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The Open Source Business Resource

Editorial

Dru Lavigne

How Open Source Strengthens Business Models

Tony Bailetti

The Emerging Promise of Business Ecosystems

Peter Carbone

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The number of market offers that rely on open source to generate companies' revenues is increasing. Open source has transformed how we develop software, hardware, content, and scientific knowledge. It is now transforming how we commercialize the market offers that generate revenue for companies that rely on open source projects.

Commercialization is the theme of the February issue of the OSBR. The focus is on how new market offers that use open source make money.

Tony Bailetti from Carleton University contributes a tool to measure the strength of a business model and shows how open source can be used to strengthen market offers' business models.

Peter Carbone, a veteran executive who specializes in ICT strategy and commercialization, highlights the relevance of new business models and ecosystems in the knowledge-era economy.

Edy Ferreira and Stoyan Tanev from Carleton University describe the ways companies make money from market offers that rely on open source hardware projects.

David A. Wheeler, a software developer and technical author, argues that there are two types of commercial software: proprietary software and F/LOSS.

Jennifer Bell introduces VisibleGovernment.ca and describes why open government data is a valuable investment in Canada's infrastructure.

Mike Kavis answers the question "How can an individual or small business give back to an open source community?".

As always, we encourage readers to share articles of interest with their colleagues, and to provide their comments either online or directly to the authors. We hope you enjoy this issue of the OSBR.

The editorial theme for the upcoming March issue of the OSBR is Geospatial and the guest editor will be Dave McIlhagga, CEO of DM Solutions.

Dru Lavigne

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OPEN SOURCE STRENGTHENS BUSINESS MODELS

“In all enterprises, it’s the business model that deserves detailed attention and understanding.”

Mitch Thrower

For a company’s commercialization efforts to succeed, it needs to come up with great market offers which have great business models. Open source (OS) is neither a business model nor a market offer. A market offer with a weak business model will derive little benefit from OS regardless of how good the OS may be.

Little is known about how OS strengthens the business model of a company’s market offer. This article provides a conceptual tool that can be used to capture, share and communicate the strength of a company’s business model and help articulate tacit knowledge into explicit knowledge. The second half of the article provides many examples that show how OS strengthens a company’s business model.

This paper is relevant to: i) top management teams who must formulate their companies’ business models clearly and communicate what is expected from OS; ii) top management teams who are considering investing in OS projects, participating in OS development, or influencing schedules and priorities of OS projects; iii) staff of OS foundations who must attract company investment and participation in their OS projects; and iv) academics who undertake research in the alignment of product development and OS evolution for the purpose of improving business performance

Distinguishing Between Market Offer and Business Model

The OS literature incorrectly uses market offer types such as subscriptions, service support, and software as a service to mean business models.

Moreover, this literature stream often discusses the relationship between business models and OS in a superficial manner.

In *Why Business Models Matter* (<http://teaching.ust.hk/~ismt302/busmod.pdf>), Magretta proposed that a business model must pass two critical tests: the narrative test and the numbers test. A business model passes a narrative test when the story makes sense and the numbers test when the expected profit and loss statement adds up. However, Magretta makes no attempt to measure business model strength.

Anderson, Narus, and van Rossum (<http://tinyurl.com/d8pjcn>) highlight the importance of developing customer value propositions based on the few points of difference for which customers are willing to pay.

According to Johnson, Christensen and Kagermann (<http://hbr.harvardbusiness.org/2008/12/reinventing-your-business-model/ar/1>), a business model defines the:

- value delivered to customers and other key stakeholders
- profit model
- key resources, processes, and norms required to deliver value to key stakeholders and profits to the company

A market offer (offer) defines: i) what is purchased; ii) rights over what is purchased; and iii) how buyers purchase. Offers get jobs done for customers, solve customers’ problems, and satisfy needs that customers have. An offer needs a business model. An offer and its business model are two sides of the same coin.

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It is argued that a business model is the narrative and expected profit and loss statement that define the:

- importance of getting the job done, solving the problem, or satisfying the need
- value delivered to customers, company and other key stakeholders
- control over or access to the key resources, processes, and norms required to deliver value

Other key stakeholders may include channel partners, complementors, and customers' customers. The value propositions for other key stakeholders need to be as compelling as the customer value proposition. For example, a company that has a channel partner as part of its go-to-market strategy needs to deliver both compelling customer value and compelling channel partner value.

Business Model Strength

It is argued that six variables affect the strength of a business model:

1. Significance: how important to target customers is the job to be done, the problem to be solved, and the need to be filled.
2. Customer value: how much better is the company's offer at delivering value on the elements that matter most to target customers compared to the next best alternative offer.
3. Partner value: how much better is the company's go-to-market model at delivering value on the elements that matter most to channel partners and complementors compared to the next best alternative go-to-market model.

4. Profit: how likely is it that the company will achieve the desired revenue growth and profits over the next three years.
5. Leverage: how much control or access the company has over the key resources processes and norms required to deliver value to customers and partners compared to the strongest competitor.
6. Intellectual property: how well the company can protect its intellectual property for which customers are willing to pay.

Each variable can be assigned a weight that reflects its relative importance, where each weight can range from 0 to 9.

The first variable captures the importance to target customers of getting the job done. The next three variables capture what value is delivered to customers, partners and the company. The last two variables capture how the value will be delivered.

Consider the case of a multidisciplinary team that is developing a business model for an offer. To measure the strength of the business model for the new offer, the team assigns weights to reflect the relative importance of the six variables. Table 1 indicates that the team perceives significance as being the most important variable and has it allocated a weight of 8. For each target statement, the team provides a response that measures the level of agreement/disagreement with the statement.

Table 1 shows two ways to measure business model strength. The first uses weights that are all equal to 1. Business model strength is the ratio of 22, the sum of the responses to the six target statements, and 42, the maximum score possible. In our case, when the weights for all variables are set to 1, business model strength is 52.4%.

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The second way to measure business model strength relies on a weighted average of the responses. Business model strength equals the sum of the product between weight and response score as a percentage of 378 (9x6x7) as show in the last column of Table 1. In our case, when different weights are applied, business model strength is 34.9%.

OS and Business Model Strength

OS can strengthen or weaken a business model. OS can strengthen a business model if its use:

- persuades customers of the importance to get a job done, solve a problem, or fill a need
- makes the offer more valuable on the elements that matter most to customers, channel partners and complementors relative to the best alternative offer

Table 1: Two Ways to Measure Business Model Strength

| | Target statement | Weight (0 to 9) | Responses (1 = Strongly disagree 7 = Strongly agree) | Contribution (Weight x Score) |
|------------------------------|--|---------------------------|---|---|
| Significance | Target customers are convinced that it is very important to get the job done, solve the problem, or fill the need | 8 | 5 | 40 |
| Customer value | Our offer delivers more value on the elements that matter most to our customers when compared to the best alternative offer | 6 | 3 | 18 |
| Partner value | Our offer delivers more value on the elements that matter most to our channel partners and complementors when compared to the best alternative offer | 6 | 4 | 24 |
| Profit | It is very likely that the company will achieve the desired revenue and profit targets | 7 | 5 | 35 |
| Leverage | Our company has better access or control over the key resources required to deliver value than our strongest competitor | 3 | 2 | 6 |
| Intellectual property | Our company can protect its intellectual property for which customers are willing to pay much better than our strongest competitor | 3 | 3 | 9 |
| | | Sum = | 22 | 132 |
| | | Business model strength = | 52.4% (22/42) | 34.9% (132/378) |

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- increases the likelihood that the revenue and profits from the offer will achieve company's targets
- increases access or control over the key resources, processes and norms required to deliver value to customers, channel partners and complementors
- increases the company's ability to protect its intellectual property for which customers are willing to pay

We provide some examples of how OS can strengthen business models. The examples are organized by variable and do not provide an exhaustive list.

1. Significance: community plays a major role in OS. The free exchange of ideas and code benefits everyone. When members of an OS community convince customers of the importance of getting a job done, scores in the significance dimension increase and the offer's business model becomes stronger.

Various communities have convinced customers of the importance of avoiding vendor lock-in. This results in stronger business models for many offers that build on OS stacks. Similarly, the Xen community has convinced customers of the importance of server virtualization. This results in stronger business models for companies such as Cintrix and Virtual Computer that market offers which use a Xen-based client hypervisor as a tool.

2. Customer Value: OS assets such as open hardware, software, and content offer many elements that essentially deliver the same value to customers as that delivered by the best proprietary alternatives.

Customers do purchase and benefit from proprietary software, hardware, and content. There is little benefit to a company that relies on OS in coming across to customers as being zealot-like. This may undermine the credibility of the company's customer value proposition. The objective is to identify the points of difference OS provides and that customers value. If OS delivers value elements that customers consider to be superior to those offered by proprietary alternatives, the offer's business model will be strengthened.

For example, with OS you see what you get. Customers can examine the source of the asset line by line. An OS asset that is widely distributed and frequently fixed can deliver significant value to customers. With OS, hundreds of professionals examine the asset's source to discover bugs and fix them quickly. Contrast this with commercial assets where customers may end up being at the mercy of suppliers of secretive and bug-filled proprietary products.

With OS, access to the source code accelerates the development of add-ons that enhance the asset's functionality.

With OS there are no license fees for development or runtime. For this reason, OS reduces ownership costs and increases flexibility as to where to operate the asset. Contrast this with proprietary alternatives where you must pay license fees and make decisions on where to run the asset based on licensing agreements.

With OS, customers do not need to upgrade their assets with other customers as they can stay at a previous version and add enhancements selectively. Moreover, with OS, customers do not have to wait for a supplier to provide the features they require as they can add these features themselves.

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With OS, customers can monitor development and no longer have to depend on suppliers' promises of delivery dates. Frequently, these delivery dates are not met or the dates are met with assets that lack all the promised features.

With OS, all can beta test the next release of an asset without the restrictions associated with testing proprietary assets such as restrictions on time or the number of users. In OS, beta testing is not restricted to a few organizations and platforms as is the case of proprietary assets. Moreover, the results of tests are public. Contrast this with tests of many proprietary products where suppliers prevent customers from publishing test results and portray products in their best light.

In OS, both users and suppliers are stakeholders of OS assets as everyone must succeed. Contrast this with the adversarial relationships that frequently exist between suppliers of proprietary assets and their customers.

With OS, talented individuals who are not part of the core development team are more likely to contribute to user documentation. Contrast this with the development of documentation of many proprietary products where there is lack of communication between product developers and documentation writers.

OS provides more opportunities for developers to incorporate users' ideas into OS assets. Users are more likely to try OS assets and provide feedback based on its use.

With OS, development efficiency increases. OS enables: i) rapid learning of how products work; ii) greater collaboration; and iii) faster debugging.

When an organization adds features or functionality to an OS asset, a large number of smart people that the organization does not have to pay will help improve these features and functionality.

OS assets are released when the community feels it is ready. Contrast this with commercial alternatives which are released to meet revenue targets set by senior executives.

OS assets often support multiple compilers and do not lock customers into one supplier platform.

3. Partner Value: OS provides significant value to partners as many of the elements that differentiate OS from proprietary alternatives are also valued by partners.

Some value elements are unique to partners. For example, to founders of startups, venture capitalists (VCs) are important partners. VCs are institutions and high net worth individuals who bring managerial and technical expertise as well as capital to companies with high growth potential. VCs like OS because they can spend more money in global go-to-market strategies instead of research and development (R&D). For startups, OS can significantly reduce time-to-cash for the startup and increase the return on investment for capital suppliers.

The governance, IT infrastructure and norms of OS make it easier for partners to collaborate. OS provides an out-of-the box approach that supports collaboration across partner organizations and individuals and harnesses global innovation to meet customers' needs. For example, OS can enable two companies that use the same OS asset as the means to two very different ends to partner.

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OS assets are readily available to existing partners and can be easily distributed to new partners. OS ubiquity increases the value of OS to partners.

4. Profit: when a supplier uses OS, the likelihood that the profit targets for its offer will be achieved increases. A supplier that uses OS may have more control over its costs and better assessment of market size and sources of revenue.

OS makes the development and sales costs of a supplier more predictable. The supplier does not have to worry about changes in the prices of commercial alternatives. Moreover, OS reduces the cost of finding customers, promoters and distributors for the suppliers' offers, and the cost of shaping the message promoters will pass on to their friends.

A supplier can readily find on the Internet those individuals and organizations that promote the OS upon which their offers rely. These individuals and organizations are important to the supplier for two reasons. First, they are potential customers. Second, they can recommend the supplier's offers to others who may benefit from the offer.

