

USAGE OF OSS IN MULTIMEDIA COURSES

Nurhizam Safie Mohd Satar, PhD.
Independent Scholar
nurhizam@gmail.com

ABSTRACT

The paper will share the experience of using the Open Source Software (OSS) in teaching and learning multimedia technology in an open and distance learning environment. OSS has been introduced because of costing, technology and legal implication factors in which these aspects assists in reducing the digital divide gap among learners particularly in rural area. Three multimedia courses namely Audio Technology in Multimedia, Video Technology in Multimedia and 3D Animation had adapted the use of the Open Source Software (OSS). Audacity, Kino and Blender are the software integrated in the multimedia courses. The institution had integrated these multimedia software to its own LiveCD which was developed on Ubuntu platform. Issues and challenges such as the OSS function capability, comparison of OSS and proprietary software, costing, tutors expertise, technology variety and mindset change among instructors and learners will be discussed in this paper.

Keywords: open source software, multimedia, digital divide, live CD

1.0 Introduction

Current development in multimedia technologies have had a major impact in many facets of our lives; work, communication or education. Multimedia rich content, the emerging of Web 2.0 and a various human-computer interaction techniques, have become common parts of daily life. Such progress means a growing industry involved in producing both the technology and the content. This in turn has triggered a series of new educational programs aimed at educating professional to work in the field of multimedia communication.

Although recent technology achievements have made many multimedia production tools available and affordable, the cost of establishing a comprehensive environment for multimedia production is still relatively high. The costs, in terms of multimedia purchasing and maintenance, are even higher for an educational institution which needs to cater a variety of systems to educate learners for more than one possible career such as web design, online journalism and animation production.

Having the knowledge of multimedia technology is significant for those working in the field of mass communication, journalism and advertisement. An alternative approach taken in reducing the cost of multimedia software is to utilize the Open Source Software (OSS) for the Multimedia undergraduate program. OSS is a recent phenomenon that has the potential to revolutionize the multimedia industry. Many OSS tools have been developed specifically for multimedia systems, in addition to general-purpose tools which can be used in multimedia projects.

Globally, interest in OSS is maturing, particularly in developing countries. Governments are considering policies to promote its use, businesses are recognizing its potential and educational sector is giving increasing attention to the opportunity for localization that it presents.

2.0 Rational of using OSS

When outlining the multimedia distribution project, a question arises - why is it necessary to have an OSS based distribution for multimedia courses? The concept of open source software (OSS) was introduced in 1984 by Richard Stallman. The following factors are the reasons to opt for OSS multimedia application.

2.1 Lower Costs

The initial acquisition cost of OSS multimedia distribution is insignificant. Indeed, it is usually possible to download OSS without any cost. If there is limited bandwidth network, it may be more convenient to get the software in a CD-ROM/DVD-ROM or flash drive. Furthermore, there is no licensing fee for each user or computer, as by acquiring proprietary software and it can be freely distributed once a copy is downloaded or made available on any media. Upgrades of OSS can usually be obtained in a similar way, making the upgrade costs negligible as well.

2.2 Precise set of freedom

OSS qualifies as free software if its distribution license guarantees the freedom to run the program for any purpose, to redistribute copies, to study it and adapt it to the user's needs and to change it and redistribute it once modified. (Stallman 1984). The most famous of such licenses is the GNU General Public License (GPL). This license guarantees and protects the user's freedom by defining the conditions under which the software and its source code must be made available, as access to the source code is a precondition for realization of the user's freedom. Furthermore, the open philosophy of OSS is consistent with academic freedom and the open dissemination of knowledge and information common in academia.

2.3 Reliability, performance and security

OSS is considered to have better reliability, performance and security. The development methodology of OSS tends to assure high quality of the software. Bugs are rapidly

removed with the help of large numbers of developers and from the community which result the software to be more reliable. One of the reasons for better security is the availability of the source code, which allows vulnerabilities to be identified and resolved by third parties.

2.4 Creativity and innovation enhancement

An academic environment where OSS is prevalent will encourage professors and learners to creatively think, experiment with and participate in the development of OSS that might eventually lead to innovative solutions. The open and collaborative nature of OSS allows learners to examine and experiment with software concepts at virtually no direct cost to the university. A great deal of innovation originates from universities and many of the OSS were initially developed in an academic environment. For example, in 1984 Richard Stallman started developing a free operating system called GNU in the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology (MIT). Linus Torvalds started the work that resulted in Linux in the University of Helsinki in Finland.

2.5 Alternative to illegal copying

Educational institutions that cannot afford to pay for licensing fees may resort to using illegal copies of the proprietary software. With OSS, universities can use as many copies of the software as require to distribute among the learners. The use of OSS also discourages piracy by learners, many of whom can ill-afford the purchase of licensed copies of proprietary software. If proprietary software was used for learning, learners would have no choice but to use illegal copies of the software to do homework and assignments at home or on their computers. In contrast, there is no restriction against making copies of OSS for use outside institutions.

