

# **Open Source: economy and business models**

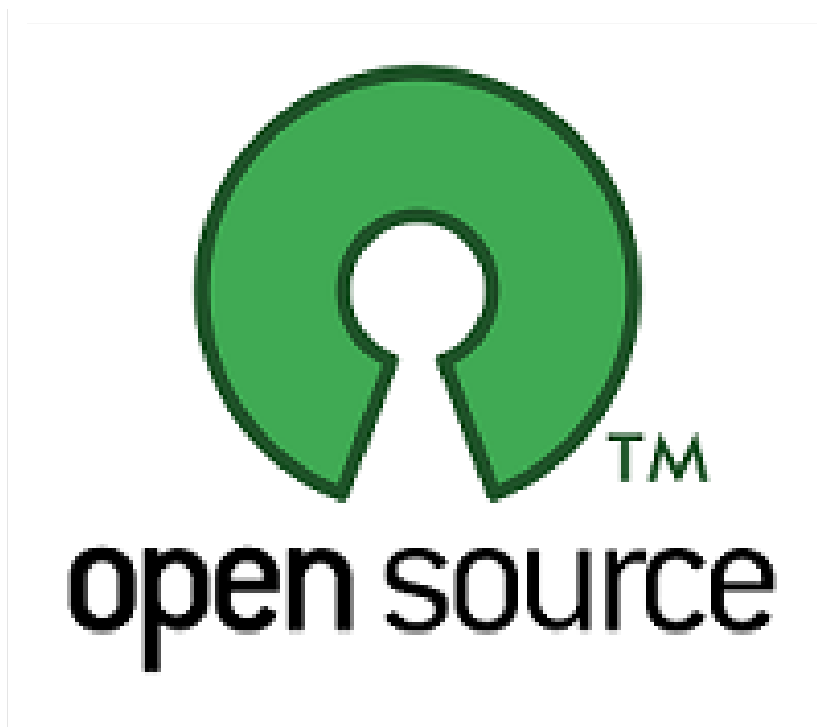
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term paper – winter 2010  
INFO331 – Software Engineering

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The Open Source logo

## Reminder

It is fitting to begin with a definition of what we are going to talk. Indeed, if the exact terms are not used from the beginning, confusion can set in and the reader will be lost among several important terms. Let's start with a definition of Open Source given by the GNU Foundation and especially let's separate it from free software.

Although freedom of software is not dependent on how we call it, there are differences in names given to him: different words bring different ideas. Richard M Stallman formulated the free software philosophy in the 1980s. In 1998, few people in the free software community began using the term "Open Source" (open software) instead of "free software". The term "Open Source" quickly became associated with one approach, a philosophy, values and even different criteria for which licenses are acceptable. The Free Software movement and the Open Source movement are today separate movements with different views and objectives, although they can work together, and they do, on some projects.

The fundamental difference between the two movements is in their values, their ways of seeing the world. For the Open Source movement, the question of whether software should be Open Source is a practical question, not ethics. As someone said: "Open Source is a development methodology and Free Software, a social movement." For the Open Source movement, non-free software is a suboptimal solution. For the Free Software movement, non-free software is a social problem and Free Software is the solution. [3]

With the sharp rise of the number of projects and Open Source software during the past decade, many authors, analysts and specialists have studied the free world. The result is the large number of books and studies on the subject and the full extent of its fields. Here, we will mostly concern ourselves with development models, distribution models and actors in the sector.

Thousands of OSS, dozens of new companies... The purpose of this paper is to see the results of the worldwide Open Source movement and to take lessons about the Open Source movement in the computer market. Indeed, the Open Source offers a model of software distribution in a break with traditional models of the software industry. Its expansion creates a new framework in which the traditional actors of the computer can explore a variety of business models, whether new or already in practice but rarely used. In this report, I discuss mainly about these questions: What are the Open Source model and its income's model? What are the conditions for an Open Source initiative to success? How the Open Source model face of changing business models and what is the future?