If a supplier's growth is a function of the number of its net promoters, OS can significantly increase the growth of the supplier's revenue and reduce its cost of sales.

5. Leverage: a company that uses OS can increase control or access to the resources and processes it requires to deliver value to customers, the company and other relevant stakeholders. For example, the use of OS can increase the number of talented individuals that a company can access to develop its offers.

A company can observe the behaviour of contributors to OS projects and approach the most talented individuals to work in company projects as full- or part-time employees or as contractors.

A company can gain access to a well defined customer base that is anchored around the OS projects upon which the company's offers rely.

A company can use OS to reduce the barriers to enter a market that is dominated by proprietary vendors.

A company can lever OS communities to reduce the number of unfair comments from detractors of its offers. Members of the OS community are more effective at arguing against unfair public comments about a company's offer than company employees. They are diligent on countering the fear, uncertainty, and doubt (FUD) that may be spread by competing proprietary alternatives.

OS is available to anyone. This places companies, large and small, on equal footing. However, a company can become involved in the governance of the OS community and influence project direction. To strengthen its offer's business model, a company needs to exert more control over the OS project than other companies.

6. Intellectual Property: OS enables a company to compete based on the points of difference for which its customers are willing to pay and collaborate with other companies on the development of assets for which customers are not willing to pay. This enables companies to concentrate their resources in creating intellectual property. The greater the number of customers that wish to pay for the intellectual property a company owns, the stronger the offer's business model.

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An example of this is Apple's use of the user interface of Mac OSX as the differentiator. This user interface is built on top of Darwin, an OS computer operating system.

Conclusion

There is a need to understand how OS affects business model strength. The tool introduced in this article enables a new product team to design a strong business model at the initial stage of the offer development life cycle and communicate how OS strengthens the business model.

The tool introduced is offer-centric. A business model is linked to an offer, not a business unit or a product portfolio.

Coming up with great offers that use OS assets is not a winning proposition. To win in the marketplace, great business models are needed for the offers that rely on OS for generating revenue and profits.

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Recommended Resources

Open Source is not a Business Model
<http://blogs.the451group.com/open-source/2008/10/13/open-source-is-not-a-business-model>

Open Source Business Model is 'Broken'. Really?
http://www.informationweek.com/blog/main/archives/2008/12/open_source_bus.html

Open Source: The Model is Broken
http://www.businessweek.com/technology/content/nov2008/tc20081130_276152.htm

Licensing and Business Models
http://eco.uninsubria.it/dipeco/Quaderni/files/QF2008_6.pdf

What Vendors Really Mean by Open Source
<http://www.zdnetasia.com/insight/software/0,39044822,62049928,00.htm>

Clarifying Business Models: Origins, Present and Future of the Concept
<http://www.scribd.com/doc/1038389/The-theory-of-Business-Models>

EMERGING PROMISE OF BUSINESS ECOSYSTEMS

"It may be hard for an egg to turn into a bird: it would be a jolly sight harder for it to learn to fly while remaining an egg. We are like eggs at present. And you cannot go on indefinitely being just an ordinary, decent egg. We must be hatched or go bad."

C. S. Lewis

This article highlights the relevance of new business models and ecosystems in the knowledge-era economy. We begin with an introduction then argue that the shift in what is valued drives the need for new business models. The third section provides examples of innovative business models. The fourth section describes two key roles in an ecosystem: keystone and niche player. Finally, the last section provides the conclusions of this article.

Introduction

The rules for business and commercialization success are changing significantly as we transition from an industrial-era to a knowledge-era economy. This transition has both negative and positive consequences. Old rules don't work and change is thrust upon companies. The good news is that there are new tools to help address the challenges of the knowledge-era economy.

The rapid rate of change in technology, markets, end-user expectations, and business models requires companies to innovate faster than ever before. Technology innovation alone is no longer a sufficient factor to achieve success or growth. Successful commercialization requires innovation in business models. This innovation needs to satisfy customer needs in new ways, and defend against low cost disrupters. [Editor's note: Wikipedia's entry for disruptive technology provides a good introduction and further references (http://en.wikipedia.org/wiki/Disruptive_technology)].

Traditional industrial-era business models held that competitive advantage was based on product excellence, in-house technology innovation, and careful management of scarce resources and supply chains. This perspective served the industry well when resources were costly and scarce and the unit of value did not extend to information and into the virtual, digital domain. Plentiful networking capability, software systems that have little supply chain to manage, and global communities of open source players innovating around customer problems in real time have rendered these traditional business models ineffective at driving business results.

In the knowledge-era economy, companies can only be effective if they implement new business models that address evolving customer values.

In *Reinventing Your Business Model* (<http://hbr.harvardbusiness.org/2008/12/reinventing-your-business-model/ib>), Johnson, Christensen, and Kagermann assert that a business model needs to be changed to:

- address shifts in the basis for competition
- fill job gaps
- disruptively exploit new markets or technologies
- serve an underserved or not served constituency
- defend against low cost disrupters

Shift in What is Valued Drives New Business Models

At the core of the transition from an industrial- to a knowledge-era economy is the change in what is valued by the customer.

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Two key factors affect the success of a company:

- whether or not the company implements a business model that recognizes the change in what is valued
- how well the company can use ecosystems to harness innovation and scale to global levels

The changes in user behaviour and the associated value propositions are significant and result in power shifts between industries. Consider three cases. First, the ability to record video causes value to migrate away from storage to entertainment. This shift increases distributors' power and decreases broadcasters' power. Second, broadband Internet shifts books to the web. For example, Wikipedia replaces the encyclopedia and real time RSS feeds replace magazines. This shift increases content creators' power and decreases publishers' power. Third, MP3s and digital media rentals replace CDs and DVDs. This shift increases the power of Internet hosting providers and decreases the power of the distributors of physical media.

New entrants have been quick to introduce new business models that leverage existing infrastructure in novel ways. For example, in the Information and Communication Technology (ICT) world, broadband transport and associated quality of service is assumed. The new business value is associated with delivering a differentiated end-user experience. It is fueled by devices such as the iPhone and Blackberry Storm that deliver new end-user values such as an integrated user services portal for the purpose of enhancing the user experience.

Shifts in user value are pervasive. In the social networking world, Facebook has evolved from a simple collaboration tool to a hub of information for a growing

number of people. It has displaced instant messaging for the current generation of technology savvy netizens. The pervasiveness of the Internet and ease of access to both people and data have created information overload. Social networks are excellent and effective ways to transform enormous amounts of data into useful information. When social networkers wish to make purchase decisions, they consult their social networks. Social networkers can determine which products best fit their applications and which ones their friends are using.

These forms of endorsement are extremely powerful and enable vast amounts of data to be processed in very short timeframes. Another example is when business or government professionals leverage mobile access and email. During a meeting, they can instantly consult their social network to get information, get advice or confirm facts. This capability accelerates the pace of business. Governments have used this approach to provide support to leaders during Question Period in Canada (http://en.wikipedia.org/wiki/Question_period). The ability to harness information and people across the global Internet shifts the basis of competition away from local individuals and companies to global networks.

An environmental shift has been occurring with the growth of virtual worlds such as Second Life, and gaming environments such as the World of Warcraft. As more people visit these virtual worlds, they become the social meeting place of choice for the current generation, displacing shopping malls, street corners and basketball courts. Many companies have recognized and adapted to this shift by setting up shops in virtual worlds. Companies can offer movies, shopping, creative pursuits, and even advanced education.

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There are bridges between the real and virtual world, such as voice conferencing between avatar owners, virtual shopping assistance that results in products shipped to your real world address, and exporting of virtual assets such as a document that you created or award that you have won in the virtual world into the real world. Hotels are being built in the virtual world which rapidly and cost effectively collect feedback on services, amenities and designs before being built in the real world. Even within the virtual world, there are real estate agents for virtual property, decorators, and casino operators, all living in this new environment.

These virtual world transactions generate real money for people as evidenced by the interest of federal taxation agencies. This virtual world displaces more passive activities like television and movies by bringing interactivity, travel and new entertainment values to the forefront.

In the knowledge-era economy, new business models are emerging and competition between business models is becoming a much more significant factor in business success. Companies need to both recognize the nature of competition and choose how they will participate in the market.

Business Models Compete

The richness of solution alternatives for any particular user need creates opportunities for smaller players to challenge large incumbents successfully. Take for example company owners who need a specific application or business process such as a customer relationship management (CRM) system. They have a number of alternative suppliers of solutions. They can approach a:

1. **supplier of a CRM packaged software** and purchase the application and run it within their own operations. This is the traditional product-centric approach where differentiation is based on features, support services, and customization of solutions.
2. **supplier of hosted solutions** for free or subscription based solutions at very attractive cost structures. In some cases, the hosted solution supplier will monetize via advertising, effectively commoditizing the packaged software vendor's offering.
3. **full service system integrator** and acquire CRM as a component of a larger and more sophisticated solution. This one-stop shop approach has appeal for users who are concerned about their existing high value embedded systems and approach this need as merely an incremental value. It is very difficult for a new player to enter into this domain, especially alone, due to the power of the incumbents' installed base.
4. **device supplier** such as Apple or RIM. The device supplier shifts the value proposition to instantaneous mobile and dynamic access by offering the software essentially for free in exchange for profitable device revenue. Since device life cycles are relatively short, device suppliers can bring an ongoing flow of innovation to the user.
5. **supplier of software infrastructure** such as IBM, Oracle, or open source communities to provide the technology and tools to build a customized solution. In this case, one pays for the tools and/or tool support and the application is customized by the user.

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The cases described above illustrate current innovations. New business models will emerge over time, providing companies with more choices on how they wish to compete in the marketplace.

In the knowledge-era economy, it is increasingly difficult for a vendor to raise barriers to entry and protect a customer base. For example, when a competitor provides an application for free in exchange for advertising revenue, it undermines the traditional vendor's value proposition of selling the application.

In the knowledge-era economy, the value proposition of an offer does not guarantee success. To compete effectively, a company's business model must be better than similar and different business models used by other players.

In the knowledge-era economy, smaller players can concurrently collaborate and co-create value to compete effectively against larger players. Smaller players can readily attack larger players using disruptive business models.

Since it is no longer viable to pursue business as usual, we examine which new mechanisms exist to compete in the new knowledge-era economy.

Why a Business Ecosystem?

A business ecosystem (http://en.wikipedia.org/wiki/Business_ecosystem) provides many advantages. It can provide a small company with the proprietary advantage it needs to compete against other larger companies. An ecosystem provides the mechanism to lever pockets of excellence in research, technology, business and marketing in various local regions and industry sectors into a globally competitive force.

Modeled on a natural ecosystem, a business ecosystem addresses two distinct market dimensions. First, in stable business environments, ecosystems provide resistance to invasion. Large companies such as Microsoft resist changes to their business models and drive communities to serve them. In other words, they treat the ecosystem as just part of their supply chain. Second, in dynamic and unstable environments, ecosystems provide resilience against external change. The rapid innovation that players in an ecosystem can achieve contributes to the adaptation required to survive change. These dimensions protect some large players (collaborators) who are increasingly vulnerable in the dynamic world while allowing new players to leverage an effective ecosystem to attack other large players (dominant incumbents).

Business ecosystems nurture new business models. Although the term business ecosystem was coined some time ago, its dynamics are not well understood.

Two roles are key in a business ecosystem: keystone and niche player. The keystone's role is to provide a focal point for the overall ecosystem and enable it to adapt to external changes. A keystone is responsible for the:

- overall output and productivity of the ecosystem
- monitoring of overall health and taking action to ensure that the system is functioning efficiently
- resilience and stability of the ecosystem by stimulating other members to remain healthy and to assume the role of missing members
- innovation and creation of new members required to provide ongoing value and growth to the ecosystem membership

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A keystone fulfills its responsibilities by providing a dominant design or reference architecture/implementation that facilitates collaboration and harnesses collective innovation. In an open source community, a keystone like the Eclipse Foundation anchors the hundreds of players that are collaborating to create new value propositions. The Eclipse Foundation was able to consolidate the industry around their value proposition and compete effectively against the dominant player. If the market stabilizes, there is an opportunity for one of the members of the ecosystem to grow to become a dominant player.

A niche player is the second key role in an ecosystem. Niche players need not be small or narrow in size and scope. They tend to be focused players, contributing rapid innovation in their area of specialty to the overall ecosystem and its collective value proposition. By collaborating amongst themselves, mimicking the symbiotic relationship between many species in a natural ecosystem, niche players present a healthy and strong contribution to a larger value proposition. For example, one niche player may be a specialist in research and design whereas another specializes in export and distribution. Collaboration provides both companies with economic advantages. To facilitate collaboration, the keystone provides common technology, processes, skills, relationship management, and intellectual property management.

