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RESEARCH ARTICLE

Open Source Development (OSS) under Eclipse Public License (EPL)

Rebaz M. Nabi[1], Rebwar M. Nabi[2], Rania A. Mohammed[3]

1. Network Management Department, Technical College of Informatics, Sulaimani Polytechnic University, Sulaimani, Iraq

2. Department of Information Technology, Computer Science Institute, Sulaimani Polytechnic University, Sulaimani, Iraq

3. Department of Computer Network, Computer Science Institute, Sulaimani Polytechnic University, Sulaimani, Iraq

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Corresponding Author

Rebwar M. Nabi

Abstract

Currently mounting popularity of open source software has changed the software industry scenery affectedly. Insufficient technical subject problems today are as ardently debated as that nearby open source and commercial software; two well-known models of software licensing. Policy concerns nearby open source software and commercial have also confounded Governments around the world. Therefore, in this paper the emergence of open source licenses will be discussed in detail with its developments. Furthermore, this document will explore different licenses in open source community and benefits of some open source licenses such as Common Public License (CPL) and Eclipse Public License (EPL). Most importantly, this study will investigate about an EPL and its benefits to the organizations. This paper also explains whether an EPL is reasonable ideal to develop proprietary (commercial) software. Finally, the idea of using open source application as well solutions in regards to E-Government will be discussed.

INTRODUCTION

In the recent years mounting popularity of open source software has altered the software industry scenery dramatically. Few technical subject problems today are as ardently debated as that nearby open source and commercial software; two well-known models of software licensing. Policy concerns nearby open source software and commercial have also confounded Governments around the world [5]. A solution to some of the struggles currently faced in various countries can be particularly open source software, especially among developing nations. Such challenges include grappling with the pirating problem, aspiring greater control over software that is acquired and dealing with broader policy perspectives on how best to develop a successful domestic software industry [10][13][15][8].

The open source movement is a wide-range of movement of several individuals who support the use of open source licenses for some software. In open source development, the users are feeling free to edit and distribute the software products to the public use, and it may be freely incorporated into any derivative work, or proprietary [12]. Open source development motivates learning and understanding via the transmission of understanding about the things in open source software.

Programmers who support this open source development philosophy contribute to the open source community by voluntarily writing and exchanging designs and programming code for software development. This approach to software development allows anyone to obtain and modify open source code.

THE IMPORTANCE OF THIS STUDY

The main contribution of this paper is a better understanding of what are OSD and EPL will be added to state-of-the-art in this area. Moreover, in order to pave the way for developers to make ideal decision about different licenses that works in this field. The focus is to identify central structures and coordination patterns in open source communities (OSCs). Likewise, this contribution is based on the effects and the affiliations that OSD and EPL do have and their advantages. More importantly, management control and supervision mechanisms are collected in the specific definition of governance of this paper. Furthermore, an overview of different types of Open Source Licensing will be available for developers as well as decision makers to whether rely on such systems or not. Finally, as we all know the argument of using Open Source platforms as well as software become incredibly popular in regards of E-government, therefore in this paper we will be presenting how Open Source can benefit us.

BACKGROUND

A. What is a Software License?

A software license is an agreement between users and the owner of a software program that allows them to do certain things that would otherwise be an infringement of copyright law [16][8]. The software license usually answers questions such as:

- Where and how often can you install the program?
- Can you copy, modify, or redistribute it?
- Can you look at the source code?

The price of the software and the licensing fees, if any, is sometimes discussed in the license agreement, but usually it's described elsewhere.

B. What is Open Source License?

Open source does not just mean access to the source code. The distribution terms and conditions of open source must comply with the following criteria [11]:

- Free Redistribution
- Source Code
- Derived Works
- Integrity of The Author's Source Code
- No Discrimination Against Persons or Groups
- No Discrimination Against Fields of Endeavor
- Distribution of License
- License Must Not Be Specific to a Product
- License Must Not Restrict Other Software
- License Must Be Technology-Neutral

C. The History of Open Source

The free software foundation was launched in 1985 [18]. A group of individuals formed that the term, free software should be replaced by open source software (OSS) as an expression which is less ambiguous and more comfortable for the corporate world. Software developers may want to introduce their software with an open source license, so that anybody may develop the same software or understand its internal functioning. Open source software generally allows anyone to create modifications of software, change it to new environment system, share it with others or even market it.

