BEST PRACTICES FOR OPEN SOURCE TECHNOLOGY MANAGEMENT IN LIBRARY AND INFORMATION CENTRES.

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Abstract: Open Source technology management in library and information centers is a challenge and an opportunity. A general perception rooted among library professionals is that Open Source softwares are difficult to implement and not user friendly. Lack of awareness and opportunities for training are the main barriers for wide adoption of Open Source software in libraries. Success rate of Open Source technology implementation depend on attitude to build skill set and dedication of library staff.

Keywords: Open Source Software, Library Automation.

INTRODUCTION

In developing countries technology management in libraries are in negligible state. Often, library staff are not involved in decision making process in technology selection and implementation. Proprietary softwares are extensively used for library automation purposes. The companies behind them have aggressive marketing strategies and those products are neatly packed and presented. But with proprietary software, library staff do not get any control over the computing environment. Their source code will not be available to libraries. High price and no possession over data are the main disadvantages of proprietary library softwares. Therefore, technology management in libraries using proprietary software do not fulfill the requirements of library staff and user community.

But more Open Source softwares are also extensively used for library automation purposes. The advantages of using Open Source software are free availability, customisation, frequent updating, community participation, standard compliant etc. Eric Lease Morgan **[1]** find many aspects of open source software very similar to the principles of librarianship. Both community, value free access to information, peer review, standing for the benefit of public and non profit orientation.

OPEN SOURCE TECHNOLOGY IN LIBRARIES

Initial stages, technology was applied in libraries for the automation of traditional activities like cataloguing and circulation. Later it has made impact on operations like information searching, retrieval, reference services, electronic publishing, user studies, decision making and even in marketing of library services. Technology was found suitable for the automation of traditional activities in libraries and also to start various new services.

Following are the common reasons for applying technology in libraries [**2]**;

1. To cope with increasing demands,
2. To allow more activities to be performed by library staff,
3. To improve existing services,
4. To provide new services,
5. To collect better data to aid overall management of the library.

Till the global recession, technology adoption in libraries in developed countries were very common with the availability of surplus fund. They implemented automation of house keeping operations using the highly priced proprietary software. They began to think about cost effective alternative technology solutions against highly priced software when library funding is severely affected due to financial recession after 2007. Marshall Breeding forecasts that the library automation industry will face a difficult year or two like other sectors of the economy. He opines about the impact of financial recession on library automation industry,

“Many libraries must defer replacements or upgrades of their automation systems, regardless of how desperate the need. I've heard from a number of libraries running legacy systems that originally planned migrations for the near-term that have been forced to postpone their plans. Economic pressure will also cause some libraries to take less-expensive automation options over alternatives that they might prefer with higher price tags”**[3]**.

In initial stages itself a few libraries explored the possibilities of open source software in libraries and they tested the packages and successfully implemented appropriate ones. This tempted more libraries in USA and European countries to hopefully turn towards open source software as an alternative against proprietary library technology solutions. According to Eric Lease Morgan **[4]** , due to following reasons open source softwares are suitable for libraries;

1. Community participation,
2. things "free as a free kitten",
3. an investment in personnel,
4. taking responsibility for your computing environment, and
5. greater opportunities for innovation.

Libraries are attracted to Open Source technology not only due to its free availability, but due to its attractive philosophy. Open Source software development is maintained by users community itself. They working together to solve common problems through participative development process. Morgan compares Open Source software community works similar to the peer-review process in academia. Works are put forward, people examine the works and make suggestions for improvement, the works are edited, and the process begins anew **[5]**.

TECHNOLOGY PLANNING

Planning for open source technology adoption is a crucial process for libraries. It is easy to start from scratch for libraries having no automation system used previously. Most of the libraries in developing and under developed countries are not computerised yet.

They can adopt Open Source software for automating their house keeping operations without much investment in data migration process. Advance planning is necessary in case of libraries that wish to adopt Open Source alternatives instead of their high priced proprietary automation systems. They have to consider following factors while preparing to migrate to Open Source software,

1. Permission from library authority,
2. Settlement with proprietary technology vendors,
3. Data migration from legacy system,
4. Attitude of staff members,
5. Decision about Open Source software support: in-house / commercial support ?
6. Time required for technology implementation, etc.

Library can assign a core team for the planning and implementation process. Library staff, technical staff and Open Source Technology consultants can be included in the team. You can request the support of Free Software community members in your area for consultation.

