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The Open Source Business Resource


Editorial
Chris McPhee, Mekki MacAulay

Open to Everyone: How Open Source Communities Can Benefit from Diversity Without Disunity
Teresa Jewell

Integrating Lessons from Other Disciplines into Open Source Practice
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OpenOttawaLibre: An Interdisciplinary Approach to Building Creative Cities
Michael Ayukawa and Julie DuPont

Implementing a Deal Development Platform for Business Ecosystems
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Bloom: A Relationship Visualization Tool for Complex Networks
Frank Horsfall

Recent Reports

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Contribute


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***It is my great pleasure*** to introduce the August issue of the OSBR - my first issue as Editor. The editorial theme is Interdisciplinary Lessons.

***Culture can be defined as***: "This is how we do things." Culture helps establish norms within a discipline and sets the ground rules for getting things done, but it can also stifle creativity and innovation. Great leaps forward often come by chance, through innovation introduced by outsiders who bring a new perspective.

***In this issue, the authors*** describe the value of interdisciplinary lessons and approaches. They encourage us to keep our eyes open and look for inspiration in other fields to better meet the challenges we face in our own. Serendipity is nice when it happens, but sometimes we need to make our own luck.

***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.

***The editorial theme for the*** upcoming September issue of the OSBR is Keystone Companies and submissions are due by August 15th. October's theme is Sales Strategy and submissions are due by September 1st. Please contact me (chris.mcphee@osbr.ca) if you are interested in making a submission.

**Chris McPhee**

**Editor-in-Chief**

*Chris McPhee is in the Technology Innovation Management program at Carleton University in Ottawa. Chris received his BScH and MSc degrees in Biology from Queen's University in Kingston, following which he worked in a variety of management, design, and content development roles on science education software projects in Canada and Scotland.*

***Some believe that great advances***, discoveries, and innovation result from concentrated efforts within distinct fields. However, progress using this traditional practice has been slowing for some time. The next great discoveries are unlikely to come from further refinements in highly-specialized fields working in isolation. Rather, they will come from creative collaboration between practitioners and researchers from two or more distinct fields, combining their knowledge, theoretical principles, and methodologies in ways never before considered.

***I recently had the pleasure*** of giving a talk at the Interdisciplinary Graduate Conference at Cambridge University in the United Kingdom (http://igc2010.co.uk). There I met a vibrant group of researchers and practitioners from diverse fields, including molecular biology, art history, criminology, architecture, English literature, and engineering. I expected to gain insights from one or more of the fields represented at the conference, but I was surprised to find that every presentation I attended yielded valuable interdisciplinary lessons that could be applied to my own field of research.

***This issue analyzes lessons from*** other disciplines to provide a new perspective on the challenges faced by open source communities, practitioners, entrepreneurs, and other participants. The goal is to extract and apply the collective wisdom of a diverse group of authors to help solve relevant problems. The first two articles in this issue provide specific interdisciplinary lessons from diverse fields that are relevant to open source communities. The remaining articles describe projects in which platforms are being developed to promote, encourage, and analyze interdisciplinary work.

***Teresa Jewell, author of TheQueery.com***, recounts lessons from the history of the feminist movement and applies them to the challenges faced by open source com-

munities. She argues that inclusiveness and cohesion are key to successful social movements and that a united approach would strengthen open source communities. A focus on achieving common goals is more likely to promote the development of the open source movement than divisive internal debates.

***As author of the second*** article, I review select lessons from disciplines that are relevant to open source communities. First, lessons from the fashion industry challenge the notion that intellectual property protection, such as copyright, fosters innovation. Second, lessons from the gaming industry are applied to the challenges of community development and business model development in open source communities. Third, I show how lessons from the field of scientometrics can inform efforts to measure the health of open source ecosystems. Finally, I suggest approaches to uncover further lessons in other fields.

***Michael Ayukawa and Julie DuPont*** describe the OpenOttawaLibre project, which is being developed to strengthen Ottawa's position as a creative city. Michael is the founder of Cornerportal and Julie is a Cultural Planner for the City of Ottawa. They use an interdisciplinary approach to bring together creative industries, businesses, academia, local and global talent, and government to solve existing and emerging problems. They prescribe an ecosystem approach to event organization and facilitation to improve discussion and debate between participants, while breaking down organizational barriers and avoiding polarization.

***James Makienko and Leonard De Baets***, from Carleton University's Technology Innovation Management program, describe a project to create a deal development platform for business ecosystems. By extending an open source customer relationship management tool, the platform will track the flow of a deal and the interactions between the players involved at different stages, from the moment a customer submits a problem, through refinement of proposals and prototypes, to completion of the deal. An emphasis on co-creation between customers and suppliers represents a shift from traditional linear development models.

***Frank Horsfall, Bloom Founder and*** Lead, wraps up the issue by describing the Bloom open source project. Bloom is a relationship visualization tool for complex networks and business ecosystems. The article provides an overview of the visualization technology and, using a real-world case study, it shows how the tool can be used to quickly reduce large amounts of data on network connections into understandable, manageable, actionable chunks for decision-makers.

**Mekki MacAulay**

**Guest Editor**

*Mekki MacAulay is the Principal of OSStrategy.org (http://osstrategy.org), a consulting firm that helps companies improve their competitive advantage and strategic positioning in a world embracing open source. Mekki is also the president and founder of MekTek Solutions (http://www mektek.ca), an IT services company based in Ottawa. Mekki holds undergraduate degrees from Carleton University in Computer Systems Engineering and Psychology, and a Master's degree in Technology Innovation Management. His research interests focus on open source adoption; open source ecosystem value creation, extraction, and keystone company positioning; and quantifying the value of passive participation in open source projects.*

*"In order to get the maximum benefit from the process, the maximum diversity of persons and groups should be equally eligible to contribute to open sources."*
Open Source Initiative

Open source is at once a type of software licensing, a community model, an ideology, and a social movement. As a movement aiming not only to promote open source software within the software development community, but also to change the attitudes of commercial users, it can benefit from lessons learned by earlier social movements.

