THE OPEN SORCE MOVEMENT

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Abstract: *Open-source software is software whose source code is available to users under a given license. Because of its accessibility, open-source software is becoming increasingly more popular in various fields of study, as an alternative to proprietary software, which can be expensive and unadaptable. The Open Source Movement began in the 1990s as a response to the commercialization of software in 1970s and 1980s.The main characteristic of open-source software is the ability to adapt the program itself to fit the user's needs as well as the freedom to distribute such modified programs, creating an environment for continuous change and improvement of the program and the users. The objective of this paper is to present the introduction and advancement of open-source software. After displaying the economic and social environment that led to the open-source movement, we will analyze its advantages and disadvantages. The final part will present the possibilities for applying open-source software in different fields.*

Keywords*: open-source software, free software, Open Source Movement, Open-source software licensing*

1. INTRODUCTION

Open source software, which gained a significant amount of popularity in the recent years, has been an integral part of the software development industry for a long time. Developers and companies everywhere are adopting this, once alternative, concept of distributing and developing software. With computer programs like GNU Linux, Apache web browser, Mozilla web browser gaining success exponentially through years, open source software has gained a reputation of being reliable, adaptable, stable and accessible.

The use of open source software, its benefits and flaws had been debated for years and the purpose of this paper is to explain the rise and motivation of the Open Source Movement. After going over the Open Source Definition, we will discuss the history and development process of open source software. Then we will explain the motivation and ideology behind the Movement, and its flaws.

2. WHAT IS OPEN SOURCE SOFTWARE?

Open source software is computer software that is available through a license which allows users to study, use, modify, and distribute said software freely. As opposed to the traditional proprietary software, which is legally the property of the organization or individual who created it, open source software ensures liberty to the user, who can change the software itself in order to adjust it to his needs. According to The Open Source Initiative [1], the distribution terms of open source software must comply with the following criteria:

1. The user must have access to the source code.
2. The license must allow free redistributions of the software.
3. The license must allow modifications to the software.
4. The license must not discriminate against any person or group of persons.
5. The rights attached to the program must apply to all to whom the program is redistributed.

The idea behind these terms is to encourage a constant improvement of the software by letting the users take control of modifying and upgrading it. This creates a unique dynamic within the computer development communities that, in a way, lets the software update and improve itself.

3. THE ORIGIN OF FREE SOFTWARE

The concept of open source software appeared in 1960s, in the early stages of software development. At that time, software programming was used by scientists and engineers who freely exchanged and modified software [2]. At first, open source was perceived as inferior to proprietary software, and it was thought to be filled with technical issues related to copyright and licensing.[3] These issues fueled the emersion of proprietary software.

In 1970s, there was a rise of independent software firms who started producing software for industry standard computer platforms. Through time, this led to a shift in the perception of software, which was now looked at as an important intellectual capital. This is how the concept of proprietary software emerged. Companies started protecting programming innovations under contract, copyright, patent and trade secret law. They kept the source code of their programs hidden, thereby supplanting the collaborative programming communities that helped sustain software development. In order to prevent users from obtaining pirated software, most companies attach some form of End User Licensing Agreement (EULA) on all distributed software. EULA prohibits users from decompiling or reverse engineering the source code. Even if the user menages to decompile and modify the source code, he must not distribute or use those changes in any way [5].

This shift enraged many software developers, and led Richard Stallman to fund the Free Software Foundation, a tax-exempt charity that raises funds for work on the GNU Project. The GNU Project seeks to develop Unix-compatible software and return software to a state of freedom. The purpose of the Free Software Foundation is to ensure that the end user can use the software freely. This does not mean free of cost, but free to use, modify and distribute. Stallman believed that software, like any form of knowledge, should be freely shared by all humanity.

In order to legally protect the GNU project, he created a “copyleft” license, which is now called the “General Public License” (GPL). According to the GNU project official site:[6]

“The license agreements of most software companies try to keep users at the mercy of those companies. By contrast, our General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. The General Public License applies to the Free Software Foundation's software and to any other program whose authors commit to using it. You can use it for your programs, too.

When we speak of free software, we are referring to freedom, not price. Specifically, the General Public License is designed to make sure that you have the freedom to give away or sell copies of free software, that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things”.

The “copyleft” license, as expressed by GPL is a “part license, part manifesto” in which the software is treated as valuable knowledge, made to be used in any way, distributed freely and modified at user’s will, and not as intellectual capital. This is an act of rebellion against commercialization of software that shaped the software development industry.

Stallman’s GPL has an interesting way of protecting software because it obliges anyone using a part of the code published under the GPL license in their program to submit the whole program to the GPL even if other parts of program fall under a different license. This prevents the “proprietary” parts of the program to “corrupt” the free (as in freedom) nature of the original code. [7]

In 1991, Linus Torvalds, a Finnish programmer, wrote the initial version of Linux and then made this program freely available through the Internet and urged the users and to contribute to its development and improvement. By, making the source code of his project freely available on the internet, Torvalds was able to get insight from an enormous pull of users, who pointed out the flaws of the program, added new functions and made their own versions. The project has grown rapidly to produce a powerful, fast, efficient and reliable operating system.