SOFTWARE PROCUREMENT

Selection and procurement of Open Source software is entirely different from proprietary software. Selection of an ideal software package from a group of numerous similar package is a very difficult task. For example, selection of a Content Management System among one hundred solutions is confusing. OSS Watch **[6]**, a public service for higher and further education institutions in the UK put forward certain tips to be considered for selecting Open Source software:

1. **Reputation**: Libraries can select Open Source Software popular among libraries for performance and reliability. For example, Dspace is a popular archiving software and Koha is a popular Integrated Library Management System. Both softwares are adopted by reputed libraries from many countries.

2. **Ongoing effort**: Active projects usually have regularly updated web pages and busy development email lists. They usually encourage the participation of those who use the software in its further development. If everything is quiet on the development front, it might be that work on further updation and development has been suspended or even stopped.

3. **Standards and interoperability**: We have to ensure that the software package has incorporated the standards used in libraries. Popular standards used in libraries for resource description and information resource retrieval are CCF, MARC, UNIMARC, MARCXML, DublinCore, AACR, Z39.50, SRU/SRW, OAI-PMH etc. Library standards and protocols can help to ensure interoperability between similar systems and data migration.

4. **Community and Commercial support**: Community support is essential to maintain the Open Source software inside the library. We can approach community members to clear our doubts regarding usage and maintenance of the software. Community expect your contributions in bug fixes, reporting usability problems, suggestion for new features and writing documentation.
You can also seek commercial support for software installation, customisation and maintenance. Open Source premium service providing companies can help libraries to host the software in remote servers and it saves the cost of server hardware, electricity and technical staff.

5. **Version**: Often Open Source software development process is always active. Therefore we can find and fix problems easily. It result in frequent release of new additions and updates to software. Try to select most recent stable releases. Its not possible to upgrade the software whenever the release of new minor versions occurs. We have to monitor the software development process and prepare a schedule for software up-gradation in library.

6. **Documentation**: We have to ensure the availability of documentation for installation, maintenance and end user work.

7. **Skill set**: Assessment of skill set of our staff is a pre-requisite for Open Source software implementation. Staff must be ready to acquire or upgrade their existing skill set.

8. **Project development model**: “An open source project should have a very clear development process that describes how contributions are made and how they are evaluated for inclusion. It should also describe how contributors investing considerable resource in customisations can become a part of, or influence the project management. This is to reassure significant contributors that their contributions will remain valuable to them in the future. In some projects there is a formal structure governing this kind of development, in others the structure is fluid, in both cases the rules of engagement need to be clear”

9. **License**: We have to check about whether the license of the software allows free usage and customisation. GNU General Public License compatible free software licenses are more flexible licenses for Open Source software distribution. The GNU General Public License (GNU GPL or simply GPL) is the most widely used free software license, drafted by Richard Stallman for the GNU project. GPL is the license used in about 60% of all software packages released under a free software / open source license [**7**].

Well documented frameworks are available for the evaluation of different Open Source software against other. They are QSOS (Qualification and Selection of Open Source Software), and the Open BRR(Open Business Readiness Rating Model). Both methodologies are proposes more or less similar aspects. Each methodology proposes a predefined set of criteria for evaluating Open Source projects. The evaluation consists of scoring the various criteria based on a standard scoring procedure. Users can adjust the importance of each criterion according to their context by
varying the weight assigned to each criterion. A decision can be taken based on the resulting relative scores [**8**].

DATA MIGRATION

Moving data from legacy system to new system is considered as most difficult part in technology implementation. A library automation system stores three types of data; bibliographic data, user information and transaction details. Most of the library automation systems follows no library standards for data storage and retrieval. Proprietary system vendors do not allow library staff to export the data in standardised formats like MARC or CSV file due to the fear of loss in business. We have to negotiate with our legacy system vendor to get back our data. We have to ensure that the exported bibliographic data is in one of the standardised formats like MARC, UNIMARC, MARCXML or Dublin Core. Then we can directly import the data in to new system after minor editing without head ache. If, data is not in standardised format, try to export as CSV format. Helpful tools are available for converting from CSV format to bibliographic formats.

IMPLEMENTATION

In implementation stage library requires the support of users, library staff and system administration team. System implementation team should announce about the activities going on in advance to all library stake holders. In first phase of the implementation includes the discovery and assessment of the requirements. It includes the hardware and software environment to run the software; i.e. database, operating system, location of all the application client and server platforms, network environment, application versions, anticipated transaction volume. etc [**9**].