# 1. What are the Open Source models

The concept of Open Source software (OSS) is around twenty years old, but for many years his fame has not gone beyond the boundaries of communities of Open Source programmers. The number of OSS, however, has steadily increased over the years. Whereas the chosen field of OSS is Internet and multimedia, all software layers are concerned, from the software infrastructure (OS, databases, middleware) to user interfaces through applications. The Open Source movement is in a phase of wide media coverage promoted by the success of its two flagship products, Linux and Apache, and, secondly, the birth to many small publishers from, for most of them, a "communities" of programmers of Open Source world. Its success is also measured by the number of higher and higher traditional actors - publishers, manufacturers, service companies, large and small - that have already taken a stand for the free software movement and announce their strategy around Linux, Apache, or a more comprehensive approach to Open Source.[1]



[Linux & Apache: the biggest Open Source Project](#)

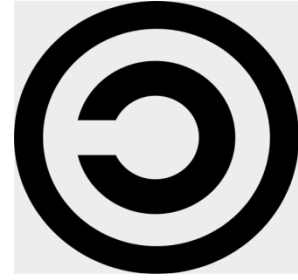
## 1.1 Open Source R&D models

The Open Source R&D model is based on a principle of accessibility of the source code of a program. Developers access the source code then have the freedom to use it, make changes and publish improved versions without asking anyone's permission and without paying any rights like copyright type attached to the software. Open Source's people speak about copyleft: each person possessing a copy of the work has the same freedoms as the author. As Stallman said, "software freedom means the freedom to run, study, modify and distribute the program." [3]

In rarely cases, the source code can be paid - the free source code is not necessarily linked to the concept of Open Source - that is to say that programmers may have to pay, or make a donation, for a copy of free software or can get it free. But in any case, he enjoys the freedom to copy and modify software, and even to sell copies.

In this context, the R&D model is based on a "community" development model which involves a large number of developers (about tens of thousands of developers for Linux) not only for programming tasks, but also the tasks of testing and validation of different versions of software. The collaborative programming, testing, validation that is taking place within an Open Source community can exceed means mobilized by a traditional publisher. We perceive immediately the benefits of the Open Source R&D model but also its limitations. The benefits of the Open Source R&D focus primarily on reduced development costs and the mobilization of resources potentially

very important for programming and testing. In return the source code is freely available and is downloadable. The main limitations of the Open Source R&D model is that it is unable to provide users with a perspective on its future use options. The potential user can never be sure that the configuration he wants to be done - and when it will be. In other words, Open Source software offers no warranty to the customer (actual level of features, support, updates).



copyleft symbol, a mirrored copyright

To cope with market expectations while maintaining a share of its advantages, the model of Open Source R&D tend, IDC says, to "professionalize". That is to say that the management of its development and support of its development will be mainly by engineers and developers employed by publishers often actors of the traditional computer market. In the end, the result of the professionalization of the R&D should lead to two models of development. A model of shared development on large projects such as Linux, the major gain is a reduction in development costs; its limit is the allocation of resources for development of specific features. A product development model supported mainly by a single actor, the objective of this approach is to open the product to a large number of potential users while controlling the development of advanced features. Its limit is the part of development costs borne by the primary editor.

One of the major problems when developing an Open Source project is the problem of collective action because there is no official project and team manager. "People have different preferences around the goal, they have different tolerances for costs and effort, they find difficult to evaluate the importance of others' and their own contributions." [5]

## 1.2 Open Source income models

Three source of revenue models are emerging through the analysis of the Open Source experience.

The first of them is based on a free distribution of the software on the market but under certain conditions of use beyond which the customer pays the license. Under these license terms, part of the source code is available and use of software is, for example, limited to tests or certain types of developments. Major actors in the global IT use this pricing model (IBM, Microsoft, Sun...). The advantage for them is to expand distribution of their products at lower costs to their customers while gaining an Open Source aura. More over the customers can develop products or plugins based on a proprietary technology that can help them to be engaged by a famous company.

