
OPEN SOURCE SOFTWARE DEVELOPMENT: HISTORICAL AND CURRENT PERSPECTIVES FOR ACADEMIC LIBRARIANSHIP

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Abstract

Open source software production is a successful new innovation model which disproves that only private ownership of intellectual property rights fosters innovations. The emergence of Open Source Software (OSS) has gained the attention of research librarians and created new opportunities for libraries to make optimum utilization of the software keeping in view of the benefits not only to the users, but also to the libraries with respect to time, space and accessibility. The paper attempts to discuss the concept of Open Source Software in the modern era by highlighting the relevance of it to the library profession by tracing historical developments of Open Source Software's. It also elucidates the development of open source operating systems over a period of time and provides briefly the Open Source Software projects available in the Internet era for the professionals of different disciplines.

Keywords: Library Software; Open Source Software; Digital Library

1. Introduction

As libraries become digital libraries, there is a need to ensure that librarians don't become "virtual". The role reinforces the place of Librarians in providing high quality, useful content to our customers and as a result, librarian's active participation in the library community's technology ecology, especially through understanding and involvement in software development, enables us not only to play the game but also to help shape the rules as well.

Open Source Software (OSS) is both a philosophy and a process describing the intended use of software and methods of distribution. OSS is more equated with the Latin word liberat which means to liberate, and not necessarily gratis. Open source software can be used to gain that home field advantage that allows the user to customize, augment, change, and enhance the software so that it better meets their needs. OSS in essence, empowers libraries through knowledge and understanding and brings library values to software.

During 1970's to 2000's, Open Source Software evolved into a sophisticated movement that has produced some of the most stable and widely used software packages ever produced. More specifically, since 1998, the Open Source Software movement has become a revolution in software development. It represents different model of software distribution typically in the Information and Communication Technology era; computer software has been sold only as a finished product, otherwise called a precompiled binary, which is installed on a user's computer by copying files to appropriate directories

or folders. On the contrary, OSS is software that is licensed to guarantee free access to the programming behind the precompiled binary, otherwise called the source code. Some major projects gaining significant market share from commercial developers such as Microsoft.

Open Source Software (OSS) is a model of computer software development where the source code is available for programmers to view, read, modify and re-distribute without the property right restrictions of proprietary software. OSS is copyrighted and distributed with license terms designed to ensure that the source code will always be available. While a fee may be charged for the software's packaging, distribution, or support, the complete package needed to create files is included, not simply a portion needed to view files created elsewhere. The Library and Information centers can employ these Open Source Software's to keep pace with time to explore the information resources to the world on the web by creating tags interoperable with web standards.

2. Definitions

Open Source Software has been defined by eminent experts in different way conceptualizing the meaning and some of them are stated below.

"The Open Source Definition allows greater liberties with licensing than the GPL does. In particular, the Open Source Definition allows greater promiscuity when mixing proprietary and open-source software"¹

Richard Stallman defined Open Source Software that allows the inclusion of proprietary software and ignores the philosophical issue of software freedom. Without these freedoms, there is no philosophical imperative to improve one's community. Nevertheless, disagrees on the basic principles, but agrees more or less on the practical recommendations²

The basic definition Open Source Software is:

- The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources.
- The program must include source code and must allow distribution in source code as well as compiled form.
- The license must allow modifications and derived works and must allow them to be distributed under the same terms as the license of the original software.
- The license may restrict source code from being distributed in modified form only if the license allows the distribution of patch files with the source code for the purpose of modifying the program at build time.
- The license must not discriminate against any person or group of persons.
- The license must not restrict anyone from making use of the program in a specific field of endeavor.
- The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.
- The license must not be specific to a product.

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- The license must not contaminate other software by placing restrictions on any software distributed along with the licensed software.

Richard M Stallman⁴ defines free software as possessing four essential freedoms:

- You have the freedom to run the program for any purpose.
- You have the freedom to modify the program to suit your needs. (To make this freedom effective in practice, you must have access to the source code, since making changes in a program without having the source code is exceedingly difficult.)
- You have the freedom to redistribute copies, either gratis or for a fee.
- You have the freedom to distribute modified versions of the program, so that the community can benefit from your improvements.

3. Relevance of Open Source Software in Philosophy of Librarianship

Quality OSS rises to the top in the same way cream rises to the top of fresh milk. This presents itself as another opportunity for libraries, not so much in terms of library services or collections, but in the time spent evaluating products and revealing its collections to the world in accepted protocols. OSS provides a framework - possibilities for resource sharing - in order to take control of our situation. This sharing of ideas will bring more minds together and ultimately create more robust solutions. OSS provides the means to give back to the Internet.

Many librarians are now considering OSS because of its low purchase costs. Unlike commercial software there are no initial purchase fees, licensing fees, or upgrade fees. Furthermore, OSS is generally not tied to proprietary hardware, so the hardware costs associated with OSS tend to be lower. Other direct costs for OSS are often lower than those for comparable commercial software. Since the original supplier of the software has no monopoly on information, the market for support and maintenance of OSS is more competitive than that for commercial software with comparable user bases. Thus support and maintenance costs are often lower⁵

The four similarities between open source software development and librarianship as enunciated are⁶

- Both open source software development and librarianship put a premium on open access. Both camps hope the shared information will be used to improve our place in the world. Just as Jefferson's informed public is a necessity for democracy, open source software is a necessary for the improvement of computer applications.
- Human interactions are a necessary part of the mix. Open source development requires an understanding of the problem the computer application is trying to solve, and the maintainer must assimilate patches with the application. Librarians understand that information seeking behavior is a human process. While databases and many "digital libraries" house information, these collections are really "data stores" until the data is given value and put to use whereby the stores become libraries.
- Third, it has been stated that open source development will remove the necessity for programmers. Yet Raymond posits that no such thing will happen. If anything, there will an

increased need for programmers. Similarly, many librarians feared the advent of the Web because they believed their jobs would be in jeopardy. Ironically, librarianship is flowering under new rubrics such as information architects and knowledge managers.

