

# Application of Free and Open source software and its Impact on society

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**Abstract**— Free and open source software is one of the effective tool that can make the world self-dependent. It facilitates the design and use of your own software. This can also lead to economic liberty as the FOSS is available at a very low cost. These softwares are also more secure as the users can report the threats or bugs to the developers and developers can update the software to make it more reliable for the future users.

**Keywords**— Free and Open source software, effective tool, self-dependent, economic liberty, secure, reliable

## I. INTRODUCTION

This paper will give an overview of what is free and open source software and will mainly concentrate on its uses in various fields with some of its effects on our society.

## II. FREE AND OPEN SOURCE SOFTWARE

Free software is a term coined by Richard Stallman, programmer in MIT Artificial Intelligence Lab. According to him free in free software means the freedom one can get from using these softwares. These softwares could be used, modified, redistributed without any permission required.

Open source software is basically the same in which the source codes of the software are available at free or nominal cost so one can install it and use it.

Free softwares should satisfy the following criteria in order to be called as free software. These features are laid down by Richard Stallman creator of GPL (GNU General public License)

- A. The freedom to run the program for any purpose.
- B. The freedom to study how the program works and modify it.
- C. The freedom to redistribute copies.
- D. The freedom to distribute the modified copies so as to help the entire community.

## III. FREE SOFTWARE DEVELOPMENT MODEL

The FOS development model is based on information, comments, test results, features, and requests exchanged

between the developers and users. The participants in the FOS are motivated by the exchange of knowledge to achieve recognition from their peers. Also, the technology transfer improves when the flow of information is two-way among the producers and consumers, which can be achieved through the FOS model adoption. The purpose of citing the above developmental model was to show that how user can help in developing new products.

## IV. APPLICATION OF FREE AND OPEN SOFTWARE

The main application of free and open source software is due to the fact that it is available at very low cost, other applications are from research and training where young minds are taught about the working of software. So that they can build new products.

### A. Business Firms

FOS has found a wide application in many of the business firms. As these softwares are available free of cost so companies can gain huge profits by using them. Whereas the proprietary softwares require huge capital investments.

One of the essential features of the Free and Open source software is that it can be changed as required. Using this feature they can customise the software as required. So now they need not to be dependent on the vendors for any update or change in the software. Below given are some of the FOSS that can be used in business houses.

- 1) *Linux* –It is a type operating system which is derived from the UNIX family. Linux can be used on wide variety of computer hardware ranging from mobile phones, tablet computers and video game consoles to mainframes and supercomputers.

Linux is predominantly known for its usage in server. In a 2009 survey it was found that about 40% of the servers use Linux. The popularity of Linux on standard desktops (and laptops) has been increasing over the years due to the graphical user environments. The two popular environments are GNOME and KDE both of which support a wide variety

of languages. The bar graph below shows the use of different soft wares.

