

Realizing the potential of open source software in libraries

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Abstract—The potential of open source software are immense when it comes to implementing them in libraries. Libraries are realizing that such an environment promotes a sustainable software development cycle in which users, producers and service providers of such open source products have an important role to play to improve the products. While the cost involved when opting for open source alternatives are comparatively less compared to proprietary software products however what is more significant are the values that developers shared through their work that make Open Source Software (OSS) important for libraries functionally and economically. Implementation of such products in libraries are becoming popular due to the quality of the software at a lower cost along with the flexibility that they offer in the customization of the features as per the library requirement. The remote possibility of being locked-in with a single vendor for support along with the presence of a vibrant community for sharing of information further draws open source software development activity similar to librarianship. Adopting open source software have an effect on staffing in libraries though to the advantage of libraries. However, to realize the complete picture of adopting open source software to a library's advantage, librarians need to be aware of the limitations that are involved with respect to usability of open source software to avoid unwanted consequences.

IndexTerms— Open source software, libraries, digital libraries, librarianship

I. INTRODUCTION (HEADING 1)

Libraries lately have sense the potential advantages of open source software. Once within their practical grasp, open source products are equivalent to existing proprietary products and even better. In such a scenario, they respond positively by obtaining the software freely and if required signing a contract with vendors for customization and support services. This creates a sustainable open source library software development cycle, enabling producers of such open source products, and service providers to continue and improve the products thus extending their functionality.

Interestingly, one sign of open source software's success in the market for libraries is the adaptation and promotion of that software by vendors that have historically licensed only proprietary software. However, an additional point that needs to be emphasized is that open source software is not and never will be, without cost. Take a proprietary environment; someone has to pay for software development, the support services to make the software easily useable and even marketing costs to persuade librarians to use proprietary software and services. However, in a marketplace with viable open source alternatives, these costs, comparatively, will be less compared to proprietary software products since development; distribution and maintenance are significantly more efficient and economical.

The use of open source software will also have an effect on staffing in libraries over a period of time. Its use will give a much greater incentive for library managers to have staff with software expertise. It is also expected that a library with sufficient in-house expertise will have the ability to use and even improve the software for very little cash outlay, thus utilizing its own staff expertise than that of the vendor's. These benefits will, over the long run, tend to increase the desirability of having computer and software expert manpower on the library payroll. This will also make it possible for libraries that have very few monetary resources to still use world-class library software. Having such widespread in-house expertise will also result in librarians and library application programmers giving to the worldwide library community their expertise in the form of code development, documentation, training materials, online help, and other forms of community support. These all will tend to perpetuate and re-invigorate a sustainable cycle of open source software development and use in libraries—all while promoting the values of information access and cooperation on which modern librarianship is founded as in “[1]”.

II. OPEN SOURCE SOFTWARE AND LIBRARIANSHIP

The tendency of continuous feeling of community ownership of an open source application that strengthens over time shares a striking similarity to the economic value of libraries. While serving its community of users, a library returns the benefits of its monopoly to individual users instead of reaping monopoly profits for financial gain. Libraries are usually not-for-profit, funded public organization of which their influence on the computer industry is minimal. In view of this, presence of software programmers to develop library applications will be just a few in numbers as in “[2]”. Open source software development is similar to librarianship. Both value the idea of sharing information and open access. Both camps promote the gift culture of information either in the form of source code or journal articles which in the process not only improve computer applications but also the world around us as in “[3]”.

Finally, the main reasons why Open Source Software (OSS) are becoming popular and implemented in libraries are due to availability of a quality software at a lower cost which is flexible to a library requirement and not locked-in with a single vendor for support as in “[2]”. Some of the main factors that influence libraries to adopt OSS are as follows:

- i. Software licenses do not burden libraries budget.
- ii. With OSS products a case of being locked with a single vendor is eliminated. Libraries have the liberty to opt for an external technical support or in-house if available.
- iii. Facilitate the creation of library communities to collaborate and share relevant issues surrounding adoption of OSS.