- Free software defines software that provides its users the freedom to run, copy, distribute, study, change and improve the software using the GNU Public License (GNU).
- Open source software was coined in 1998 and became popular among those who wanted to focus on the software source code being available and compliant with the OSD.
- The OSD is protected and promoted by the Open Source Initiative (OSI).

Fig.1 Affiliates list [14]

D. Open Standards Requirement for Software

a. The Requirement

There are certain standards which should be conformed for implementations in open source software

b. The Criteria

Before using any open source software or platforms it is important to check whether it is comply with the following Open Standards Requirement (OSR):

- **No Intentional Secrets:**

There should be inherent processes to fix the flaws which can be identified during implementations or testing. More importantly, the necessary details for interoperable implementation must not withheld in regards to standards [24].

- **Availability:**

The Availability of standards should be in place in term of being free and public (e.g., from a web site) under royalty-free terms at reasonable and non-discriminatory cost [24].

- **Patents:**

"All patents essential to implementation of the standard must be licensed under royalty-free terms for unrestricted use as well as must be covered by a promise of non-assertion when open source software practically considered" [24].

- **No Agreements:**

"There MUST NOT be any requirement for execution of a license agreement such as non-disclosure agreement NDA, grant, click-through, or any other form of paperwork to deploy conforming implementations of the standard" [24].

- **No OSR-Incompatible Dependencies:**

There should not be any sort of requirement criteria failure in regards with any other technology during of implementation of the standard.

E. List of Affiliate Members

The open source Initiative affiliates scheme allows non-profitable and not-for-profit organizations to become the members of OSI. This scheme is now open for all applications. A list of latest affiliates is shown in below picture.

F. Why Open Source

Open source gives us a flexibility to share, edit and redistribute our codes to the public use. Through sharing code, programmer will get different ideas from the world wide programmers and they will distribute their codes again to the open source community [11][12]. Here is a chance to build a very good software product as much better than

proprietary software. Internet is an extensive platform to share each of us knowledge and get back good ideas to build our own products. Hence, the security would be higher than the commercial software.

a. Types of Licenses

Open source licenses are licenses that must comply with the open source definition and it has to allow software to be used freely, modified and shared. All licenses must go through the Open Source Initiative's license review process in order to qualify.

Here some of the approved licenses are shown below.

- Apache License 2.0
- GNU General Public License(GPL)
- GNU Library or "Lesser" General Public License(LGPL)
- BSD 3-Clause "New" or "Revised" License
- BSD 2-Clause "Simplified" or "FreeBSD" license
- MIT License
- Mozilla Public License 2.0
- Common Development and Distribution License
- Eclipse Public License and
- Few more….

Fig.2 Open Source Development [17]

b. Open source development

Open source development is a process to develop open source products using the similar products available publicly. Open source products are always available with its source code to access, modify and improve its performance [22]. In past, the open source development method has been unstructured; because there was no clear tools, phases, programmers, etc. In recent days, there has been lot of changes in development of open source with clear cut coordination and communication with the Community

The above structure simply describes about the phases in open source software development. It is somewhat different from the normal software development process. Because, it is totally depends upon the inter-connected programmers.

c. Open source platforms

Open source software developed using several different languages like Java, PHP, Perl, and Ruby on Rails, Python, CFML (ColdFusion Markup Language) and others.

d. Why open source software getting popular and its benefits?

Open software development has become very popular during the last few years, especially for open development platforms like Eclipse, are supported by big software companies, research institutions as well as universities [5][8][10]. The possible reasons behind that the open source development benefits us reasonably. Some of the benefits are given below.

- Reliability
- Stability
- Audit ability
- Cost
- Flexibility and Freedom
- Support and Accountability

G. Products

Software systems developed by the programming languages are called as products in the universal market. There are two different products available as described below.