The second model is based on service provider. The distribution of Open Source software opens opportunities to sell value added services around the software. The challenge for companies that engage in this way is to differentiate them from the competition because, in theory, customers are also free to change service provider while maintaining the same Open Source software. [2] I made an internship four years ago in a company named Pilot Systems which sells services around an Open Source CMS named Plone. The boss told me it was a growing market and they had more and more customers, they feel reassured by the fact that they could access the code and they could change their service provider when they wish.

The last model is the integration of Open Source software into a wide software or hardware offer. This third model applies primarily to free software, as part of a broader offering sold by major players that have the following characteristics: they include basic and limited functionalities or standardized in the system. They have a marginal value in the value chain for IT solutions which they are integrated, they are cheap and small margins products. Differentiation of solutions which they are integrated tends to be on others functions than basic functions.

### 1.3 Models followed by companies

Considering the trend on the model of Open Source R&D and the evolution of its revenue models, strategies have emerged that allow actors of traditional computer market to take advantage of opportunities offered by the Open Source. The first experiments in Open Source followed these strategies or a combination of these strategies.

The model of standardization is to impose Open Source software, or a piece of Open Source software as a standard in a market. The issue is particularly important, and the goal more feasible when the market is emerging and enabling new technologies. This was the case of TCP/IP and SNMP whose stabilization was accompanied with the emergence of computer networking technology.

Integration of an Open Source offer in a more comprehensive strategy is already followed by many traditional actors in the computing world (IBM distributes a modified version of the Apache Web server in its WebSphere suite, Dell integrates a version of Red Hat Linux on its servers from the factory). [1] These actors see in the Open Source an opportunity to expand their sales of technology. It can be applied on a mature market where some critical functions tend to move. This is the case, for example, of the server market on which an offers cross-platform is now part of differentiating criteria. It can only be set up with mature Open Source technologies capable of broadcasting in a market in traditional economic terms.

The Open Source can be an alternative option for a company which, facing one or more competitors in well-established dominant positions and is unable to impose its product on the market in the classic economic conditions. To exist, the solution can pass through the distribution of its product by opening its source to federate a large number of users and become a force in the market. To some extent, Linux and Java have been launched to cope with dominant positions.

Selling high level services around Open Source software is an alternative that applies to an emerging market or a new technology. IDC says this model of value added can also be effectively used by service companies to expand their income.



Linus Torvald, Linux creator

Playing with the right image conveyed by Open Source is a major engine of the computer market in communication. The Open Source movement conveys an image of freedom, innovative technology, sharing community, an image far from the standard economic practices and constraints. Companies such as SAP, IBM and Sun have made Open Source announcements primarily for the communication.

In a context of major recruitment difficulties, the company may have an interest in encouraging the participation of its best developers in Open Source projects following a policy of motivation of highly skilled resources.

## 2. Changes in software business models

We have all heard today about OSS, at least as regards the two emblematic figures of this movement: Linux and Apache. Beyond the reputation of this highly publicized new delivery program we must acknowledge that its impact is undeniable now on the computing market. The free software movement has spawned numerous small publishers from, most of them, a "communities" of programmers in the Open Source world. But there is certainly not only the main result of its impact on the software market. Its success is measured primarily by the high number of traditional actors - publishers, manufacturers, service companies, large and small - that have already taken a stand against the free software movement and that may change the game.

### 2.1 Changes on different points

The economic model of Open Source, as defined around the notion of "freedom" is in rupture with traditional models of the software market on a few major features. Here are four key areas of value chain software market: development (R&D), distribution, support, and the price of licenses. We will go over these four different points and see what changes can be made in traditional business models.

On the traditional market of software, R&D, products development and solutions are made by the internal developers' team of publishers or are obtained through acquisitions or partnership agreements and alliances. Any member of the Open Source community develops its products through an open environment. The work is made available to the community during the process and the final source code too.

For the distribution, the traditional market used until recently sparingly Web to distribute its products. The Open Source community predominantly uses the Web as a distribution channel in its own right for both the infrastructure software and applications.

About sales and prices of licenses, the traditional market is paid on the sale of licenses and its updates. The license price is set according to different criteria for the main of them the number of users, the number of machines and the number of processors... The development of software can also be financed by a client to a need specific. Most of Open Source licenses products are free; this is the case of the most famous of them: Linux and Apache. However, some types of Open Source licenses accept the principle of non-free products developed under certain conditions.

