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Commercial Opportunities of Open Source Software

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ABSTRACT

'How can you make money if you give the software away for free?' is a common retort offered by people when discussing the concepts of Open Source Software (OSS). While it is true that OSS can be free, it is also true that new and innovative business models can generate significant revenues for agile software companies. In this paper 14 business models are identified that may be applicable to OSS. However, these business models are not critically analysed.

Keywords

Open Source Software, OSS, business models.

1. INTRODUCTION

1.1 The Rise of OSS

Although Open Source Software (OSS) in essence has been around since the dawn of the Information Age, it has lately become far more visible. A study in the European Union found that 78% of local government authorities use OSS (Ghosh & Glot, 2005). Lacy (2005, para. 2) notes that 'According to a new study by consulting firm Optaros, 87% of organizations are now using open-source software, somewhere.' This quote from Lacy is one of many; and it appeared in the on-line edition of Businessday, which is not on a technical website. Indeed, a search of the Businessday website for "Open Source Software" on 18 October 2007 found 13 articles; a similar search on the Financial Times site produced 1205 hits. In almost all the cases the articles dealt with a corporation's adoption of OSS in some form or another. OSS projects such as Linux, Apache and PostgreSQL have highlighted a fact previously known to a relatively small number of people: that OSS can be used for robust and mission-critical applications – like banking (Lai, 2006a). Indeed, 60% of the top 500 supercomputers in the world run Linux (Lyons, 2005). New Zealand, on the other hand, appears to be slow in the uptake of OSS (Hendery, 2006).

Businesses are slowly starting to realize that their operations have become totally dependent on OSS. For some companies the Internet is a vital piece of infrastructure, and the Internet will disappear in a puff of 404 errors if OSS stops working. This is justified by the observation that nearly 70% of all websites are run on Apache and GoogleHTTP, both of which are OSS webservers (Netcraft, 2007). The Firefox web browser on the client side is

also making big inroads; about 10% of users world wide use it (Lai, 2006b) including the French Police (Noon, 2006). Indeed, early in 2008 the French Police announced that all their desktop PC's will be running Linux, not Microsoft Windows (AFP, 2008, para 1).

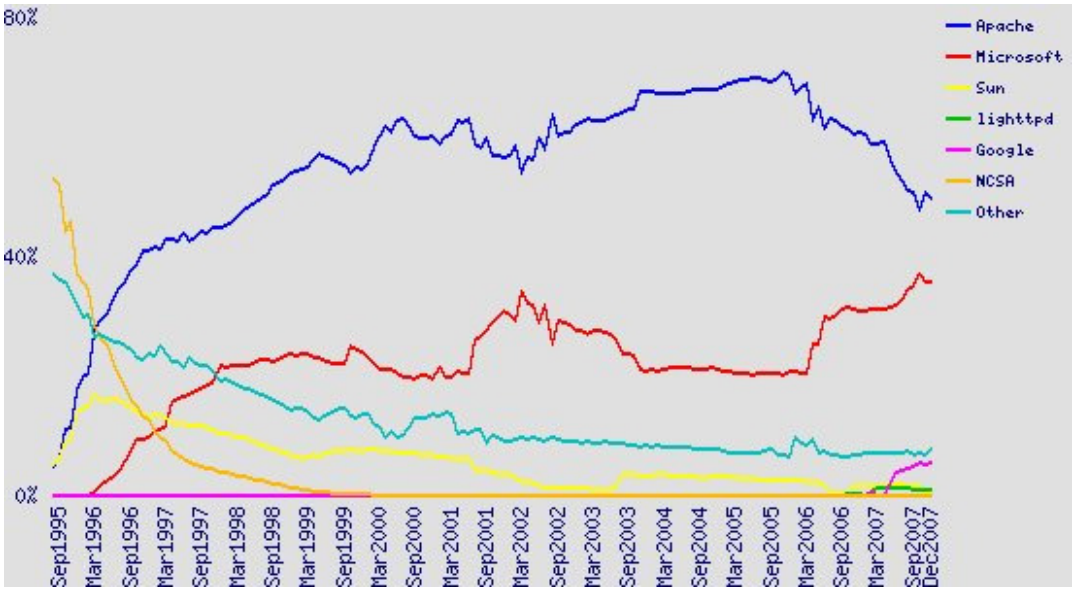

Figure 1. Market Share of Web Server Software (Source: www.netcraft.com, December 2007)

In some quarters of the software industry, however, this move towards OSS has caused confusion and stress. Software developers, used to the traditional model of software marketing, are finding the question 'How can you make money if you give the software away for free?' difficult to answer. The objective of this paper is to summarize the strategies that enable software developers to do exactly that: make money using Open Source Software.

