

CHAPTER 2

OPEN SOURCE CONCEPTS

TERMINOLOGY AND DEFINITIONS

FREE SOFTWARE

- Free Software means the software is freely accessible and can be **freely used, changed, improved, copied and distributed** by all who wish to do so. And no payments are needed to be made for free software.

OPEN SOURCE SOFTWARE (OSS)

- Open source Software can be freely used but it does not have to be free of charge. In Open Source Software source code is available to customers and it can be modified and redistributed without any limitation.
- An Open source software may come free of cost or with a payment of nominal charges that its developers may charge in the name of development, support of software.

FOSS (Free and Open Source Software) / FLOSS (Free Libre/Livre and Open Source Software)

- The term FOSS/FLOSS is used to refer to a software which is both free software as well as open source software.

GNU

- GNU refers to **GNU's Not Unix**.
- The GNU project was initiated by **Richard M. Stallman** with an objective to create a system compatible to UNIX (an open source Operating System) but not identical with it.
- With time, GNU project expanded and it is not limited to only an Operating System, now it offers a wide range of software and application.

FSF

- FSF is **Free Software Foundation**.
- It is a non-profit organization created for the purpose of supporting free software movement. **Richard Stallman** founded FSF in 1985. FSF has funded many software developers to write free software.

OSI

- OSI is **Open Source Initiative**.
- It is an organization dedicated to cause of promoting open source software. **Bruce Perens and Eric Raymond** were the founders of OSI, that was founded in Feb 1998.

W3C

- W3C is acronym for **World Wide Web Consortium**.
- W3C is responsible for producing the software standards for World Wide Web.
- It was created in October 1994, to lead the World Wide Web to its full potential by developing common protocols that promote its evolution.

PROPRIETARY SOFTWARE

It is the software that is neither open nor freely available. Source code of proprietary software is normally not available. Because of this, its modification and further distribution is either forbidden or requires special permission by the supplier or vendor.

DIFFERENCE BETWEEN OSS AND PROPRIETARY SOFTWARE

S.no.	Open Source Software	Proprietary Software
1	It is available free of cost.	It is not free of cost.
2	Source Code of software is available.	Source Code of software is not available.
3	Modification and further distribution is allowed.	Modification and further distribution is either Forbidden or requires special permission by Supplier or vendor.
4	E.g. Linux, MySQL, NetBeans IDE	E.g. Microsoft Windows OS , Adobe Photoshop

FREWARE

- It is a software which is available free of cost and which allows copying and further distribution, but source code of software is not available and therefore no modification can be done.
- Microsoft Internet Explorer (Browser) is an example of Freeware.

SHAREWARE

- It is software, which is made available with the right to redistribute copies, but it is stipulated that if one intends to use the software, often after a certain period of time, then a license fee should be paid.
- In Shareware the source code is not available and modifications to the software are not allowed.
- Antivirus software Trial Versions are examples of Shareware.

OPEN SOURCE/FREE SOFTWARE

1. Linux

- It is a popular operating system which is free as well open, it means its underlying source code is available to all and anyone can freely use it, modify it and redistribute it.



2. Mozilla

- It is a free, cross-platform, Internet software suite that includes:
(i) Web Browser (ii) an email client (iii) an HTML (Hyper Text Markup Language) Editor

- Mozilla's cross-platform, standalone web browser, Firefox is very popular and is one of the most downloaded software on Net.



3. MySQL

- It is one of the most popular open source relational database system in the world.

4. OpenOffice

- OpenOffice or OpenOffice.org is an office applications suite. It is intended to be compatible and directly compete, with Microsoft Office.



- OpenOffice version 1.1 includes: Writer (Word Processor) , Calc (Spreadsheet), Impress (presentation program) etc.

5. PHP

PHP (Hypertext Preprocessor) is a widely used open source programming language primarily for developing dynamic web pages.

6. Python

It is an interpreted, interactive programming language. It is developed as an open source project, managed by the non-profit Python Software Foundation.



STANDARD

- A Standard refers to an established set of rules or requirements, which are approved by a recognized body and is widely used across various software platforms. E.g. **PDF (Portable Document Format)** is a technical standard widely used by the industry.
- The Standards can be broadly categorized into : **(i) Proprietary Standard** **(ii) Open Standard**

PROPRIETARY STANDARDS

- The proprietary standards are those, for which users have to buy license to use them. Their specification is not publicly available. Proprietary standards are owned by a single company/vendor.

- Standards like **Microsoft office formats (e.g. .doc , .docx , .ppt , .xls etc)** or **Windows Media Formats (e.g. .wma , .wmv etc.)** are proprietary standards as they are the property of their respective owners.

DISADVANTAGES OF PROPRIETARY STANDARDS

1. Recipient may not be able to read the file – For instance, you create a document in Microsoft Word 2013 and send it to your friend who does not have Microsoft Word 2013 application, then he/she would not be able to open and read the file.

2. Single Supplier or vendor has total control over the functionality and usefulness of the product – Since a proprietary standard is the property of a certain company or vendor, other users and developers cannot enhance its functionality.

OPEN STANDARD

- Open Standard are those whose specification is **open to all, i.e. is publicly and freely available** without any restrictions. The Principles of Open Standards are :

1. Availability – Open Standards are available for all to read and implement.

2. No Royalty – Open Standards are free for all to implement, with no royalty or fee.

ADVANTAGES OF OPEN STANDARDS

1. Making the data accessible to all – Open standards remove the restriction of using any specific software or license. Hence, people are and will be able to open the files using software of their choice.

