

# Open Source Interest Groups : Literature Review

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## Abstract

Open Source can be characterized as a disruptive technology that changes rules of behavior in information technology. Those rules and related regulations define new trends in accumulating a collective knowledge in general and in software industry in the first place. To keep track of those trends, it is important to understand the motives and interests of the participants. We propose a taxonomy of participants by grouping them according to their interest in and their influence on the Open Source process. We conclude with the proposition of stratification of open source community by expressed intellectual property rights.

## 1 Introduction

A broad discussion of Open Source Software was prompted by work of (Raymond 1998). In his paper he proposed a metaphor of “cathedral and bazaar” to compare commercial and Open Source software development styles. He suggested that dramatic increase of a pool of developers has a revolutionary nature and has unbeatable advantage over commercial development. This was followed by series of studies of motivation, community building and virtual project management. Raymond suggested that “Brooks law” about complexity of the project growing as a square of the number of participants resulting in slowing down the project, is not true in case of Open Source, and cited Linux project as a proof of this.

Raymond's paper was criticised by N. Bezroukov (Bezroukov 1998) as idealistic and his metaphor as vulgar. Author finds that Open Source development activity is very similar to academic research, which makes existing knowledge about academic communities useful in understanding of Open Source process. This would be a good starting point for a study, but we couldn't find further research on this (has to be verified).

Noticeably, Raymond's paper was initially written about “Free Software”, then changed to Open Source without mentioning differences between two, so the Open Source wasn't perceived as a new movement in 1998.

The Open Source Initiative had materialized in 1998 by registering OSI's certification mark. It was started as a movement of hackers (experimental software scientists) with a purpose to create a business case for free software. Free Software Foundation was created in 1985 and had support from academic community and enthusiasts, but wasn't appealing for businesses. By 1998, at least two free software projects matured to the degree that they could compete with commercial products (Linux and Apache server) and started getting their market share.

OSI successfully made its case proposing several business models (OSI Editorial, "Open Source Case for Business") and was perceived as a competitor by Microsoft (Halloween Document I). What was new in this competition is that threatened monopolist Microsoft had to respond and attack not a company, but a process. Other software manufacturers were divided. SCO whose main product was a Unix brand, was trying to protect itself by suing Red Hat for using its proprietary code, but wasn't successful at that. Netscape sided with OSI by contributing free code to new Mozilla browser. Hardware manufacturers like Sun and IBM pledged their support and are sponsoring Open Source activities.

## 1 Interest Groups in Open Source Movement

Since in information-based society everybody is dealing with software as a user, developer or vendor, future of open source will be defined by a large groups of people. We attempt to identify groups that have common interests in open source by reason of their occupation/business.

### 1.2 Computer Scientists

We include in this group academicians and students. (Bezroukov, 1999): "From a theoretical point of view, participants in an open source project should probably be considered as a special kind of academic workers. Solutions for typical problems developed in academic community are directly applicable to open source and its use can probably provide important benefits to the open source development model".

### 1.2 Hardware and software manufacturers

In fact these are two different groups and their strategies are not the same. In the context of competition for platforms they can be grouped together. Strategies of the corporations in computer industry toward Open Source studied in detail in (West 2003). Two main hybrid strategies are identified:

- 1 Opening parts – some layers of architecture while retaining control over other layers;
- 2 Partly open - disclosing technology under such restrictions that it provides value to customers while making it difficult for it to be directly employed by competitors.

Reasons of switching to Open Source are inability to allocate enough R&D resources to build a competitive product and intention to broaden product acceptance. The underlying goal of these strategies is to get control over a platform and be able to differentiate their products.

One of the conditions of a fair competition in software industry is a published interfaces. That was achieved in “Unix world” by Open Systems standards, in particular by Posix. With Open Source the industry is making another step to actually develop standards as an open code. Thus, there is some similarity of Open Source development and standards process (Schmidt, J.).

“Recently several large corporations used a second avenue of financing of open source projects. When a given open source project can promote a strategically important hardware component, programmers can be assigned to it. This activity becomes a standard "loss leader". Digital contributions to Linux seems to belong to this scheme. Current Intel and IBM interest in Linux seems to fall into this category” (Bezroukov, 1999):

## *1.2 Private Participants*

Private participants as a group are a backbone of Open Source development process and play a major role in a project up to a point of its productization. That's why their motives and behavior is getting more attention by researchers. Study of Linux project(Hertel 2003) shows that behavior is consistent with existing models for voluntary action and virtual teamwork. It was pointed out though that the research has to be done on other projects.

Linux is apparently the biggest and most successful project, but there are some arguments against using it as a guideline to make generalizations about Open Source development. Linux was built upon nearly 30 years of Unix R&D, that started in 60<sup>th</sup> at Bell Labs by D. Ritchie and K. Thompson. Community development and motivation of the Linux contributors was definitely affected by this unique advantage. In this context, new and successful projects like Freenet are of particular interest.

The study has been done on Freenet project by ( Krogh et al 2003) who analyzed joining behavior of participants. Qualitative grounded approach was used to develop analytical categories and propositions based on a common sense and project data. In their paper, authors classify participants as joiners, newcomers, developers, and core

developers. They introduced constructs of “joining script”, “specialization”, “contribution barriers”, and “feature gifts”, and proposed relationships among these. One of the finding of this study was a high turn over of the participants. Managing a project with a ever changing team is a specific challenge of Open Source and requires more research.