Commercialization is the goal of any business venture and ecosystems can help smaller or specialized companies succeed by filling gaps in their domestic capability and facilitating collaboration.

The following example attempts to illustrate the power of a business ecosystem.

Consider a concrete business opportunity that requires a diverse set of capabilities to be pulled together to meet customer needs that are beyond the capability of any single small company. The ecosystem members' response would be as follows:

- one of the niche players would assume the ownership of the overall value proposition, and identify which components are required to be assembled
- the keystone would be leveraged to identify and assemble members that could fill the gaps in the value proposition and identify areas where innovation is required to drive ongoing differentiation
- niche players would collaborate around the keystone's dominant design to rapidly prototype, validate, and implement the required value proposition and then deliver this to the buyer

In this example, niche players are able to commit an ongoing supply of rapid innovation beyond anything a single larger player can commit. They may even be able to bring a greater breadth of capability to the customer by way of an ever evolving and growing ecosystem. The strength of the ecosystem increases as the diversity and size of the membership grows.

The response described above will be disruptive to large incumbents and generally beneficial to ecosystem members and all customers. By changing the business models, smaller players are better able to compete. The open source community and some companies have shown how ecosystems can be used to harness people and innovation worldwide.

EMERGING PROMISE OF BUSINESS ECOSYSTEMS

Companies that leverage control-based business models may perceive the open and collaborative nature of ecosystems as a weakness, similar to early reactions questioning the viability of open source communities. Participation in an ecosystem does require a change of behaviour, much like moving from a solo to team sport.

Conclusions

The new knowledge economy has created many opportunities for new offers and new business models. The industrial-era business models are being disadvantaged by new disruptive models that are enabling new players to effectively compete in markets from which they were previously excluded.

Business ecosystems provide superior value propositions by embracing a market pull model instead of the traditional market push model. The push model requires a single company to promote and sell what it has, absorbing all of the costs on its own. Ecosystems enable a company to better address a customer need, as it can bring a diverse set of capabilities and innovation to the solution very quickly.

Ecosystems have tremendous potential to help companies, especially in the current recessionary times, where partnerships and collaboration are critical to survival and growth. A concerned group of Canadian companies is considering establishing a strong ecosystem focused on the ICT sector, a Canadian sector strength. They are proposing to create an ecosystem derived business advantage by: i) facilitating partnering through pre-packaged legal considerations and intellectual property rights ownership; and ii) lowering investment barriers to markets with pre-packaged technology building blocks.

The goal is to provide both cost and revenue benefits to members, helping Canada compete more effectively on the global stage. Member interest has focused around: i) sharing business and market development costs and efforts; ii) gaining favourable access to sophisticated technology capability; and iii) leveraging larger players to gain access to deal flow and to participate in fulfillment beyond their own capabilities.

Ecosystems provide agile and effective collaboration to support commercialization. Technology transfer and network clustering mechanisms focus on specific opportunities and are better suited to stable environments. Ecosystems more effectively fill gaps and address changes so that better outcomes can be achieved.

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Recommended Reading

Connect & Develop: Inside Procter & Gambles New Model for Innovation
<http://hbswk.hbs.edu/archive/5258.html>

MAKING MONEY WITH OPEN SOURCE HARDWARE

"In a sense, hardware is becoming much more like software, up to the point where you actually fabricate an object. That's why you're starting to see open source techniques in hardware. Design is largely going to shift out from manufacturers to the communities."

Eric von Hippel

http://www.wired.com/techbiz/startups/magazine/16-11/ff_openmanufacturing

The study of open source software (OSS) development and business strategies has become the subject of significant research interest. However, there is little research on business models associated with the development of open source assets other than software such as hardware and content. This article provides an overview of current business models for creating revenue for both open source software and hardware. It then summarizes our research of market offers to identify the ways companies use open source hardware (OSH) projects to make money. The research results provide insights about the dimensions of open source business models in an area other than typical software development.

OSH Definitions

There is no consensus on the definition of OSH. With OpenSparc (<http://opensparc.net>), Sun Microsystems defines OSH from a development perspective as "a collaborative process around developing new chips." Jeffrey Rowe defines OSH as "hardware for which all the design information is made available to the general public" (<http://manufacturing.cadalyst.com/manufacturing/article/articleDetail.jsp?id=420352>). OpenCollector points out that in addition to design information, information on how to use the hardware, including documentation about its interfaces and the tools used to create the design, must be freely available (<http://opencollector.org/Whyfree/free设计.html>).

Jamil Khatib of Opencores.org suggests that: "All design files should be available for free. This includes schematic, Hardware Description Language (HDL) code, and layout files. Software and firmware interfaces such as drivers, compilers, instruction set, and registers interfaces should be available and open source. All information and documentation, like application notes and interfacing information, should be also openly available" (http://www.pldworld.net/_hdl/2/_ip/free.chips.for.all.html).

Gregory Pomerantz provides another OSH definition (<http://homepages.nyu.edu/~gmp216/papers/bmfosh-1.0.html>) with more emphasis on license characteristics. He points out that OSH licenses must: i) grant permission to freely distribute the source code and any hardware device design based on it; and ii) grant permission to create derivative works based on the source code and distribute them under the same license. Phillip Torrone explains that OSH must use a license that permits users to study, change, and improve the design, and to redistribute it in modified or unmodified form (http://www.makezine.com/blog/archive/2007/04/open_source_hardware_what.html). Torrone organizes electronic hardware into six layers and explains that the license terms and the information that is shared in each of the layers is different. The six layers are:

1. Hardware diagrams including the physical dimensions for enclosures and mechanical subsystems. Designs in this layer are normally described by vector graphic files.
2. Schematics and circuit diagrams including images in PDF, BMP, GIF or other formats.
3. Parts list of needed components.

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4. Layout diagrams including electronic circuit designs, copper prints of circuit boards and drill files.
5. Core and firmware including the source code that runs on an Integrated Circuit (IC). It could also refer to the design of the IC itself described in Hardware Description Language (HDL) files.
6. Software or Application Programming Interface (API) including the source code that is used in a computer to communicate with the OSH.

Business Models

Most business model definitions are related to the way companies create value for customers and how a company takes business opportunities to generate profits.

In Do Some Business Models Perform Better than Others? (<http://seeit.mit.edu/Publications/BusinessModelsPerformance12July2006.pdf>) Malone et al. developed a general business model classification based on each company's revenue stream by means of two variables. The first variable is the type of user rights sold to customers. The four defined types include the:

- creator who sells the right of ownership by significantly transforming the asset
- distributor who sells the right of ownership without significantly transforming the asset
- landlord who sells the right to use the asset, such as companies that license the use of software
- broker who sells the right to be matched with potential buyers or sellers of another asset

The second variable is the type of asset used to create the market offer and includes four generic asset types:

- physical: durable and non-durable items, such as food and hardware
- financial: monetary assets such as cash, stocks, bonds and insurance policies
- intangible: non-physical assets such as protected intellectual property (IP), knowledge, goodwill, brand image, and software
- human: people's time, effort, knowledge and skills

The combination of the two variables results in 16 detailed business model archetypes that could be used as a tool for business model analysis.

OSS Business Models

OSS profitability and business models are still poorly understood and there is no single framework that would explain their potential determinants. The most critical issue for an OSS business is that the licensing terms used allow the free redistribution of the licensed software. Therefore, it is usually not feasible to base revenue on licensing fees.

Rajala et al. (<http://is2.lse.ac.uk/asp/aspectis/20030126.pdf>) identify the following essential elements in any business model for software companies:

- product development
- source of revenue and pricing
- sales channel options
- servicing and implementation approach

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Jussi Nissilä identifies the key elements of any software business model in slightly different terms:

- value creation and revenue logic
- market offerings and positioning
- product development, implementation and servicing

He also argues that, in the case of open source business models, the above key elements must be complemented by the: i) extent of community development and review; ii) style of development method as more open or more closed; iii) license type as more restricted or more liberal; and iv) importance of the OSS in the end product. Importance ranges from pure OSS where no proprietary components are added, OSS driven where the core is open source with proprietary component added, to proprietary software driven where the core is proprietary with some open source components added.

Dual-licensing seems to be one of the most popular ways of making money. In addition to the revenues that comes from selling the fee license, this model may also provide complementary revenues through technical support and services. Dual-licensing differs from a purely free model. First, the OSS community does not have the development power to start competing products because the control of the core is held by the original developer. Second, users have the possibility of buying a proprietary license. There are two fundamental legal requirements for a commercially successful dual-licensing model: the i) need of a license with a strong copyleft clause; and ii) possession of undisputed rights over the software (<http://opensource.mit.edu/papers/valimaki.pdf>).

OSH Business Models

There is little research on the types of business models specifically related to OSH. With OSH, the open asset is different from the ultimate market offer, the manufactured hardware device itself. OSH is not about hardware, it is about the intangible assets related to hardware design information. This makes existing OSS business model classifications not directly applicable to companies involved in OSH projects.

Salem & Khatib (<http://eetimes.com/news/design/features/showArticle.jhtml?articleID=22103383>) suggest the following models:

1. Design distribution: enabling companies to sell distributions containing a set of designs.
2. Design technical support: enabling companies to offer technical support related to open designs.
3. Design implementation: enabling companies to implement and sell the designs by paying royalties to the original developers.
4. Releasing: enabling companies to release their designs under a GPL-compatible license, whenever the implementation is considered commercially available.

Additionally, companies working under contract for a chip manufacturer could open source a design to enable the participation of other chip manufacturers and develop multi-purpose and customizable designs. Companies could also open source IP that is not intended to be sold, but rather to be integrated into a product or service. This IP will have the benefits of an open source development process without risking revenues.

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Clive Thompson identifies two main economic models for OSH-based market offers (http://www.wired.com/techbiz/startups/magazine/16-11/ff_openmanufacturing). The first is to concentrate not on selling hardware but instead on selling expertise as the inventor. The second is to sell OSH devices while trying to keep ahead of the competition. The heart of this second economic model is higher competitiveness based on complementary assets.

OSH Challenges

In OSS, "free" may be confused with "gratis" because it often costs nothing to make your own copy. In OSH the situation is different. People can download free hardware designs, but they either have to pay someone to manufacture the hardware or buy the components and tools and manufacture the hardware themselves. In most cases, it is very costly to manufacture the hardware. The costs are related to the replication of the physical hardware, not with the replication of the design itself. However, the benefits of an OSH collaborative process are not reduced by the slowness or difficulty of the replication process of the physical hardware. Companies may still choose to capitalize on the commercial benefits of the OSH collaborative process by participating in collaborative development of hardware that is required by all but is a differentiator for none.

The costs related to designing, verifying and understanding OSH are also high. This requires appropriate EDA (http://en.wikipedia.org/wiki/Electronic_design_automation) tools which are very expensive. In addition, hardware testing and verification requires expensive external hardware equipment such as oscilloscopes, analyzers and wafer probes. Currently, there are open communities developing open source EDA tools that will eventually improve to the point

where they will be competitive with commercial EDA tools. A major obstacle is the fact that some commercial EDA tools are designed to work with commercial FPGAs (<http://en.wikipedia.org/wiki/Fpga>) that are protected by commercial secrecy. Open source EDA tools could not be adapted to interface with those FPGAs without facing legal problems. One of the suggested solutions is the development of open source FPGAs whose interfaces would be open enough to allow the use of any open source EDA tool.

In some pieces of hardware, the cost of the IP, which includes the cost of the design, is much lower than the cost associated with manufacturing and integration. For example, in the case of microprocessors, designs built on OSH IP cores (http://en.wikipedia.org/wiki/Semiconductor_intellectual_property_core) alone are not likely to be commercially successful. This means the cost of some commercial IP cores must be added to the final cost of the hardware product (<http://doi.ieeecomputersociety.org/10.1109/MDT.2004.68>). Bugs in hardware designs can unexpectedly increase manufacturing costs by causing physical damages to the chip or other parts of the system. This challenge is a major difference between OSH and OSS. It is additionally aggravated by the increasing technological complexity of state-of-the-art microchip designs and manufacturing requirements.

It is difficult for OSH developers to design products without infringing existing patents. Spooner (<http://news.zdnet.co.uk/hardware/0,100000091,2085331,00.htm>) has pointed out that established companies, such as IBM and Intel, might not be directly challenged by the OSH movement because of the patents they use to keep their products safe. In many cases, existing hardware design patents will seriously complicate the deployment of OSH designs.

