

Open Source Software

Open source software is computer software for which the source code is made available under a copyright license (or arrangement such as the public domain) that meets the Open Source Definition – a formal specification of what it means to be open source.

The aim of the open source movement is to make software easier to understand, modify and duplicate. Hence, an open source license permits users to use and change software, and to redistribute it in modified or unmodified form.

Open source software can be developed in traditional ways. However, such software has become associated with a particular model of software development which sees itself as substantially different from traditional approaches.

Open source software is the most prominent example of open source development. Traditional software development is that promoted by people like Frederick P. Brooks in his book *The Mythical Man-Month*. In contrast, the open source guru Eric Raymond distinguishes between two different models of software development: the cathedral model and the bazaar model'. In the cathedral model, development takes place in a centralised way. Roles are clearly defined and include people dedicated to designing (the architects), people responsible for managing the project, and people responsible for implementation.

Raymond suggests that all software should be developed using the bazaar model. This he describes as 'a great babbling bazaar of differing agendas and approaches'. Such a bazaar model tends to have features such as:

- Users as co-developers. The users of open source software potentially become co-developers. Users are encouraged to contribute to the software with additions, code fixes for the software, bug reports, documentation etc. The general principle is that having more co-developers increases the rate at which the software evolves. One key claim is that the rate at which bugs are identified and fixed increases with open source production. Torvald Linus the originator of Linux states this as a law that 'Given enough eyeballs all bugs are shallow'.
- Early Releases. Versions of software are released as early as possible so as to increase the chance of finding co-developers.
- Frequent Integration. New code is integrated as often as possible so as to avoid the overhead of fixing a large number of bugs at the end of the project life cycle. Some open source projects have nightly builds where integration is done automatically on a daily basis.
- Several Versions. Open source software tends to have at least two versions. A development version is for users who want immediate use of the latest features, and are willing agree to accept the risk of using code that is not yet thoroughly tested. The users can then act as co-developers, reporting bugs and providing bug fixes, in fact acting as co-developers. The stable version offers the users fewer bugs but usually fewer features.
- High Modularisation. Open source software tends to be highly modular - this allows for parallel development by a larger network of programmers.

- Dynamic decision making structure. A decision making structure, whether formal or informal, is needed - this structure makes strategic decisions as to the on-going design of the software.

The Open Source Initiative is an organisation dedicated to promoting open-source software. The organisation was founded in February 1998 by Bruce Perens and Eric S. Raymond when Netscape Communications Corporation, published the source code for its flagship Netscape Communicator product (a Web Browser) as free software. This was due to the lowering profit margins and competition with Microsoft's Internet Explorer software.

A US federal court has ruled that anyone using the code distributed under an open source software licence must attribute the author of the software and acknowledge the source of the files as well as explaining how the code has been modified in any way. This means that a commercial company cannot take some open source software, modify it and then sell it on as a commercial product.

The bazaar model of software development might be seen as an alternative to conventional approaches to information systems development. However, some maintain that the approaches promoted by the open source movement are not suitable for bespoke information systems development for a number of reasons. Perhaps the most important difficulty is that the requirements for such systems rely on a great deal of business domain knowledge whereas open source production relies on a wide distribution of commonly accepted requirements for software. Hence, successful open source software products tend to be packaged or commoditised software products that can be used across a range of different industries; for example IS development tools.

Two examples of such products are considered in the next section – MySQL and Linux.

MySQL and Linux

The data management layer of the typical ICT system is normally relies upon a database management system or DBMS. First released in 1995, MySQL is a multi-user relational DBMS which has more than 11 million installations world-wide. The applications software is considered one of the most prominent examples of open source software. MySQL is popular for web applications and acts as the DBMS component of the so-called LAMP stack for application development. The DBMS has been used as part of the ICT infrastructure of organisations such as Wikipedia.

Linux is a computer operating system, which is based on a popular operating system created in the 1960s known as UNIX. An operating system is a piece of software that manages resources on some computing device and provides an interface used to access such resources. An operating system performs basic tasks such as controlling and allocating memory, prioritizing system requests, controlling input and output devices, facilitating computer networking and managing files.

The name Linux is attributed to the creator of this operating system's kernel or core facilities. Work on the kernel started in 1991 by Linus Torvalds while he was a student at the University of Helsinki. Torvalds continues to direct the development of this kernel.

Although Linux is generally available free of charge, several large corporations have established business models that involve selling, supporting, and contributing to Linux and free software. These include Dell, IBM, HP, Sun Microsystems, Novell, and Red Hat.

The free software licenses on which Linux is based explicitly accommodate and encourage such commercialisation. One common business model of commercial suppliers is charging for support, especially for business users. A number of companies also offer a specialised business version of their distribution, which adds proprietary support packages and tools to administer higher numbers of installations or to simplify administrative tasks. Another business model

is to give away the software as a bundle in order to sell hardware. Many netbooks are sold in this manner with Linux pre-installed.

Many free software titles that are popular on Windows, such as Pidgin, Mozilla Firefox, Openoffice.org, and GIMP, are available for Linux. A growing amount of proprietary desktop software is also supported under Linux, examples being Adobe Flash Player, Acrobat Reader, Matlab, Nero Burning ROM, Opera, RealPlayer, and Skype.

Points for reflection

- Investigate the range of software produced using the open source model. For instance, is office software available as open source? Can you run an entire desktop computer using open source software?
- Investigate the similarities between open source software production and the collaborative production of web content.
- The open source software movement has now been in existence for over a decade. Hence, one might argue that earlier critics of the movement who argued that it lacks a sufficiently robust revenue model have been silenced. But what of the software development industry. Does it undermine the business model of companies like Microsoft?
- Why do companies need to have DBMS such as MySQL in their ICT infrastructure? Why is MySQL preferred for use by companies such as Wikipedia?
- What advantages do organisations that adopt linux achieve as compared to those that utilise Microsoft Windows as their dominant operating system?