Open source, Closed source and GNU!

Introduction:

Every software application is built from a source code and that computer program gives instructions to the application on how to function. It is in the hands of creators to decide on whether the application should be made Open source or Closed source. When an application is made Open source, the source code is available to public and developers can read or modify the code as per requirements. Whereas if the application is made Closed source, the source code can neither be accessed nor visible to the public.

Origin and rise of Open Source:

At the beginning of internet era when closed source is proliferated, open source was always back lashed and often viewed as a threat and violation to Intellectual property rights. Software was starting to take its shape and it was overwhelming for a single company to produce huge results and that's when open source started to gain momentum. With the release of Linux OS in the early 1990s, Open source programming projects using MySQL, Perl, PHP became popular. In 2008, GitHub provided platform for open source developers all around the world to share their code and collaborate with other developers on various projects. [1] Many well-known software application projects like Facebook's user interface, Goldman Sach's data modelling programs, Walmart's cloud management platform are open sourced [2] [3] [4]Few more popular examples of open source projects are Wikipedia, Firefox, Selenium, Hadoop, MongoDB etc., [5]Fun fact is that most of the open source programs are developed collaboratively by thousands of people from volunteers, hobbyists to technical employees at companies.

Coming to monetization of open sourcing, Red Hat was the first company to figure out a successful business model for its open source operating system, Linux. Red Hat sells open source software solutions and technical support. Anyone can download software but if enterprises need business support and greater security a subscription is required. After decades of commercial growth IBM acquired Red Hat for 34 billion dollars which is by far considered as the largest software acquisition in the history. [6]

Individual/ non-commercial profitability of open sourcing is almost non-existent. Developers, hobbyists' path to do business with open source is less clear. Voluntary side projects sometimes become so popular and widely used that they even end up being a part of fortune company projects. One such example is Linux kernel, Linus Torvalds initially mentioned " I am doing a (free) OS (just a hobby, won't be a big and professional like GNU) for 386(486) AT clones. " [7] Now Linux runs almost everything for example Apple's iCloud, NASA's Pleiades, Pentagon and so on. [8]

Licensing of Open source:

Although by the definition source code of Open source application must be freely available to the public, there are few conditions under which the software can be used and redistributed. Open source licensing requires complying with the properties of Open Source Definition, OSD. Whereas the personal/ non-commercial access of source code doesn't necessarily need license. The license terms and conditions basically restricts the users to preserve the name of the owners, include a copyright statement in the code and follow the same license for the newly derived applications. There are over 200 open source licenses listed in official open source webpage like Apache license, BSD license developed by Berkeley Software Distribution, MIT license and so on. Of all the licenses only half of them around 100 are approved by OSI, Open Source Initiative. Licenses are often distinguished by few parameters like Distribution, Modification, Trademark grant, Patent grant and so on. [9]

Origin and more of GNU:

The origin of GNU dates to 1970s when Richard Stallman, the then staff programmer at AI lab, M.I.T was developing an operating system along with bunch of hackers. Stallman didn't like the idea of restricting user with an administrator and password system and eventually got out of that project. It was the time of proprietary clashes with open source, Stallman had many negative experiences which soured him on the idea of commercial software. This hostility to commercial and proprietary software world made Stallman look for other alternative and he started working on free and open operating system, GNU! The name of GNU came from "Gnu's Not Unix" which means it is similar to UNIX operating

system but not same! UNIX is a proprietary software and Stallman and team had to write a replacement for it from the scratch.

In a document interview Linus addressed Stallman as a great philosopher and himself as an engineer. Stallman eventually became the founding father of free software movement. Through his operating system he created a legal, philosophical and technological foundation to the movement. These advancements gave voice to many contributors to develop and sell GNU software and technical support. The most successful and prominent of these was Cygnus Solutions now part of Red Hat. [10]

Licensing of GNU:

Richard Stallman penned license for free and open software and named it as GNU General Public License, GPL. Many open source developers regard this license as one of the most well-written software agreements. Unlike other commercial or profitable license agreements, GPL is written on the standpoint of open source community which allowed many developers to feel accepted and acquired more contributors. Linux is also licensed under GPL version 2 which requires the derived code to be on same license agreement and also provide the originated source code to the recipient. There are currently around 20 licenses compatible with GPL , GPL Version 3 being the latest. [11]

Closed source:

Closed source software or non-free or proprietary software is a computer software that can be installed/downloaded only by obtaining license from the publisher. The source code of the software is a guarded secret and the publisher companies reserves the rights to use, modify and share the modifications or share the software.