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None of the existing OSS licenses are designed to cover all aspects of hardware design. At the same time, hardware has become more like software. HDL (http://en.wikipedia.org/wiki/Hardware_description_language) code is considered by the Free Software Foundation (FSF) to be software which can be legally distributed with OSS licenses. However, according to Richard Stallman, although IC definitions written in HDL can be copyleft, ICs themselves cannot be copyleft, because they cannot be copyright.

A copyright can protect a design from being copied and modified, but it cannot regulate the manufacturing, distribution and use of products based on the design. Patents are used in such cases, but patents are expensive and not as flexible as copyright. The final result is that, for a design that is copyleft by a GPL-like license, “any person can legally draw the same circuit topology in a different-looking way, or write a different HDL definition which produces the same circuit”, thus making the benefits of copyleft in hardware somewhat limited.

Since 2007, the Tucson Amateur Packet Radio (TAPR, <http://en.wikipedia.org/wiki/TAPR>) organization has been promoting the TAPR Open Hardware License (OHL) as a legal framework for OSH projects. TAPR argues that the license can be used for any kind of physical tangible product. As a share-alike license, modified designs can be redistributed only by using a license with the same rights as those granted by the license of the original design. They point out that “OHL is not primarily a copyright license” and, although it does not prohibit a company from patenting an invention related to an open hardware design and then enforcing its patent rights, it states that parties who receive any benefits from an open hardware design “may not bring lawsuits claiming that design infringes their patents or other intellectual property.”

Another challenge arises as hardware is not as modular and compartmentalized as software. Modularity is a critically favourable characteristic for OSS production. For example, modularity was important in the case of the Apache software allowing developers to work in particular areas without affecting other modules. Netscape faced significant difficulties when releasing the Mozilla browser as OSS due to the insufficient level of modularity in its software architecture and a major restructuring of the program was needed to address that problem.

Another obstacle facing OSH is what OSS faced more than a decade ago: lack of credibility. It is expected that the OSH community will eventually convince users that the OSH model works and high quality OSH designs can be achieved.

Identification of Different Ways of Monetization

Our examination of 4 companies, 88 market offers and 93 OSH projects resulted in the identification of seven different ways of making money with OSH:

1. Services over owned or third party OSH: this category includes companies that offer customization and consulting services over hardware designs developed by the OSH projects they are participating in.
2. Manufacturing of owned or third party OSH without additional proprietary hardware components: this category includes companies manufacturing and selling pieces of hardware based entirely on the OSH designs developed by the OSH projects they are participating in.

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3. Manufacturing of proprietary hardware based on OSH: this category contains companies that sell the right of ownership of pieces of hardware based on OSH assets developed in projects they participate in. The designs of those pieces of hardware are not entirely open source, but contain some proprietary modules and components. The final design of the market offer is a modified and improved version of the original OSH design.
4. Dual-licensing: this category is similar to the dual-license model found in OSS. It includes companies owning OSH designs that are offered for use under either a GPL license or a proprietary license. The design does not contain any proprietary module.
5. Proprietary hardware designs based on OSH: this category is similar to the previous one, but the hardware design that is offered for use under a proprietary license contains proprietary components or modules.
6. Hardware tools for OSH: this category includes companies selling the right of ownership of development boards for the testing and verification of hardware devices manufactured on the basis of the OSH assets developed by the OSH projects the companies participate in. The designs of these boards are entirely proprietary.
7. Software tools for OSH: this way of making money with OSH includes companies selling the license for software tools for the development of OSH assets. The software tools are entirely proprietary.

To examine the distinguishing characteristics of the seven ways of making money we used three dimensions:

1. Type of user rights sold to customers. Two types of user rights were found to be relevant to our research: i) creator, which is based on selling the right of ownership of the market offer by significantly transforming the OSH asset; and ii) landlord, which is based on selling the right to use the market offer asset.
2. Type of market offer: this includes three relevant types of assets: i) physical, including the hardware device manufactured on the basis of an OSH asset or the software and hardware tools used for the development, test and verification of the OSH assets or hardware devices; ii) intangible, including the OSH asset itself or other intangible assets related to the market offer; and iii) human, including people's skills, expertise, time and effort to offer services such as custom designs, consulting or training.
3. Degree of integration of the OSH asset into the market offer: includes four options: i) pure open source, when the market offer is the same as the OSH asset and there are no proprietary components added; ii) open source driven, when the core of the market offer is open source but there are some proprietary component added; iii) proprietary driven, when the core of the market offer is proprietary but there are some open source components added; and iv) proprietary, when the market offer is not based on the OSH asset and includes only proprietary components.

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Discussion

The results of our research can be summarized as follows:

1. Companies turn OSH challenges into business opportunities. We identified two types of market offers that were unique to OSH: i) manufacturing OSH devices; and ii) developing proprietary tools for test and verification of OSH designs and OSH manufactured devices. The development of proprietary OSH test and verification tools represents a clear opportunity for companies exploring new ways of making money based on OSH. Both types of market offers address two of the main challenges associated with OSH. First, most of the product costs related to OSH are associated with manufacturing. Second, the tools for the test and verification of OSH designs and manufactured OSH devices are very expensive. Therefore, by exploiting these opportunities, companies turn OSH challenges into business opportunities.
2. OSH stack development is not exploited as a way of making money. While some companies make money by selling stacks of software comprised of OSS only, a similar way of making money with OSH was not found. This dissimilarity could be related to the lower degree of modularity of hardware designs. Hardware stacks are more difficult to design because of the higher interdependency of hardware modules.
3. Subscription services are not exploited as a way of making money. While OSS companies can make money by selling subscription services, many OSH projects do not require further improvements in their designs because they already fulfill the function needed by the end users. The OSH designs found in our research sample do not seem to require a continuous development process and were based on a single release of the source code. This is especially true for OSH projects related to small IP cores. In contrast, most OSS projects require a continuous development process and frequent releases. It is difficult for a company working on OSH to make money by selling subscription services because most of the OSH projects are developed “on-time” or have few or very infrequent releases.
4. OSH dual-licensing follows the same logic as in OSS as it also requires the use of highly-restrictive licenses and undisputed rights.
5. OSH can be used to create standards and commoditize a particular technology layer. It is worth mentioning that our research found one company owning an OSH asset without any associated market offer: Sun Microsystems and its OpenSPARC project. Sun publicly articulates its strong interest in creating a healthy open source community around OpenSPARC to: i) commoditize a particular technology layer and move profitability to adjacent layers where market offers are optimized and have greater value; and ii) create standards or eliminate competitors who could potentially capture value from that layer.

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6. The classification of the ways of making money depends on the integration of the OSH asset into the market offer. It was found that in order to deal with the distinction between the OSH asset and the market offer, we needed to introduce the degree of integration of the OSH asset into the market offer. The analysis of OSH-related business models should take into account the specific ways of integration of the open source assets into the final offering.

Conclusions

The objective of our research was to identify the ways companies use OSH projects to make money. The manufacturing of hardware devices based on OSH designs was found to be the most popular commercialization method. Services over existing OSH assets, dual-licensing and the development of OSH test and verifications tools were identified as additional viable options. The study shows that the classification of the different ways of making money depends on the degree of the integration of the OSH asset into the market offer and can not be based only on the type of market offer and the type of user rights sold to customers.

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Recommended Resources

Open Hardware Business Models

<http://www.osbr.ca/ojs/index.php/osbr/article/view/570/523>

Setting Up Shop: The Business of Open Source Software

<http://hecker.org/writings/setting-up-shop>

Open-Source Hardware

<http://www.embedded.com/story/OEG20020524S0078>

F/LOSS IS COMMERCIAL SOFTWARE

"The software created by open source communities became so powerful that commercial interests embraced those communities, supported them, learned from them and now are using the mechanisms of open source to make their businesses run better. This embrace has extended so long that commercial open source and open source are virtually synonymous."

Dan Woods

<http://tinyurl.com/66vkym>

Many people mistakenly use the term "commercial software" as if it was the opposite of Free/Libre Open Source Software (F/LOSS). This is in spite of: i) the rise in commercial development and support for F/LOSS; ii) the goal of most F/LOSS projects to incorporate improvements, which is actually a form of financial gain; iii) official definitions of "commercial item" that include F/LOSS; and iv) F/LOSS licenses and projects that clearly approve of commercial support.

In reality, there are two types of commercial software: proprietary software and F/LOSS. This paper provides examples for each of the four points mentioned above, briefly notes some alternative terms, and ends with some conclusions, explaining why it is important to understand that F/LOSS software is almost always commercial.

Defining Key Terms

Let's first define our key terms:

F/LOSS: can be briefly defined as software with a license that gives users the freedom to run the program for any purpose, to study and modify the program, and to redistribute copies of either the original or modified program without having to pay royalties to previous developers.

Commercial: the New York Times' Everyday dictionary defines commercial as: "a) oriented to profit-making, or more generally b) of, pertaining to, or suitable for commerce, where commerce means intercourse, dealings, the buying and selling of commodities, or trade." In other words, something oriented toward profit or at least something pertaining to public trade or dealings.

Commercial Item: US law governing federal procurement defines "commercial item" to include "Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and that (i) Has been sold, leased, or licensed to the general public; or (ii) Has been offered for sale, lease, or license to the general public" (<http://www.thecre.com/fedlaw/uscode/41/403.html>).

As F/LOSS has become more prominent in the computer industry, many have tried to differentiate F/LOSS from software released under other license terms. Unfortunately, some use the term "commercial" as something distinct from F/LOSS. Those who differentiate between F/LOSS and commercial products, as if they were opposites, fail to understand what is happening in the software industry. Let's examine why treating F/LOSS and commercial as opposites is fundamentally flawed.

F/LOSS is Increasingly Commercially Developed and Supported

In the world of software, F/LOSS is being increasingly supported by for-profit industry heavyweights with billions of dollars on the line. In 2004, it was noted that 37,000 of the last 38,000 changes in the Linux kernel were made by developers specifically paid to make those changes.

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In 2001, IBM invested \$1 billion in Linux and a year later had already almost completely recouped that investment, suggesting some astounding returns on investment. My paper "Why OSS/FS? Look at the Numbers" (http://www.dwheeler.com/oss_fs_why.html) shows that market after market is being affected by the influx of F/LOSS.

A 2008 report from consulting company Bluewolf (<http://www.bluewolf.com>) found that "the advancement of open source software is triggering an increasing need for specialized application developers...higher-end, more complex application development proves difficult to complete overseas...The rise of open source software in application development puts developers with a specialization in those technologies in a position to ask for a 30 or 40 percent pay increase".

Venture capitalist (VC) behavior also shows that presuming F/LOSS is non-commercial is a mistake. InfoWorld's Savio Rodrigues reported in 2007 that VCs invested a sum total of \$1.44 billion in F/LOSS over the period 2001-2006 (http://www.infoworld.com/weblog/open_resource/archives/2007/07/). While not every investment will yield reasonable returns, VC investment is a pretty good sign that F/LOSS is a commercial industry.

Some non-profit organizations support F/LOSS, but were created to support the for-profit commercial industry. For example:

1. The X Window System is supported by the X.Org Foundation (<http://x.org>), a company organized as a scientific charity under US IRS code 501(c)(3). It was "chartered to develop and execute effective strategies that provide world-wide stewardship of the X Window

System technology and standards," including to "research, develop, support, organize, administrate, standardize, promote, and defend the X Window System." The X.org Foundation members come from various organizations, many of which are for-profit, and are members because X Windows is critical to their business.

2. The Firefox web browser is supported by the Mozilla Foundation (<http://www.mozilla.org/>), which exists "to provide organizational, legal, and financial support for the Mozilla open-source software project and its mission to preserve choice and promote innovation on the Internet." The Mozilla Foundation is incorporated as a California not-for-profit corporation. In August, 2005 it established the Mozilla Corporation, a taxable wholly-owned subsidiary of the Foundation. In 2005, the Mozilla Foundation and Mozilla Corporation had a combined revenue of \$52.9M and \$8.2M in expenses.

Motivations for the use or support of F/LOSS differ among commercial organizations. Many view F/LOSS as a better support infrastructure for the product or service they actually sell, providing cost avoidance by cost sharing. Others give away the F/LOSS and sell support, training, and/or customization. Many for-profit organizations realize the value of commoditizing complements, where you sell more of product if the things related to it, which you don't sell, are cheaper. Dr. Marco Iansiti and Gregory L. Richards concluded that F/LOSS projects with a large amount of commercial investment involved companies with an economic reason to invest (<http://www.hbs.edu/research/pdf/07-028.pdf>).

