Open Source – History and Development

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The Open Movement and Libraries

Abstract

In the 21st century, we think of open source in terms of software or online full text access. A documented beginning of open source can be traced to the early 20th century with the implementation of a tool called cross-licensing agreements, these agreements allowed automobile manufacturers to share technology in the form of patents for the benefit of American automobile industry. In the 21st century The Cathedral and The Bazaar was the tool that gave the impetus for the open source movement. The Cathedral and The Bazaar is ultimately, what brought the code for the browser Netscape into the public domain. This decision resulted in Firefox. Open source continues to ramp up and the open source movement is including universities, colleges, corporations and libraries and if we take a lesson from the past all will benefit.

Discussion

The origin of open source and its development.

Free sharing and open source are not 21st century ideas we tend to think of open source as always being connected to the Internet as software but open source was in existence early in the 20th century although it took a different form. That form was automobile manufacturing. For those of you familiar with early automotive history, Henry Ford challenged the patent of George Selden. Selden had a chokehold on the automobile industry but Ford won a challenge to Selden's patent (The history of free and open source, 2009).

This breakthrough by Henry Ford was the beginning of open source in the modern age and with the formation of the Motor Vehicle Manufacturers Association was instrumental in agreements called cross-licensing agreements these agreements existed between the United States automobile manufacturers of the day. Each automobile manufacturing company modified the technology and filed patents, these patents shared, no exchange of money, no lawsuits and an industry thrived (The history of free and open source, 2009).

Now in the late 20th century the Advanced Research Projects Agency Network (ARPANET) developed a procedure called request for comments, this protocol became the root of telecommunication networks protocols and is defined as a collaborative open source effort of the 1960's which you may know as the Internet (Strickland, 2007). This was followed by the development of a user group called SHARE whose goal it was to assist with software exchanges (About SHARE, 2008).

However, on the cusp of the 21st century in 1998, a group met in the Palo Alto, California home of a leading member of the Foresight Institute (Foresight Institute: studying transformative technologies, 2009), Christine Peterson. The Foresight Institute was established in 1986 and its goals were to focus on potentially revolutionary technologies. Those in attendance were Eric Raymond, Michael Tiemann, Larry Augustin, John Hall, Todd Anderson and Sam Ockman. This meeting had been held to explore the explosive potential of the announcement that Netscape was releasing its source code into the public domain (Newton, 2009). The management at Netscape had been influenced by Eric's decisive paper The Cathedral and The Bazaar (Raymond, 1999).

In order to appreciate the significance of the Netscape announcement, it is important to understand the differences between free and shareware. Open source then referred to as freeware is to include *the* code with distribution as well as modifications of derivative works. Shareware has a negative connotation because it connects to an individual who has written an application and commonly asks for money to further the development of one application with little or no help offered if the application fails to function as advertised. Freeware (open source) also has the same reputational difficulties (Open Source Initiative, n.d.). The Palo Alto meeting discussed many ideas that would separate freeware from shareware and the open source name was selected. This was a rebranding of freeware and the group that met in Palo Alto that day wanted to ride in to the market on the announcement of Netscape's decision. To improve freeware's now open source's reputation to the public. Their decision was followed by an open source conferences by Tim O'Reilly and then the Open Source Initiative by Eric Raymond and Bruce Perens. The growth of the Internet was in no small part instrumental in the expansion of open source software (Newton, 2009).

Changes with open source moved quickly with IBM feeling threatened by open source and propelling UNIX into the open

source business model, Red Hat followed next taking on the proprietary UNIX and windows systems. These players were on the field until the failure of the dotcoms. Additionally the dotcom failure was the cause for the open source application Firefox's slowed success (Newton, 2009).

In order for software to be considered open source the terms of use must comply with the following as defined by the Open Source Initiative: The acceptance of the free redistribution. The program must include the source code. The license must allow modifications and derived works. The integrity of the author's source code must be maintained, meaning that the license may restrict the source code from being distributed in modified form. Groups or persons may not be discriminated against. There can be no discrimination against fields of endeavor, meaning that the license must not restrict anyone from making use of a program under this license. The distribution of the license requires that the rights to the program apply to all and the license cannot be product specific nor can the license limit another software program (Open Source Initiative, n.d.).

The shift to open source is about the needed tools to manage and share resources and with the growth of digital resources, it is about using monetary resources more efficiently

(Parry, 2009). It is about providing access to resources using better technologies leaving behind those technologies that are no longer effective with some technologies functioning virtually unchanged since the 1980s. Non-library software as an example has changed dramatically in the last ten years leaving universities and libraries behind. The Cathedral and The Bazaar has shown the library community that it can be better to trade in the open noisiness of the bazaar then in the dark quietness of the cathedral (McDonald & Jannik, 2004).

