning most of the libraries commenced their automation process with the support of propriety softwares like *LibSys* and *Alice for windows*. However at present, *Koha (OSS)* has become famous since many libraries struggle to gain financial support from universities to maintain commercial software. It is noteworthy to mention that few university libraries are engaged at experimental level to exploit different open-source softwares that are popularly available on the market.

Both Linux and Windows Server platforms are equally utilized to run the ILSs in these libraries. Moreover, the survey identifies that all university libraries have their own server to host the system.

4.5 Automation Modules in Use

All ILS softwares used in university libraries have necessary modules to automate all the library function. However, as Figure 4 shows, not all the university libraries have utilized every available module in ILS software to automate their functions. Majority of the libraries have currently utilized ILS to perform cataloguing (93 percent), circulation (80 percent), and OPAC services (93 percent).
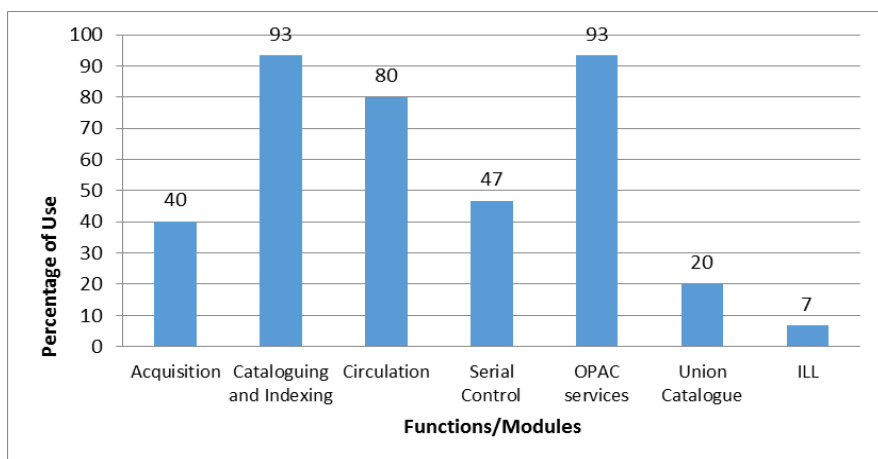

Figure 4: Modules utilized in ILS

Amongst them, 40 percent of libraries utilize acquisition, 47 percent uses serial control modules, and 20 percent of them provide union catalogue services. Very few libraries (07 percent) do offer automated inter-library lending (ILL) services to their users.

4.6 Human Resource for Automation

To be effective and successful in long run, university libraries should be equipped with essential expertise both in substance and number. In this regard, 31 per cent of responded libraries have received basic training in data entry, 26.2 per cent had trained personnel on circulation counter management, 16.7 per cent received training to handle acquisition module, and 11.9 percent of responded libraries are capable of managing their systems and/ or database. Considerable numbers of staff have obtained skills in hardware management and computer networks.
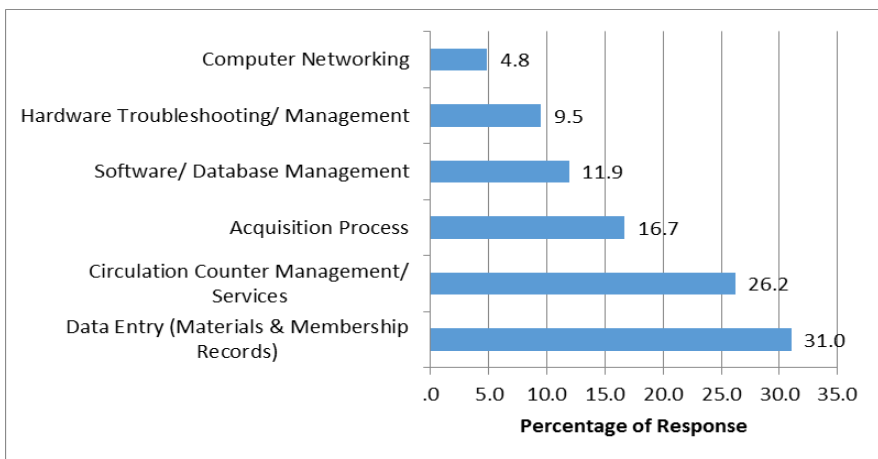

Figure 5: Areas of Training

Few libraries have appointed computer programmers *cum* system analysts, who can be utilized to manage libraries' databases, systems, and network. In addition, these libraries have employed computer application assistants who can help with data entry.

4.7 Associated Automation Activities

Though majority of the libraries surveyed are automated, they incorporated different accompanying features to such as bar-coding, RFID tags, Tattle tapes and CCTV monitoring system.

Generally, these operatives are assigned to ensure the security to the resources.

Bar-coding of materials and identity cards

Bar coding library materials is a complex process that requires discreet planning (Landau, 2001), since errors can pose irreversible issues at later points, especially with a huge collection. Once a bar code symbol is applied to a material and is linked to the database, the book will circulate through the automated system. Scanning bar codes is much faster and more accurate (http://aurorabarcode.com). More than 70 percent of university libraries have started bar-coding their collection and, are using a device to extract information optically from barcode labels both from information resources and user identity cards.

Security of materials –EM gates, CCTV and RFID

Nearly 57 percent of university libraries are engaged in manual security measures to protect their information resources from being stolen. Despite, few other libraries have installed electromagnetic (EM) security gates (14.3 percent), RFID technology (14.3 percent) and CCTV surveillance (14.3 percent). These technologies add significant improvement to the library automation process.