1.2 The General Public License

This paper focuses on OSS, not "Freeware" or "Shareware", but "Open Source Software". Wikipedia offers popular definitions on these concepts (Wikipedia, 2008a; Wikipedia, 2008b; Wikipedia, 2008c).

In particular, it explores OSS released under the General Public License (GPL)), as the use of software released into the public domain or under BSD-type licenses does not require companies to 'give away' the software.

The Berne Convention for the Protection of Literary and Artistic works, ratified in Paris in 1971, intimates that copyright automatically belongs to the creator of a piece of work (For the full text of the convention, see http://www.law.cornell.edu/treaties/berne/overview.html). It would apply similarly to a piece of software: anybody who wishes to use the code will have to obtain the author's permission.

If I wish to share my code with other developers, then the Berne Convention creates an administrative problem. It simply is not practical to give permission on an individual basis - there are hundreds of thousands of OSS projects under development, each one using from a few to hundreds of pieces of OSS code. The Sourceforge website (http://sourceforge.net/) currently lists 160,186 OSS projects and 1,704,963 registered users (as at the 18th October 2007). Sourceforge is probably the largest website storing OSS projects, but there are thousands of smaller ones. Bearing in mind that anybody can download the software from these websites, not just registered users; mathematically speaking, the number of communications to obtain permission would be n(factorial)/2, where "n" is the number of individual pieces (not projects) of OSS. Clearly this is impractical, especially if it is my wish, as copyright holder, to share my code with other people.

In order to protect the copyright of the author of the software and overcome the problem of

obtaining permission to modify the code, the GPL was created. This allows me, as the author of the software, to share my code with anybody not only without losing copyright, but also without the administrative overheads of ordinary copyright. However, I still own the copyright, and as such still have all the legal protection afforded to me by the laws of my country.

Most OSS projects are released under the GPL or the Lesser Public License (LGPL) for libraries and subroutines. The GPL is published and maintained by the Free Software Foundation, which estimates that 75% of all OSS is released under the GPL.

The GPL addresses the issue of copyright and is not an End User Licensing Agreement (EULA) as one would find in commercial software. The GPL is aimed at software developers, not end users. However, it does state that end users can copy and use the software freely, and as such it does address some of the issues in a typical EULA (Zymaris, 2003).

The GPL allows software developers to use source code for their own projects, provided a number of conditions are adhered to. These conditions boil down to:

- The copyright notice must be clearly displayed in the source code.
- Software developers can alter the code as much as they want. If the software is to be used for an internal project, then these changes need not be made public. However, if the altered software is to be distributed to third parties, then the full source code must be made available to anybody (not just the third party) who wishes to see it. In addition, the changes must be clearly marked.
- No restrictions are placed in using (i.e. running) the GPL software.
- Software developers may bundle (aggregate) their proprietary software with GPL software without any restrictions, provided that it is made clear which part is GPL.

In short, the GPL states: 'Don't steal, but you may borrow.' A new version 3 of the GPL has been prepared and replaced version 2 in 2007.

2. OSS BUSINESS MODELS

2.1 Packaging

In its simplest form, 'packaging' refers to the production of a distribution medium (e.g. a CD) containing a suite of OSS. There is nothing to stop any entrepreneur from packaging and selling OSS. The vendor may add some proprietary code to it. This is exactly what companies such as Red Hat, Xandros, Linspire and Novell are doing. Even though anybody can download the various OSS packages, configure them and make it all work, end users are more than happy to pay commercial companies to do this job. The reason of course is simple enough: end users have neither the skill nor the time to do this.

2.2 Commercial Proprietary Software

There is absolutely no legal or technical reason stopping a software developer from writing proprietary software and sell this for OSS platforms. IBM, Oracle, SAP and Caché all offer their proprietary products on Linux - and sales are booming. Literally anybody with the skills can develop and sell proprietary software that runs on the Linux operating system. This is a huge opportunity. Although Linux lags behind Microsoft Windows in terms of the availability of some application software, the number of available applications on Linux is quite big. 'Information workers' may find that they have all the software tools needed for their jobs.

