UNIT 15 OPEN SOURCE MOVEMENT

Structure

15.1 INTRODUCTION

Open source is a set of principles and practices that promote access to the design and productions of goods and knowledge. The term is commonly applied to the source code knowledge. The term is commonly applied to the source code of software that is available to the general public with relaxed or non-existent intellectual property rights. This allows users to create software content through incremental individual effort or through collaboration. Open source denotes that the origins of a product are publicly accessible in part or in whole. The term open source refers to software in which the source code is freely available for others to view, amend and adapt. Typically it is created and maintained by a team of developers that crosses international and national boundaries.

Technically speaking, software is made of lines of instructions to computers called 'code'. Depending on the complexity of the software, its code can be a few dozen lines or several million lines. This code is written following the rules of a certain grammar, called a language like C++ or Java. Changing or modifying the code can extend or modify the features of the software. Commercial companies like Microsoft and Oracle view the code as their intellectual property and protect it to the extent of

not allowing modification even by their customers who have paid to buy and use it. Open source groups, like those behind Linux Operating System considers software as a 'building block' which can and should be modified by its users to customize it for their particular use.

15.2 OBJECTIVES

After studying this unit, you should be able to:

- explain the term open source;

- describe the difference between open source software and proprietary software;

- list the advantages of open source software;

- describe legal issues which pertain to such software; and

- know application of open source in other fields.

15.3 HISTORY OF OPEN SOURCE

The history of open source is actually a very interesting one. To start with, in the beginning there was only one free (Libre) software. Later on proprietary software was born and it quickly dominated the software landscape to the extent that now it is usually considered as the only possible model by many people. However, in recent times the free software has again gained popularity.

During the 1960's when IBM and other companies were selling large scale commercial computers, they came with some software which was free (Libre), free in the sense that it could be freely shared among users. This came with a source code, and hence could be improved and modified. However in the late 1960's and mid 70's the proprietary software started making their place in the market.

In the late 70's and early 80's Richard Stallman, an American software developer who had an idea that sharing source-code and ideas is fundamental to freedom of speech developed a 'free' version of the widely used 'UNIX' operating system. This resulted in a 'GNU' program which got released under a specially created General Public Licence ('GNU.GPL'). The GPL is the license under which much Open Source code is distributed. It enshrines the idea that computer code, like speech, should be free to be copied, interpreted, modified and generally mashed-up. This was designed in such a way that source-code could remain openly available to all. This software was basically designed for commercial usage or distribution. Such an approach was called 'free software'. Thus the term "free" denotes that anyone could modify the software as per his/her needs.

During the 80's and the early 90's open source software continued its development. USENET and Internet actually helped out to co-ordinate transnational efforts, and to build up strong user communities.

Please answer the following Self Assessment Question.

Self Assessment Question 1   *Spend 2 Min.*

What was the first open source software available in the beginning?

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15.4   TYPES OF SOFTWARE

Computer software can be broadly split into two development models.

1)   Proprietary software, and

2)   Open source software (OSS)

Proprietary software or 'closed software', as the name suggests are software which restrict access to and use of the source code. As per the "Wikipedia", proprietary software is software that has restrictions on using and copying it, usually enforced by a proprietor. The prevention of use, copying, or modification can be achieved by legal or technical means. Technical means include releasing machine – readable binaries only and withholding the human readable source code. Legal means can involve software licensing, copyright and patent law.

The term is used by the Free Software Foundation to describe software that is not free software or semi-free software. Technically, the term means software that has an owner who exercises control over the software. Thus, it can be used for all software that is not in the public domain. However the FSF uses the term to highlight that the owner is of prime importance, in contrast to "free software", where the freedom of computer users is of prime importance.

Proprietary software thus in other words means that which is owned by an individual or a company (the one that developed it) and thus there are major restrictions on its use, and its source code is therefore kept secret.

Open Source Software (OSS)

Open source software on the other hand is one where there is an underlying 'source code' which is made available under a licence. The developers and users have to adapt and modify it as per their need.

