

## OPEN SOURCE SOFTWARES FOR EDUCATION

Gagandeep Marken

Assistant Prof., Department of Computer Science and Engineering  
NIILM University, Kaithal, Haryana

**Abstract:** - *E- Learning offers tremendous potential to increase the availability and convenience of education. Variety of online content is available that can include: text on a website, digital audio, digital video, animated images, and virtual reality environments. In the present era of globalization information sharing has been revolutionized with the help of IT and ITes. The education system is observing a paradigm shift from proprietary software to open source, for e-learning applications. In fact, open source software (OSS) development can provide the necessary flexibility to combine languages, scripts, learning objects and lesson plans, effectively, without the cost and rigidity of proprietary software. In recent years, numerous open access LMS software"s have emerged as viable alternatives to costly proprietary and commercial products. Open source software"s of Content Management Systems (CMS) and Learning Management System (LMS) are gaining popularity. The paper throws light on advantages, disadvantages of using open source software in different application areas. Particularly education.*

**Keywords:** *Open source software, software evolution, license, e-learning, content and Learning Management System*

### Introduction

**An open source** refers to a computer program in which the **source** code is available to the general public for use and/or modification from its original design. **Open-source** code is meant to be a collaborative effort, where programmers improve upon the **source** code and share the changes within the community. It is a computer software with its source code made available and licensed with an open-source license in which the copyright holder provides the rights to study, change and distribute the software for free to anyone and for any purpose. Open-source software is very often developed in a public, collaborative manner. Open-source software is the most prominent example of open-source development and often compared to (technically defined) user-generated content or (legally defined) open-content movements

### Defining the Open source

*With all this background about open source we can define what constitutes the open source. **The distribution terms of open software must confer to the following:***

- No restriction should be placed on the redistribution of open source. Thus the user or anybody else should be free to give away the software independently or as a component of aggregated software distribution. Code the software distribution must include source code along with the compiled form if any. The source code is then it should be available on the Internet readily without any charge.
- The license may restrict source code from being distributed in modified form only if it allows the distribution of patch files with the source code. However the license must allow distribution of the software built from modified source code. In such cases the modified works may be allowed to carry a different name or a different version number.
- The license must not discriminate against any person or a group of persons.
- The license must not restrict the use of the software to any specific field of work. It should be available for use in general.
- License must not be specific to a product: The license of the software must not depend on it being a part of a particular software distribution. It should be distributed and used on the same license even if it is not a part of any major distribution.

- The license must not put restrictions on the other software that is being distributed along with the licensed software.
- License must be technology neutral i.e. It should not be Dependant upon a specific technology or a style of interface Keeping all this in view, a license has been setup under the name of GPL (General Public License), the version 3 of which has been recently released.

Based on the licensing and the commercial point of view, the software in general, can be divided into the following types.

Commercial/proprietary software

Shareware software

Freeware software

Open source software

### 1. Commercial Software

Such software are based on the centralized model of software development as used by the commercial companies. In this the decisions and the functions related to the software are controlled and performed by a closed group of developers. Often the decisions are governed by the market, the past performance of the software, the company policies, the profit-expense ratio etc.

This type of software is distributed as a copyrighted binary file only. To the user, there is a cost involved which is charged on per license or per seat basis. Most of the popular brands are commercial and are distributed in this manner—for example—Software from Microsoft (like MS Office, MS Windows etc.), Oracle database system etc.

**Advantages** of such type of software are directly reaped by the company only, since the development is a one-time process whereas the market for the software may exist for many years to come. Often, the proprietary nature of the software means obtaining patents on certain portions or on the whole of the software, thereby helping the company to monopolize the market. At the same time the users tend to stick to the software they have been using in the past, hence new software finds it hard to get accepted. The user gets a fully functional software with support, service and training for certain period of time. Usually updates are also provided for certain time period by the company. Thus, the software maintenance is less troublesome.

**Disadvantages** are mostly on the user side. The user buys licenses at a cost. The user in most of the cases less very little choice to make. The software available may be outdated or in many cases, not suited/optimized for his hardware (e.g., the software may have been compiled and optimized for 80486 processor while he is using a high and Pentium system) leading to less efficient use of the hardware capabilities. Updates are difficult to obtain and that too at an additional cost. Therefore, once the user buys a software, he is tend to stick to it and to the particular version, for several years to come mainly due to the high cost involved in the buying new versions. Further, the bugs are difficult to fix and the user may have to wait till the company releases a new version or a bug fixing patch, which may take some time.