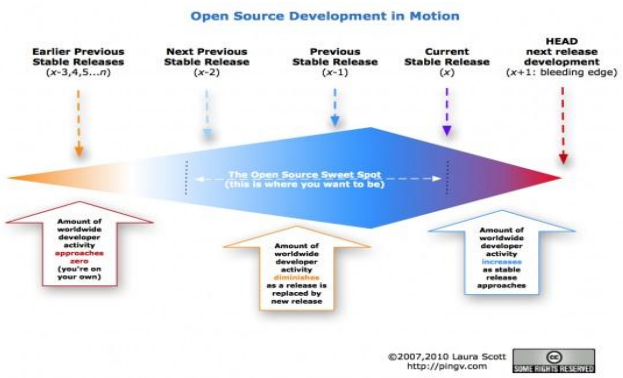

Fig 3. Open Source Devlopment in Montion Illustration

a. Open Source Products

Open Source products which have made a higher effect in the software industry. Due to the evolution of the open source products many commercial based products are becomes to the end. Due to the open source is made available to the public user. So, the user can change the code according to his requirements and bear excelling results [6]. Open-source software is developed in a public with cooperation. Open-source software is the most outstanding example of open-source development. Open source which mainly demands on alterations and redistribution of a software.

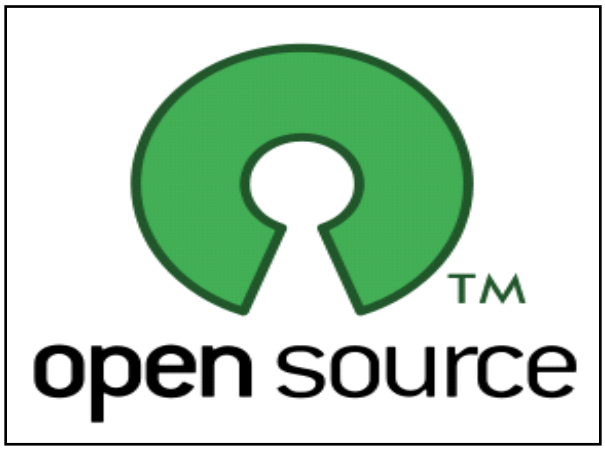

Fig.4 Open source Logo [20]

These days, the open source development performs an important role in software development [10]. As highlighted in [19] there are number of products in open source applicable today for each and every need in all the fields for example Technology, educational, Applied Fields and etc. Here, some of the open source products given below.

- OpenBiblio - For Library system
- Adempiere - ERP business suite
- Open - Computer Vision Library in C++

b. Commercial Software

Commercial software, which is quite opposite to the open source products in which the source code is not available to the user, occasionally it will be available for free of cost, in case of high extent commercial products user has to pay for it, is also known as pay ware, which is a computer software that is created for sale or that presents commercial purposes [23].

Commercial software can be corrective software, and free software packages are being the source code is handed out on successive request. All or particular sections of software packages and services that support commerce are progressively made accessible as free software.

A similar, but clear-cut classification in the software industry is commercial software which notice to software produced for sale, but beyond meaning it is closed source [24]. This includes products from Sun Microsystems, Red Hat, Google, Apple Computer, and Microsoft Corporation. Microsoft Corporation uses "commercial software", to illustrate their business model, but is almost entirely proprietary.

H. Eclipse Public License

CPL (Common Public License) is a free software / open source license introduced by IBM [1][2][3]. Both Free Software Foundation and Open Source Initiative have approved this license terms of CPL.
The CPL has its stated aims of encouraging and supporting collaborative open-source development with software licensed under other licenses, including many other closed licenses. The Eclipse Public License (EPL) is a slightly modified version of the CPL [7].
The EPL replaces the CPL and removes some terms relating to litigations related to patents [1][7]. It is designed to be an industry-friendly free software license. The EPL-licensed programs can use, modify, copy and distribute the work, in some cases being obligated to release their own changes.

a. What is the latest version of the EPL?

Versions 1.0 is the latest version of the EPL and it is also the initial version of the EPL also [1].

b. Reasons for EPL license Introduced

The EPL was written mainly for the Eclipse Foundation. It changes the Agreement Steward, formerly IBM for the CPL to be the Eclipse Foundation for the EPL [1][2][3][7].

To reduce the number of open source licenses, IBM and Eclipse Foundation agreed upon using solely the Eclipse Public License in the future [4][7]. Open source initiative therefore lists the Common Public License as deprecated and old-fashioned by EPL.

c. EPL Reliability

The Open Source model has an advantage of turning users into potential co-developers. With source code available, users will help you debug quickly and promote rapid code enhancements. Given a bit of encouragement, users will diagnose problems, suggest fixes, and help to improve the code far more quickly than you could independently. Lots of organizations have hope on this open source development solely under EPL license, because it allows users to create their own software license from common restrictions on license.

d. Benefits of EPL

The EPL grants these rights:

- to copy, adapt and distribute the program in source or object code form
- to distribute the code in object code form alone under a different license, provided that license is compatible with the EPL
- patent rights from all contributors to use and make available the code
- to distribute works which contain the code in combination with new code modules, and to license the new code modules in any way the distributor wishes

e. What Does The Eclipse Public License Do?

