

Open Source Software Use in Education

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What is Open Source Software?

- Publicly available for downloading and installing
- Freeware requires no payment – but maybe a donation to help the developer(s)
- Shareware usually required a payment within 10-30 days
- Open source is typically free to use through the General Public License (GPL) which allows free downloading and distribution of software also known as “copyleft”

What is Copyleft?

- “*Copyleft*” is a general method for making a program or other work free, and requiring all modified and extended versions of the program to be free as well (Free Software Foundation 2008.)

History of Open Source Software

- Roots can be traced back to the 1960's during the development of the Advanced Research Projects Agency Network (ARPA)
- Massachusetts Institute of Technology programmer Richard Mathew Stallman founded the Free Software Foundation and in 1985, published the GNU Manifesto
- Linus Torvalds created LINUX in 1990
- Eric Raymond's paper "The Cathedral and the Bazaar" published in 1997

A Major Switch in Software Design

- The University of Illinois' National Center for Supercomputing Applications (NCSA) developed the web browser Mosaic but was later commercialized by Marc Andreessen and other Mosaic developers and called Netscape (NCSA, 2008.)
- The Netscape team released their software source code setting the stage for future collaboration in open source software

The Rise of Google

- Google was officially founded in September 1998, a new software giant with a new attitude arose to the ranks of the top software developers.
- The company was started by two doctoral students designing a new search engine and has exploded into a major software creator of free and open source software and fosters new programmers to contribute to projects.

SourceForge

- SourceForge was launched in 2001 and is now the largest open source software development web site in the world with more than 180,000 projects and more than 1.9 million registered users (SourceForge, Inc. 2008.)
- Software developers both in amateur and professional status contribute programs and code segments to a wide variety of uses and industries.

The Cathedral and the Bazaar Model of Software Development

- The cathedral model is development of software by a small number of developers releasing finished products at infrequent intervals.
- This is the model most major commercial software development use
- The Bazaar Model enables multiple versions, usually a stable version and versions in stages of development. Most users use the stable version and early adopters help debug and test these “pre-release” versions and provide feedback

The Cathedral and the Bazaar Model of Software Development (cont.)

- Netscape and later Mozilla and Google started using this model for their software development.
- This model allows for potential faster and wider testing and feedback and encourages a larger pool of contributors and developers and hence ideas (Pfaffman 2008).
- This model basically pushes the beta (and some alpha) testing to the user base instead of paying software engineers for the testing.

Technology Budget Problems in Education

- Software Purchases & Maintenance Costs
 - Productivity Tools such as Microsoft Office
 - Server Tools – File server and email servers
 - Administration software – Accounting software, etc.
- Technology Support and Services
 - Personnel
 - Vendor Maintenance Contracts
 - Internet Connections – T1, Fiber, etc.
 - Student Services Contracts – Gradebooks, Student Information Management (hosted on or offsite)
- Hardware Purchases – Desktops and Laptops, etc.

What Do We Teach: Programs or Concepts & Skills ?

- Most software taught in schools have open source alternatives to save money but still teach the same concepts & skills

Commercial Title	Open Source Title
Microsoft Office	OpenOffice or StarOffice
Adobe PhotoShop	Picasa or GIMP
Microsoft Windows	Ubuntu or Fedora
Microsoft Server 2008 (IIS web server)	Ubuntu Server (Apache, MySQL, PHP, etc.)
Adobe Acrobat	CutePDF, PDFWriter
Sony Sound Forge	Audacity
Adobe Dreamweaver	Joomla CMS, Google Sites , or Blogs (Blogger, EduBlog, etc.)
Blackboard Course Management	Moodle Course Management

What Do Educational Institutions Think About Open Source?

- Many K-12 schools are switching servers to open source and using some desktop software instead of commercial
- Students can then use the same software at home without buying software
- Some schools use online encyclopedias and wikis to research information. One such site is Curriki. Content is provided by teachers, educational foundations and other sources.
- A literacy program called Free-Reading is being used in Florida (O'Hanlon 2008).

What Do Educational Institutions Think About Open Source? (cont.)

- Even with the potential to save money some technology directors are cautious with open source due to lack of dedicated support, security of the systems, interoperability between systems, & technical expertise of IT of software in use.
- Some Chief Information Officers have expressed that if commercial software costs keep rising & budgets keep shrinking that open source software may be the answer. Many schools remain undecided about it. (Williams van Rooij 2007).

Education Initiatives in Open Source

- InACCESS – Indiana Affordable Classroom Computers for Every Secondary Student is a program to provide low-cost, easy to manage computers to all of Indiana’s more than 300,000 students (Waters 2007).
- This program uses “recycled” or older desktop and laptop PCs that can run Linux (Ubuntu) and loads open source software saving hundreds of dollars per computer . It was designed to have low/no cost PCs in High School English and Language Arts classrooms. (Indiana DOE, 2008).

InACCESS Software Used

- Sun Microsystems' *STAR OFFICE*

- *Star Writer (Word processing software)*
- *Impress (Presentations software)*
- *Star Calc (Spreadsheet software)*
- *Star Base (Data base software)*
- *Star Draw (Graphical drawing software)*

- CMAP (<http://cmap.ihmc.us/>)

- REALplayer for Linux

- Firefox web browser

- GIMP (Image manipulation software)

- Codeweaver's *Crossover Office (Crossover Office allows many applications designed for Microsoft Windows to run under a Linux operating system)*

- Moodle

Education Initiatives in Open Source

- Danville School District 118 in Illinois uses OpenOffice as a replacement for Microsoft Office and Moodle for classroom management. They found out that students did not care what programs or operating systems they used as long as they can get to the Internet, play their music and get their assignments done. (Waters 2007).

Education Initiatives in Open Source

- Vassalboro Community School in Maine had a Microsoft-based server that crashed days before school started. Their technology coordinator searched online for help and found an open source solution called SME server, installed Linux and was ready by the start of school with all of his 600 student user accounts.
- Once the school was using Linux, the school cut their technology operating costs by better than half of the original annual fees (Trotter 2004).

New Generation of Teaching Tools

- Web 2.0 Software

- Tools used to enhance creativity, communications, secure information sharing, collaboration and functionality of the web. (Wikipedia, 2008).
- Tools like Skype, Blogs, Wikis, Social Networking, Video & Photo Sharing Sites and Microblogging

- User empowered sharing software

- Podcasting (audio & video)
- Video Conferencing - Even free online!
- Video Production and Sharing
- Web based productivity tools

Conclusions

- Open source software is here to stay and has been making progress over time
- Education and government sectors will use these types of software especially when budgets are tight and they do not have enough resources for commercial software
- Open source software will continue to mature and have even more offerings as future programmers join the open source community

Key Readings on Open Source

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