Inspiring similarities between open source software development and librarianship as in “[3]” are highlighted as follows:

- i. Both open source software development and librarianship favours open access. In the case of open source software, the shared information will bring improvement in the areas of computer applications while libraries will improve our place in the world.
- ii. Human interactions play an important role in the merging of these domains. Development of open source software needs to understand the problem along with possible solutions. Librarians understand that information seeking behaviour requires the intervention of a human process to add value to the collection in a library or a digital library.
- iii. Third, it has been stated that open source development will remove the necessity for programmers. However, as in “[4]”, such a scenario will not happen. Instead, there will be an increased need for programmers. Similarly, on the same line, many librarians feared the advent of the Web because they believed their jobs would be in jeopardy. Ironically, librarianship at present is at its peak though under new names viz. information architects and knowledge managers.
- iv. Both institutions use peer-review, a process whereby an increased in community interaction reduces software issues.

III. USABILITY AND ISSUES OF OPEN SOURCE SOFTWARE IN LIBRARIES

Another factor that often comes up is the usability of open source software. While most open source systems are developed by programmers who lack information on the end user needs thus making it difficult to use. Another issue related to this usability is the unavailability of suitable documents on how to work with open source software which is unlikely in the case of a proprietary software. Most of the programmers working in open source projects do it as a hobby with least interest in other activities like documenting the software thus affecting the usefulness of a software to its potential users as in “[5]”.

However, open source can succeed because its community activity lacks profit motivations, the absence of proprietary rights in its hierarchical co-ordination along with its diffusion in environments dominated by proprietary standards as in “[6]”.

By its nature, open-source development requires free exchange of ideas, community involvement, and the efforts of talented and dedicated individuals. There are environments in which it simply does not flourish due to pressures from several sources which may prevent this from happening. In addition, openness and complex licensing issues invite misuse and abuse. Some Open Source (OS) projects are initiated to solve a specific problem. Certain issues are common among all Free Open Source Software (FOSS) projects. Other challenges may be domain specific. Open source software powers many of the web sites on the Internet, corporate computer servers used for research and development and a range of new gadgets that have broad appeal. It is becoming a ubiquitous, if not always visible, presence in the world today. Though, professional quality is difficult to achieve with a ‘hobby’ level of effort, the open source development model responsible for such useful software largely succeeds on donated time and resources. It is remarkable that a worldwide community has been able to accomplish so much, and benefit society and commerce in so many ways as in “[7]”.

Qualitative assessment of usability illustrates some of the usability issues of open source software over proprietary software as in “[8]” and “[9]”. Even for the more technically capable, unpolished open-source software can be difficult to use.

In general, Intellectual Property (IP) concerns can be surprisingly detrimental to open-source development. Care must be taken to choose an appropriate license if authors do not wish their work to promote the development of a commercial product. But

the license itself does not guarantee protection from violation. The Free Software Foundation (FSF)¹, from which the GNU's Not Unix (GNU)² General Public License (GPL) originates, offers legal assistance in cases of GPL violations when the copyright is assigned to the FSF. This assignment is a price that many open source contributors do not wish to pay. The use of open source software by commercial software companies for their benefit is not just a theoretical issue which indicates that they may have violated the GPL³.

Open source provides few direct benefits to the vast number of users who lack the requisite technical skills to do their own development, but instead is best suited for technically proficient users with strong motivations for customization as in “[10]”. The transition to an open source platform strategy is a continuation of that to open systems, driven by many similar factors. Open source, however, eliminates the ability of vendors to compete based on implementations since the details of an implementation are visible to all.

While shifting to such shared platforms may be the most cost-effective solution, it can also be difficult when it runs contrary to the corporate culture and previously valued core competencies. The shift also contains unexpected negative consequence. Firms with a successful proprietary architecture are able to simplify their technical and business decisions, because they control their environment and do not have to interoperate with the rest of the world. When the proprietary strategy fails, firms are forced to work with open standards to achieve interoperability, and such interoperability both requires additional technical efforts and also reduces the lock-in of existing customers as in “[11]”.