The Eclipse Public License

- Explicitly grants patent rights where necessary to operate the software,
- Keeps the covered code itself open source,
- Allows expansion of the code via new modules that can be licensed in non-open ways.

EVALUATION

In this section, the evaluation of different type of products as well as the comparison between two famous licenses will be explained. Finally, the evaluations of Open Source and products will be presented with aim of making ideal decision to use products in E-Government solutions.

A. Open Source vs. Commercial Products

In commercial (closed) software, only recognized programmers have access to source code and the programming is performed in one language alone. There is a huge gap between programmers and users and the message passes straightforward. Users are only able to use the final product and they cannot modify the source code. Moreover, they cannot see that code and adapt it. Here, the idea from the users is controlled by the programmers and nothing realistic things happen by the users.

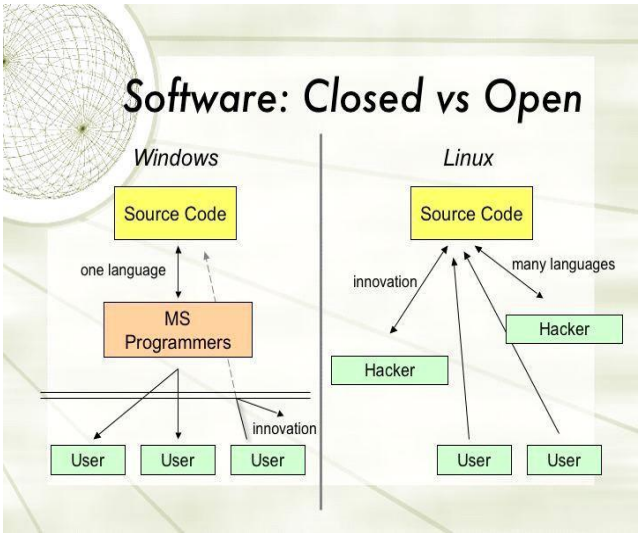

Fig 5: Open Source vs. Commercial Products [21]

In open software, the source is publicly available to anyone. Users contribute their ideas to the overall system. One user modifies something to do somewhat in the program. Another user might access that source code and he/she will write better job, which replaces the older one. It allows lots of access and different type of sources introduced and replaces the old one. This is what the open source system remains useful. Certainly, some users will opt to merely run the software as it exists, but everyone is allowed to get access to the code. Users might use different programming languages, as long as they ensure that their contribution of work with the system and won't affect the performance of the system.

B. Benefits to commercial products by open software and EPL

There are numerous advantages of commercial software by open source software. Firstly, it has most likely been thoroughly tested and is relatively bug free. Then, it was probably designed by professional companies in order to meet customer's needs. Secondly, there is always a support team that is ready to help the contributors and consumers can pay for extra functionality. Third, companies can provide more stability and continuity of the product development process.

Lastly, consumer benefits from the commercial software development model. Because their survival depends on their ability to generate profits, commercial firms have strong incentives to deliver reliable, tested and secure products that meet consumer needs and demands [10].

Further, in order to remain competitive, commercial software firms must be responsive to their customer base, for example, by continually integrating new features and services into their products. On the other hand, the disadvantages are that it may be expensive and you may need to routinely upgrade the software, which requires additional cost. Another disadvantage of proprietary software is that the product makes the business owner based on the developer. Plus, the company that creates the software according its distributors that work on the software. This means that the license is unique and not be able to switch to other business owners. On the same hand, Most of these advantages that mentioned above have the same weight for eclipse public license as well. Thus, commercial products could be useful or harmful for either open source software or eclipse public license.

C. Commercial product is the right ideal of Open Source Development

Software developed under Eclipse Public License (EPL), does not have any restrictions that it has to be released under the same license. It allows the programmer to change the license of the application. There is no need to distribute all the code of your application if you want to license the software under your own license. EPL is a copy left license; however it is a non-viral copy left so it only applies to the source of what was EPL'ed, not to what you build on top of the EPL project. Thus, it does not require that you distribute the source of your application, only the changes made to the framework itself. The terms of the EPL only apply to the source of the library, not the source of your application. Your application's code will govern by its own license (as you are not redistributing and simply "I own all the rights to this code" license).

