The Motivation Behind Investment in Development of Open Source Software Projects

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Research Article

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Abstract

This research examines the free and open source software (FOSS) attributes and finding the motivations and attraction factors for investment and participation on development of open source software projects (FOSS). It nails the answer of some key research questions such as: What drives to invest and participate in FOSS projects in the industry? Which metrics attracts developers for participate in such projects and gain profits? This paper approaches these questions by reviewing a sample of projects into examining and studying the researches regarding FOSS to figure out motivation factors behind FOSS. By understanding the motivation factors behind FOSS then the paper can also discuss about the future of FOSS at last.

1. Introduction

This paper, is going to examine the motivations of individual participants and small size as well as large companies(e.g. information technology ("IT") vendors) to invest in FOSS projects and describe how companies and individual persons participate in different projects by investing in FOSS projects and supporting them by contributing and committing in developing them. And why they are doing that ? How they can gain profits in return?

First it is going to investigate what is motivation in FOSS and examine such projects deeply to figure out the structure and visions of FOSS for finding out the metrics which motivating others to participate and being part of it.

In FOSS projects, clusters has been defined as a group of developers. This paper divided FOSS projects in two segments:

First calls "Money cluster driven " and second calls "community-driven cluster. In the first part cluster consists of projects that have received vendor investments, but in second part, clusters consists a large number of projects that have received almost no vendor investment [1].

It is going to consider the motivate factors for investors and also self encouraged (e.g. Maslow motivation metrics for individuals) and motivated independent contributors to each FOSS project and see how these contribution or invest affect on success and development of FOSS projects [2].

The contribution and supports from vendors and contributors both formally and informally can also lead some FOSS projects into success like Red-Hat and Linux project. Since these supports can help such projects to develop faster and gain market and attention of others to participate for later versions.

For finding out the motivations and background First, briefly reviewing relevant literature on individual motivations, corporate motivations, and classifications of FOSS projects and strategies for developing them. Then the paper describes the clustering approach and FOSS project sample for the paper. Next, we report and discuss findings on FOSS project clustering.

2. Background and Motivation

Philosophy of free software is a matter of using the free software freely (e.g. copylefts) and in all ways(e.g. using or editing such projects for usage in a company or personal use without restriction) and selling a copy or investing or look at the FOSS as a business project is legitimate and encouraged. Therefore there are a lot of projects starts each day in FOSS and although just some of them become really successful but there are contributors whom motivated to participate and also investors which consider the projects as business opportunities.

There is individual motivation behind participating in developing FOSS projects but others saying that there can be business motivation behind the scene which leads to invest on FOSS, by studying motivation factors for such projects

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and doing the walk-through inside them we are going to investigate what is the motivations and policy behind each part for FOSS that leads such projects to develop and even being successful [3].
Nowadays there are some well known companies like IBM which participate in such projects along with individual contributors which all of them has their own metrics that motivated them in a way to be part of developing such projects.

3. Investigation on Motivation

This part is going to investigate the factors which affects the motivations of participants and mention some FOSS projects strategies and perspectives which can increase interests of developers for participate.
The exploratory study has identified three areas which are of specific interest for further investigation: leadership, release management and company involvement. In the following, one of these areas, release management, will be selected as the scope of further investigation. This particular area will be investigated thoroughly in the light of quality management and improvement in FOSS projects.
Leadership is an interesting area to which some attention has been drawn already. Lerner and Tirole [3] stated that FOSS leaders often do not have any formal authority and that leadership heavily relies on respect and trust. There is also evidence that there are a number of different leadership style in use.
Most projects differentiate between developer releases and releases aimed at end-users but because the requirements of developers and users are often vastly different some projects put little emphasis on the latter [3].
Another important perspective focuses on FOSS is *Quality management*. "There are two approaches of Quality when applied to FOSS. First, in which conformance to specification is taken as a measure of quality, cannot directly be applied to FOSS projects which usually do not have an explicit design or a written specification" [4]. The second definition shows that many different factors have to be taken into consideration for quality. This approach may be in conflict with the priorities of many FOSS developers for example, put more emphasis on maintainability than on usability, as will be seen later [4].
A more recent model which focuses on the social structure of FOSS projects is the onion model which observes successive layers of member types [5]. According to this model, a sustainable FOSS community consists of a small group of core members, an increasing number of contributing developers and an even higher number of active users who report defects.

4. Motivation on Participation

One of the important perspective focuses on FOSS from a legal point of view is considering a license model for software distribution which is related to select a proper license for your project the proper licensing can attract contributors for your project .
There are three types which have focused on some interest factors for participating in FOSS development process:
First: *The rapid diffusion of FOSS:* within a very short time frame, various FOSS applications, such as Apache and Linux, have attained major market share and often dominate their product categories [3].
Second: "*The significant capital investments in FOSS projects":* major players in the IT sector, such as IBM and HP, have invested billions of dollars in FOSS development.Companies like Red Hat which commercialize Linux have attained considerable profit [3]. MySQL, the provider of a FOSS database, has been also very successful on the market [6].
Third: "*The new organizational structure":* the collaborative innovation process employed by FOSS projects is often seen as a major organizational innovation [3].
These types among showing a project attractive by selecting right strategies which one of them is licensing and other is choosing the proper programming language for project show that the FOSS can encourage investors to invest and participate. The concept of these three perspectives are make the FOSS organize.
For example there are more common languages in FOSS like Perl, C/C++, Ruby, Python, Java script and etc. which needs an strategy of choosing a right one for each project that can attract developers based on project vision and prospectives which mentioned and applying with right license to let the other contribute freely so it makes a project to lead further and being successful.
This strategy should consider the investigated factors in FOSS which mentioned and being compatible with the prospectives here to both together create a proper project that has opportunity for being attractive to other developers, users(which has the great role as end-user for making a project ell known and they can varied from developers to normal users based on project product) and investors.