The idea that libraries should control the technology that supports the libraries, which in turn supports the community, is a relatively new thought. This empowerment continues to be elusive for libraries large, small, public, academic or special to accomplish, as they need personnel to manage and support their in-house open source technology. If the application is an open source application, this support can be in the form of a systems librarian (Parry, 2009). However, this lack of support continues to encourage the growth of an industry to allow libraries without the means to manage an open source application in-house to outsource the needed support with such companies as Liblime (Ayre & Gould, 2009).

The Internet has forever changed the way we communicate and conduct business. It is allowing the development and rapid expansion of online archives that cross all academic and research disciplines. These archives have come to be known as open access because they are available online and in full text (Bosc & Harnad, 2005). The availability of full text online was a radical idea, which has it development through Carl Lagoze and Herbert van de Sompel in 1999. This development by Carl Lagoze and Herbert van de Sompel of a metadata tagging protocol has made open access interoperable; this was a critical development as this interoperability then promoted the development of the self-archiving repositories such as eprints, which is an Open Access and Institutional Repositories (van de Sompel & Lagoze, 2000). The exchange of large amounts of information over a network using metadata in a document with information that is standardized is one of the primary reasons for the explosive growth of open source software and open access (Bosc & Harnad, 2005).

The tools of the Open Access Initiatives (OAI) had their start at Southampton University in the United Kingdom with the e-prints software, which is the software for the Open Access Initiative archives (Bosc & Harnad, 2005). The Budapest Open Access Initiative (BOAI) on February 14, 2002 was where open

access was presented (Bosc & Harnad, 2005). The Harvard Open

Access Initiative was established in 2008; and is the primary

reason for the open access of publications of scholarly

articles. (Harvard backs open access initiative similar to one

passed by UCSC in 2005, 2008).

The growth of open access includes journals for medical

literature and research in all disciplines with these resources

growing at approximately two titles per day with repository

growth of one title per business day. Open Access policies are

in the hundreds at individual colleges, universities and

corporations. ROAR is a resource that tracks the growth of open

access repositories and the growth of these repositories does

not appear to be slowing down (Morrison, 2009).

How academic libraries and universities got started with Open

Access.

The open access movement into libraries and universities

began with the recognition that information centers such as

libraries have provided access without strings to their

communities with the possible exception of private or special

libraries, and that these organizations were beginning to desire

the same thing for their own institutional needs regarding

software applications. The open access movement in libraries

and other information centers continues to be an elusive goal (Parry, 2009).

There remains much discontent in universities and libraries over the insufficiency of the commercially available library software applications. This attitude began to bring about a drive toward the development and adoption of open source software for the management of library resources. Commercial vendors have long enjoyed the complete control over which elements of the software that libraries in particular would be made available to them, this is disturbing considering the great outlay of money that libraries and other information organization must spend annually. However, this financial chokehold on libraries has begun to weaken (Guess, 2008).

The Utah State University developed eduCommons, an open course workflows system and Carnegie Mellon designed the open learning initiatives and both institutions did this for the sole purpose of sharing open source educational resources (Atkins, Brown, & Hammond, 2007).

The growth of open source needs to continue to be supported and encouraged by large research libraries and private foundations, as often it is they who provide the impetus for smaller yet more specialized open source applications such as:

- Coastlines Community College, which developed Chengo an
  online Chinese and English language learning system, which
  have been, adapted it to Spanish language learners received
  funding from the William and Flora Hewlett Foundation
  (Atkins, Brown, & Hammond, 2007).

- Foothill-De Anza Community College, which directs the
  development SOFIA (Sharing of Free Intellectual Assets), is
  an open content initiative that represents a collaboration
  of California community colleges to provide online
  resources that have superior academic quality. This
  initiative was funded by the William and Flora Hewlett
  Foundation and modeled after MITs open courseware
  initiative. The collaboration between Foothill-De Anza
  Community College Direct and the University of Michigan has
  produced what is being termed the next generation of
  systems for distance education this open source application
  (ETUDES-NG)and is designed to improve the tools that
  support online learning (Atkins, Brown, & Hammond, 2007).

- The Monterey Institute for Technology and Education
  developed the National Repository of Online Courses and
  received funding from the William and Flora Hewlett
  Foundation. This repository has a library of high school AP
  and undergraduate courses that are available free to

students and instructors through the NROC Licenses, which

are content use arrangements for commercial vendors, such

as educational providers and textbook publishers (Atkins,

Brown, & Hammond, 2007).

How are academic colleges and libraries using OA?

University Libraries at Auburn University installed the

mylibrary open source software portal in January 2001 and it is

still in active use today. Prior to Auburn University Libraries

installing mylibrary, most academic libraries used open source

middleware software. Open source middleware software connects

software components or applications to multiple computers

thereby enabling them to interact across a network. Mylibrary

fit the open source model that Auburn wanted for its environment

because it offered the least amount of customization out of the

box (McDonald & Jannik, 2004).

