

How the Open Source Development Model Can Harness Innovation from within Your Organisation

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**Enterprise and innovation are as much about people and culture as ideas.
How can leadership help to harness entrepreneurship
and innovation to combat the global recession?**

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Innovation within Organisations: Free Ideas and Voluntary Contributions

Enterprise and innovation can only arise when the individuals within an organisation are motivated to contribute beyond their job description. Ideas must be freely given, and contribution to their development voluntarily made. Put simply, our nine to five-thirty commitment is paid for at the end of every month, the full realisation of our capacity to innovate is not.

To harness innovation and entrepreneurship, our leaders must make the leap from managing their teams as a pre-paid resource to providing the tools for an engaged community of contributing volunteers. Ideas and entrepreneurial approaches can come from any individual, but they will only be contributed when individuals are motivated, have the information required to make an informed contribution, are assured that their contributions will be credited, and can communicate their ideas with the wider organisation.

In my nine to five-thirty life, I have had the extreme luck to be exposed to a maturing model of voluntary collaboration which rises to this challenge. The open source model of software development has engaged vast communities of volunteers for over twenty years. Its principles, specifically those known as the "bazaar" model of development (Raymond, 2000), are used by software projects to harness the innovations of distributed, global communities, often scaling into the thousands of contributors.¹

The commercial strength of this model is perhaps best demonstrated by the Linux computer operating system, the most recognised product of open source development. The value of the Linux ecosystem alone is estimated to reach \$49 billion by 2011². Innovations built on Linux and other open source development activities include Google, the iPhone, Amazon.com, and indeed the internet itself.

"Free and Open Source Software (FOSS) has helped to create community-conceived, constructed and maintained technologies valued at several tens of billions of dollars. I

¹ See <http://www.ubuntu.com/community/ubuntustory> for an example of community growth. The Ubuntu open source community scaled to over a thousand contributors within two years.

² IDC's Vice President of Research in a speech at the Linux Foundation Collaboration Summit, University of Texas Super Computing Center, April 2008

don't think that there is another volunteer-based effort in modern memory with a comparable achievement, by several orders of magnitude".³

I believe, as do many others⁴, that open source principles can be applied in industries outside software to harness innovation. More specifically, I believe - and will use this essay to make the argument - that open source models of collaboration *within* organisations can harness the innovative and entrepreneurial potential of employees.

Over the following pages I will show how open source models facilitate innovation by establishing formal structures for voluntary contribution. In sharing the basic elements, or pillars, of these structures I will show that these are not software-specific, and can be applied within most organisations.⁵ I will go on to argue that these structures work by intrinsically motivating individuals to contribute ideas and innovations. Finally I will demonstrate the balance that open source software communities must make between voluntary and paid-for participation, and argue that this mix can be emulated inside organisations to harness the innovation within.

"Insight comes from individuals. The most their surrounding social machinery can ever hope to do is to be responsive to breakthrough insights - to nourish and reward and rigorously test them instead of squashing them.

Therefore the root problem of innovation (in software, or anywhere else) is indeed how not to squash it - but, even more fundamentally, it is *how to grow lots of people who can have insights in the first place.*" Raymond (2000).

³ Bill Weinberg, Senior Executive, The Olliance Group, Principal Analyst, LinuxPundit, and formerly Initiative Manager at Open Source Development Labs (OSDL). Contribution for this essay – see note 5 below.

⁴ See also Hope (2008) for open source models in pharmaceutical research; Pelosi (2009) for open source in governance; and Goldman & Gabriel (2005) for open source as used by companies to engage with external communities

⁵ This essay is in itself a small demonstration of collaboration in the spirit of open source. During research, I contacted open source leaders and developers from a number of commercial and voluntary projects and asked them to contribute a short summary of the lessons they would share with other organisations. The fifteen contributors who generously shared experiences are thanked in the closing pages, and are directly quoted and credited as much as word count allows.

How to Grow Lots of People who can have Insights in the First Place

Open source communities start with what Raymond (2000) terms a “plausible promise”. In software, this promise is an early piece of code or concept for a system, which when presented can convince others that it “can be evolved into something really neat in the foreseeable future”. More generally, this promise is an idea at its earliest stages.