2. Application and platform independence – Open Standards ensure access to resources independent of any application or platform.

3. No hidden information – In open standard formats, content of the file is completely transparent.

COMMON OPEN STANDARD FORMATS

- 1. HTML (Hyper Text Markup Language)** – It is the standard language for web and used for building web pages.
- 2. JPEG (Joint Photographic Expert Group)** – It is one of the most efficient picture compression formats. This open format is very light and allows you to determine the rate of data compression.
- 3. PNG (Portable Network Graphics)** – This open source format specially created to optimize the display of images on internet.
- 4. SVG (Scalable Vector Graphics)** – This open format allows for creation of vectorial images which are re-scalable, perfect to save bandwidth , and to allow zooming without losing the quality of image.

5. Ogg Vorbis (OGG) – It is a **lossy audio compression** format which is totally open source and with a free license. It was developed to replace all proprietary formats currently used for audio compression.(MP3, WMA , etc.)

5. Free Lossless Audio Codec (FLAC) – It is a lossless audio compression format that is totally open and free.

7. Open Document Format (ODF)

- It is an XML-based file format for representing electronic documents such as formatted text documents, spreadsheets, electronic presentations, etc.
- ODF is the default file format for applications like OpenOffice.org .
- The Open Document format is vender-neutral and can be used on different platforms, on free, open software as well as on proprietary software.

ODF File Extensions

- (i) .odt - for word processing (text documents)
- (ii) .ods - for spreadsheet files
- (iii) .odp – for electronic presentation files

REPRESENTING CHARACTERS IN MEMORY

ASCII – American Standard Code for Information Interchange

- (i) It is a seven bit code and so it is capable to provide binary code for $2^7 = 128$ characters. A computer uses the ASCII to store the information that an operator types in at the computer's keyboard.

ISCI – Indian Standard Code for Information Interchange

- (i) This is an **eight-bit code capable of coding 256 characters**. ISCI code retains all ASCII characters and offers coding for Indian scripts also. Thus, it is also called Indian Scripts Code for Information Interchange.
- (ii) This standard applies to many scripts like Devanagari, Gurumukhi , Gujarati , Oriya , Bengali , Assamese, Tamil, etc.

UNICODE

- It has been developed by Unicode consortium that was formed in 1991.
- **Unicode provides a unique number for every character, no matter what the platform, no matter what the program, no matter what the language.**
- Unicode version 3.0 represented 49194 characters, whereas Unicode version 3.1 has added many more characters, making the character count to 94140.
- **Nine Indian scripts included in Unicode** are Devnagari , Bengali, Gurumukhi , Gujarati , Oriya , Tamil , Telugu , Kannada and Malayalam.

TYPES OF INDIAN-LANGUAGE TEXT TYPING

Many tools/software have been developed to facilitate the typing of Indian Language text. These tools broadly support two types of text entries :

- (i) Phonetic Text Entry
- (ii) Keymap based Text Entry

PHONETIC TEXT ENTRY

- Words typed as per their pronunciation in English script and later converted to corresponding language word, is known as **Phonetic Text Entry or Transliteration**.

e.g. If you type, 'mera desh mahan'

It will transliterate it as → 'मेरा देश महान'

- The phonetic text entry is supported by many word processors, many search engines such as Google ,etc. and many other websites.

KEYMAP BASED TEXT ENTRY

- The mapping of a keyboard keys to specific characters are known as Keymap. Indian Language keymaps are known as **Inscript keymaps or Indian Script keymaps**.



- When you type text from a keyboard having key mapping of Indian Language Characters, it is known as **key map based text entry**.

FONTS

A Font refers to a set of displayable text characters, having specific style and size.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
0123456789

Fonts can be categorized on the basis of two parameters:

- (i) On the basis of **technical specifications**.
- (ii) On the basis of **font configuration**.

Technical Specifications

On the basis of technical specifications, fonts can be categorized as :

1. True Type Font (TTF)
2. Open Type Font (OTF)

True Type Font (TTF)

- It is a font format developed by Apple and licensed to Microsoft. **True Type fonts are 8 bit fonts.**
- In TTFs, all of the information for previewing and printing is in one file making it easier to manage fonts.
- This font is **not cross platform compatible**, different files are needed for platforms like Windows and Mac.
- **Quality of output is not so good.**

Open Type Font (OTF)

- The Open Type Font (OTF) format is an extension of the True Type Font format.
- **Open Type fonts are 16 bit fonts.**
- Like TTF, all the information about fonts are in one file.
- These fonts are **cross-compatible fonts**, and work flawlessly on Windows and Mac.
- **Quality of Output is better than TTF.**

Font Configuration

On the basis of font configuration, fonts can be categorized as:

1. Static Fonts
2. Dynamic Fonts

Static Fonts

- In static fonts, the **characters are designed and digitized and then stored in font files**. Every time printing takes place, same character will appear with same shape i.e. identical shapes.
- Almost all fonts belong to this class. For example, Times New Roman, Arial, etc. are static font.

Times New Roman

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

0123456789 . , ! ? - _ : ;

**COPPERPLATE FONT:
THE QUICK BROWN
FOX JUMPED OVER
THE LAZY DOG.**

Dynamic Fonts

- In dynamic fonts, **the characters are redefined at each occurrence** (i.e. every time they are displayed or printed) rather than when the font is created and digitized.
- All hand written fonts such as **handwritten alphabets, calligraphic letters etc.** are dynamic fonts because of individual variations.