5. Challenges & Obstacles Faced in Automation

Though library automation has much advanced in the developed countries world over the last two-decade, it is slowly but steadily progressing in developing countries. By using open-source software, solution to the economic problems could be sought; however, there are organizational problems to be resolved. Exploitation of OSSs offers possibility to develop one's own system according to their requirements. Along with the improvement of Internet bandwidth in developing countries,

open-source software may prove useful. Nevertheless, economics may not improve, and lack of power supply is likelihood in developing countries (Hopkinson, 2009).
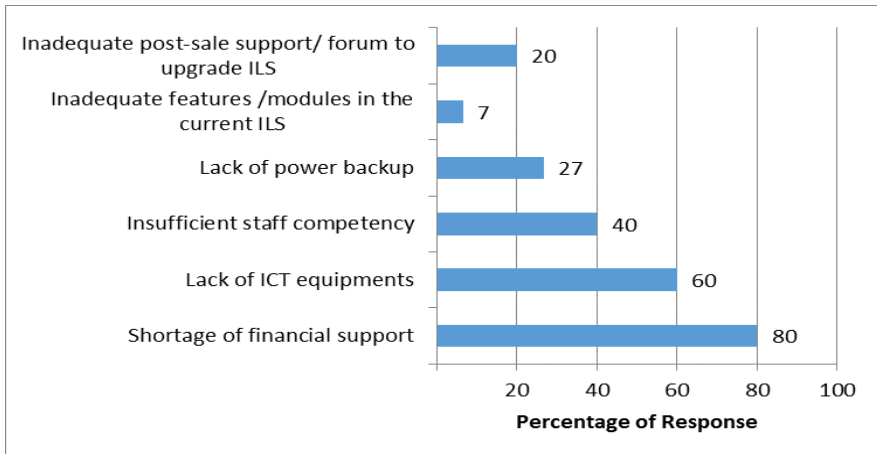
5.1 Inadequate Finance

Financial constraint is the topmost factor that presents threat to the sustainability of automation and, impedes its initiation in as many university libraries as 80 percent. In the early period of library automation, university libraries had hesitated to initiate computerization due to the unaffordable price of software, computers, servers and network equipments. This factor holds true even at present, thus university libraries in Sri Lanka, like their counterparts in other continents, are turning to exploit open-source tools to automate their functions and services.

5.2 Lack of Expertise and Commitment

To be successful and sustainable, library automation must be laterally equipped with necessary level of staff competency. The responded libraries express that their human resource is lacking experience/ expertise in the areas of database management, system troubleshoot, computer networks, and services using web 2.0 tools. These gaps are to be bridged by

offering trainings and conducting workshops. Nevertheless, there have been a number of professionals and non-academics serving their patrons with sound ICT capacity.

5.3 Precarious Power Supply

Hydropower is the main primary energy source used for electricity generation in Sri Lanka, and it contributed 12% of total energy supply. However, the absolute energy output from hydropower is predicted to remain permanent in the future with minor additions (Nexant 2003). The power sector in Sri Lanka was in crisis due to inadequate new power generation capacity additions problems manifested in the form of chronic power shortages (http://www.energyservices.lk/).

Therefore, lack of and inconsistent supply of power, especially during dry seasons of the year, has been a threat to the sustainability of automation. This phenomenon is severe in libraries that are not facilitated with sufficient power backups. Few university libraries have managed to operate power generators, which are, on the other hand, costly.

5.4 Post-Sale Service, Warranty, Currency and Uniformity

With stringent budget cuts, libraries cannot afford high-priced products to automate their services. Meanwhile, libraries that already purchased a system have difficulties in renewing the annual subscription. These have led to cumbersome state in sustaining automation, thus, university libraries are gradually venturing into exploiting open-source software.

Be it proprietary or open-source, university libraries and their branches are using different systems that present challenges when sharing, if not compatible with each other. In this regard, there should be bylaws and policies to control and manage cooperative liaison between library and repository systems (Ramanan & Ravikumar 2013).

Therefore, most important issue identified amongst university libraries in Sri Lanka is there is no accord or document to approve a uniform application of library management systems, at present, open-source software and customized tools, to automate functions and services that will improve efficiency.

Conclusion

In conclusion, almost all the university libraries in Sri Lanka have started to automate their functions and services, nevertheless, automation processes of these libraries are still in their formative stage in terms of update of systems and expediting in to novel realms of library automation. Therefore, complete exert and impact of automation on university libraries will be certainly known in the course of time.

Presently, university libraries require more funds, IT equipments, necessary level of expertise and commitment from both administration and librarians to accelerate the process. In this regard, the UGC, Sri Lanka should provide funds for both hardware and software to hasten the pace of library automation process in libraries that lack essential elements.

Exploitation of open-source software in library automation helps to solve basic challenges such as budget shortages for maintaining proprietary ILS, management of ever-increasing bibliographic records, inadequate human resource, large number of patrons, and lack of efficient administration. However, the open-source software needs authentication through constitutions, library legislation or standardization, which could be authorized by the UGC, Sri Lanka to have a standardized and uniform directives in usage and application policies in Sri Lankan libraries.

More importance is emphasized on conducting workshops and trainings required to help library professionals to educate on and learn about technical aspects behind library automation, utilization and customization of OSSs, and

computer network administration. They lack skills in computer programming and network management unless intervened by personnel who have expertise on such areas.

Finally, it is recommended to create forums among the university library professionals who are engaged in automation process in their library. Formation of full-fledged consortium among these libraries is still in conceptual state, which has to be operated at once. And, liaisons should be initiated with libraries in other countries. This would give more space to share expertise, discuss and solve problems in automation. Considering the above facts, SCOLIS/ UGC Sri Lanka is expected to design and provide basic library automation policies and directives for all university libraries to automate their functions. Moreover, time frame for automating library functions and the expenditure to be incurred should be fixed keeping in view the fact that capital is scarce in the nation's economy.

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