“People get involved in open source projects because they care about it and really want to create something. But communities don’t just materialise – they come together around ideas.”⁶

It falls to an individual to sketch and articulate this idea, but with the immediate aim to open this to the innovation and development of others. In this way, the plausible promise creates a platform on which innovation can take place.⁷

The individual who presents the idea usually becomes the project leader as the community innovating around the idea grows (Golden, 2005). The project leader has responsibility for attracting contributors, defining initial goals, and for maintaining the flow of communication and collaboration.

“Projects are often initiated by individuals with a limited goal or specific requirement, and then more and more people join and share their contributions and requirements. Open source project giants such as Apache and Linux have grown to tens of thousands of individual contributors.”⁸

Contributive communities of any size would pose a complex, resource-heavy management problem when approached with traditional, hierarchical project structures. Instead, open source development works because it has evolved a formal set of tools for communication and knowledge-management.

“Open source is about discipline, rather than chaos. Distributed development depends on strong workflows and facilities such as revision control systems and issue trackers.”⁹

⁶ Matt Kendall, Vice President Engineering, ACCESS Systems Americas, Inc.

⁷ With thanks to Leif Bildoy, Product Manager, Research in Motion, Inc., USA

⁸ Danny Huang, Head of Open Source Technology at Orange Labs Beijing, China

⁹ Mickey Lauer, Founder, OpenEmbedded, and Chief Architect, freesmartphone.org

The majority of these tools like issue trackers, mailing lists, Internet Relay Chat (IRC) clients, wikis and forums are online facilities. It can be said that the internet enabled open source development by providing the means for distributed development (Raymond, 2000), and that each open source community establishes its processes for communication and development on the best of the internet's tools. Importantly, these processes are designed towards the open source ideal of free, equal participation for any individual – every contributor can access all information, and contribute to any discussion.

“The open source approach emphasises the benefit of being able to freely use, improve and share available resources. It's best to encourage people to become stakeholders and to facilitate meaningful contributions and co-ownership.”¹⁰

I will return to the ideals on which successful communities are built in the next section, but focus here for a while longer on practical considerations. In summarising the recipe for the beginnings of a community, organisations must open an early idea to their whole staff while ensuring that every individual can make a contribution. Should organisations wish to apply this model, the open source community has developed a number of online tools which can be used to “share information, expand discussions and glean contributions from people who might not ordinarily have a say.”¹¹ ELGG (www.elgg.org) is one example, Dolphin (www.boonex.com) another.

Once the tools for communication are in place, open source communities stress the importance of “great driving” (Bacon, 2009) by providing guides for communication. These combine good sense with humour to remind contributors of their responsibilities to the wider community. Such guides, or codes of conduct, speed the flow of information between contributors.

“My all-time favourites are “JDI” (Just Do It”) and “RTFC” (Read The F***ing Code) concepts. The JDI ensures engagement by everyone and distributes responsibility. The RTFC establishes a culture of doing one's homework before asking for help. To innovate one needs to be the master of a problem, to understand exactly that which needs to be solved. JDI and RTFC encourage this pragmatically and effectively.”¹²

¹⁰ Shane Coughlan, Editorial Coordinator, International Free and Open Source Software Law Review, and General Assembly Member, Free Software Foundation Europe (FSFE)

¹¹ David “Lefty” Schlesinger, Director, Open Source Technologies, ACCESS Systems Americas, Inc.

¹² Hadi Nahari, Principal Security Architect, eBay, and Principal Mobile Security Architect, PayPal

The Pillars of the Community

Research with open source software developers leads me to believe that the most innovative communities are built on four pillars: transparency; honest, rapid feedback; teams; and decentralisation of governance.

As opposed to the often closed world of traditional companies, open source communities thrive on transparency and fully shared expertise.

“In the closed source development model the stakeholder is more or less rewarded for keeping knowhow "secret". The open source model is all about creating transparency and sharing expertise.”¹³

Transparency in open source development moves beyond an ideology into a practical model for innovation, relying on the fact that:

“The more information you disclose, the more you enable the recipients to make up their own ideas on what they want to do, or what they want to change.”¹⁴

Such transparency builds trust – trust between contributors, trust in the direction of the project, and trust in the end result. Several of the contributors to this essay emphasised the potential benefits of open source transparency in other industries, particularly finance and government.