However the distribution terms of open source software must comply with the following criteria:

i)   **Free Redistribution:** The licence which is given shall not disallow the other party from selling the software as a component of an aggregate software distribution containing programs from different sources. Furthermore, the licence will not be given for any kind of fee or royalty for such sale.

ii)   **Source Code:** The program must have a source code, and there should be a distribution in that source code.

iii) **Derived Works:** The licence must allow changes and derived works, and must permit them to be distributed under the same terms as the licence of the original software.

iv) **Integrity of the Author's Source Code:** The license may restrict source code from being distributed in modified form only if the licence allows the distribution of 'patch files' with the source code for the purpose of modifying the program at build time.

v) **No Discrimination Against Persons or Groups:** The licence must not discriminate against any person or group of persons.

vi) **No Discrimination Against Fields of Endeavour.** The Licence must not restrict anyone from making use of the program in a specified field.

vii) **Distribution of Licence:** The right attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional licence by those parties.

viii) **Licence must not be Specific to a Product:** The rights which are attached to a program must not depend on the program's being part of a particular software distribution.

ix) **Licence must not Restrict Other Software:** The licence must not place restrictions on other software that is distributed along with the licensed software.

Licence must be technology neutral

No promotion of the licence may be predicated on any individual technology or style of interface.

Please answer the following Self Assessment Question.

Self Assessment Question 2   *Spend 4 Min.*

How does open source software differ from proprietary software?

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15.5   DESIRABLE SOFTWARE ATTRIBUTES

The debate over the merits of proprietary software and OSS has gained a great momentum in recent years. However the following attributes are desirable both in open source as well as proprietary software.

Reliability – how far a system is reliable without any disturbance

Quality – number of euros in a fixed number of lines of code

Security – how flexible the software is to unauthorized actions, e.g. (virus)

Flexibility – how easily the software can meet the needs on different devices

Project Management – how organized it is

Open Standards – if a document is created in one type of software can it be readable in another

Switching Costs – the expense for moving from one system to another

Total Cost of Ownership (TCO) – the total cost expense over the lifetime of the software.

User Friendliness – how easily is it adopted by people

15.6 ADVANTAGES OF OPEN SOURCE SOFTWARE

The usual notion is that open source softwares are made available at a low cost, but this can be true in the case of proprietary software too. Therefore following are some of the advantages of open source software.

Since the source code is available and one can modify it, it is an important characteristic. This enables the unlimited timing and improvement of a software product. This also makes it possible to port the code to new hardware, to adapt it to the changing conditions, and to reach a detailed understanding of how the system works. Now experts understand that to increase the lifetime of an application, it must be available in a source form. It has been seen that binary only application does not survive for more than ten years in an unmodified form. However open source software systems have survived for more than twenty years and are still in widespread use. Because of the availability of source code, one can also isolate bugs and fix them.

Technical motivations are common because there are at times different ways to perform a work and one may not decide which one is better. So if the two parties do not reach a consensus and the user base is quite large, the code then splits into two, but both continues development. If the reasons for the split comes to an end, and both the parties agree then there may be a reunification. In other cases a 'fork' is used to co-ordinate work.

E.g. the Linux kernel has two distinct code bases, one stable and one experimental. This way one can introduce new and potentially dangerous technologies without disrupting the stable ones.

Another advantage of open source software is that no per copy fee can be asked for modified versions and thus anyone can use the current code base to start whatever new projects. One can gather knowledge at a very low cost. This is the reason why the internet software systems have become an important factor in the new economy. All new aspirants who are trying new technologies are now able to integrate and adopt them immediately without any licence agreements. The right to freely modify them is a bonus which has led to innumerable expansions in the number of communication protocols and systems, each based on the needs of one and all. This is one of the reasons for the success of the Linux Kernel, which is widely used by the students during the start up phase till they turn into entrepreneurs.

Another advantage of OSS is that there are minimal conflicting priorities due to marketing pressures. This is due to the fact that there is no single commercial entity pushing for precise delivery dates or features that must be supported. Usually OSS is made available to people only when it is ready and when the development team believes that it is good enough in its quality for use.

Finally, OSS gives a new platform for democratic action. One can say that it provides a platform for democratic action in the sense that it is designed the way people need it, improvements are made as per their needs, thus the collective desire of the community determines the overall direction of development, and modification and without compelling anyone to do that. Thus the public opinion is the backing force which leads to the progress of such a software.

Please answer the following Self Assessment Question.

Self Assessment Question 3   *Spend 2 Min.*

Fill in the blanks:

1)   With open source software there is always the possibility of creating an .... base, if the recent one is perceived as wrongly managed.