2.6 Uniqueness of Blended Pedagogy

The institution practises blended pedagogy in delivering the instructional material to the learners which consists of the following respective components:-

2.6.1 Face to face Tutorial (F2F)

Tutorials sessions are conducted fortnightly every semester where learners have the opportunity to physically interact and discuss with their tutors and peers either in classroom or computer lab setting.

2.6.2 e-Learning

Learners are required to participate in Learning Management System (LMS) and discuss with their tutors and peers on their subject matters. Through the mediation of LMS, learners are able to control their learning at their own pace and convenience. LMS is packed with e-learning tools such digital library, e-mail, chat, online forum as well as courses information delivery are duly provided to facilitate interaction among learners and tutors.

2.6.3 Self-managed learning printed module

Printed learning modules were distributed to the learners. Modules such as 2D Animation and 3D Animation courses are enclosed with the DVD-ROM multimedia distribution as to enrich the learning experience. By using the printed module, learners study at their own pace and convenience. These high quality material were developed by professors from the universities as well as practitioners from the industry.

3.0 Faculty of Information Technology

The Faculty of Information Technology offer academic programs both at undergraduate and post-graduate level. The vision of the faculty is to be a world-class educational incubator which produces cutting-edge knowledge workers who are capable of contributing to the rapid development in the field of Information and Communication Technology.

In accordance with one of the university's mission, namely; to provide an increasingly effective system of acquiring knowledge by means of employing advanced and appropriate technology, the faculty had taken an initiative to conduct a project on OSS multimedia distribution. The project is aimed to customise a Linux distribution to cater the need of multimedia software for multimedia courses.

Three multimedia courses namely Audio Technology in Multimedia, Video Technology in Multimedia and 3D Animation had adapted the usage of the software. Audacity, Kino and Blender were the open source software which integrated in the multimedia courses. The faculty had integrated these multimedia software to its own LiveCD which was developed on Ubuntu platform.

4.0 Objectives of the OSS multimedia distribution project

The objectives of the project are:

- 1- Finding the optimal OSS solution to be enclosed with the multimedia courses.
2. Investigating the advantages and disadvantages of OSS for multimedia courses, in terms of cost and performance.
- 3- Identifying the best available OSS for the multimedia courses requirements.
- 4- Integrating the OSS into a comprehensive and easy-to-use multimedia distribution

4.1 List of multimedia module selected

Three multimedia printed modules have been selected, namely:-

- 1 - 3D Animation
- 2- Audio Technology for Multimedia
- 3- Video Technology for Multimedia

Among the learning outcomes expected from the learners were to apply the multimedia theory, techniques and able to produce multimedia content. In order to

achieve these learning outcomes, hands-on exercises and activities were built-in in the modules. Multimedia software relevant to the courses were packaged with the printed modules.

4.2 LiveCD – multimedia distribution platform

The Faculty has decided to use LiveCD as the multimedia distribution platform because a LiveCD or known as LiveDistro is a computer operating system which is executed upon boot, without installation to a hard disk, does not alter the operating system or files already installed on the computer hard disk unless instructed to do so. The default option, however, is to allow the learners to return the computer to its previous state when the LiveCD is ejected and the computer is rebooted.

Furthermore, LiveCDs are designed to "demo" or "test drive" the multimedia software which integrated with the operating system, so that learners can explore the features and capability of the multimedia software without installing to their computer hard disk. The term "live" derives from the fact that these software distributions, each contain a complete, functioning and operational operating system on the distribution medium.

4.3 Ubuntu LiveCD (www.ubuntu.com)

There are many LiveCD available in the market (<http://www.livecdlist.com>). After a thorough research conducted, the faculty has decided to pack Ubuntu as the LiveCD because Ubuntu provides an up-to-date yet stable operating system for the average user and features a strong focus on usability, regular releases and ease of installation. Ubuntu is a Linux distribution for desktops, laptops and servers. The name of the distribution comes from the southern African concept of *ubuntu* which may be rendered roughly as "humanity toward others".

5.0 List of OSS multimedia

The next step is to remix and customize the Ubuntu LiveCD with the multimedia software. The following software have been selected for the respective modules, namely:

- 1) Audacity for Audio Technology for Multimedia module,
- 2) Kino for Video Technology for Multimedia module; and
- 3) Blender for 3D Animation module.

5.1 Audacity (audacity.sourceforge.net)

Audacity is an audio editor through which learners can record live audio, play audio and import, export files in various formats, convert tapes and records into digital recordings or CDs, edit Ogg Vorbis, MP3, WAV or AIFF sound files and change the speed or pitch of a recording. Audacity is cross-platform, using the Widgets software library to provide a similar graphical user interface on several different operating systems.