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Even if you limit yourself to the profit-oriented definition of commercial, where profit is only measured using money, F/LOSS is not the opposite of commercial. Someone using commercial as the opposite of F/LOSS will have trouble explaining why Red Hat is listed in the New York stock exchange. Indeed, Red Hat, Novell/SuSE, IBM, Sun Microsystems, and Microsoft have all released at least one F/LOSS product. If you include the wider definition of commercial that means "public trade", nearly all F/LOSS projects are commercial.

F/LOSS Projects Do Seek Financial Gain

Most F/LOSS projects give their users more rights than proprietary products with the expectation that others are likely to contribute back with new/improved code, documentation, and bug reports. Thus, even non-profit F/LOSS projects are trying to achieve financial gain through additional and improved software instead of money.

As Linux creator Linus Torvalds noted in a 2003 letter to SCO (<http://www.itworld.com/031208torvalds>), the law that creates and defines copyrights in the US explicitly defines the term "financial gain" as including "receipt, or expectation of receipt, of anything of value, including the receipt of other copyrighted works." While F/LOSS projects may not receive money directly, they typically receive something of value in return and nearly all F/LOSS projects attempt to create wealth in the form of improved software. They attempt to create this wealth through trade and dealings, a fundamentally commercial notion.

The US Court of Appeals for the Federal Circuit stated in their ruling on *Jacobsen v. Katzer* (http://en.wikipedia.org/wiki/Jacobsen_v._Katzer) that "Traditionally, copyright owners sold their copyrighted material in exchange for money. The lack of money changing hands in open source licensing should not be presumed to mean that there is no economic consideration, however. There are substantial benefits, including economic benefits, to the creation and distribution of copyrighted works under public licenses that range far beyond traditional license royalties. For example, program creators may generate market share for their programs by providing certain components free of charge. Similarly, a programmer or company may increase its national or international reputation by incubating open source projects. Improvement to a product can come rapidly and free of charge from an expert not even known to the copyright holder. The Eleventh Circuit has recognized the economic motives inherent in public licenses, even where profit is not immediate".

F/LOSS and US Government Procurement

The US government's official definition of "commercial item" makes it clear that nearly all F/LOSS programs are considered commercial items. This definition is important, as the US law governing federal procurement is reflected in the Federal Acquisition Regulation (FAR) System which is widely used for acquisition. The FAR specifically requires that US government agencies shall, by policy, try to use commercial items or nondevelopmental items wherever they can.

F/LOSS IS COMMERCIAL SOFTWARE

More specifically, section 12 requires agencies to “(a) Conduct market research to determine whether commercial items or nondevelopmental items are available that could meet the agency’s requirements; (b) Acquire commercial items or nondevelopmental items when they are available to meet the needs of the agency; and (c) Require prime contractors and subcontractors at all tiers to incorporate, to the maximum extent practicable, commercial items or nondevelopmental items as components of items supplied to the agency.” Since governments need a lot of software not developed exclusively for governmental use, the policy in the FAR turns out to be a rather strong requirement to use commercial items wherever possible.

The FAR defines a nondevelopmental item as “(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement; (2) Any item described in paragraph (1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or (3) Any item of supply being produced that does not meet the requirements of paragraphs (1) or (2) solely because the item is not yet in use”.

FAR section 2 defines a commercial item as “Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and (i) Has been sold, leased, or licensed to the general public; or (ii) Has been offered for sale, lease, or license to the general public”.

In section 12, the phrase “purposes other than governmental purposes” is clarified as meaning purposes “that are not unique to a government.” Nearly all F/LOSS is used by the general public or non-governmental entities for purposes other than exclusively governmental purposes. F/LOSS programs that implement functions performed by governments are often not exclusive to this purpose. More importantly, the software only has to be licensed or offered for license to the general public. F/LOSS doesn’t need to be sold or leased to be a commercial product as licensing to the public makes it commercial.

According to FAR, there are additional ways that a program can be considered a commercial item: “Any item that evolved from an item described in paragraph (1) of this definition through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation”. So, even if the F/LOSS isn’t released to the public yet, it is still commercial as long as it will be released in time. This can be helpful for F/LOSS bounty systems where people commit money in exchange for the creation of a F/LOSS result. If funding is committed to create a F/LOSS project that will be released to the public in time, it can still be considered commercial. This part of the definition also enables “ransomed F/LOSS”, where a program is already implemented but will only be released as F/LOSS if enough money is gathered.

Further, “Any item that would satisfy a criterion expressed in paragraphs (1) or (2) of this definition, but for: (i) Modifications of a type customarily available in the commercial marketplace; or (ii) Minor modifications of a type not customarily available in the commercial

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marketplace made to meet Federal Government requirements. Minor modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor". Thus, a government acquisition program can obtain a F/LOSS program, pay for minor modifications to meet its needs, and still consider it a commercial item.

Combinations are still considered commercial items as "Any combination of items meeting the requirements of paragraphs (1), (2), (3), or (5) of this definition that are of a type customarily combined and sold in combination to the general public".

Commercial companies that sell support for F/LOSS programs also meet the definition for being a commercial item: "Installation services, maintenance services, repair services, training services, and other services if (i) Such services are procured for support of an item referred to in paragraph (1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and (ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government".

The broadness of the US government definition is intentional because it "enables the Government to take greater advantage of the commercial marketplace" (<http://www.acq.osd.mil/dpap/Docs/cihandbook.pdf>).

The Department of Defence (DoD) policy memo Commercial Acquisitions, found as Appendix A in the same handbook, explains that the benefits of commercial item acquisition include "increased competition; use of market and catalog prices; and access to leading edge technology and 'non-traditional' business segments". Those who created these definitions and policies anticipated changes in the commercial market. US policy is to embrace changes in the commercial marketplace where appropriate.

An acronym used by many governments is COTS, for "Commercial Off-The-Shelf" software. Nearly all F/LOSS programs are COTS, and officially so in the US. The paper COTS Based Software Development and Integration (<http://tinyurl.com/cg3719>) defines the term COTS as being: i) commercial, essentially per the FAR definition and ii) off-the-shelf, meaning that it already exists. F/LOSS programs that are already licensed to the public and have some non-governmental use are COTS.

F/LOSS Within the US DoD

Department of the Navy CIO Robert J. Carey signed a 2007 memorandum (<http://www.doncio.navy.mil/Download.aspx?AttachID=261>) to make this clear. He notes that misconceptions about whether or not F/LOSS qualifies as COTS or GOTS (government off-the-shelf) software has hindered the Navy's ability to fully utilize open source software (OSS). The memo states that the Navy will "treat OSS as COTS when it meets the definition of a commercial item". It aligns with previous policy directives, such as Open Source Software (OSS) in the Department of Defense (DoD) (http://terrybollinger.com/stenbitmemo/stenbitmemo_pdf.pdf) and Memorandum M-04-16 on Software Acquisition (<http://www.whitehouse.gov/omb/memoranda/fy04/m04-16.html>).

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These explicitly state that the US Department of Defense and the entire US federal government are neutral with respect to F/LOSS which must be given the same consideration as other software. F/LOSS is clearly identified as commercial in Memo M-03-14 on Reducing Cost and Improving Quality in Federal Purchases of Commercial Software (<http://www.whitehouse.gov/omb/memoranda/m03-14.html>). The memo states that its Smart-Buy initiative to consolidate purchases will include "open source software support".

The DoD's Instruction 8500.2 (<http://www.dtic.mil/whs/directives/corres/html/850002.htm>) lists various rules for deploying applications. Many DoD systems are subject to the 8500.2 control DCPD-1, or Public Domain Software Controls, and some have mistakenly thought that this text prevents the use of OSS in the DoD. That impression arises from only reading the first part of its text: "Binary or machine executable public domain software products and other software products with limited or no warranty such as those commonly known as freeware or shareware are not used in DoD information systems unless they are necessary for mission accomplishment and there are no alternative IT solutions available".

However, the text ends this way: "The assessment addresses the fact that such software products are difficult or impossible to review, repair, or extend, given that the Government does not have access to the original source code and there is no owner who could make such repairs on behalf of the Government." This closing text means that the entire control does not apply to F/LOSS, since by definition F/LOSS includes source code that can be read, modified, and re-released. Further, nearly all F/LOSS programs have an owner who can make repairs on behalf of the government,

though this isn't required. This control is focused on countering the risks of abandoned binary-only programs whose source code is not available.

Section 2.4 of The Desktop Application Security Technical Implementation Guide (<http://iase.disa.mil/stigs/stig/Desktop-Applications-STIG-V3R1.pdf>) directly discusses OSS. It states that the DoD does not require "that operating system software be obtained through a valid vendor channel and have a formal support path, if the source code for the operating system is publicly available for review." It notes that "open source software takes several forms", and specifically says that:

1. "A utility that has publicly available source code is acceptable.
2. A commercial [proprietary] product that incorporates open source software is acceptable because the commercial vendor provides a warranty.
3. Vendor supported open source software is acceptable.
4. A utility that comes compiled and has no warranty is not acceptable."

The National Security Agency's (NSA) website states that "NSA initiatives in enhancing software security cover both proprietary and open source software, and we have successfully used both proprietary and open source models in our research activities." The NSA provides guides for both proprietary and OSS products.

In summary, official US documents, including US law, lead to the conclusion that F/LOSS is commercial, and that it's perfectly fine to use F/LOSS.

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F/LOSS Approval of Commercial Support

F/LOSS licenses make it clear that F/LOSS developers typically have no issue with commercial development and support, even within the narrower definition of commercial as for-profit. Many projects are established by commercial organizations as a kind of consortia, while others are established by single commercial organizations such as Sun's MySQL and Trolltech's Qt.

The Free Software Definition (<http://www.gnu.org/philosophy/free-sw.html>) states that "Free software does not mean non-commercial. A free program must be available for commercial use, commercial development, and commercial distribution. Commercial development of free software is no longer unusual; such free commercial software is very important."

The Open Source Definition (<http://www.opensource.org/docs/osd>) states in point 6 that "The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business...Rationale: The major intention of this clause is to prohibit license traps that prevent open source from being used commercially. We want commercial users to join our community, not feel excluded from it."

The Free Software Foundation's article Selling Free Software (<http://gnu.org/philosophy/selling.html>) states that: "we encourage people who redistribute free software to charge as much as they wish or can. If this seems surprising to you, please read on... When we speak of "free software", we're talking about freedom, not price... Since free software is not a matter of price, a low price isn't more free, or closer to free. So if you are redistributing copies of free software, you might as well charge a substantial fee and make some money. Redistributing free

software is a good and legitimate activity; if you do it, you might as well make a profit from it."

The most popular F/LOSS license, the GNU General Public License Version 2 (GPLv2), includes one method for copying and distributing the program ("method 3c") which can only be used for non-commercial distribution. Since other methods are not so encumbered, the clear implication is that for-profit distribution methods are permitted, as long as they obey the license.

While the vast majority of F/LOSS developers are happy with for-profit commercial development and support of F/LOSS, they do not support companies that violate the program license or try to find and exploit legal loopholes. Organizations that violate F/LOSS licenses have been brought into court. Many F/LOSS developers become upset with companies that fail to obey F/LOSS software licenses, and external observers sometimes misunderstand this anger as a general opposition to commercial use. Such anger is directed at violators, not to commercial users in general. All commercial software developers, both proprietary and F/LOSS, expect their users to obey the license provided or to negotiate something else.

Advocates of the various F/LOSS licenses often argue whether the BSD, GPL, or the LGPL is the most business-friendly F/LOSS license. The reality is that different licenses are better for different business models. What's interesting here is that so many in the F/LOSS community are arguing about which F/LOSS license is best for commercial use. This clearly demonstrates that commercial utility is considered by many to be an important property of a license.

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Others Acknowledge Commercial F/LOSS

In chapter four of his book *Open Source Licensing: Software Freedom and Intellectual Property Law* (<http://www.rosenlaw.com/oslbook.htm>), Larry Rosen says "The word proprietary is often confused with the word commercial. But a commercial license — which is merely a term used to describe a license used in commerce - can be either open source or proprietary." The Free Software Foundation has been distinguishing the terms commercial and proprietary for years.

Microsoft's relationship with F/LOSS is complicated; they use many F/LOSS components in their products, they produce some F/LOSS products such as WiX and IronPython, and they run the CodePlex site which encourages F/LOSS products. While their money is primarily made by selling proprietary products that compete with F/LOSS, Microsoft acknowledges the existence of commercial F/LOSS products.