### 2. Shareware Software

Shareware software are also based on a centralized model of development. The software development is done by a group of individuals or a single individual who keeps the source code. The source code is not made public—only binaries are distributed. The software is distributed on a shareware license basis. The existence Internet has made distribution of such software easy.

The user gets a binary copy of the software. Often this copy has a limited functionality enabled or there is a time limit of the fully functional version, which after the time falls back to a reduced functionality version or does not function at all. To get a fully functional version, the user needs to pay a certain fee as decided by the author(s) of the software. But again no source code is provided.

### 3. Freeware Software

As the name suggests, it is a free software. Written by developers, it is distributed through user groups or email or bulletin board service, Usenet or other electronic media. History of freeware is even older than the Internet. The freeware, in those days, were distributed through Bulletin Board Services run over the public telephone networks and was very popular source of free shared software. Notable among these are FidoNet, Sourcery Systems BBS etc. which provided source code under public domain, shareware and freeware programs. One of first software which was made available under this was PC Talk by Andrew Fluegelman which later on shifted to shareware domain. Now-a-days, the Free-Software Foundation created by Richard Stallman is promoting the cause of Freeware software by providing a platform on the Internet for freeware advocacy.

The authors of freeware often want to give "something to the community", but at the same time, they intend to keep the control of the software's future development, therefore, the source code is not released. Unlike shareware, where a user is required to pay certain cost, the freeware software is made available for public use freely, free of charge and for unlimited time period. However, the license of the software may impose one or more conditions like– free for personal use, non-govt. use, non-commercial use, non-profit use, academic use only etc. Like the software, the documents created using such free software, may be distributed freely as well.

Freeware may include public domain software, free software and proprietary software. But it does not include software which fall under categories of adware, spyware, demoware or a shareware where there is a cost or even a hidden cost to be paid like an advertisement or a reminder about a pro-edition or the impending time limit etc.

### 4. Open- Source

The "Open Source" refers to a set of principles and practices that promote public access to the design and the production of goods and knowledge. Although the idea is much older-since 19<sup>th</sup> century, there exists a tradition of sharing the research work among the researchers through publishing these. Benjamin Franklin was an early contributor. He donated all his inventions to the public domain after getting sufficient profit from their sales and patents. The term was coined in 1998 at a strategy seminar held at Palo, Alto, California. This was in response to Netscape' January 1998 release of their web browser's- Navigator-source code to public. This was the start of open source movement and Netscape software, renamed as Mozilla, was the first open source software. Later, several other software migrated from free software to open source license. The open source initiative (OSI) formed in Feb.1998 has been continually promoting the cause the open source by bringing several other software to open source fold.

Under open source license, the software and its source code is freely available to the general public with no Intellectual Property restrictions. The users are allowed to create software through incremental individual efforts or through collaborations. Thus there were no restrictions as in the case of freeware.

Now-a days a term "FOSS" (Free/Open source software) is more appropriately used to describe the open source software. The open source is now like a culture and is applied to many products other than software, e.g. Academic knowledge, films, music, arts etc. In fact the rights of open source culture resulted from the tussle between the creative practices and the restrictive IP laws and copy right laws of which digital millennium copy right act (USA) is a part. Similar, laws exist in almost all countries. You can now find web site dedicated to several different open source aspects like open source type of governance, journalism, intelligence, ethics, movie production, academic course ware, electronic products, research information, documentation, software etc.

**Why OSS is gaining so much popularity.** The main reasons of the popularity of these softwares are:

Some critical criteria are:

1. Budget
2. Stability
3. Flexibility
4. Scalability
5. Usability
6. Life of the solution/ software
7. Security
8. Knowledge base and Self reliance
9. Intellectual Property Rights (IPR)
10. Adaptability to various cross platforms and hardware like mobile, internet, tablet pcs, etc.

#### **ADVANTAGES OF OPEN SOURCE**

**Free Redistribution** The license does 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 license shall not require a royalty or other fee for such sale.

**Source Code** The OSS includes source code, and allows distribution in source code as well as compiled form.

**Derived Works** Most license allow modifications and derived works, and allow them to be distributed under the same terms as the license of the original software.

**No Discrimination** against Fields of Endeavour The license does not restrict anyone from making use of the program in a specific field of endeavour. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

**Is not specific to a Product** The rights attached to the program does not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed have the same rights as those that are granted in conjunction with the original software distribution.

**Not Restrict Other Software** The license does not place restrictions on other software that is distributed along with the licensed software. For example, the license does not insist that all other programs distributed on the same medium must be open-source software.