- Both institutions use peer-review, a process where “given enough eyeballs all bugs are shallow”.

In general, librarianship is an honorable profession and people are drawn to the profession because of a sense of purpose, a desire to provide service to the community. While many open source software developers create applications to solve local, real-world problems, their efforts are shared because they desire to give back to the community. The open source software and is manifested in the principles of librarianship by Blake Carver, editor of LIS News, modified Ranganathan’s Rules for open sources software are

- Software is for use
- Every computer its users
- Every reader his source code
- Save the time of the user
- A system is a growing organism.

4. Widely Used Open Source Packages in Libraries

The development of open source operating systems and related tools provides a number of software packages that have been developed as open source projects. The growth of open source software, and the scientific traditions of open exchange of information and international collaboration are the principal factors enabling science and technology in China, and as they are all over the world. The growth of open source software will also force commercial software companies to become more competitive, according to more than 50 percent of the managers interviewed for the report.

One of the biggest open source success stories is the Apache Web server, which powers 62 percent of Web sites, according to Netcraft’s September 2000 survey of Web server usage. Certainly, high quality open source programs do exist⁷.

- In 1987 Larry Wall released PERL 1.0 scripting/programming language. Perl Programming/scripting language - (<http://www.perl.org/>)
- In 1990 Guido van Rossum released Python programming language.
- In 1994 Rasmus Lerdorf released PHP/FI Web scripting/programming language. Its current release is PHP 4.0.6.
- In 1995 the Apache Web server program was released and quickly became the most widely used Web server product (which it remains today).
- In the mid-1990s mSQL, MySQL, (<http://www.mysql.com/>)
- Also in the mid-1990s Andrew Tridgell released Samba, a set of utilities that allows UNIX machines to use the same network communication protocol as Microsoft Windows.
 - Linux Kernel - (<http://kernel.org/>)
 - Apache Web Server - (<http://www.apache.org/>)
 - Samba, supports interoperability with Windows clients (<http://www.samba.org>)

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- GNOME, a desktop environment - (<http://www.gnome.org/>)
 - KDE, a desktop environment - (<http://www.kde.org/>)
 - The GIMP - bitmapped image editor - (<http://www.gimp.org/>)
 - PostgreSQL - (<http://www.postgresql.org/>)
 - PHP, Hypertext Preprocessor used for web development - (<http://www.php.net/>)
 - Mailman, Mailing list manager - (<http://sourceforge.net/projects/mailman>)
 - XFree86, Graphics infrastructure - (<http://www.xfree86.org/>)
 - Bind -(Domain naming service, a critical Internet infrastructure service) (<http://www.isc.org/products/BIND>)
 - GNU Compiler Collection (GCC, a suite of compilation tools for C, C++, and several other languages) (<http://www.fsf.org/software/gcc/gcc.html>)
 - Python Programming/scripting language - (<http://www.python.org/>)
 - Mozilla, a web browser and email client - (<http://www.mozilla.org/>)
 - OpenOffice.org - (<http://www.openoffice.org/>)
 - Open Source BSD Operating systems - (<http://www.openbsd.org/>)
 - Eric is something of a force in the open source movement and was the primary developer of the MyLibrary@NCState open source software created at North Carolina State University. One of Eric's first responsibilities here at Notre Dame is to convert our library Web site to a database-driven technology and he wants to do it on an open source platform.
 - W3C primarily pursues its mission through the creation of Web standards and guidelines. W3C also engages in education and outreach, develops software, and serves as an open forum for discussion about the Web. In order for the Web to reach its full potential, the most fundamental Web technologies must be compatible with one another and allow any hardware and software used to access the Web to work together. W3C refers to this goal as "Web interoperability." By publishing open (non-proprietary) standards for Web languages and protocols, W3C seeks to avoid market fragmentation and thus Web fragmentation.
 - Greenstone is a suite of software for building and distributing digital library collections provides a new way of organizing information and publishing it on the Internet or on CD-ROM produced by the New Zealand Digital Library Project at the University of Waikato
 - MyLibrary open source portal software
 - D-Space, an Open Source Dynamic Digital Repository, which uses Dublin Core metadata standard for describing items intellectually specifically, the Libraries Working Group Application Profile.
 - KOHA, first open source integrated library system developed in New Zealand by Katipo Communications Ltd. and maintained by a team of volunteers from around the globe, the Koha system is a full catalogue, opac, circulation and acquisitions system.
 - The University of Michigan Digital Library eXtension Service (DLXS) is a powerful, SGML/XML-aware search engine, and an ultra-versatile tool for the development of digital libraries. It provides excellent support for word and phrase searching, indexing of

SGML elements and attributes, a baseline of support for XML (without Unicode), fast retrieval, and open systems integration

- Agora - Content Management System is a flexible and modular system. Using the Internet standards XML and Java, Agora can be integrated extremely well into existing IT environments that facilitates information processing and management instrument.

5. Conclusion

Open Source Software's are the web-based applications that facilitate the library managers with an ample of opportunity to reveal its collections, which includes rare materials, institutional productivity etc. and services to the large community by creating web standards. It is now up-to the library professionals to make or mar the use of this free utility for the benefit of the users community to overcome the problems of space, time and accessibility.

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