Commercialization is so important that many governments have established organizations and research tasks on commercial F/LOSS. The European Union has examined the economic impact of OSS on innovation and competitiveness in its Information and Communication Technologies (ICT) sector and has found it to be substantial. COSS, the Finnish Centre for Open Source Solutions, is a national development agency for an open source business ecosystem. UC Davis researchers have received a three-year, \$750,000 grant from the US National Science Foundation to study how F/LOSS is built.

Alternative Antonyms

The most common antonym for F/LOSS is "proprietary software", though there are other terms like "closed source",

"non-free", and "non-FLOSS". Most terms have minor problems:

Proprietary software is also used to describe software that: i) uses its own formats or protocols instead of open standards; or ii) is never brought to market directly, such as software included as a custom system sub-component specifically to prevent acquirers from switching to another supplier. Still, when people use this term, they usually mean the opposite of F/LOSS.

Closed source has a different problem as this phrase is used by some to mean that the source code is not available. Yet, there are some programs whose source code is available but which are not F/LOSS programs, making the term confusing.

Non-free has the connotation of "costs money".

Non-FLOSS is the most unambiguous, but few use the term.

I tend to use "proprietary software" as the antonym, as it is the most widely used and thus better understood. Any of these terms is better as an antonym compared to "non-commercial".

Conclusions

Terms like "proprietary software" or "closed source" are plausible antonyms of F/LOSS, but "commercial" is not. Even within the narrower definition for commercial that means "for-profit", there are too many for-profit F/LOSS projects for this use to make any sense. When you consider the full set of meanings for "commercial", including the one involving public trade, nearly all F/LOSS projects are commercial. In short, there are two kinds of commercial software: proprietary and F/LOSS.

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This has real-world implications. Many organizations prefer commercial software to home-grown software for which they must pay all of the maintenance costs. Such organizations must search for and evaluate F/LOSS projects when they search for commercial software, and if there isn't an appropriate product available, they need to consider starting such a F/LOSS project as one possible implementation approach. If acquirers ignore F/LOSS options, they are ignoring an important and growing part of the commercial sector.

Anyone who uses the term commercial as an antonym for F/LOSS doesn't understand F/LOSS. Be wary of people who have such a basic lack of understanding; they are far less likely to give good software advice or to make good software-related decisions.

This article is based upon the paper "Free-Libre / Open Source Software (FLOSS) is Commercial Software" which is available at the author's website:

<http://www.dwheeler.com/essays/commercial-floss.html>.

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Recommended Resources

From Open Source to Long-Term Sustainability: Review of Business Models and Case Studies

<http://eprints.ecs.soton.ac.uk/13925/>

The Business of Free Software: Enterprise Incentives, Investment, and Motivation in the Open Source Community

<http://www.hbs.edu/research/pdf/07-028.pdf>

How Does the Capitalist View Open Source?

http://www.linuxtoday.com/news_story.php3?ltsn=2001-05-16-012-20-OP

Open Source Software: The Other Commercial Software

<http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.16.8802>

Free and Open Source Software:

Overview and Preliminary Guidelines for the Government of Canada

<http://www.osbr.ca/ojs/index.php/osbr/article/view/534/492>

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“No one was ever promoted for disclosing information.”

US Government Employee

Industry analyst Gartner describes web services based on open government data as having a “greater potential effect on the ability to transform government than anything else in the Web 2.0 world” (http://www.readwriteweb.com/archives/e-government_meets_web_20.php). In his technology platform, Barack Obama has made groundbreaking promises related to increasing government accountability by: i) publishing data in open formats; and ii) using online tools to involve citizens in government decision making. These transformative ideas have not yet spread to politics in Canada.

As citizens, we trust that money is being wisely spent on the systems that run our country. We trust that the people governing us have the skills, time, and information they need to make the best decisions. We trust that bureaucracies are well-designed and that the people in them are motivated to make those bureaucracies better. Unfortunately, it's hard to trust what you can't see. By publishing information in open, machine-readable formats, governments can take a powerful step towards building public trust. By sharing information, governments can start to channel the expertise of the citizenry outside of the civil service to build more effective and inclusive ways of running the country.

The non-profit VisibleGovernment.ca is working to make online tools for civic participation based on open government data a reality in Canada. This article describes why open government data is not only a requirement for greater government transparency, but also a valuable investment in our country's infrastructure.

Obama's Promise

The Obama campaign made international headlines for tapping into a wellspring of online contributions. The campaign raised \$742M dollars in total, almost twice as much as the more traditionally-funded McCain campaign (<http://www.opensecrets.org/pres08/>). The majority of this money came through online contributions. The Washington post identified Lynne Bailey, a 52-year-old mother of two who gave a total of \$120.40 in mostly \$10 increments, as a typical online donor (http://voices.washingtonpost.com/trail/2008/11/20/obama_raised_half_a_billion_on.html). Like Bailey, 90% of Obama's donors were small scale donors, contributing less than \$200 each. These small scale donations accounted for 57% of funds raised in Obama's presidential campaign (<http://www.opensecrets.org/pres08/donordems.php?sortby=S>). This wealth of donations from ordinary Americans could not have been tapped without the Internet.

The campaign also made headlines for creating online tools that allowed their army of on-the-ground volunteers to self-organize. The Obama volunteer website, called the most important video game of 2008 (http://techpresident.com/blog/entry/33178/mybo_the_video_game), allowed campaigners to post their activities, organize house meetings, share their experiences, and distribute responsibility for making phone calls encouraging voters to get to the polls. The tools showcased in the Obama campaign have forever changed the way politicians are elected. What may be more interesting is how the online tools for governing the country instigated by Obama's team and policies will change the way governments around the world work.

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Well before he was a presidential nominee, Obama was defining strategies for using the Internet to improve government openness and accountability. In 2006, Obama, along with senators Tom Coburn, Tom Carper and John McCain filed the Federal Funding Accountability and Transparency Act which mandated the creation of a searchable website of all government spending by January 1, 2008. After his initial refusal, citing that the website would be too costly to build, President Bush signed the bill on September 26, 2006. The website, fedspending.org, was released ahead of schedule in December, 2007. Not only does the website provide an easily navigable interface, it provides an application programming interface (API) for external developers to access that information and build tools of their own. According to the US watchdog group OMBWatch (<http://ombwatch.org/>), 11 states have since created similar state-spending websites and 24 other states are working towards that goal.

Building on these themes of openness and accountability, Obama included the following in his Technology Platform (http://www.barackobama.com/pdf/issues/technology/Fact_Sheet_Innovation_and_Technology.pdf) under the heading Create a Transparent and Connected Democracy: "Obama will integrate citizens into the actual business of government by:

- Making government data available online in universally accessible formats to allow citizens to make use of that data to comment, derive value, and take action in their own communities. Greater access to environmental data, for example, will help citizens learn about pollution in their communities, provide information about local conditions back to government and empower people to protect themselves.

- Establishing pilot programs to open up government decision-making and involve the public in the work of agencies, not simply by soliciting opinions, but by tapping into the vast and distributed expertise of the American citizenry to help government make more informed decisions."

Making government data available online in accessible formats is a powerful idea. For this transformation to take place, however, governments have to be willing to accept feedback and analysis based on the information generated. Thus, the second point of a willingness to "tap into the vast and distributed expertise of citizenry" becomes vitally important.

Open Systems Allow External Contribution

Wikinomics (<http://wikinomics.com>), by Dan Tapscott, opens with the story of Goldcorp, an Ontario mining company which faced bankruptcy in 1999. A young mutual fund manager, Rob McEwan, had become majority owner of Goldcorp after a messy takeover battle several years earlier. While early test drilling had indicated substantial gold deposits, years of searching by Goldcorp's engineers and geologists had not found the gold's exact location. Inspired by the story of Linux, where Linus Torvalds co-ordinated the development of a world-class operating system over the Internet, McEwan published Goldcorp's geological data and announced a challenge with half a million dollars of prize money. The analysis of the results submitted by geologists from all over the world created almost 9 billion dollars of market value.

Tapscott emphasizes that opening up that data took tremendous bravery. The company had to admit that it did not know how to find its own gold.

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McEwan “realized that the uniquely qualified minds to make new discoveries were probably outside the boundaries of his organization, and by sharing some intellectual property he could harness the power of collective genius and capability”. What if governments in Canada were to take the same attitude?

There have been several examples in the US and UK of web sites that use government data, opened up through APIs, gathered by scraping, or compiled by citizens themselves, that allow citizens to contribute analysis, expertise, or local knowledge for public benefit. A short list of these sites includes:

Maplight.org: produced by the Sunlight Foundation, this website analyzes the relationship between contributions and votes in the US congress. The site shows simple histograms, per bill, of donations by groups for and against the bill, against a histogram of votes. The site allows citizens to look for trends between contributions and votes by bill and by law-maker. By making this information visible, the site is effectively crowdsourcing (http://en.wikipedia.org/wiki/Crowd_sourcing) the function of a contribution watchdog, enabling issue detection and discussion by both bloggers and the mainstream media.

PeerToPatent.org: the goal of this site, a project of the New York Law School, is to relieve some of the burden of over-worked officers at the US Patent and Trademark Office by tapping into an on-line community of civilian experts. These experts search for and explain prior art, as well as vote on the strength of patent applications. A year into the pilot, the PeerToPatent system reported over 2,000 citizen reviewers with the average reviewer spending six hours reviewing each patent.

FixMyStreet.com: this site, produced by the UK non-profit MySociety, allows citizens to report public safety and nuisance issues in their neighbourhood such as graffiti, potholes, or bad lighting. Citizens can then subscribe to an RSS feed to receive updates on a particular problem by the town council. This website not only provides citizens with an easy way to report and monitor problems, it reduces the burden on authorities who are less likely to have to handle repeated complaints submitted individually. Further, the number of subscribers to a particular problem can be used as a rough indication of public interest in an issue.

These sites are early experiments in the field, and represent the iceberg tip of what may be possible.

Open Systems Make Failure Less Costly

Finding the best ways to analyze government information and collect value from public feedback is going to take a lot of experimentation. In *Here Comes Everybody* (<http://www.shirky.com/herecomeseverybody/about.html>), author Clay Shirky qualifies the probability of a successful solution as a scalar distribution pattern where there’s a very large number of failures, some modest successes, and a few solutions that will do amazingly well. Being prepared to accept a lot of failures is the key to finding the successes.

Government bureaucracies are failure-averse for very good reasons. Public scrutiny and the spectre of being accused of wasting taxpayer funds make for a cautious environment where money is only spent on guaranteed successes. By publishing data in open, standardized formats, governments can off-load the costs and stigma of failure to external organizations.

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Like Goldcorp, governments can take the open approach to innovation by challenging advocacy groups, the nascent community of armchair egovernment-geeks, and the for-profit market to build a better way. The government can then take advantage of the value created by the best solutions. Solutions that don't work can die quietly, without any tax dollars having been spent.

Open Systems Create New Markets for Innovation

Unrestricted access to government data will create new markets for innovative ways of presenting, analyzing, and combining that data. Some creative companies will eventually find profitable ways of using this information to generate value. Some of these discoveries will inevitably be even more valuable as public goods.

For the last 10 years, Cisco has grown by accepting the fact that, even though it employs some of the most brilliant people in the industry, there is a very low probability of the future's most successful idea being generated in-house. Instead, Cisco's model is to buy the cream of innovation, effectively outsourcing their technology research and development to the venture capital market and startups. If the government were to get in this habit of buying the most successful innovations in displaying and using government data, and turning them into public goods, it would create a thriving market for more of the same. Further, if the government were to open source the tools that it buys, it would create an expanding base of software components for building increasingly sophisticated tools.

An Architecture for Open

The UK's Power of Information Task Force has proposed an application framework for implementing government

transparency. In a thoughtful blog post this past June (<http://powerofinformation.wordpress.com/2008/06/19/more-architecture/>), Richard Allen proposed the following re-visioning of the way that the data in a government website is used. Instead of a closed model where the presentation, analysis, and data layers are locked together, Allen presents a model with access layers between data, analysis, and presentation, and an interaction layer laid over top. These access layers give third parties the flexibility to hook into the data directly to provide their own analysis or to use information from the government's analysis layer to provide their own presentation interfaces. Finally, the interaction layer allows people to discuss the information and provide feedback. Figure 1 illustrates the difference in architecture. As a concrete example of how this model can be applied, Allen presents the evolution of tools around the UK's parliamentary Hansard, a record of parliamentary proceedings, as seen in Figure 2.