Libraries has to decide in this stage about installation platform. The concept of buying hardware and maintain installation inside the library with the assistance of system staff is becoming obsole. Libraries can install the software in remote servers / cloud computing environment. Advantages of this model are [**10**]:

- Accessible from anywhere with an internet connection
- No local server installation
- Pay per use or subscription based payment methods
- Rapid scalability
- System maintenance (backup, updates, security, etc) often included in service

- Possible security improvements
- Reliability

The system need to run in testing mode to ensures that all functional requirements of the system are met and timing requirements such as throughput, response time, and latency are met [**11**]. In this stage sample data can be imported to assess the system performance. We can invite users and library staff to use the system and have to arrange provisions to collect feed back. On the basis of feed back collected from users, system team can optimize system for the production environment. It includes the customisation of software interface and functional modules. Most of the Open Source software are not ready to use, need customisation before deployment.

During the implementation stage of an Open Source library management system, library users support is essential to test the performance of OPAC. Library staff need to evaluate the performance of functional module like acquisition, serial control, cataloguing and circulation. After obtaining the users acceptance, the system can be deployed in production environment.

TRAINING

Libraries need to make arrangement for permanent training programmes for staff and users. Training programmes should help to acquire the skills for maintain the software and use it effectively for day to day activities. We also also need to consider what level of training is needed for employees on how to use the software, who will carry out this training and what they charge. It's often worth investing in a 'train the trainer' approach with Open Source tools, building your own internal training skills to keep total costs to a minimum [**12]**. Lot of options are available for building in-house training support for Open Source software. Self service approach using online community resources is more feasible and cost effective. Useful information for training available from software home page, wiki and discussion forum. Key people in the project implementation team can attend training programmes organised by professional bodies and educational institutions. Otherwise, library can assign an Open Source service provider for training the library staff. Two things must be kept in mind while making frameworks for training in Open Source software; learn how to use the software and keep informed of ongoing

software developments. Documentation available from software website may not be suitable for library staff. User manuals for training purpose should be developed both in print and electronic format. Creating online discussion forum for library staff would be a good option for clearing doubts and to broadcast technology updates. “Staff is a library’s single most expensive resources and should be treated that way. Any investment made in retooling staff skills to meet the challenges and opportunities of the electronic age will be repaid many times over in better service to clientele and in a vital and engaged workforce”[**13]**.

Training for library users also need serious attention. Computers and networking have made librarians and patrons more equal in gaining access to, storing, retrieving, and representing information in novel and efficient ways, to the extent that fundamental changes in relationships among libraries, users and information have occurred [**14]**. Therefore, library need to develop user education programmes for regular visitors and also for those who are making transaction with library online. Developing user friendly interface for online catalogue and digital library is helpful for users to get familiar with new systems. Integration of web 2.0 features is also a good strategy to socialise users with system and deliver user education programs.

MAINTENANCE

Maintenance of Open Source software inside library need more responsibility from staff. If no computer expert is available in the library for the assistance, library staff need to learn the maintenance of Open Source software. Familiarity with Linux Operating System and related utilities are essential for maintenance of Open Source Library automation solutions. Prepare a framework for routine software maintenance activities. It includes the tasks related with database backup, maintenance of hardware, training, up-gradation of software, monitoring software developments etc. Maintaining server inside the library need more resources and installation of software in online server space is an ideal option to get savings in electricity and technical assistance charges. Libraries in a region can pool resources (hardware, software, human resources) for the convenience of maintenance and reduce the expenses.

CONCLUSION

Success of Open Source software implementation in libraries depend on the skill set and dedication of library staff. They need to upgrade existing skills or acquire new skills to implement the Open Source library solutions. A general perception rooted among library professionals is that Open softwares are difficult to implement and not user friendly. Lack of awareness and opportunities for training are the main barriers for wide adoption of Open Source software in libraries. Professionals bodies, government agencies and Library Science schools should take initiative to organise training programmes and developing customised tools for easy installation of Open Source softwares. According to Morgan, Open Source software is not "better" than closed source software. Nor is closed source software "better" than Open Source software. For the most part, both types of software get the job done. For the most part, both types of software have similar costs -- both financial and emotional. The difference lies in control **[15]**.

Open Source culture empower libraries to try innovative technologies in their working environment. This practice help them to develop solutions to solve their technology related problem within the walls of libraries. If librarians are able to handle Open Source technology management themselves, libraries can achieve cost effective technology solutions for better services.

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