5. Motivation on Investment

There is Motivation factors for the vendors as well as investors for contributing and investing on FOSS projects according to Harvard Business School research, like by expanding the Open Platforms , use OSS as a way to standardize IT components and move up the software stack to higher Margin Businesses and take advantages of pricing in OSS which are economic interests for investing on such projects [7].
If vendors were altruistically motivated to contribute to FOSS projects, it would expected to see an even distribution of investments across projects. However, given the concentration of investment in clusters , vendors more likely have economic motives for contributing to FOSS projects. Considering FOSS business models , around distribution, service, and subscriptions, it seems most likely that vendors are investing in FOSS as a complement to their existing IT product portfolios [7].
It can figured out that how vendors revenue the businesses. First, by examining how the amount of OSS-related revenues is related to the size of core businesses FOSS can complement. Second, by looking at IT vendors' actions towards FOSS by software segment. If vendors are using FOSS as a complement, then they likely avoid investing in OSS projects in the same software segments as their proprietary offerings.
Vendors' actions were described as compete, collaborate, or contribute. Compete is defined as actively promoting a proprietary product over an open source equivalent.
Collaborate is defined as helping distribute or market open

source software, and possibly offering some technical support, but not contributing code.
Studies shows vendors who can not only invest in FOSS projects that immediately complement their IT portfolios but also modify their portfolios so the FOSS project becomes Complementary [7].

Self-marketing is another reason can motivate programmers or projects to start investment in FOSS. Programmers may also regard working for open source software as an effective way to demonstrate their capability and skillfulness in programming.This argument of self-marketing has an important implication. The larger the contribution of an individual to the open source projects, the more likely it is that the commercial software vendors will recognize the value of the individual [3].

6. FOSS Projects and Analysis

"The FOSS project have sample consists of projects with community interest and significant activity" this projects can attract investor for developing it and gaining higher market shares [6]. There is some application for FOSS segment that include customer application, Content Applications, Application tools for Development(ex. erlang solution company receives invests for creating tools offered by other companies for a special functionality), Information & Data Management, Security , open source operating systems(ex. GNU) , Application Deployment , Information Access projects and more.
In projects , when developers is dedicated to the work(working with interests and passion for the final product) , then the fully loaded cost of the developers is counted in the investment of the project. If previously open source was developed, then the cost of developing that code is counted towards the total cost in project . Venture capital investments in such a Start-up companies can happen since the venture capital firms are investing in companies that will become IT vendors.
By This methodology understands the total investment in FOSS by not including customer contributions (e.g., cash donations or resources spent creating additional code to deploy or customize an OSS project for their own use), volunteer time, or donations from individuals or other non-profit foundations for investment [7].

6. Discussion

The most important findings in this paper are reviewing of FOSS projects (and its attributes) into clusters and the identification of IT vendors' motives in each cluster. Individuals' motivations for contributing to FOSS had been found to be a mix of intrinsic and altruistic. For vendors, the equivalent of an intrinsic motivation is an altruisticmotivation, and the equivalent of an extrinsic motivation is an economic motivation. By studying FOSS projects, a "money-driven cluster" identified where IT vendors' motives are economic.
"community-driven cluster", monetary investment from IT vendors is limited, and IT vendors appear to be altruistically motivated in their contributions. The best reason of investment in FOSS projects and motivation in this way of work is open source product You might be reducing the market's overall return on investment, but at least you'll have a second chance a satisfying your own investors by making your company a successful open source business. You'll be in good company and you'll gain profit back by high developed OSS platform or or projects [7].
With a proper license(Depends on your project specification and vision) for your open source product (like licences used mostly for ex. GPL), you might well receive help from the system integrators, customers,and software vendors higher in the IT stack.
Commercial open source is available in source code form. Unlike community open source, however, one company controls commercial open source. This way, commercial open source software can gather some of the benefits of community open source. During the early days of an open source project, this is an advantage, as the company can provide clear direction and muster more resources than community open source projects typically can.

8. Conclusion

This research has found that the introduction of time based releases is associated with two coordination
mechanism that allow FOSS projects to better cope with great organizational complexity: regularity and the use of schedules [4]. "By using time rather than features as the criterion for a release, the time based release strategy allows better planning in projects which have little control over their contributors". The introduction of a time based release strategy therefore leads to a more planned and controlled software development process [7]. This in turn contributes to more consistent levels of quality. Finally, it is argued that the findings about coordination and quality from this dissertation can be replicated and used in other volunteer projects whose aim is not the creation of software [8].
The future of FOSS is based on both projects which is going to introduce and expansion of FOSS rather than proprietary projects but by FOSS development methodology which can gain attraction for motivating both contributors, developers and investors there will be more market as the life time of FOSS goes on. There was just an idea from Richard Stallman (whom initiated the free software movement and GNU project) which now leads to be a competitor for software market and freelance development [9]. Such efforts and this reseaech showed that the future of software development and organizational point of virew of change management for process imporevent in organizational , team and individual perspective is dependant of the software licensing and investment as well in which FOSS plays essential roles in this field [10, 11]. Using FOSS at last could make the outcome of each project more reliable and successful.

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