Contribution barrier was introduced in ( Krogh 2003) as a function of several factors making it difficult for a joiner to contribute a code. The factors are ease of modification, choice of programming language, ease of integration and code interdependencies. It was shown that this barrier can be lowered by “feature gifts” from other developers, providing useful tools for the project.

Other barriers can be observed on example of Apache Foundation, which is overwhelmed with proposals and the managing board has no capacity to consider all of them. On the other extreme, there are many unpopulated, or empty projects on sourceforge.net, where anybody can start his/her own project.

Study of Freenet is applicable to other projects because it was started with no code base, with ideas presented in master thesis of I. Clark. The uniqueness of the project is that it challenged US Government policy on communications by using enhanced encryption and anonymity. It is an ambitious project and it has attracted a lot of interest from the participants and a media. Motivation to participate was, at least partially, ideological, which means observations can not be extended to more mundane projects.

Motivation of “gift giving” from anthropological point of view was discussed in (Zeitlyn 2003). I was noticed that there is no such thing as a free gift. “By giving code [participant] creates the obligation on the recipients of his gift to give back other code... Gift giving and acceptance establish moral lasting relationships between the parties”. We can add here that GNU General Public License was a legal incarnation of this kind of relationship. Further, the metaphor of open source groups as a families, given in the same paper seems questionable and can be argued. Just to mention that family is not a voluntary group.

## *1.2 Governments*

There is a rising interest by governments toward accepting Open Source model. First, to lower cost of government infrastructure. Second, to maintain a competitive environment and deter monopolists . Third, to involve more people in creation of public knowledge. At this time, certain interest was expressed by several governments with the statements that open source software wil be considered alongside with commercial software.

## *1.2 Development Portal Providers*

This is another term for organizations hosting open source projects. This is a relatively new and fast growing type of sevice. Portal includes development and

configuration management tools and database of projects. All services are provided for free. The main business goal is collection of information on projects (intelligence). This information can be used for such purposes as finding projects with new interesting ideas, potential for commercial product, or a person with required skills to hire. Technically, there is more than enough resources on internet to accommodate needs of those who want to participate in projects. It is obvious that portal providers are in competition for best people/projects. The strategy is to attract people by better tools, ambitious projects.

Competitive strategies of portal providers have not been studied in the literature yet which points us to a research opportunity. As an example, VA Software that develops and sells portal infrastructure, maintains Open Source development network website and cooperates (supports) with SourceForge portal provider.

### *1.2 Conservatives: opposition to Open Source*

Some concerns are expressed by programmers predicting lower valuation of programmer skills, rise of outsourcing and decline in investments due to open source movement.(Carroll 2003): "Carpenters aren't forced to contend with a free-carpentry movement, and financial analysts at Merrill Lynch aren't pilloried at "free financial analysis" conventions. For whatever reason, a surprising number of people whose aim is to make a living from programming endeavor to provide free alternatives to product sold by others within the industry". These concerns should be addressed in future studies. One approach can be that "free software" is a competitive response to "low-cost software" from overseas outsourcing at the time of economic downturn. New business models are needed to account for new realities.

### *1.2 Radicals: Against Intellectual Property*

The problem of retarding influence of intellectual property rights on innovation was discussed in a broader than software context by (Martin 1995): "More fundamentally, it needs to be recognized that intellectual work is inevitably a collective process. No one has totally original ideas: ideas are always built on the earlier contributions of others". The methods suggested to fight IPR , among others, are "noncooperation, boycotts and setting up alternative institutions". These ideas if implemented in full, would endanger capitalism which is proven to be efficient in creating and delivering of public goods. Open Source sets up an alternative institution and new rules for a fair competition in a market economy.

Microsoft caused a damage to software industry by turning computer scientists into "hackers" discovering "undocumented features" of DOS and Windows. Open Source is a hacker's response, it is ideologically motivated and at the same time it is a return to a common sense for software developing community.

## 5. Conclusion

Open Source process is a way of creating a new knowledge. It includes basic research, engineering development and creation of public goods by way of commercializing knowledge using business models and intellectual property rights. The change from proprietary to open code, ability to publish software allows computer science to evolve like other branches of academic science (e.g. math) – freedom to make a contribution, community scrutiny and building upon latest and greatest.

The major contributing factors that made Open Source go mainstream are Free Software initiative in 1985, explosion of internet in 1994-95 and achieving of commercial quality by Linux in 1998.

The evolution of organizational forms to bring together talent for innovation in software development has gone from physically moving people to join a project, to geographically distant teams, and then to virtual teams. Open Source adds a huge pool of developers.

Based on differences in group interests, it is logical to suggest that open source movement will branch into several streams. It is happening already with projects labeled with particular licenses stating IPR. Academic researchers tend to use GNU General Public License, engineers may prefer Common Public License, application programmers – Apache type of license.

There is not as much difference between free and non-free as between available and non-available, accessible and non-accessible. Monetary interests, short or long-term, are always have to be reckoned with. The disruptive nature of Open Source is that it removed some barriers of participation created by proprietary code practices.

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