While it is true that such wasteful competition leads to new and better software, it does so relatively slowly and only at the cost of a significant duplication of effort. This is the high price of innovation under the current library market conditions in which suppliers of proprietary software dominate. Think how much faster new software could be developed. Also imagine how much faster it would be to improve products if any programmer anywhere who wanted to look at and enhance the software could do so. Finally, imagine that the people who developed and gave away that software could make a decent living by getting adequately paid for their efforts especially in the library market, where commitment to cooperation, open standards, and common communication protocols have long been admired and rewarded as in “[1]”.

IV. OPEN SOURCE SOFTWARE FOR DIGITAL LIBRARIES

The proliferation of the World Wide Web gave rise to Digital Libraries which are one of the significant gift to library users which enables them to access scholarly information as and when they wish to as in “[12]”. Related with the creation and delivering of digital collections, robust and flexible digital collections management and presentation software is essential. However, continual evolution and investment are required to maintain a digital library since digital library technologies and contents are not static. Very few commercial digital library products are comprehensive and extensible enough to support this evolution and many of these still in the early release and are in the process of being used and tested widely. While these require an initial investment in license fees or staff time which may be unaffordable for libraries, few of these products offer the full range of functionality needed for a digital library. Open source applications in particular allow developers and users to modify the system and tailor it to their own particular needs. Though like commercial software, open source software will not be a perfect solution however being open systems it offers developers and users the opportunity to modify functionality and create interfaces for integration with other software. The close collaboration between programmers and digital library staff will facilitate the creation of many important features on the system resulting is a highly extensible system, tailored to a local environment and requirements, with easy-to-use tools for data entry and collections administration with a powerful and attractive user interface as in “[13]”.

Traditionally, Digital Libraries (DLs) were developed as a single block, proprietary software which is complex and difficult to manage. Lately, the trend is establishing digital libraries on open source software, modular in nature, which are easy to use and manage especially by librarians. Several digital library component models are now beginning to emerge, with the launching of the Open Digital Library (ODL) as in “[14]” and OpenDLib projects as in “[15]”. Surprisingly, this has facilitated librarians to create digital libraries instantly even without having experience in webpage designing.

The following hypotheses given below indicate the economical and functional importance of OSS for libraries that arose from the values that OSS developers gave to their work as in “[5]”.

- i. OSS is an economical alternative to libraries' trust upon proprietary software.
- ii. OSS will be essential if libraries are to develop software and systems according to patrons' needs with respect to openness, customization, documentation and bug detection and fixing.
- iii. OSS ensures that the functionality of online library systems and services will benefit the library patrons.

1 <http://www.fsf.org/>

2 <https://www.gnu.org/>

3 http://www.oreillynet.com/cs/user/view/cs_msg/22344

V. LIMITATION OF OPEN SOURCE SOFTWARE FOR LIBRARIES

The following four hypotheses makes an attempt to reveal the reasons why Open Source Software (OSS) development is not more a part of the library's mainstream activities but are exclusively performed by a few developers thus acting as deterrents for wide adoption in libraries as in “[5]” and listed below.

- OSS lack of formal support makes it difficult for libraries to use or participate in OSS development.
- OSS lack of a collaborating model that allows librarians and developers to contribute is a hindrance to OSS development.
- OSS is not always easy to implement, use and maintain due to lack of proper documentation.
- OSS initiatives lack of inclusiveness by neglecting non-systems librarians and library patrons in the design and testing process of OSS benefits just a selected staff involved in systems management instead of the wider library community.

VI. CONCLUSION

While the potential of open source software for libraries is immense, it is however left upon the librarians to evaluate the values and limitations of their adoption which is in fact the need of the hour. For future sustainability, without a doubt, it is the role of librarians to introduce such platforms to other librarians and users through trainings and hands-on session. In-depth research on this domain will for sure iron out the limitations that libraries encounter while implementing open source software and thereby bring to light the values and benefits of open source software which are a reflection of the true spirit of librarianship.

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