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OPEN SOURCE RESOURCES

In the previous lesson you have learnt about digital presentation. In this lesson you will learn about open source resources. Open source refers to a program in which the source code (i.e., the executable computer program) is generally available to the general public for use or modification from its original design. Open source is created by the efforts of programmers and organisations which improve upon a code, find glitches, add features etc., and share the changes within the community to be reviewed and used. In this lesson you will learn about usability of open source, benefits of open standards and industry standards, commercial benefits of open standards and database management system.



OBJECTIVES

After reading this lesson, you will be able to:

- use Open Source;
- list the benefits of Open Standards and Industry Standards;
- commercial benefits of Open Standards.

11.1 USE OF OPEN SOURCE

The inspiration for open source is considered to be different from the otherwise paid proprietary softwares and programs previously available through large companies. These companies owned the softwares, which were available to the users at a price and in the limits of certain terms and conditions.



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Open source made a revolution in programming and the software industry by providing new and exciting products free of cost. The primary motive to generate an open source code is to have more useful, bug free products which are easily available and can be tinkered with, according to the requisites of the user.

A certification standard issued by the Open Source Initiative (OSI), indicates that the source code of a computer program is made available free of charge to the general public.

An “OSI Certified” product means that it must meet the following criteria:

- The author or holder of the license of the source code cannot collect royalties on the distribution of the program.
- The distributed program must make the source code accessible to the user.
- The author must allow modifications and derivations of the work under the program’s original name.
- No person, group or field of endeavor can be denied access to the program.
- The rights attached to the program must not depend on the program’s being part of a particular software distribution.
- The licensed software cannot restrict on other software that is distributed with it. Similar to the certification standards, Open source has its own distribution terms which the product must comply to.
- **No restriction for selling:** The license shall not restrict any party from selling or giving away the software as a component. The license shall not require a royalty or other fee for such sale.
- **Source Code:** The program must include source code; the source code must be in the form in which a programmer would modify the program.
- **Derived Works:** The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.
- **No Discrimination:** The license must not discriminate against any person or group of persons. For example, it may not restrict the program from being used in a business, or from being used for generic research.
- **Distribution of License:** The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.
- **No Restriction with Other Software:** The license must not place restrictions on other software that is distributed along with the licensed software.

11.2 OPEN STANDARDS

An open standard refers to the standard that allows full public assessment and can be used without constraints in unbiased form. They are free from legal or technical clauses that limit its utilization in any business model. It can be managed and further developed independently. It allows you to share all kinds of data freely and with perfect reliability.

Open standards provide several benefits:

- **Application Independence:** To ensure that access to resources is not dependent on a single application.
- **Platform Independence:** To ensure that access to resources is not restricted to particular hardware platforms.
- **Long-term Access:** To ensure that quality scholarly resources can be preserved and accessed over a long time frame.

Some examples of recognised open standards bodies are:

Standards Body	Comments
W3C	World Wide Web Consortium (W3C). Responsible for the development of Web standards. Relevant standards include HTML, XML, CSS, SMIL, SVG, etc.
IETF	Responsible for the development of Internet standards (known as IETF RFCs). Relevant standards include HTTP, MIME, etc.
ISO	International Organisation For Standardization (ISO). Relevant standards areas include character sets, networking, etc.
NISO	National Information Standards Organization (NISO). Relevant standards include Z39.50.
IEEE	Institute of Electrical and Electronics Engineers (IEEE).
ECMA	ECMA International, Association responsible for standardisation of Information and Communication Technology Systems.

Industry Standard: It is often used to refer to a widely used proprietary standard. For example, the proprietary Microsoft Excel format is sometimes referred to as an industry standard for spreadsheets. In a similar way, to provide a consistent format to the user, various softwares conform to a common, relatable standard though some changes can be there in features. This is done so that the user is not confused and does not have to bargain or negotiate between products of different companies and platforms.



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Commercial Benefits of Open Standards: The big benefit of Open Source software is not the reduced license costs, but the flexibility it brings.

- Interoperability
- Vendor neutrality
- Efficient use of existing resources
- Greater use of automation
- Flexibility
- More options provide more opportunities to optimise
- Lower and manageable risk
- Robustness and durability
- Quality

11.2.1 FOSS

Free and Open Source Software (FOSS) is a computer software which are free and open source. They are also available and can be freely licenced to use, copy and modify the software based on need or requirement. The source code is openly shared so that user can use or improve the existing software. FOSS provides freedom to run a program for any purpose. You can study the program and can customize it based on your needs. You can use source code freely and can distribute to anyone. We can enhance program and can release the updated code to the public.

Benefits of using FOSS

Secure: Operating System or platform are not perfectly secured but security aspect of FOSS attracted public organizations to consider FOSS solutions.

Stable and Reliable: FOSS servers are functioning fine for years without making any maintenance issues.

Reduced dependence on import of software: FOSS reduces the cost of proprietary software licenses.

Developing Local Software Capability: Everyone is able to modify and redistribute the software which helps in learning and acts as an excellent training system.

Shortcomings of FOSS

There are still few areas where full featured FOSS products are lacking. They are not completely compatible with proprietary systems. But people are switching to FOSS very fast so these type of issues will be reduced. As FOSS mainly focuses on functionality so desired documentation is not available as such.

Some FOSS Projects are:

BIND	DNS Server
Apache	Web Server
Sendmail	Email Server
Open SSH	Secure Network Administration Tool
Open Office	Office Productivity Suite
Linux Kernel	
GIMP	Graphics

In India, department of Electronics and Information Technology (DeitY) has taken many initiatives in adapting the FOSS. India's strength can be increased in the field of Information Technology. This step fill gaps of digital divide with significant cost savings. It increases the knowledge based society and reduces total cost of ownership.