Originally, www.parliament.uk took an integrated approach where the Hansard data was "wrapped up with Parliament's own analysis output and presented to the public in an official website." The innovation of a click-use license for copyright allowed a citizen-managed project called publicwhip.org.uk to begin scraping the data and providing it for public use. Allen describes the process: "An access layer has been created for Hansard with a screen scraper and Click-Use license to address both technical and copyright issues. The scraped data goes through an analysis process at publicwhip.org.uk. Access to the output of this analysis process is offered by means of XML data under a Creative Commons license. An API has been produced to make it very easy to get this data. TheyWorkForYou.com provides a very good and popular presentation layer for this content. The data as reworked by TheyWorkForYou is also commonly

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presented in many other places on the web such as MPs' personal sites. There is a comment facility built into TheyWorkForYou to provide a layer of interaction around the content. It is also cited in many blogs that generate their own interaction as well as featuring in mainstream media stimulating further discussion. The new architecture now provides a platform for more innovation around the Hansard data set with very low barriers to doing this."

David Robinson, of Princeton's Center for Information Technology Policy, takes the concept of fitting access layers into existing government IT architectures one step further. In his paper Government Data and the Invisible Hand (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1138083), Robinson argues that intra-departmental reporting channels should be exposed to the public, who can provide external validation to complement internal checks and balances.

Figure 1: Traditional Approach vs. Power of Information Architecture

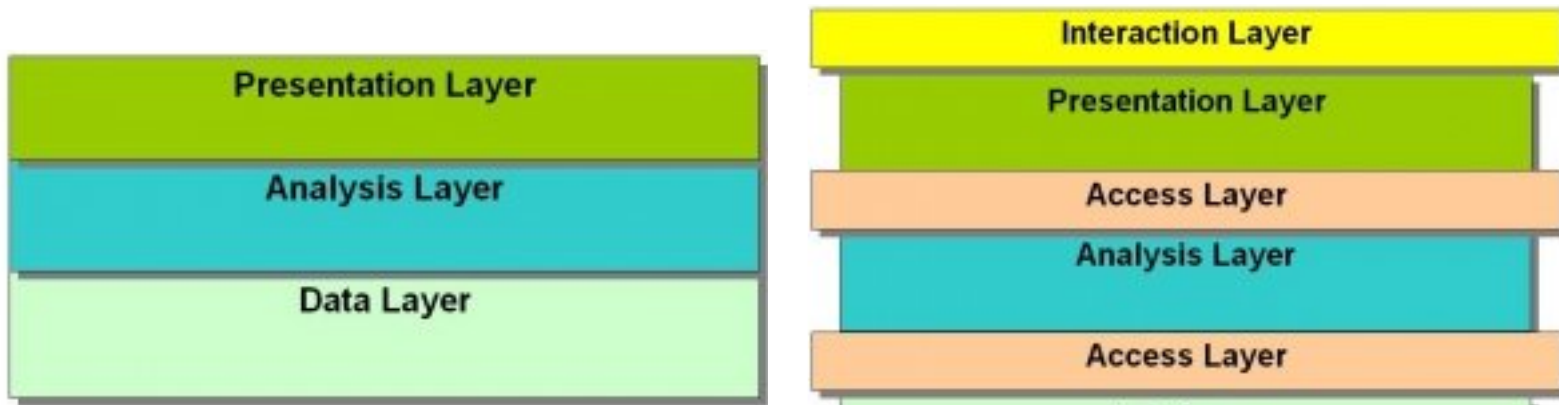
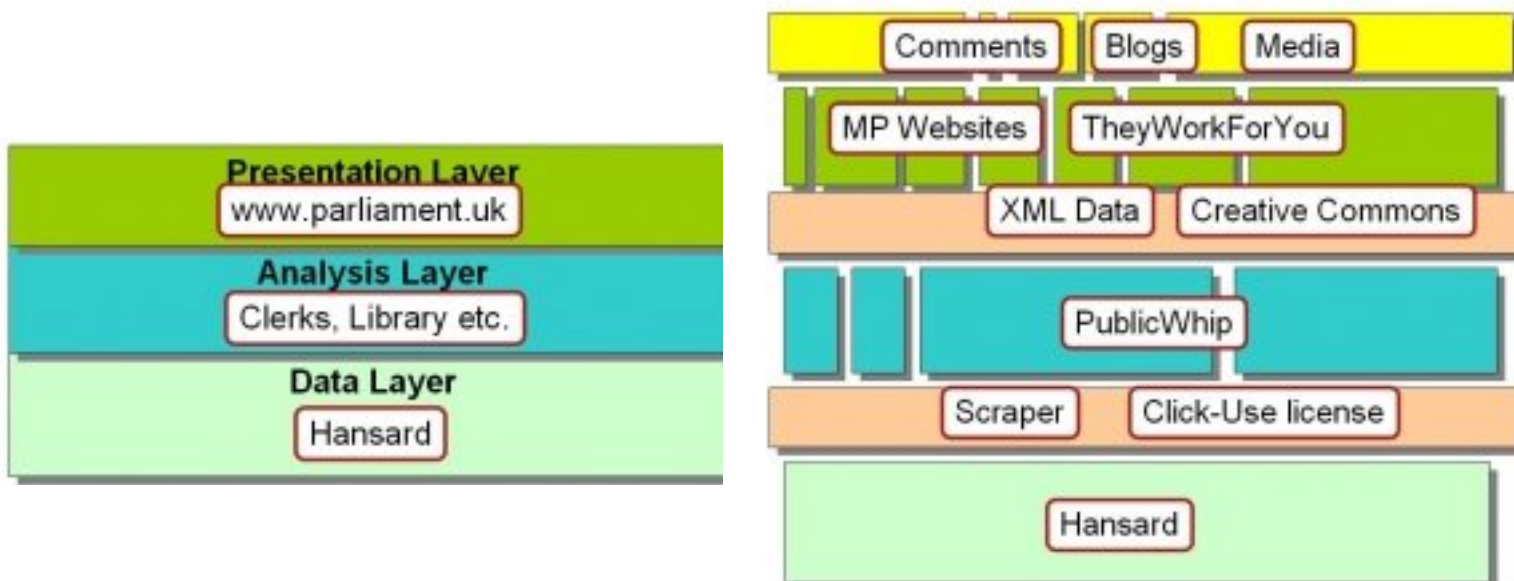


Figure 2: Hansard in the Old and New Model



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If this model were followed by the Canadian federal government, data provided to the Auditor General for fulfilling its mandate of “holding the federal government accountable for its stewardship of public funds” would be opened up to access by external agencies (http://www.oag-bvg.gc.ca/internet/English/admin_e_41.html). Like the Peer-to-Patent model, the Auditor General would begin to benefit from scrutiny of the data by external bodies. Systems may well evolve that relieve the burden of oversight from the staff of the Auditor General altogether, allowing them to pay attention only when issues are reported. With a system built on openness, the public may also start to trust that the government in Canada is in fact well run, instead of being required to take it on faith.

Open Source Tools for Open Data

Open source licensing for the tools that present and use government information takes the concept of transparency to the level of the source code. It enables public scrutiny of the presentation and analysis methods. In the words of one of OMB-Watch’s recommendations for President Obama: “...agencies should have a policy to exercise a preference for open source software for government activities as a means to improve stability, transparency, metadata quality, and cost-efficiency. Open formats for government information and open software applications will enable collaboration between agencies and will increase civilian oversight, participation, and use of taxpayer-funded resources” (<http://www.ombwatch.org/21strtkrecs.pdf>).

South Africa, Brazil, and China have begun to adopt policies favouring open source. According to a 2007 report in the open source online magazine Tectonic, “all new software developed for or by the [South African] government will be based

on open standards and government will itself migrate current software to FOSS. This strategy will, among other things, lower administration costs and enhance local IT skills” (<http://www.tectonic.co.za/wordpress/?p=1377>).

The call for open, standardized APIs for government data creates an incentive for governments to provide new systems for publishing that data. Many government bodies will be facing the same problems around producing reliable data streams complete with sensible meta-data.

In the Canadian federal government, departments are typically left to come up with their own solutions, paid for out of each departmental budget. This leads to a proliferation of redundant systems built according to the preferences of each department’s information technology consultant. Were departments to pool their resources into a joint open source effort to create data publishing systems, it would save costs and create a foundation of inter-departmental co-operation. The software produced would also benefit from the public scrutiny, oversight and contribution of Canadian citizens. Further, it would be free for governments around the world to adopt, creating the potential for contribution from citizens world-wide.

Open System Roadblocks

The rewards of a civil service career are asymmetrical and civil servants often feel that they live in a fish bowl. This fish bowl is made of a particular type of filtered glass: one where only the bad light gets through. Overwhelmingly, the disclosed information that gets publicized by the media is the negative, career-destroying kind. Information that points to success and improvement are rarely publicly celebrated. This is something that has to change.

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Recognizing that the incentives against transparency outweigh the incentives for, OMBWatch has recommendations for institutionalizing open. These include:

- having the government leader instruct agencies to request sufficient resources in funding, personnel, and technical capacity, to implement the vision of a more transparent government
- making transparency part of federal job evaluations where it is part of the job description
- implement directives protecting whistle-blowers who disclose waste, fraud, or abuse within an agency
- creating a system of transparency score-cards for rating agencies
- giving out transparency awards to celebrate achievements and best practices

Beyond these recommendations, external bodies that use government information should, as much as possible, build systems that create heroes rather than scapegoats. Individuals who find ways to save money, increase efficiency, or deliver a valuable service in an innovative way should be publicly rewarded, either through external financial compensation or public recognition.

Public service was, at one time, thought of as a calling. If civil servants who improve the way government functions are celebrated with the same media reverence granted successful businessmen, perhaps it may become one again.

Promoting Citizen Services Based on Open Government Data

The non-profit VisibleGovernment.ca was officially incorporated in December, 2008 to promote online tools for government transparency. One of its founding

principles is that while there is a sound case for open government data, a third party organization is needed to raise awareness of the issues and to marshal public support.

VisibleGovernment.ca's strategy is to build a limited number of pilot projects to gain visibility in Canada for the power of open government data to transform the relationship between citizen and government. The I Believe in Open pilot (<http://ibelieveinopen.ca>) challenged candidates in the 2008 federal election to pledge to five aspects of government transparency. The site also collected signups from voters, organized into ridings, so that member of Parliament (MP) candidates could see the support level in their area. 400 MP candidates signed our online pledge, 38 of whom were elected.

Another VisibleGovernment.ca pilot is a tool for visualizing federal government travel and hospitality expenses. The project gathers data from tables published in a variety of formats spread over 100 different department websites, and creates an interface that citizens can use to visualize this information, compare departments, and see trends over time. The project provides an RSS feed so that other groups can use the data to create tools of their own. With help from volunteers in the Montreal high tech community, over 30,000 records have been collected so far. A Montreal web development company specializing in data visualization has volunteered to do the visualization website, which we intend to launch at the Social Media for Government conference in Ottawa this February (http://www.aliconferences.com/conf/social_media_govt_canada0209/index.htm).

The long term goal of VisibleGovernment.ca is to direct money and attention to external projects that further our mission via grants and contests.

GOVERNMENT TRANSPARENCY

By being a catalyst driving public support of open government data, and pushing the envelope of innovation for ways of analyzing and presenting that data, we hope to create a network of active citizens who believe that open should be the normal state of governments.

Ways Forward

In the last two weeks, more than one grass-roots forum has appeared to advance a new era in civic participation. Toronto's ChangeCamp (<http://groups.google.com/group/changecamp/web/what-is-changeamp-1-page-brief>) and Montreal's Forum Ouverte (<http://forumouvert.communautaire.qc.ca>) are two such movements calling for an open exchange of ideas around using technology to re-define the role of the citizen. The spontaneous emergence of these groups shows the demand for new ideas and tools in the Canadian government.

VisibleGovernment.ca seeks the expertise and participation of grass-roots groups, advocacy organizations, and citizens across the country to make online tools for civic participation based on open government data a reality. If you share this goal, here are some concrete steps for action:

- host a ChangeCamp or Forum Ouverte in your city
- research resources and strategies on the VisibleGovernment.ca, Sunlight Foundation, or MySociety websites

- contribute to a VisibleGovernment.ca project
- start a dialogue with your public representatives on how they can be more open

For more information, visit the Visible Government.ca website, join our online discussion group (<http://groups.google.com/group/visiblegovernment-discuss>), or email jennifer@visiblegovernment.ca.

Jennifer Bell has a background in launching software startups. Prior to founding VisibleGovernment.ca, Jennifer was on the seed management team of Tungle Corporation, recently named one of Canada's top 10 Web 2.0 startups to watch. Previously, she was a software developer, and later architect and product manager, for Nimcat Networks, which was sold for \$43M in 2005. Jennifer has degrees in Electrical Engineering and Computer Science from the University of Saskatchewan, and an MBA in Entrepreneurship from McGill University.