University of Arizona Library has been involved in rebuilding

academic libraries in Afghanistan since April 2002 as well as a

project in there in 2005. Both of these projects involved the

digital libraries alliance, which is part of the Afghan eQuality

Alliances: 21st Century Universities for Afghanistan initiative.

The purpose of these projects is to provide access to library

resources using an open source integrated library system (ILS).

Koha was selected for the following five academic libraries in Kabul, Afghanistan:

- Kabul University

- Kabul Medical University

- American University of Afghanistan

- Institute of Polytechnic

- Kabul University of Education

Most integrated library systems software is commercially controlled. The Afghanistan project has limited funding which means that going with open source software would continue to open up options such a language support, which has allowed the project to develop its own future and direction (Han & Rawan, 2007).

How successful have academic libraries and information organizations been with open access software?

Auburn University Libraries became a leader in the open source movement after installing a UNIX based server and implementing an open source library application called NOTIS (McDonald & Jannik, 2004). Libraries and information organizations typically viewed open source software (OSS) products and projects as experimental. Many times, open source

projects are viewed as incapable of scalability or
sustainability, which are another of the major concerns by
libraries regarding the selection of an open source application.
The implementation and maintenance particularly for small
libraries that generally have little or no in-house technical
staff cannot support an open source software investment;
regardless of the money that could be saved in the expenditure
of annual licensing fees and periodic upgrade charges (McDonald
& Jannik, 2004).

The new generation of catalogs such as VuFind created, as
open source software by Villanova University *is a* library
gateway or portal and is designed and developed for libraries by
libraries. VuFind's goals are to allow library users to search
all of the library's resources such as catalog records,
journals, and digital resources through this one portal
effectively replacing the OPAC. VuFind is completely modular
allowing libraries to select only the basic system, and at some
future point elect to add additional components. As VuFind is
open source, libraries can modify any of the modules that best
suits their community. Some of the libraries currently using
VuFind are University of Michigan, Wake Forest, Colorado State,
York University, London School of Economics, University of
Georgia; and other academic libraries (Parry, 2009).

What support, if any that they received or finally receive from administration?

Measuring support for open source is challenging as not all open source installations are known or are up to date. The possible exceptions are those colleges and universities with deeper pockets, which can take the plunge more easily in part due the personnel resources and may have an easier time influencing administration or members of the board of the viability of open source software. However, the following libraries are pressing on with open source applications despite the apparent lack of support at their institution by introducing open source in small steps with pilot projects and gently fanning the flames of success and acceptance (Guess, 2008).

- Auburn University's mylibrary portal has not gained wide spread support at the university, but it has built up a stable reputation due in large part to the continued success of its open source portal inspiring the university administration to investigate how portal information can be incorporated with the planned enterprise-wide university portal. Auburn University considers these information channels, one interface accessing multiple types of information (McDonald & Jannik, 2004).

- Utah State University is becoming a major source of open
  and sustainable learning with the resources provided by
  their institution through the Center for Open and
  Sustainable Learning (COSL) and the development eduCommons.
  The goal of this system *is to* provide direction for authors
  wishing to publish their materials in an open access
  format. This guidance includes but is not limited to
  copyright issues, creating course packs and repository
  services. Utah State University is one of many educational
  institutions that are going to remove the barriers that are
  keeping other institutions from creating their own MIT-
  style Open Courseware portal (Atkins, Brown, & Hammond,
  2007).

Some in librarianship and in other information fields are not
happy with the new types of catalog or information interfaces.
These catalogs and interfaces allow users to search for all
materials through one interface. These have been referred to as
a Google type of interface and are viewed as a disservice to the
user. These interfaces are leaving the users to fend for
themselves and because users are beginning to feel that they can
search effectively without any assistance, they have been led to
believe, through the ease of use of these new interfaces, that

they no longer need the services of information professionals
(Parry, 2009).

Conclusion

Information professionals are becoming increasingly concerned
that libraries and other information centers are going to be
kicked to the curb by virtue of the changes in these interfaces.
To the dismay of some, the Google style catalog interfaces are
being developed by commercial vendors and by the open source
development community. Innovative Interfaces with Encore and
Media Lab Solutions, Inc with AquaBrowser are pursuing such
commercial developments (Parry, 2009).

The open source trend will no doubt grow in both educational
institutions and other information organizations, it is blogged,
unconferenced and podcasted about and based on the growth of
repositories, software and support the open source movement is
just hitting its stride. The increase of requests and yes
sometimes demands for open source and open access are increasing
exponentially. Individuals, groups or organizations who resist
or are inflexible and choose not to investigate any type of
participation with open source may find themselves as the open

source movement progresses and gains not only momentum but

converts in the position according to Peter Suber of being a

"toll road" in an open access world (Suber, 2009).

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