2)   The .... is the backing force which leads to the progress of such Open Source Software.

15.7   LEGAL ISSUES

15.7.1   Copyright

Software is protected using the copyright system. Same protection is given as on books, music or film, and the buyer of software is licenced the use of a copy of the product. Software is usually not purchased but a licence is given to use it. Copyrights are used to protect computer software but all do not use copyrights to have rights in software. Some use copyrights so that no one may have any rights in software; there is a new word for it 'copyleft'.

Now, as we know, software where source code and object code both are freely available is called 'open source software'. In copyleft open source software, source code and object code are freely available to be used, modified and improved without any changes. The term open source software is often used in the sense of open source software that is copy left.

15.7.2   Software Patents

Whereas copyright protects the software code from being copied, patents can be used to prevent the innovative solution or effects of software from being copied. Now, usually the government grants the patent holder rights, in return for sharing the information on how the technical result was achieved. The extent to which the software should be patentable is controversial. A key issue is whether the software has a 'technical effect' or is used for a business process.

The scenario in US is that for business processes the software can be patented. In EU currently 'business processes' are not patentable.

15.8 OTHER SUCCESSFUL OPEN SOURCE SOFTWARE

1) Open office.orgsuite

2) Mozilla

3) Ximian

Office suite provides bundle of softwares that are used in an office. The most popular office suite is Microsoft Office Suite. Open Office.Org suite is similar to it.

Software which permits one to access internet is called Web Browser. There are many such softwares. Opera, Internet Explorer etc. Mozilla is a web browser open office. Org suite and Mozilla both can be operated in Linux as well as Windows.

Microsoft outlook is an electronic personal information manager. It manages one's e-mail, calendar, appointments etc. Ximian is also an electronic personal information manager. It is similar to Microsoft Outlook; however, it works on Linux only. (Open source software and Intellectual Property Rights by Judice Yatindra Singh).

Please answer the following Self Assessment Question.

Self Assessment Question 4   *Spend 2 Min.*

Name a few open source software.

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15.9 APPLICATIONS OF OPEN SOURCE IN OTHER FIELDS

The principle of open source can be applied to a variety of other applications as well as software development. They are:

Markets: Software is not the only field affected by open source; many fields of study and social and political views have been affected by the growth of the concept of open source. Advocates of one field will often support the expansion of open source in an other field, including Linus Torvald who is quoted as saying, "the future is open source everything".

The open source movement has been the inspiration for increased transparency and liberty in other fields, including the release of biotechnology research by CAMBIA and the encyclopaedia named 'wikipedia'.

Cola Drinks: Open cola is another idea inspired by the open source movement. Soft drink giants like Coke and Pepsi hold their formulas closely guarded secrets. Now

volunteers have ported the recipe for a similar soda drink on the internet. The taste is said to be comparable to that of the standard beverages.

Beer: There is also an open source beer called Vitosφl.

Pharmaceuticals: There have been several proposals for open source pharmaceutical development, like the one which led to the establishment of the tropical disease initiative. There are also a number of not for profit "virtual pharmas" such as the Institute for one World Health and the Drugs for Neglected Diseases Initiatives.

Let us now summarize the points covered in this unit.

15.10   SUMMARY

● Open source software in other words means software where the source code is made available to all, and a licence is given for the modification and development of the software as per the need of the user.

● The availability of the source code makes it simpler to use by the user.

● However, there are legal issues related to such software which are copyright and patent issues.

● The open source movement is gaining momentum in other fields other than the software i.e. we now have open colas, open source in software, hardware, pharmaceutical industries etc.

15.11   TERMINAL QUESTIONS

1)   Discuss the history of open source software right from the beginning till date.

2)   Discuss the advantage of open source software over the proprietary software.

3)   What are the distribution terms of open source software?

15.12   ANSWERS AND HINTS

Self Assessment Questions

1)   Libre was the first open source software used in the beginning.

2)   Licence is given to modify and develop the software as per ones need.

3)   (1) Alternative code, (2) Public opinion.

4)   Mozilla, Linux.

Terminal Questions

1)   Refer to section 15.4 of the unit.

2)   Refer to section 15.5 of the unit.

3)   Refer to section 15.6 of the unit.

15.13 REFERENCES AND SUGGESTED READINGS

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