**Technology-Neutral** Most of OSS is technology neutral.

#### **Role of Computers & Internet**

The explosion in information exchange among the users in recent years, was due to two main factors-The explosive growth in use of personal computers causing one precedented rise in the general users access to digital media and due to the Internet. The digital media, due to its low cost as compare to the analog media (like television, telephone etc.), is now the main medium of information exchange. The goals of the open source could not be achieved without the Internet. It is open source's most valuable asset and allows for easy and inexpensive redistribution of open source. Through the Internet, the users instead of being limited to their own limited source and facilities, are granted access to a vast network of facilities and resources of inexpensive digital media and storage, some of which are free. The users also get to access to each other, thereby, facilitating the collaborative, development and decision making without any international and cultural boundaries. Further, the speed with which digital media travels on Internet allows the open source culture to spread worldwide.

## Application of Open Source Software in Education

Most of the experiments in technology start from the academic institutes. In case of the open source as well the initiative came from the academia. Starting from simply freeware working on DOS or full operating system like Linux, the software contributed by the academic community, to the open-source pool, have been very popular. Further, the documents and other creative works produced/created through the use of open-source pool, have been very popular. Further, the documents and other creative works produced/creative through the use of open-source are also many time times made available freely under open-source license. Several project like Connections project of Rice university, Open Courseware project at MIT, the Open Source Cultural Database, Open Web School etc., are the examples of the use of open-source in education and similar fields. Educationists have create open source curricula which are instructional resources and for which, the digital source can be freely used, modified and distributed. A service –OSS Watch, funded by Joint Information Systems Committee of the UK, acts as advisory body for higher education institute wishing to use, contribute and develop Open source. In the are of research, many funded research projects produce software and other projects as a part of their work. Some of these projects allow these works to be made available freely under Open Source license.

In a developing country like India, the role of open source is very important. In education area, we find small schools with low budget. Such schools and other similar Institute are certain to benefit from the use of open source. Already several institutes have included Linux and open-source education in their curricula. Many of them are using open source platforms to perform their day-to-day operation like email service, web services and application services etc. The use of Open source platform to perform. The use of open source is mainly due in education is growing day by day.

Recently OSS has become more of a mainstream product with many companies adopting it in their offices. OSS market share has also grown rapidly making many companies sit up and take notice of the OSS phenomenon.

IBM recently announced that the company would devote almost \$1 billion dollars to support Linux. (Burke, 2000); • Forrester Research estimates that more than 55% of the world's 2,500 biggest firms use open source software, with almost a quarter using the software in production systems. (Connor, 2000); • Sun released Star Office, an office suite similar to Microsoft Office, under the GPL license; To be sure, free/open source software still faces challenges. Both Red Hat and VA Linux, two of the most prominent corporate supporters of Linux, still lose money. Microsoft has various code sharing licensing methods under “Shared Source Initiative” program which details around 22 different licenses tailored around different industries and products.

## 5. Conclusion

Every thing that is good often also becomes the target of criticism and open source is no exception. Critics cite the need of direct compensation for the work of creation. It is clear that most of the creative works involve large amount of labor. Hence, retaining the IP rights can provide a way of obtaining financial compensation that can cover the labor costs. It is argued that perhaps, the financial implications may mean that many have caused some of the good works would never have been created in the first place. Another criticism is that the open source projects are not self sustaining and succeed only if there is a strong central manager. Further, the proponents of freeware oppose to the open source movement by arguing that the open source is threat to free software's ideal and refuse to give up the idealistic standards of FSF.

However, whatever be the criticism and opposition, the open source movement has touched the hearts and has relieved the financial burdens on the pockets of the users. The products are robust, popular and free. Support is available over the Internet 24x7 days and is free too. The only thing that matters is the assembly of a full product. Thus open source has a bright future and will form the backbone of the future computing models

**References:**

N. Pankaja, Mukund Raj P K, Proprietary software versus Open Source Software for Education , American Journal of Engineering Research (AJER) e-ISSN : 2320-0847 p-ISSN : 2320-0936 Volume-02, Issue-07, pp-124-130.

Williams, Roy (2003). 2nd European Conference on E-Learning Glasgow Caledonian University, Glasgow, 6–7 November 2003. Academic Conferences Limited.) [4].

Scott Wilson, Open source in higher education: how far have we come? (the guardian, 28 March 2013)

DIBONA, C. OCKMAN, S. and STONE, M.: 'Open Sources: Voices from the Open Source Revolution', O'Reilly Press, Sebastopol, CA, 1999

SCACCHI, W.: 'Understanding Software Process Redesign using Modeling, Analysis and Simulation , Software Process--Improvement and Practice, 5, (2/3), pp. 183-195, 2000.

Sommerville, I., Software Engineering, 8th Edition, AddisonWesley, New York, 2006.