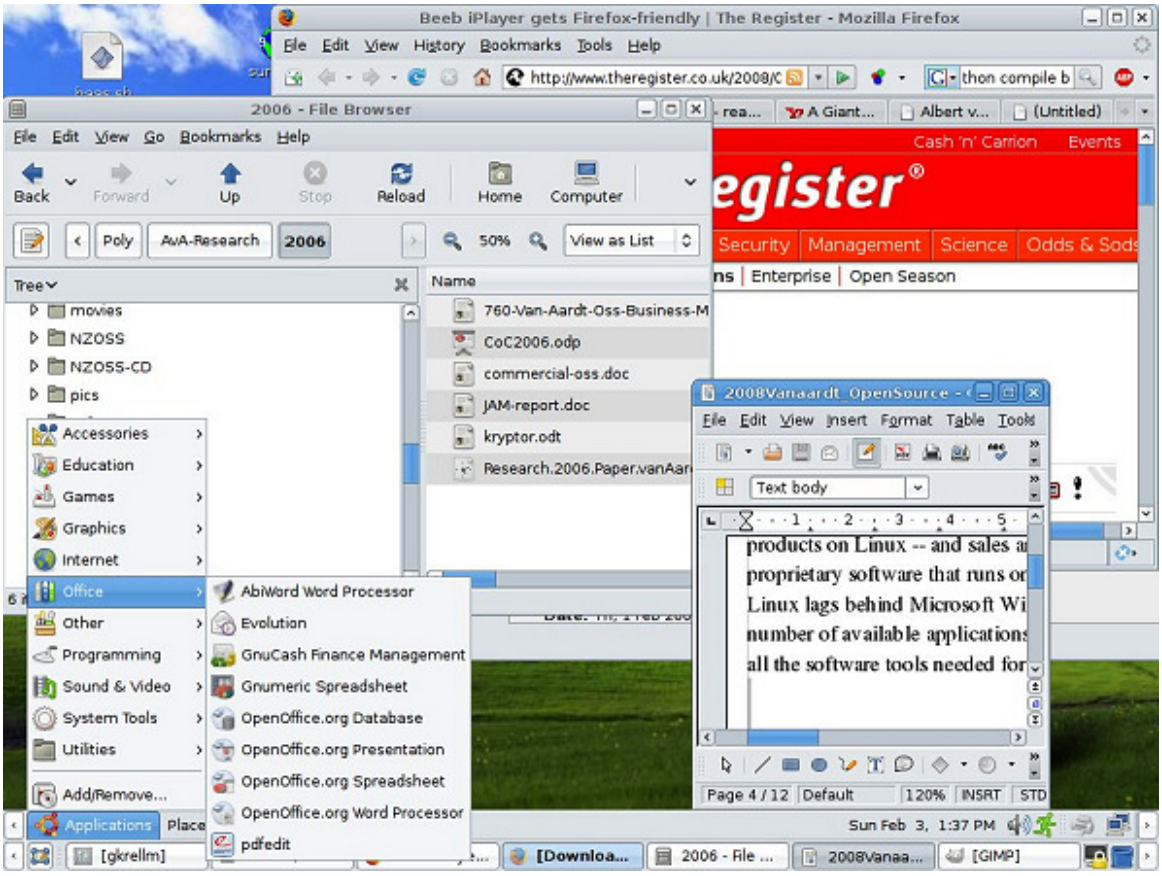

Figure 2. A Wide Variety of OSS Desktop Packages are Available

There is also nothing stopping vendors of current software products, for example Microsoft Office, to port their software to Linux and sell it in the traditional manner, if they so wish. Big commercial software companies, such as Adobe, Autodesk and Intuit can expand their market relatively easily by porting their software to the Linux platform. The only caveat is that, where GPL software is used, the rules must be obeyed.

2.3 Commercial OSS: Dual Licensing

It is, of course, also possible to produce OSS and sell it. Although, in theory, the end user can download the OSS and make it work by himself, many businesses prefer to have a vendor they can call upon to help if things do go wrong. For example, the OpenOffice suite is free, and can be downloaded from: http://www.openoffice.org. But OpenOffice shares most of the code base with StarOffice 8, sold by Sun Microsystems for US$69 per copy. A business which would like to have Sun's support would rather go for the paid-for version than the free version. Sun claims that more than 61 million copies of StarOffice have been downloaded which most certainly means a healthy revenue stream for Sun.