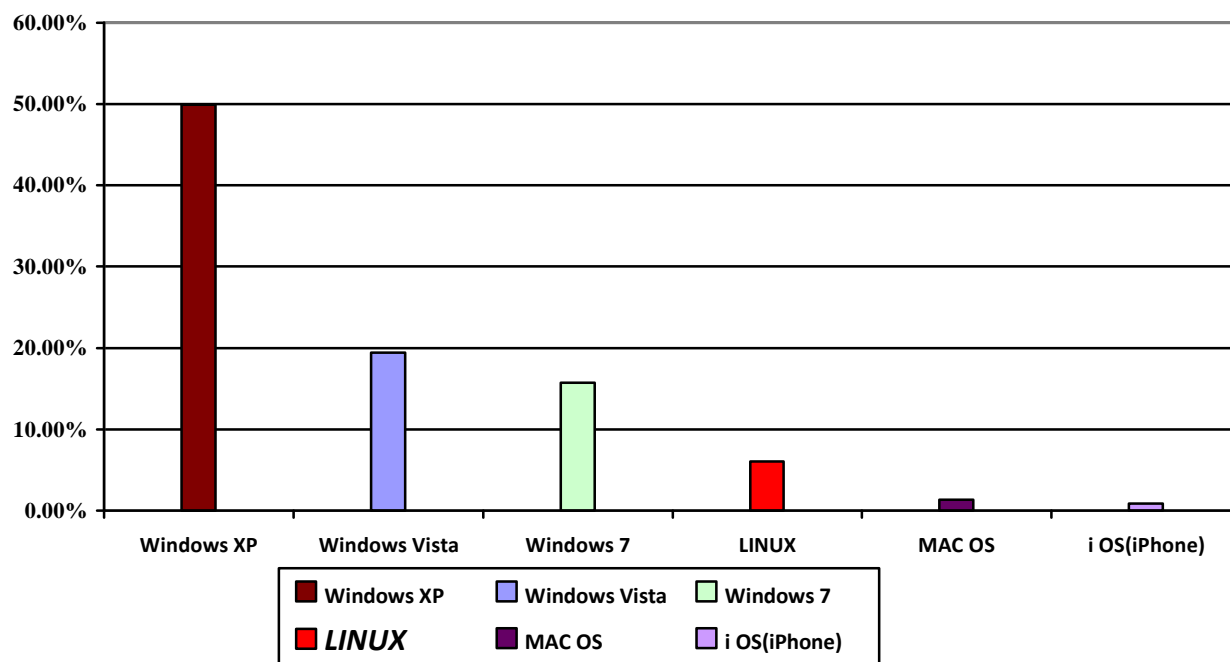


Figure 1 Usage share of web client Operating System

- 2) *My SQL*- It is the world's most popular open source database software, with over 100 million copies of its software downloaded or distributed till date. With its superior speed, reliability, and ease of use, My SQL has become the preferred choice for Web, Telecom companies and forward-thinking corporate IT Managers because it eliminates the major problems associated with downtime, maintenance and administration for modern, online applications. Many of the world's largest and fastest-growing organizations use MySQL to save time and money powering their high-volume Web sites, critical business systems, and packaged software — including industry leaders such as Yahoo!, Alcatel-Lucent, Google, Nokia, YouTube, Wikipedia, and Booking.com. MySQL is a key part of LAMP (Linux, Apache, MySQL, PHP / Perl / Python), the fast-growing open source enterprise software stack. More and more companies are using LAMP as an alternative to expensive proprietary software stacks because of its lower cost and freedom from vendor lock-in.
- 3) *Apache*-The Apache HTTP Server, commonly referred to as Apache is web server software notable for playing a key role in the initial growth of the World Wide Web. In 2009 it became the first web server software to surpass the 100 million web site milestone. Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation.

The application is available for a wide variety of Operating Systems like GNU, Linux, Solaris, MAC OS X, and Microsoft Windows. Since April 1996 Apache has been the most popular HTTP server software in use. As of February 2010 Apache served over 54.46% of all websites and over 66% of the million busiest sites. Apache is primarily used to serve both static content and dynamic web pages on the World Wide Web.

- 4) *BIND* is by far the most widely used DNS software on the Internet. It provides a robust and stable platform on top of which organizations can build distributed computing systems with the knowledge that those systems are fully compliant with published DNS standards. BIND is open source software that implements the Domain Name System (DNS) protocols for the Internet. It is a reference implementation of those protocols, but it is also production-grade software, suitable for use in high-volume and high-reliability applications. BIND is available for free download under the terms of the ISC License, a BSD style license.
- 5) *Sendmail* is a general purpose network mailing routing facility that supports many kinds of mail-transfer and -delivery methods including the Simple Mail Transfer Protocol used for email transport over the internet. Sendmail is a well-known project of free and open source software that has developed both as proprietary and free software. In 2001, approximately 42% of the publicly-reachable mail-servers on the Internet ran Sendmail. More recent surveys have suggested a decline, with

29.4% of mail servers in August 2007 detected as running Sendmail in a study performed by E-Soft, Inc. Sendmail is trailed by Microsoft Exchange Server, Exim, Postfix; these four being the only mail servers with more than 10% of the total.

### B. Educational Institutes

FOSS has found a large application in the field of research and education. Educational institutes can use the open source software to teach the future coders about how a software works. These softwares come with open code that can be used, modified many a times to learn different things. In contrast the proprietary software comes with only training of how to use the software i.e. the working manual. In other words it shows with it what one can do. It never discloses the codes to the users. For example while downloading the Linux kernel a open source software one can find there are two options one for new users another for experienced users. If clicked on the other option one can change the settings as per requirement. These features are only available in FOSS.

## V. IMPACT OF FREE AND OPEN SOURCE SOFTWARE

### A. Economic Impact

FOSS is available with free or nominal cost so the firms using these softwares can get huge profits in their balance sheets. The FOSS are updated periodically to incorporate new changes that were suggested by ethical users. So many Companies update their software without any extra cost. They also get the improved security from the updated versions. It is due to the efficiency of FOSS that today about 40% of the servers use Linux. Below given are some details of an Indian firm that got huge benefits while switching to open source softwares. The name of the firm is Life Insurance Corporation of India. It was needed to connect its 2048 branches across the country to make all the divisional offices achieve the 100% branch computerization. All the branches were connected to the zonal and divisional offices through Wide Area Network (WAN) while the offices in the same city are connected via a Metropolitan Area Network (MAN). Each branch has one dedicated server while the divisional and zonal offices had about 10 servers each and the central corporate office had about 50 servers. Thus, in total, the server count was close to 3500. Each branch had about 20 to 30 workstations. The total desktop count was close to 30,000.

TABLE I  
DETAILS OF SAVINGS

Items	Cost Saving
Servers-All of them were migrated to LINUX	\$ 5 million
Desktops-Also migrated to LINUX	\$ 3.75 million
Total	\$ 8.75 million

### A. Social Impact

The primary goal of the FOSS Project is to build a collaborative community of developers and users. Developers develop their products to help the community to be self dependent i.e. not to be excessive dependent on vendors for their products.

The social impacts of making the software and its source code available for free start from the users of the software. Users who are using the free and open source software play an important role in making the software robust. As they could only know what are the drawbacks or threats to the software. Now if the users who are competent enough in the programming language in which the software is written, they can directly change the code and can make the software more reliable. They can either release it in the market with the previous developer or can relaunch the new product in the market. The licenses under which these soft wares products are protected like GPL allow them to do such things without any permission from the real developers else they can also give their essential feedback to developers so that they can change the software and release the new version in market to make it easy for the future coders.

Also, in this type of Software developmental process one with sound knowledge of the programming language from any part of the world can join the developers to give out cheap, efficient and robust software to the world. From this they can gain more knowledge of the working of software and also gets recognition from big software firms.

Other impacts of FOSS are that now more people have become computer literate. Generally the proprietary soft wares are developed in the western countries so all of them support only the main languages of the world and ignore other languages. FOSS has helped them to make the software available in their own local language.

Example-BOSS (Bharat Operating System Solutions) is a derivation from Debian software developed by C-DAC (Centre for Development of Advanced Computing) in 18 Indian languages which has helped them to make its citizen computer literate.

## VI. CONCLUSIONS

The conclusion that can be drawn from the above text that free and open source software are the cheapest, secure and customizable software that has wide application in making the world less dependent of the proprietary software and to innovate new products to help the mankind.

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