Regarding support, the traditional market develops support packages and training programs for their partners. These offers and programs are different levels of complexity. As part of the Open Source community, the support is mainly the exchange e-mails with developers and distributors and newsgroups on the Internet.

## 2.2 Conditions for Open Source to succeed

If the Open Source offer is abundant, several thousands of software, economic successes and the experiments conducted by the tenor of the computer market are much less numerous and confined to a few dozen cases.

The level of Open Source offering is very unequal. It covers a vast range of products and very fragmented in terms of technology. Complete products are relatively rare. Most projects involve specific components (pieces of well-defined programs, libraries for a specific function, utility and special tools) that require a certain level of expertise to handle. But the market demands packaged products rather than disparate components: according to IDC data, the vast majority, nearly 90%, of teams that have deployed Apache Web Server for their enterprise applications have never watched the Open Source server source code. This is a primary prerequisite for commercial success of Open Source software: it must be integrated within a product to attack a market with a chance of succeeding.

Furthermore, IDC believes that a second condition for success is that the free software initiative must be supported by a structured organization whose purpose is to impose its product on the market. In other words, products must be backed by a company, group or association that can only provide structure and visibility essential to win.

IDC also notes that the success stories in Open Source are related to the integration of infrastructure software (OS, servers ...). First in Operating Systems there are Linux and BSD-derived systems (FreeBSD, OpenBSD and NetBSD) that are free operating systems types of UNIX. Second in Web servers, one of the most famous software in the Open Source world is undoubtedly the software known as Apache Web server. Today, millions of web sites are running Apache. Third virtually all modern programming languages have free implementations (C, C++, Objective-C, C#, Perl, Java, PostScript, Ruby...).

All these software have tended to standardize a common set of basic features that users and vendors could add their contribution providing a competitive advantage. IDC has identified this trivialization as a third condition for a successful Open Source initiative.

After investing market of operating systems, including Linux, and dominated the market for Web servers, with Apache, the Open Source movement should tackle new areas by climbing in the software layers. In this dynamic, application servers are a logical stage of development. [1]

One example, Lutris Technologies, an American company that has developed an application server, born of an initiative called Open Source Enhydra. This application server is the bridge between applications HTML, XML, and Java and allows developers of web pages and software developers to work independently but in energy on the same project. It relies on the ObjectWeb initiative, which was launched in October 1999 by Bull, France Telecom and INRIA in the context of providing developers with a set of software components for deployment of distributed application platforms. ObjectWeb arises as unifying initiatives around Open Source Middleware Company.



## 2.3 Open Source lower costs for better quality software

The benefits of the Open Source R&D are known and widely discussed in the press and in the open source community: they focus on reduced development costs and better theoretical quality products. [4]

The Open Source community which wants to reduce development costs has systematically supported Web as a communication tool. The creators of Linux for example have from their inception, used the Web to provide access to any developer who wanted to work on Linux. [4] This enabled them to find the development time and resources, this globally for the development of drivers, utilities, and even programs they needed. We see immediately the potential to reduce costs of R&D which this model is a carrier. The consideration is of course that the source code is freely available and can be downloaded by anyone - and everyone can do whatever he wants as long as the result of his work is returned to the community.

Other benefits are usually mentioned by the suppliers of Open Source software. They include the best software quality and performance. This quality comes from the way of Open Source development community that mobilizes many developers; we are talking about tens of thousands of developers for Linux, not only for programming tasks, but also for the tasks of testing and validation of different versions of software. The collaborative work of testing, validation, comparison that is taking place within an Open Source community would exceed the resources mobilized by a traditional publisher; the result would be the software more reliable and efficient.

The argument of customer perception is seductive, and there were inquiries from users of Linux, it seems companies are indeed sensitive to such arguments as with the low cost of Linux makes it a priority argument for adoption of the OS. Indeed, behind the strong argument of free, Linux enjoys a good image in terms of robustness, but also stability. The availability of source code, one of the bases of distribution of free OS is also well placed in the qualities that lend themselves to Linux users. Moreover, the reading of the results shows that customers can be segmented into two groups depending on the interest they find in the adoption of Linux. The first segment consists of small and medium businesses very price sensitive, the other segment includes large companies favoring a high level of service to the price aspect.