The GNU and Linux programs are closely related. Torvalds wrote Linux based on Stallman’s and Gnu software tools, and, in turn, placed Linux under the legal protection of GNU General Public License. Since then Linux has not stopped being enhanced with new functions and applications added by thousands of anonymous users. [7]

3.1 From free to open source

In 1998, when Bruce Perens and Eric Raymond expressed their suspicion that firms may not be convinced by GPL due to Stallman’s term “free software”. Their concern was that the concept of Stallman’s “free software” is not able to be integrated within commercial development. That’s how the open source software movement started as a way of adapting the Stallman’s free software movement to a more business oriented point of view. [2]

This is where the distinction between free software and open source software is visible. Free software is more of an ideological concept, whereas the open source software is an adapted version of free software to fit the practical use of open source licensing.

In the same year, Netscape Corporation wanted to release their browser program, Netscape Navigator, under an open source license like GPL. However, the difficulties involved in GPL lead to Netscape developing a new license, the Mozilla Public License, which now serves as an important model of an open source license useful in situations involving commercial software.

Bruce Perens then established he Open Source Initiative with the mission to promote open source. He created the Open Source definition, in which he gave the 10 conditions needed for software to be considered the open source, some of which were mentioned in the first part of this article. Interestingly, the GPL, the BSD, which will be discussed later, and the Mozilla Public License are all in conformity with the Open Source Definition. [3]

3.2 Other open source licenses

Artistic License permits the user to copy and modify the original source, but any modification or incorporation of the original source code into another work must contain attribution to the original source code, and must document what portions od the new, modified work are products of the original source. The modified work can be distributed as proprietary under the licensing terms. This license is compliant with Open Source Definition, but is not considered copyleft. [5]

Berkley Software Distribution (BSD) license is similar to the GPL, the only difference being that derivative works are not automatically subjected to the BSD license. It was designed to be more appealing to the commercial developers. This license is compliant with Open Source Definition, but is not considered copyleft. [5]

4. DEVELOPMENT OF OPEN SOURCE SOFTWARE

Most open source projects begin with a single developer who’s taking an interest in solving a particular problem. He or she then creates the code base and makes this code available to others on a platform with a pool of developers who are interested in the same kind of a solution to attract their attention and inspire them to contribute to the project. In a group effort, developers start working on the project until the initial problem is solved and their needs are met. Then, they share their results to an online service and let the other user review them, and possibly let them know about issues with the code. [8]

The nature of open source development is beneficial to everyone involved in a process of developing a OSS program. For less experienced programmers, OSS projects provide an unmatched learning opportunity since they are supported by a pool of generally friendly, experienced programmers willing to help them polish their skills. On the other side, experienced programmers are able to stage their talent, and get better opportunities by gaining reputation.

5. IDEOLOGY AND MOTIVATION

Open source movement began as a revolt in the computer programming industry against software growing more proprietary in 1960s and 1970s. The main problem that most of the community found with proprietary software is its “closed” nature. In order to keep their programming innovations a secret from competitors, companies started using contract, patent, and copyright law.

Copyrights and patents ensure property rights to creators and inventors in order to spur further innovation through increasing the amount of material in the public domain and rewarding inventors and creators [9]. Despite innovation being the primary goal of these laws, there has been a lot of debate on whether or not this is applicable in software development.

Stallman, the creator of the free software movement, was one of the first to voice his concern with the changes in copyright law that increased the scope of proprietary right of copying holders. The open source movement is based on the idea that protecting the software with patents and copyrights does not result in high-quality end product, on the contrary, it prevents the project to be seen and reviewed by like-minded developers, resulting in terminating its improvement.

The culture around open source software is best depicted by Eric Raymond in his paper “The Cathedral an the Bazaar” [10], where he describes the movement by its contrast to Western exchange culture in which people interact according to their personal interests. He characterizes the motivation of the participants as gaining social status in the community not by what they own, but rather what they give away:

“When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves. People improve it, people adapt it, people fix bugs and this can happen at a speed that, if one is used to the slow pace of conventional software development, seems astonishing. We in the open source community have learned that this rapid evolutionary process produces better software than the traditional closed source model, in which only a very few programmers can see the source and everybody else must blindly use an opaque block of bits”.

The quality of open source software does not come from its management but from its openness. It benefits from the “many eye balls” approach that ensures that the code is tested and retested by a world-wide user pool.

6. DOWNSIDES

The main problem with open source software lays with legal rights afforded to developers, mostly because they are largely unknown. For a license to be enforced under principles of contract law, an offer, acceptance and consideration must be present. When it comes to open source licensing, programmer usually provides a piece of source code on a website, with the licensing agreement in plain site, as an offer. Acceptance and consideration are harder to prove. Case law and legal doctrines are untested with regard to open-source. [5]

The other problem is that there are fewer choices available for open source software, and it is being modified on an ongoing basis, which can make it difficult to ensure that the software is compatible with other applications. Moreover, OSS development does not always lead to high-quality products, most OSS projects do not even reach their final implementation stage, but only successful examples are mentioned, but this is the case with any software development projects.

7. CONCLUSION

Proprietary rights are widely used by publishers to keep their monopoly by enforcing restrictions on general public. In software development industry, this is especially dangerous because of the very nature of software development. This makes the Open Source Movement a significant political intervention in our society, which shapes many digital communities of today and fights the increasing commercial and proprietary interests that advocate privatization and commercialization of software. It is fairly clear that open source software is a successful alternative to proprietary software. With its many benefits, including accessibility, it is a good way to start for those interested in software development.

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