Q. How can an individual or small business give back to an open source community?

A. When I first started working in information technology (IT) in the mid 80s, the mainframe was still the platform of choice and personal computers were not yet common place. As IT evolved, there was a huge shift from centralized systems to distributed computing and eventually to Internet enabled systems. During this evolution, more functionality and empowerment shifted from IT professionals to end users. Now, end users have personal computers and mobile devices connected directly to the Internet with thousands of software applications at their disposal. With the emergence of open source software (OSS), individuals and small and medium businesses can compete with large companies by using free or low cost software that supports many of the same features of commercial software packages.

Most open source communities rely on the volunteer work of many people within the community. After using OSS for many years, I felt obligated to give back to an open source community. First, I had to decide which community to support. I took an inventory of all of the open source products that I had used at both work and home. I was amazed to find that at work alone, we were using over one hundred open source products either directly or bundled as part of a commercial software package. At home, almost everything I use is open source because I find it hard to justify spending a few hundred or even thousand dollars on software that I use in my spare time. I also have several old machines that I salvaged by installing Linux. After reviewing my list of OSS products, I narrowed my choices down to Linux and OpenOffice.

I felt that Linux had enough large companies behind it like IBM, Sun, and Red Hat and that my impact would be minimal as compared to working with the OpenOffice community.

The next step was to figure out in what capacity I could help. There are many ways that a person can contribute to an open source community. Obviously, donations are a great way to help but active participation is just as important. The most popular participation methods are development and testing efforts, but the needs don't stop there. Each community needs help with documentation, troubleshooting and assisting users in forums, and graphics and art work for branding through logos, widgets, and banners. The OpenOffice community has a user experience team made up of volunteers who discuss usability, user interface design, features, and functionality. But I felt that I could make the biggest impact by helping to market OpenOffice. I happen to have a large social network, a nice following on my blogs, and have had numerous articles published in various printed and e-magazines. My contribution is to spread the word by writing and speaking about my experiences with open source and OpenOffice.

About two years ago, my frustration level with my Windows machine at work hit a new high. Between Outlook taking 10 minutes to open in the morning, blue screens of death appearing throughout the day, and formatting inconsistencies across the suite of Microsoft Office products, I had finally had enough of losing productivity on behalf of expensive commercial software. I downloaded the latest version of Ubuntu and installed it on my work laptop. My company was a full blown Microsoft shop, although we did have some applications that used Linux.

A few of us in IT were allowed to use Linux because our application required it. I took this privilege one step further and eliminated all Microsoft products from my toolbox. I set out to prove that even in a Microsoft shop, one could co-exist entirely with OSS. This was a big test for OpenOffice and a great opportunity to put to bed many myths about OpenOffice and OSS in general. I started blogging about my experience and the OpenOffice marketing effort began. I put OpenOffice badges on my blog, blogged about OpenOffice news, and even saved my last slide on a recorded presentation I did at a technology conference to market the fact that the entire presentation was created on a Linux box with OpenOffice. Two of my Microsoft Free blog postings were picked up by Slashdot, Digg, Delicious, a dozen other social bookmarking web sites, and e-magazines like Linux Today, ZDNet, and Computer World. A radio station interviewed me about my experiment.

Two years later, those two postings make up about 65% of all of the traffic I have received to date. Seven months after the second posting, it still gets as many hits each week as my newly posted entries. I primarily write about enterprise architecture, service-orientation, and organizational change management, yet some of the top searches for my blog are “open source + visio” and “open office”. My contribution to the community has been providing the world with a real life example of a successful case study of OpenOffice co-existing long term in a Microsoft shop. Many readers can see that many of the myths about open source and OpenOffice are just that, myths. From my blog traffic statistics, I see that many people have clicked on the OpenOffice download badge on my blog. I have generated an ongoing discussion, which is evident from the enormous amount of comments left by readers.

I am not trying to sell anything or convince people to switch. Instead, I make people aware of what their options are and how much progress the community has made over the years. So, my marketing efforts as an individual provide impact for the OpenOffice community.

As a user of OSS, do you blog, Tweet, or use Facebook? If you can't afford to commit large amounts of time, you can still help your favourite OSS community. The next time you use an open source product and you like what you see, send out a Tweet or a status update on your favorite social networking platform and start a conversation. It could be as simple as “Just read this great article about OpenOffice by Mike Kavis in the OSBR”.

Mike Kavis has over 23 years of experience in Information Technology. He is currently CTO/Chief Architect at a technology startup and has his own consulting company. Mike has worked in the health, retail, CPG, manufacturing, and loyalty marketing industries. Mike earned a BS in Computer Science from RIT and received his Masters in Information Technology and Executive MBA from Colorado Tech. Mike writes about technology for CIO.com and SOAInstitute.org and blogs at <http://it.toolbox.com/blogs/madgreek>.

Recommended Resources

Open Source and Microsoft Free
<http://it.toolbox.com/blogs/madgreek/open-source-and-microsoft-free-17339>

Microsoft Free - One Year Later
<http://it.toolbox.com/blogs/madgreek/microsoft-free-one-year-later-25078>

January 5

FreshBooks Open Sources their iPhone Time Tracking App at MacWorld

Toronto, ON

Toronto-based FreshBooks have released the source of their iPhone time tracking application to reduce the learning curve for developers wishing to build iPhone applications.

<http://www.freshbooks.com/blog/2009/01/05/were-open-sourcing-our-iphone-time-tracking-app-for-macworld/>

January 7

Roaring Penguin Delivers Easier Monitoring and Management of Anti-Spam

Ottawa, ON

Roaring Penguin Software Inc., makers of the acclaimed CanIt line of anti-spam solutions, today announced that they have teamed up with GroundWork Open Source, the leading commercial open source supplier of monitoring and management software to integrate CanIt and GroundWork Monitor. This new solution enables Managed Service Providers (MSPs) to effectively monitor the performance and availability of their clients' critical email and anti-spam infrastructure.

<http://www.roaringpenguin.com/node/570>

January 14

Identi.ca gets Funding for Open Source Twitter

Montreal, QC

Montreal-based Control Yourself, Inc. (CYI) has received an undisclosed amount of financing from VCs at Montreal Start Up. This investment will help CYI build its Identi.ca software into the open source foundation of a federated network of public and private microblogging sites.

<http://controlyourself.ca/2009/01/15/investment-by-montreal-startup/>

January 15

Seneca College gets \$50,000 Grant to Work on Eclipse WTP

Toronto, ON

After previous successes with its students contributing to open source community projects, Toronto-based Seneca College is hoping to replicate that experience with IBM Corp.'s Eclipse Web Tools Platform (WTP) with a \$50,000 grant from IBM. Past collaborations with Mozilla Corp. and Red Hat Inc. have proved fruitful for the communities and students, and "now, what we're interested to do, is grow this and clone it to other large open source projects," said Evan Weaver, chair of the school of computer studies.

<http://www.itworldcanada.com/a/Daily-News/535f19fd-095e-4143-90ae-8a990bb67de5.html>

UPCOMING EVENTS

February 20

Reducing the Cost of BI Ownership

Toronto, ON

At this free breakfast seminar, learn more about open source Business Intelligence (BI) software and view live demos of zero-cost BI tools.

<http://www.sqlpower.ca/page/breakfreeseminar>

March 4-6

PHP Quebec

Montreal, QC

PHP Quebec is pleased to present the seventh edition of the PHP Quebec Conference where PHP experts will be presenting real life solutions to developers and project managers. With events such as the PHPLab, the Job Fair and the Cocktail, the Conference will be a great opportunity to meet with local experts, core PHP developers and sponsors.

<http://conf.phpquebec.com/en/>

March 11-12

BNC Technology Forum

Toronto, ON

This conference brings innovators together to discuss the future of the publishing industry, business models, transitions and new use cases for books.

<http://events.booknetcanada.ca/>

March 12

eConcordia Summit

Montreal, QC

The eConcordia Summit 2009 will welcome professionals, experts, practitioners, researchers and educators to meet and network with high-profile leaders who will address how technological advances are impacting the way we learn today.

<http://www.econcordia.com/summit2009/>

April 1-4

2009 Canadian Moodle Moot

Calgary, AB

MoodleMoot is an onsite conference and a simultaneous online event that provides an opportunity to share and network with other Moodlers and to find out more about Moodle directions and emerging practices.

<http://moodlemoot.ca>

April 2

Mobile Embedded Development Conference

Waterloo, ON

This free event will provide a synopsis of a few smart phone platforms and developing on them using open source software. Pre-registration is required.

<http://www.fosslc.org/drupal/node/75>

FREE BREAKFAST SEMINAR:

Reducing the Cost of BI Ownership

Learn how to fine-tune your Business Intelligence Strategy in these challenging economic times

DISCUSSION TOPICS

- Are you a victim of your Business Intelligence success?
- Maximizing your BI Budget: how to do more for less
- Virtual Data Warehousing (EDW vs. VDW)
- Off-shoring vs. Near-shoring: what & when to outsource?
- Delivering on the BI Promise:
End-users creating 100% of BI Reports
- Discover the truth about Open Source BI software
- Learn how to avoid the escalating costs of BI software
- View live demos of zero-cost BI tools
- Open discussion (Q & A)

your attendance entitles you to a
FREE 1/2 DAY ASSESSMENT
 of your BI environment
 to help you recover your BI budget



Friday Feb. 20th at 8:30am

SQL Power Boardroom • 4950 Yonge St. Suite 2110 • Toronto
 free continental breakfast at 8:30am • seminar from 9am to 11am

Hosted by SQL Power - The Canadian Business Intelligence Authority

Register online at www.sqlpower.ca/seminar or contact us at 1-866-SQL-POWER or info@sqlpower.ca for more information.



UNLEASH THE INTELLIGENCE WITHIN

WWW.SQLPOWER.CA

The goal of the Open Source Business Resource is to provide quality and insightful content regarding the issues relevant to the development and commercialization of open source assets. We believe the best way to achieve this goal is through the contributions and feedback from experts within the business and open source communities.

OSBR readers are looking for practical ideas they can apply within their own organizations. They also appreciate a thorough exploration of the issues and emerging trends surrounding the business of open source. If you are considering contributing an article, start by asking yourself:

1. Does my research or experience provide any new insights or perspectives?
2. Do I often find myself having to explain this topic when I meet people as they are unaware of its relevance?
3. Do I believe that I could have saved myself time, money, and frustration if someone had explained to me the issues surrounding this topic?
4. Am I constantly correcting misconceptions regarding this topic?
5. Am I considered to be an expert in this field? For example, do I present my research or experience at conferences?

If your answer is "yes" to any of these questions, your topic is probably of interest to OSBR readers.

When writing your article, keep the following points in mind:

1. Thoroughly examine the topic; don't leave the reader wishing for more.
2. Know your central theme and stick to it.
3. Demonstrate your depth of understanding for the topic, and that you have considered its benefits, possible outcomes, and applicability.
4. Write in third-person formal style.

These guidelines should assist in the process of translating your expertise into a focused article which adds to the knowledgeable resources available through the OSBR.

Upcoming Editorial Themes

| | |
|--------------------|---|
| March 2009: | Geospatial Guest Editor: Dave McIlhagga, DM Solutions |
| April 2009: | Open APIs Guest Editor: Michael Weiss, Carleton University |
| May 2009: | Open Source in Government Guest Editor: James Bowen, University of Ottawa |
| June 2009: | Women in Open Source Guest Editor: Rikki Kite LinuxPro Magazine |

Formatting Guidelines:

All contributions are to be submitted in .txt or .rtf format.

Indicate if your submission has been previously published elsewhere.

Do not send articles shorter than 1500 words or longer than 3000 words.

Begin with a thought-provoking quotation that matches the spirit of the article. Research the source of your quotation in order to provide proper attribution.

Include a 2-3 paragraph abstract that provides the key messages you will be presenting in the article.

Any quotations or references within the article text need attribution. The URL to an online reference is preferred; where no online reference exists, include the name of the person and the full title of the article or book containing the referenced text. If the reference is from a personal communication, ensure that you have permission to use the quote and include a comment to that effect.

Provide a 2-3 paragraph conclusion that summarizes the article's main points and leaves the reader with the most important messages.

If this is your first article, include a 75-150 word biography.

If there are any additional texts that would be of interest to readers, include their full title and location URL.

Include 5 keywords for the article's metadata to assist search engines in finding your article.

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