Another argument focuses on the sustainability of the product that was purchased by the customer that means the durability of the product is purchased by the customer. When the source is freely available, the publisher can stop development of its product or disappear without disrupting a lot the client company. The client company, which has the source code, can support the software as needed and no longer bound hand and foot to the evolution of a publisher and its strategy of product development.

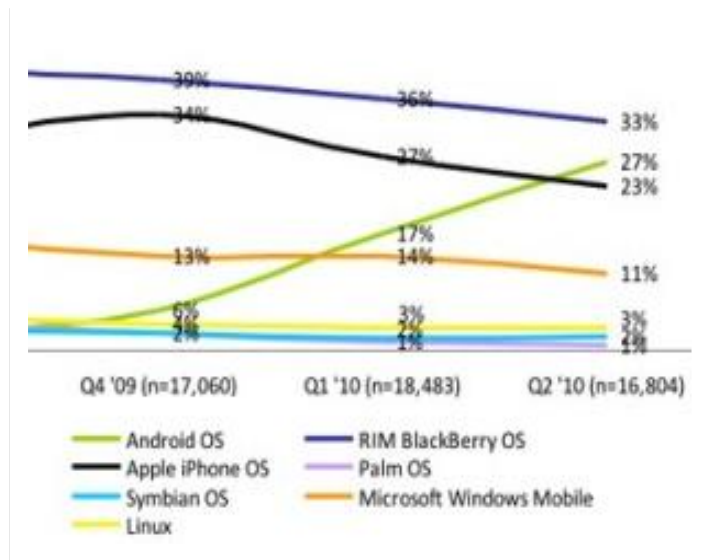
But this continuity, which is based on the principle of the model of Open Source R&D, has another problem for the Open Source customers: Open Source software offers no warranty to the customer (actual level of features, support, updates...). In other words, the model of Open Source R&D is unable to offer a perspective on its future

use options. The potential user can never be sure that the configuration he wants to be done - and when it will be. So sometimes a problem appears, it is the chicken-and-egg one. For example, “many companies wait for application to be available before they deploy Linux in their environment, but in the same time the developers wait for customers to deploy Linux before they make their applications available.” [1]

### 3. The future of Open Source model

As we have seen in this research paper about the economic model of the Open Source world, the future looks bright and beautiful and all mapped out. In the coming years, the economic model will be developed further to try and probably succeed to meet and exceed business models in place for very long. [4]

One recent example is the Open Source project Google Chromium (Chrome browser and Chrome OS soon) that is gaining increasing market share. But the most profitable initiative for Google is the redemption in 2005 of the company Android



Mobile OS Market Share

Inc. that specializes in mobile operating system. Google has made Android Open Source and is becoming the market leader in mobile telephony.

Another very promising future for the world Open Source is probably the Cloud Computing and its applications. [6] If we keep Google as example, we can see that this company tries to emerge on new markets and takes market shares of big companies in place since years. Google Documents is more and more in competition with Microsoft Office, Microsoft has been forced to revise his model and integrate web services in his office suite. Google News tries to bring more information to the user than the news websites. And everyone can contribute to Google’s projects thanks to Google Code. But I really think, if I base my judgment on what already exist, that “closed source” software will always be present in the market because the product delivered has very often a better quality.

One thing we may need to expect is the takeover by big private companies of smaller companies related to Open Source. This happened when Oracle bought Sun Microsystems and therefore that revolves around Java and MySQL. But a survey of Open Source users has revealed that Oracle was considered a better steward of Java and MySQL compared to Sun. Jaspersoft, a software company providing Open Source Business Intelligence, surveyed 500 of its customers about what they foresaw for the future of Java and the database. The result is that most large companies surveyed were planning a more intensive use of Java, and they expected to see an improvement of MySQL under the direction of Oracle. 80% of them think that Java will also improve or at least stay the same.