During the conflict period between Open source software and Proprietary software, Microsoft's Bill Gates penned an "Open Letter to Hobbyists" in which he expressed his dismay on the factors that's hindering him to build a quality software. This happened when Microsoft's BASIC needed to be altered but they were lacking funds to hire few programmers while the shared software of BASIC is being circulated in the market. [12]The letter went rampant and it immediately spiked the copyrights infringement of software that was eventually called proprietary software. But the object code copyrights

weren't clear until Apple Computer Inc., filed a lawsuit against Franklin Computer Corp. which eventually allowed Apple to be able to force Franklin to withdraw its clone by 1988. [13]This allowed other companies to speak up and one such incident is IBM believed that their PC BIOS code copyrights were infringed by two California firms. IBM won the dispute by making the firms agree with reimplementing the BIOS in a way they are unquestionably not an infringement. [14]

Licensing of Closed source:

Most of the closed source software are covered by copyrights that comes along with trade secrets, patent rights and legal basis for the owner to have exclusive rights. The source code is considered as a trade secret. Proprietary software licensing agreements are usually non-negotiable. [15]

Closed source vs Open source:

While there are many factors that distinguish between Closed source and Open source, software license agreement is the ultimate parameter. Few other undiscussed factors are stated below:

- Further Development: Closed source code can only be accessed by the creators who are usually the employees at the publisher's company which limits the number whereas Open source code is free and open which allows limitless scope of growth with the help of massive collaboration of open source community.
- Support and solutions: Open source is behind in this aspect as the Closed source community tend to have designated teams for support. While few Open source software companies like Red Hat do provide solutions that'd still leave out many unattended software queries.
- Flexibility: Open source is undoubtedly more flexible than Closed source but this depends on the requirements and the resources.
- Pricing: This is also the biggest difference between Open source and Closed source. Open source is almost free of cost or a less amount for paid service subscriptions whereas Closed source applications tend to charge depending upon the functionality, assistance and added features which could be a huge amount. Closed source pricing model includes rights to use the software as an upfront cost or subscription

- Code quality: Although closed source claims to be striving for code quality, Open source always have a room for enhancement and it can only get better.
- Demography: This factor is always neglected and not considered as much as it should be. Open source is ultimately the better option and it is still to the surprise of many developers that few popular closed source applications are inaccessible in some parts of the world.
- Safety and Security: The difference with this factor could be little conflicting depending upon the software we're talking about. Considering in general facts, Open source is risk-free which is eventually more safe and secure. That is because Open source is flexible enough to always modify as per requirements while Closed source is restricted for modifications and redistributions. But this is not always the case! When the closed source application is true to its functionality and works perfectly fine on the designated OS, this could be more reliable as user will get a prompt and reliable support from the owner.

Finally, there is no better type of application without actually knowing the business requirements and objectives.

Conclusion:

Open source and Closed source are equally the most valuable and astounding inventions in the software world. There are many unsung heroes, hobbyists and volunteers who paved the way for future generations when there were no proper resources and sophisticated hardware. The exemplary amount of contributions be it open source or closed source is truly commendable.

Innovations have come and are still coming from Open source world. The community of Open source is widely spread all across the world. On the other hand, Proprietary software world is being reliable and continuing to produce many quality solutions. Both the software worlds have undergone profound transformations over the past century and there's still more to it.

We have bigger problems now and are constantly in need of technological support. With the real world problems rapidly growing like environmental concerns, health care solutions, wildlife

extinction and so on, the complexity in building technological solutions is only going to build up irrespective of the software type. After all, how good is technology if it is no use to mankind!

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