The MySQL database management system is another example. MySQL is freely available, and is very widely used. But the company behind it, MySQL AB (http://www.mysql.com/)) also offers a commercial license to clients, which then covers support for the product. This model is starting to offer serious competition to commercial vendors (Lacy, 2006). In other words, one can give away the source code and sell it at the same time!

2.4 Support Services, Systems Integration and Hardware

Modern information systems can become quite complex, and most businesses do not have the resources to maintain and manage their IT infrastructure. A number of OSS based companies, such as IBM, HP, Red Hat and Novell, offer support services to help their customers. And business is booming: HP announced revenues of US$19 million for 2005, up 37% from 2004 (Gali, 2006, para 9)

The OSS support market is wide open. A number of entrepreneurs have set up their own small businesses offering support to clients. The very nature of OSS makes it easy for anyone with the skills and determination to study the software and become very proficient in it. This opens the door for many small companies to provide the support services. It would probably be reasonable to predict that many more small support companies will be launched in the future - simply because it is relatively easy (the code is accessible) and cost effective (the code is very low cost).

One step further on the support road is integrating various OSS packages with commercial, proprietary software. A simple example is integrating Linux servers on a Windows LAN with various other software packages. Linux is used extensively in the server environment so integration with commercial software is very important to end users. Software companies offering support for OSS oft often also provide integration services. Unisys is an example of such a company, but there is a lot of scope for new business in this area.

Another option is to sell hardware with OSS installed and offer support services for this. Hewlett-Packard has announced that they generated revenues to the tune of US$6.2 million in 2005 selling Linux servers, leading the marketplace with a 27.7% share (Gali, 2005, para 10). IBM is in a very close second position with a 19.8%.

Numerous smaller companies are also offering similar products. An example is Cybersource at http://www.cyber.com.au . For small businesses, a low cost Linux server and some software support can significantly cut their costs, and small OSS support companies can provide this service. This is happening on a growing scale.

2.5 Education and Training, publishing, and Subscription Services

The growing uptake of OSS in the business world is creating a demand for OSS engineers. Many institutions already offer education and training in various OSS packages, such as Linux. But demand is still growing, and more training is needed. This area is also wide open for commercialisation and entrepreneurs are setting up training establishments. Universities and polytechnics which are not yet providing this sort of curriculum should seriously investigate such possibilities.

Both paper and electronic publishing have benefited from the interest in OSS over the last few years. Numerous books and magazines are available on just about every topic in the OSS world. However, there is always room for more. In particular, simple guides aimed at the newcomer are still relatively scarce, and users typically have to scour through web sites and on-line forums to find answers. This is also an area that offers great commercial potential.

Some OSS vendors offer a subscription service as a revenue generating strategy. Linspire (http://www.linspire.com/) is probably the best known, while Mandriva offers a 'user club' subscription model at http://wwwnew.mandriva.com.

2.6 Building with OSS

Using OSS to create a business is relatively new. Amazon and Google are both built on top of OSS. Amazon is not a software vendor but rather an on-line store, and its whole IT infrastructure is composed of OSS. Indeed, it can be said that OSS saved Amazon (Shankland, Kane & Lemos, 2001). Amazon is still very happy with its model (Cowley, 2004). Amazon of course makes is money from e-commerce, while Google makes it from advertising.

Another successful example of building a business on top of OSS is the digital imaging industry. Companies such as Weta Digital, Pixar Studios, Dreamworks and Disney all use various OSS packages, notably the Linux OS. The Linux Studio Organisation has been set up by these companies to share ideas (http://www.studiolinux.org).

However, this sort of model is not limited to the 'big boys'. Cleverly et al. (2004) states that 86% of New Zealand businesses employ 5 people or fewer. These small companies typically

have only rudimentary book keeping facilities or outsource their bookkeeping. If a software entrepreneur were to set up a website with something like SQL Ledger (http://www.sql-ledger.org/), an on-line accounting service could be offered to these small businesses. Such a service could be expanded to include aspects such as advertising, planning and budgeting - all using OSS and thus having a very low start-up cost.