“The entire open source activity is transparent. Because everything is seen and scrutinized by multiple eyes, there is a much better opportunity to find and correct flaws.”¹⁵

Transparency is key to the next pillar of open source development – rapid, honest feedback. This is essential in the innovation process, rewarding contributors’ work with the almost immediate input of experts. Participants build their reputation in the community through both the quality of their contributions and the quality of the feedback they provide to others.

¹³ Leif Bildoy

¹⁴ Harald Welte, Open Source Liason, VIA, and Founder, openEZX.org

¹⁵ Matt Kendall

“The combination of iterative development combined with honest (and sometimes very blunt) peer review leads to a culture of life-long learning and a constant improvement of the skills of the team.”¹⁶

Another important aspect is the co-ordination of contributors into teams, each focused on a subtask within the wider project. This makes the project more approachable (Bacon, 2009) and goes some way to countering Brooks’s Law, which states that in traditional development models, the complexity and communication costs of a project increase by the square number of developers, while work done rises only linearly.

“Brooks's Law is founded on experience that bugs tend strongly to cluster at the interfaces between code written by different people, and that communications/coordination overhead on a project tends to rise with the number of interfaces between human beings.” (Raymond, 2000)

By breaking the whole community into distinct teams, open source development reduces the number of communications interfaces. As long as team goals are well-defined, interaction between teams is minimized. This makes communication more efficient, increasing the speed of development, and thereby innovation.

In addition, by combining team structure with transparency, open source development makes decentralised governance a workable reality. Individuals are autonomous in their work, and supported by their teams. Each individual contributes both to project innovation, and to the governance of the project itself.¹⁷

“Rules are set by the creators directly and they adapt to the people and situation as needed. Even the base values guiding the project are set by the people who are actually executing it. The net result of this self-organization is that people are accountable and enjoy a high degree of ownership.”¹⁸

¹⁶ Mickey Lauer, Founder, OpenEmbedded, and Chief Architect, freesmartphone.org

¹⁷ The specifics of open source teams, their communications and governance systems, cannot be given enough justice in this essay. For further reading see Bacon’s chapters on Measuring Community (p.187-200) and Governance (p.211-267). For a primary example of team governance and reporting, see The GNOME Foundation’s Q2 2009 report at <http://foundation.gnome.org/reports/gnome-report-2009-Q2.pdf>

¹⁸ Matt Kendall

The net result of these four pillars is that open source communities are by in large self-organising and self-governing. Their success demonstrates that organisational “ideals” like transparency, open feedback, close teams, and decentralisation, can with the right tools and structures, become a reality. In the next section I will explore the importance of these ideals to the most important requirement for innovation – the motivation to contribute.

The Motivation behind Innovation

Golden (2005) writes that because open source is written by volunteers, “managing” open source contributors is an exercise in figuring out “a good way to motivate” them. I would argue instead that the very structures of open source, those described above, have developed either intentionally or organically to create a culture to harness motivation – specifically, intrinsic motivation.

Intrinsic, or internal, motivation has been defined as an innate propensity to engage our interests and exercise our capacities (Deci & Ryan, 1989). Something which fulfils our need for personal interest, autonomy, self-determination, and ego can motivate us in this way. This is opposed to extrinsic, or external, work motivators like wages or the promise of promotion.

Reading my correspondence with open source contributors, it strikes me that the principles of open source work precisely because they increase intrinsic motivation. Developers are motivated to join a community by personal interest in the starting idea, they are autonomous in their engagement, and enjoy a high degree of self-determination in the direction of their work.

What’s more, thanks to the community’s “rough meritocracy” of open participation, contributors have a much greater scope for self-realisation than most encounter in their careers.

“The person who’s got the right combination of willingness and ability is the one who gets to do the job at hand.”¹⁹

Each individual is motivated by the opportunity to rise to new responsibilities, and gain recognition for their achievements – which the community can immediately respond to in reviewing contributions.

¹⁹ David “Lefty” Schlesinger, Director, Open Source Technologies, ACCESS Systems Americas, Inc.