Does EPL is the right ideal for developing commercialized applications? Nowadays, EPL is used in several organizations to develop their own products. As described above, EPL is the right choice to develop commercial software, because it has so much of support for different platforms (languages) and plug-ins.

So, developers are really indeed to use this Eclipse framework to develop software applications. It acts as a base for every development process.

Through using this EPL, they can minimize the time and money to be spent on a particular project and increase the productivity of project in a big manner.

D. Differences between EPL and CPL.

In CPL [1][2][3], Section 7 contains the following statement.

"If Recipient institutes patent litigation against a Contributor with respect to a patent applicable to software (including a cross-claim or counterclaim in a lawsuit), then any patent licenses granted by that Contributor to such Recipient under this Agreement shall terminate as of the date such litigation is filed. In addition, if Recipient institutes patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Program itself (excluding combinations of the Program with other software or hardware) infringes such Recipient's patent(s), then such Recipient's rights granted under Section 2(b) shall terminate as of the date such litigation is filed."

The first sentence was removed in the EPL. Many members believed that the first sentence was overly broad and viewed as an inhibitor to the continued growth of the Eclipse eco-system. The second sentence remains unchanged in the EPL.

The current Eclipse Foundation Intellectual Property Policy further clarifies the general principles under which the Eclipse Foundation shall accept contributions, license contributions, license materials owned by the Eclipse Foundation, and manage other intellectual property matters.

MANAGERIAL IMPLICATION IN REGARDS WITH E-GOVERNMENT

The decision concern using the OSD in government is controversial issue. This study discussed the OSD and the proprietary software, their differences, philosophy and techniques have evaluated. To find out that the OSD or the commercial software is the most suited this paper compared them according many field, for example, philosophy, design, testing and maintenance and superiority. The philosophy of commercial software (CS) is closed source, this means users cannot view the source code and modify, possible share all are restricted by the copyright law. So, the program works as a binary code that computer just understand the software and execute it. The main aim of this is to sustainable investment. In contrast, as explained above, OSD allows users to edit the code, share, unlimited use and freely view (Note that, freely refers to freedom of use rather that of cost-free). OSS does require money to maintain and develop, especially those who working in the commercial area. As their philosophy are different it is difficult to identify which one is the best, as well as the knowledge of how these affected environment are deployed. Both of them can be used in an appreciated environment to achieve desired outcome.

The testing of the CSD normally involves the internal and the beta test in order to fix bugs before release it to public. This is done with the limited environment chosen by testers; others have to wait until a vender release a new version to fix the bugs however commercial companies are more likely to be reliable in case of helping users with support and maintenance. Unlike the commercial software, as the OSS is available to public that developers can test it before final release. This can be used to eliminate bugs, users are not to force to wait to a new release because they can be able to fix bugs and test the software immediately in the real environment. However, this might be challenge because the developers who contribute the OSS scattered all over the world.

In the case of security, David Wheeler implies that OSS is more secure than the CSD [25], for instance, according the Linux development survey that devoted by Evans Data found that " 92% of their Linux system have never been infected with a virus and 72% never been cracked"[25].

Improvements and the advances in IT field for both CS and OSS are necessary. However, OSS has proven to provide philosophy of a superior development. Through the OSS techniques, it has been proved that are usually better suited and quality that the CS especially in government field. Despite of the disadvantages, OSS has provided flexible, interoperable and secure for government environment. There surly a very successful example is Linux.

Generally, it is difficult to decide that OSS or CS is better solution for government environment. It can be determine which kind is better on case by case principles by the environments. However, based on OSS standard with regards a government, it can be said that OSS is more appreciated development techniques and a superior, as explained in the sections.

CONCLUSIONS

This paper has presented some of the key resources of various free and open source licenses; in order to help you consider what kind of license you might want to apply to your own code. An important note is that the participation of open source licensed software packages in the commercialized products. It has been clearly shown to the public about the importance of Eclipse Public License. The EPL is the best license to certify your software as open source software and it allows you to commercialize your product. The way you choose the license is your wish as it is being a business friendly license. Finally, we have also presented the importance of using Open Source Software in E-Government project as well as applications.

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