Many embedded devices, such as cellphones, automated teller machines, routers, avionics equipment and others run OSS internally. This means that the manufacturer of this device can save costs and therefore be more competitive in the marketplace. In the embedded market Linux is by far the leader, with 49% of the market (Ziff Davis, 2007, para 6). However, the truly big business using OSS is web hosting. Most web hosting companies are running OSS, as reported by Netcraft (http://news.netcraft.com/archives/2008/02/06/february_2008_web_server_survey.html) . Setting up a web hosting site is not that difficult, and the reduced costs of OSS means that profit margins are comfortable.

An area that has not seen much growth is that of home PCs running on OSS. 'Linux on the Desktop' is a hotly debated topic, but there are indications that this market is growing. Small companies to support home and small businesses are slowly starting to emerge, but this market clearly is underdeveloped. This, of course, offers a golden opportunity for entrepreneurs to get their foot in the door - but caution should be exercised to not move too far ahead of the market. Nonetheless, numerous resellers of OSS are already in business, and a cottage industry of supporting desktop installations is emerging.

Finally, a case of making profit with OSS: advertising. The Mozilla foundation is a not-for-profit organization. It is the manufacturer of the Firefox web browser and the Thunderbird e-mail client, both OSS packages and free as in 'no cost' (http://www.mozilla.org). Despite being a non-profit organization, the Foundation showed a healthy surplus of just over US$1 million at the end of 2005. According to the website of the Foundation, revenue is generated from donations. However, these donations take many forms. The two most generous are from Google and Amazon, and it works like this. When a user uses the Firefox search box for Google to do a search, the Google website returns the results of the search with a few advertisements on the right hand side of the page. These advertisements are tailored to the topic of the search, and advertisers pay Google for this service. Google in turn then pays the Mozilla Foundation. The deal with Amazon works in a similar way. In this manner the Mozilla Foundation can afford to pay its bills as well as give the OSS away at no cost. And it should be noted that even the smallest firm can participate in Google's "AdSense" program (https://www.google.com/adsense/).

Google is venturing into the arena of free on-line software, paid for by advertisements with http://www.writely.com/ for the Google word processor and http://www.google.com/googlespreadsheets/tour1.html for its spreadsheet.

It is notable that Microsoft is also starting to explore the concept of software-as-a-service, to be paid for via advertising (http://msdn.microsoft.com/architecture/saas/). Microsoft is also starting to offer on-line applications (http://get.live.com/?mkt=en-us).

3. CONCLUSION

Predictions about the future are almost never more than approximately correct. However, statisticians tell us that approximate predictions are far better than no predictions at all. On such grounds it is probably safe to say that will become an even bigger player in the software world. OSS is perceived by end users to have some clear advantages, especially in relation to costs and stability, and the demand for OSS will increase. Astute software developers can benefit from this demand, but the traditional business model of software distribution will have to be adjusted. It is possible to commercialize OSS, but innovative thinking is needed.

It would also seem logical to conclude that the OSS environment, by its very nature, will offer a level playing field and therefore foster competition and innovation. The current situation in the software industry can hardly be described as competitive - but this is likely

to change rapidly over the next five years. With literally millions of programmers working on tens of thousands of software projects it is evident that the software landscape is in for a radical change. Casadesus-Masanell and Ghemawat (2003) suggest that proprietary software will be around for many years, but caution vendors of proprietary software to adjust their views on OSS. Indeed, an IDC survey of 5000 developers from 116 countries found that 71% of these developers use OSS in 54% of the companies (Vaughan-Nichols, 2006). This study notes:

> *'The use of open source beyond Linux is pervasive, used by almost three-quarters of organizations and spanning hundreds of thousands of projects,' said Dr. Anthony Picardi, IDC's senior vice president of global software research in a statement. '**The real impact of open source is to sustain innovations** in mature software markets, thus extending the useful life of software assets and saving customers money.' (Own emphasis) (Vaughn-Nichols, 2006, para.7).*

Both software companies and educational institutions need to take serious note of these changes. OSS has proved itself in many instances to be equal or better than proprietary software, and the demand from end users will spur further development. Not that there are no poor quality OSS packages; quite the contrary! But the OSS development model, with its built in peer review, tend to weed out poorly written software in an almost Darwinian way.

'By employing an open source software as a product instead of developing its own, Red Hat is lowering the barriers to entry and transforming the production-oriented software industry into a services industry.' (Mantarov, 1999). Although Mantarov's prediction is seven years old, it is indeed happening.

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