We can safely predict that Open Source will win or at least be a major actor in the near future, if it is not already. The GNU/Linux has become the testing system for students in computer science, and they introduce these free systems in their business and companies, when they have graduated. Research laboratories have adopted the model of Open Source because the sharing of information is essential in the scientific method, and the Open Source makes it easy to share the software.

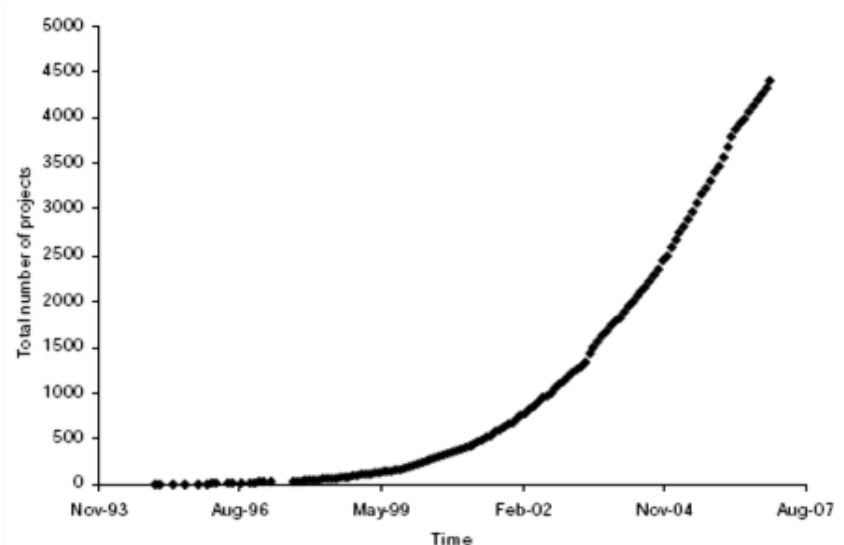
Companies are also adopting the model of Open Source because it allows groups of companies work together to solve a problem without fear of prosecution for a monopoly, and because the gain provided by the free contributions to their software of programmers from the general public. Some large companies have adopted Open Source as a strategy to combat companies like Microsoft who is described as "black beast" for Open Source, and ensure that no other company ever again dominate the IT industry as some did. But it is in the past that we must seek the most reliable indication of the future of Open Source: in just a few years, we went from nothing to a solid fund of programs that solve many different problems, and they are currently millions of users who are followers of the Open Source movement.



Microsoft : the enemy of Open Source

## Conclusion

As we have seen in this study, the world and the Open Source model are well. Companies use Open Source to make more money but also to federate and have a bigger community of users. They also use the Open Source aura to have a good image on the market. After a strong rise in recent years, the curve tends to stabilize in its increase. A balance has been found: the major Open Source initiatives such as Linux continue their battle against Microsoft and smaller projects continue to grow



Increase of number Open Source projects

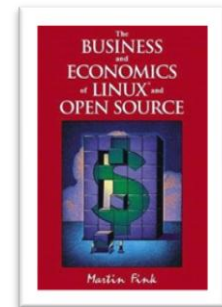
but failed to penetrate. One fears for the future is that the projects continue to multiply again and again and that developers continue to disperse. In this case, Open Source software cannot fight and the Latin proverb "divide et impera" (divide and conquer) will be denied.

To conclude, let me show you some impressive numbers about Source Forge: "2.7 million developers create powerful software in over 260,000 projects. Our directory connects more than 46 million consumers with these open source projects and serves more than 2,000,000 downloads a day. Source Forge is where Open Source happens."

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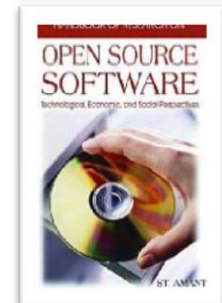
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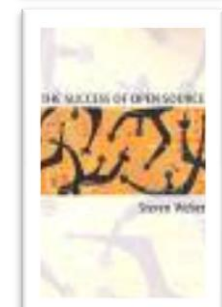
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