11.2.2 BOSS (Bharat Operating Systems Solutions)

BOSS (Bharat Operating System Solutions) is an Indian GNU/Linux distribution developed by CDAC and is customized to suit Indian's digital environment. It supports most of the Indian languages. BOSS comes with many features required for desktop of government organizations. It helps in routine tasks and utilities for desktop.

BOSS GNU/Linux "main" Component License Policy includes that all applications must have full source code and should allow modification and distribution of modified copies under the same license. BOSS community wants to support software and fix bugs and translate it or improve it, so distribution of source code is very important for them.

BOSS is very user friendly GUI based operating system. As we all are aware that different languages are used and spoken across the country so it provides multilingual support for different states. BOSS is going to prove a revolution in the FOSS development period which has already started in the country.



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**Notes****The BOSS Free & Open Source Software Guidelines**

(Ref: BOSS GNU/Linux User Manual from CDAC)

1. Free Redistribution

The license of a BOSS GNU/Linux component may 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 may not require a royalty or other fee for such sale.

2. Source Code

The program must include source code, and must allow distribution in source code as well as compiled form.

3. Derived Works

The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

4. Integrity of The Author's Source Code

The license may restrict source-code from being distributed in modified form only if the license allows the distribution of “patch files” with the source code.

5. No Discrimination Against Persons or Groups

The license must not discriminate against any person or group of persons.

6. No Discrimination Against Fields of Endeavor

The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

7. Distribution of License

The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.

8. License Must Not Be Specific to BOSS GNU/Linux

The rights attached to the program must not depend on the program's being part of a BOSS GNU/Linux system. If the program is extracted from BOSS GNU/Linux and used or distributed without BOSS GNU/Linux but otherwise within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the BOSS system.

9. License Must Not Contaminate Other Software

The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be free softwares.

System Requirements

BOSS GNU/Linux does not impose hardware requirements beyond the requirements of the Linux kernel and the GNU tool-sets. Therefore, any architecture or platform to which the Linux kernel, libc, gcc, etc., have been ported, can run BOSS GNU/Linux. To install BOSS GNU/Linux you need very minimum system configuration.

The hardware requirement details are as follows:

- Hard Disk – 5.0 GB (unpartitioned space)
- RAM – 512 MB
- DVD-ROM drive

To install BOSS GNU/Linux from disc, you need the installation DVD, currently, BOSS GNU/Linux supports the i386 and x86_64 architectures.

11.2.3 Massive Open Online Courses (MOOCs)

Massive Open Online Courses(MOOCs) are also available for learners. It is an online medium for course delivery and learning. Participants can learn various courses of their choice with standard course content or material and assignments (eg: Coursera, edx, khanAcademy etc.).

MOOC is a web-based platform where unlimited number of students get chance of distance education from best institutions in the world. They have forums and interaction sessions between the students, guides and professors. They provide video lectures and course material to students and discuss about problems, issues students are facing. They guide students to get the proper in depth knowledge of the course.

If there are courses of your interest that you are not able to pursue you can do that through MOOC.

How does it work?

MOOC is like an online platform where students and teachers together form a pool of resources which is freely and readily available for you all to utilize.



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It facilitates with:

- Listening of lectures.
- Downloading notes.
- Peer evaluation by communicating with each other.
- Virtual online classroom.

MOOCs in India

In India, there are various non-profit and commercial institute. They offer courses worldwide.

Indian Institute of Technology (IITs) and Indian Institute of Science (IISc) offers online courses with no fee and no registration charges, i.e., these courses are free of cost. WizIQ, Open2Study, Coursera, Ed, Udemy are the provider of MOOCs. Coursera is top most provider of MOOCs. NIOS, NCERT, IGNOU, Consortium are for educational qualification, NPTEL, UGC along with the HRD (Human Resource Development) Ministry has also launched the MOOC programs in India for secondary, higher secondary, bachelors and masters degrees. SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) offers many courses with audio visual medium, illustrations, research and case study. You can refer swayam.gov.in website for more details.



INTEXT QUESTIONS 11.1

State whether the following statements are true or false:

1. The license of open source requires Fee for sale.
2. W3C is also known as World Wide Web Committee.
3. The distributed program must make the source code accessible to the user in OSI Certification.
4. BOSS is a multilingual software.
5. NPTEL is paid software.



WHAT YOU HAVE LEARNT

- Open source refers to a program in which the source code (i.e., the executable computer program) is generally available to the general public for use or modification from its original design.

- An open standard refers to the standard that allows full public assessment and can be used without constraints in unbiased form.
- Free and Open Source Software (FOSS) is a computer software.
- FOSS can be freely licenced to use, copy and modify the software based on need or requirement. The source code is openly shared so that user can use or improve the existing software.
- BOSS (Bharat Operating System Solutions) is an Indian GNU/Linux distribution developed by CDAC and is customized to suit Indian's digital environment. It supports most of the Indian languages.
- BOSS comes with many features required for desktop of government organizations. It helps in routine tasks and utilities for desktop.
- MOOCs is an online medium for course delivery and learning. Participants can learn various courses of their choice with standard course content or material and assignments.



TERMINAL EXERCISE

1. Define open source software.
2. Write a short note on open standards.
3. What is FOSS? What are the benefits of using FOSS?
4. Describe MOOCs.



ANSWERS TO INTEXT QUESTIONS

11.1

1. False
2. False
3. True
4. True
5. False



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