“Filling a role is merely a question of doing the thing. I never have to ask permission. I am free to explore my own limits.”²⁰

The contributor gains respect and recognition through their contributions, which enforces the final aspect of intrinsic motivation, ego. The open source model of collaboration rewards every contribution made with feedback – not the empty feedback of quick praise, but serious peer review of an informed, engaged community of peers.

In summary, open source development models drive voluntary activity through intrinsic motivation. This is rather different from traditional organisational structures which tend to plan solely for extrinsic motivators like wage and hierarchy. I believe this to be a barrier to innovation and entrepreneurship, which, as discussed in my introduction, must be addressed as voluntary activities.

Combining the Voluntary and the Commercial

So far I have discussed open source models of voluntary collaboration as though they were entirely separate from the “paid” workplace. I chose to do this for clarity and to demonstrate the high potential of the open source model in motivating and harnessing voluntary innovation. However this separation is not a reality for the majority of open source projects, nor should the open source model be seen as an “out of hours” activity by organisations evaluating its application.

While most open source projects start as entirely voluntary efforts, most like Linux, GNU, Apache and MySQL evolve with support from commercial companies.²¹ These companies provide financial investment and employ professional developers to contribute.

“All the well known open source projects have corporate sponsors and the engineers get paid. That is true for Linux and it is true for pretty much all other well known apps.”²²

²⁰ Dave Neary, Member, GNOME Foundation, and docmaster for the maemo.org community

²¹ With thanks to Bill Weinberg

²² Martin Steinmann, Member of the Board, The SIPfoundry, and General Manager, SMB, Nortel

Other projects are started by commercial companies then opened as community projects. One example is Eclipse.org, a development platform initially conceived by IBM in 2001, and supported by a consortium of commercial companies. The consortium grew to 80 company members by 2004, including HP, Intel and Red Hat, when the project was turned into non-for-profit open source foundation (Eclipse, 2009).

Eclipse and other such projects²³ mean that there is a growing body of open source experience in harnessing two worlds simultaneously – those of voluntary and paid-for contributions. The key thing to note is that the structures are the same for both worlds. Whether I am voluntary, paid to contribute, or indeed somewhere in between, I have access to the same information, the same tools, the same community, and the same intrinsic motivational drivers.

“Most interesting is not “communities versus companies”, but rather how the concepts can be overlaid and co-exist. In software development companies have learned to leverage communities and vice-versa.”²⁴

Harnessing Innovation from within Your Organisation

The success of open source development is built on universal collaborative structures, and these can be applied within organisations to harness the innovative and entrepreneurial potential of employees.

“Organisations can apply the same techniques and processes to encourage innovation. Concepts like peer review, reputation, transparency and community trust are general concepts that can be applied – it’s not software specific.”²⁵

²³ See also: The LiMo Foundation, www.limofoundation.org, started by a consortium including Vodafone, Motorola, and Samsung; The Symbian Foundation, www.symbian.org, a software platform developed by a commercial company Symbian, (bought by Nokia in 2008), then opened as a community foundation in 2009; and The SIPfoundry, www.sipfoundry.org, a community established by Pingtel Corp. (Pingtel was bought by Nortel in 2008)

²⁴ Jean-Marie Andre, Entrepreneur, Founder of Purple Labs

²⁵ Leif Bildoy

The application of these open source principles would give organisations an internal stream of innovation, which in many cases would be a direct alternative to investment in external resources. For example, an organisation with open source inspired collaboration systems could turn to the body of its staff on issues such as company branding, or product development, before paying for the "expertise" of external agencies.

“Innovation can come from anywhere. By promoting inclusivity across an organisation (or wider!) not only do you gain in innovation, you also foster an increased feeling of ownership amongst members, leading to cross-team collaboration and increased productivity across the board.”²⁶

Open source, voluntary contribution can combine with paid-for participation, to create a balance of extrinsic and intrinsic staff motivators. If every employee had the opportunity of full participation, and the motivation to contribute, I believe the benefits in terms of innovation and entrepreneurship would be enormous. I believe that open source software development models can take organisations, and their leaders, a long way towards this ideal.

²⁶ Rob Taylor, Director, Codethink Ltd.

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Contributors

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