5.2 Kino (www.kinodv.org)

Kino is a non-linear digital video editor. Its vision is: "Easy and reliable DV editing for the Linux desktop with export to many usable formats." The program supports many basic video editing and assembling tasks. Kino can import raw AVI and DV files, as well as capture footage from digital camcorders using the raw1394 and dv1394 libraries and export to camcorders using the IEEE 1394 or video1394 libraries.

5.3 Blender (www.blender.org)

Blender is a 3D animation software. It can be used for modelling, texturing, rigging, skinning, animating, rendering, particle and other simulations, non-linear editing, compositing, and creating interactive 3D applications. Blender has a robust feature set similar in scope and depth to other high-end 3D commercial software such as SoftImage, Cinema 4D, 3DS Max, Lightwave and Maya. These features include advanced simulation tools such as rigid body, fluid, and softbody dynamics, modifier based modelling tools, powerful

character animation tools, a node based material and compositing system and Python for embedded scripting.

6.0 Challenges and Issues

There are several challenges and issues need to be resolved after the distribution of the LiveCD with the printed modules . Among them are as follow:-

6.1 Change Management

Some learners feel reluctant to use the LiveCD because it is a free software and they have the mentality that whatever free is cheap and have insufficient capability compare to proprietary software. The faculty need to change the mindset of the learners by illustrating to them the capability of multimedia-based OSS. These technical evidences and case studies shall be integrated in the modules.

6.2 LiveCD running slow

The LiveCD is running slow in some relatively old computer of the learners. The faculty will conduct research to resolve such problem. One of the alternative is to use Live USB (using flash drive) instead of LiveCD.

6.3 Technical support

On top of the technical support from the faculty available through phone and e-mail, learners need to get technical support from the general community of users and developers through newsgroups, mailing lists, web sites and other electronic forums. To them, this is a hassle jobs to do. To overcome this issue, the faculty need to prepare dedicated online forum which might includes Frequently Asked Questions (FAQ).

6.4 Competent tutor

The Faculty members need to train the tutors to be competent in teaching and using the multimedia software.

7.0 Future Research Direction

Specific recommendations and feedbacks from the learners and tutors had triggered future research on LiveDistro. Among them were:-

7.1 New media

The faculty team will explore new multimedia distribution to be run on flash drive or DVD-ROM. Both media have high storage capacity compare to CD-ROM. With higher storage capacity, a lot of other software can be integrated and customize into it.

7.2 New multimedia distribution

Apart from Ubuntu, there are many others LiveDistro to be explored. The faculty need to conduct research on new distribution which can run on flash drive or DVD-ROM. Portable, light and fast Linux operating system with a modular approach an outstanding design are some the criteria for LiveDistro on USB drive.

7.3 Expand to other multimedia courses

The faculty will expand the idea of built-in the open source software to other courses such as 2D Animation, Multimedia Development, Web Programming, Operating systems and Information Technology and Its Application.

8.0 Conclusion

Exploration in OSS multimedia distribution is a challenging effort taken by the instructors. Such initiatives were taken to reduce cost, reducing the digital divide among learners, enhance creativity and innovation, guarantees the freedom to run the software for any purpose, to redistribute copies, to study it and adapt it to the user's needs and to change it and redistribute it once modified. It also works as an alternative to illegal copying of software among learners. Thus, OSS provides a solution for learners to continue with their learning unencumbered by cost and legal issues.

9.0 References

- Audacity. www.audacity.sourceforge.net
(accessed January 11th, 2008)
- Blender. www.blender.org (accessed
January 12th, 2008)
- B. Batpurev (2006). Evaluation and
Adaptation of Open Source software for
Distance Learning in Asia. The 19th
AAOU Annual Conference. Jakarta,
September 15-17, 2005
- D. Wheeler (2007). Why Open Source
Software/Free Software (OSS/FS)? Look
at the Numbers!,
http://www.dwheeler.com/oss_fs_why.html.
- Kino Video Editor. www.kinodv.org
(accessed January 12th, 2008)
- _____. <http://www.livecdlist.com> (accessed
January 26th, 2008)
- _____. <http://en.wikipedia.org/wiki/LiveDistro>
(accessed January 27th, 2008)
- _____. http://en.wikipedia.org/wiki/List_of_Live_Distros (accessed January 27th, 2008)
- Terbuc M (2004). Free/Open source
software in e-education. 3rd International
Science Symposium – Project Learning
- Stallman, R. (1984). GNU's Not Unix! - the
GNU Project and the Free Software
Foundation (FSF). <http://www.gnu.org>.
- Tan Wooi Tong, (2004). Free/Open Source
Software Education. ISBN: 81-8147-
565-8, ELSEVIER New Delhi, India
- Ubuntu Foundation. <http://www.ubuntu.com/>
(accessed January 29th, 2008)