This article is intended for entrepreneurs, developers, and open source proponents who wish to maximize the market for their products. It will begin with a discussion of the successful strategies and common pitfalls of the feminist movement. It will then apply these lessons to the open source community. Overall, it will discuss the importance of united ideologies, inclusive communities, and the pursuit of legislative changes in promoting open source software as a viable alternative to traditional proprietary software.

**Historical Lessons from the Feminist Movement: Internal Discord**

Since its inception in Britain in the late 1840s, the feminist movement has experienced many successes and setbacks in its mission to achieve equality for women (http://tinyurl.com/23odvkl). While many of these setbacks have come from external sources, such as right-wing conservative movements and difficulties in breaking through longstanding systemic discrimination, others have come from within the movement itself.

A primary example of internal dissension is the frequent disagreement between different rights activists in terms of which groups to represent and which platforms to support. In the United States, this resulted in a split between liberal and radical feminism within the largest women's association, the National Organization for Women (NOW, http://now.org), that lasted from the late 1960s to the 1990s.

The divide centred on whether lesbian issues should be included within NOW's push for equal rights for all women, with lesbians being considered too radical and "the seeds of [the feminist movement's] destruction" (http://tinyurl.com/33b6m32). Initially, many prominent lesbian women's rights activists were exiled from the organizations they had themselves founded or supported as members. Toward the 1980s and 1990s, room was made for the inclusion of this group, but only according to a narrow definition of what its membership could entail (http://tinyurl.com/3x7hbmm). NOW has since welcomed lesbians fully into its fold.

Even where sexuality has not been an issue, various groups have taken different perspectives on the role of women within marriage, the family, the workplace, and society in general. In the earliest moments of the American feminist movement, disagreement on whether women should have the right to vote nearly resulted in this issue being removed from the "Declaration of Sentiments" of the first women's rights convention in 1848 (http://legacy98.org/move-hist.html).

In the 1960s, the Women's Liberation Movement drew a parallel between housewives and war prisoners that encouraged some women to break free of their home lives and husbands' 'oppressive patriarchy.' However, it also left happy homemakers incensed at the defamation of their traditional family values as they were made into negative symbols for the movement to fight against (http://tinyurl.com/2f29688).

In other cases, open rivalry has erupted between groups with differing priorities as each attempts to secure policies in favour of its own interests at the expense of the interests of others (http://www.jstor.org/pss/448066). This lack of consensus can thus harm all sides of the movement.

**Historical Lessons Continued: Sources of Success**

The women's movement succeeded in gaining momentum and support despite these internal differences for two major reasons. The first was an inherent understanding that legislative changes needed to be made for women to have any influence over the policy issues central to their concerns. The second consisted of a set of very powerful activist voices that pushed these issues into the mainstream.

When the movement was first founded, the women at its head realized that the laws that kept them powerless within society would not be changed until they themselves had a say in the making of these laws (http://legacy98.org/move-hist.html). Consequently, their initial list of grievances recognized that they lost all rights to property, education, physical wellbeing, and even their own children within the institution of marriage, but even more so that the right to vote was fundamental to their ability to change these laws.

In the 1960s and 1970s, the continued push for legal changes to promote women's equality resulted in affirmative action programs being implemented throughout North America (http://www.inmotionmagazine.com/aahist.html). Where women had still been struggling to enter the workforce alongside their more established male peers, these programs ensured their ability to participate. In Canada, this legislation ultimately resulted in the Employment Equity Act (http://tinyurl.com/38q7vng).

The key to these legislative changes being enacted was the dissemination of women's issues by strong voices like Betty Friedan, Gloria Steinem, and Germaine Greer, among others, not to mention their political allies in the form of major figures like former American presidents John F. Kennedy and Lyndon B. Johnson. Even though these figures did not represent the whole of the women's movement, no dissenting voices from within were strong enough to outshine the powerful rhetoric of the more radical and outspoken feminists.

Despite internal conflicts, the diversity of opinions and organizations reflects the variety of perspectives within society, and these are a positive indication of the amount of thought, discussion, and support in favour of women's issues. The trouble emerges when these groups fight each other for political prominence instead of working together in pursuit of their common interests. Correspondingly, it is when the movement unites to pass new legislation that all women benefit the most. It is from this perspective that we can apply the lessons learned by the feminist movement to the open source community.

**Disunity and Discrimination within the Open Source Community**

The open source movement can learn from the experiences of the feminist movement in terms of the downsides of internal rivalries and discrimination when promoting a cause.

Like NOW and its competing organizations in support of various subgroups, the historic rivalry between such open source authorities as the Free Software Foundation (FSF, http://www.fsf.org) and its spin-off Open Source Initiative (OSI, http://www.opensource.org) often has a divisive effect on supporters (http://tinyurl.com/2cz9aeh). Even

though these organizations have similar ideologies and shared principles, open source users and developers can find themselves forced to choose sides. Such rifts can occur on purely academic issues such as whether to call their software "open" or "free", never mind on more complicated questions such as which license to use for a product.

At an even more basic level, disunity exists within the open source community in terms of the exclusion of various interested groups. In the feminist movement's initial fight for equal rights for all members of society, this took the form of some women's organizations excluding the rights of single mothers and homosexuals from their mandates. Within open source, the group most often ignored is the non-technical user.

In "Cave or Community? An Empirical Examination of 100 Mature Open Source Projects", Sandeep Krishnamurthy notes that "communities do things other than produce the actual product [such as] provide feature suggestions, try products out as lead users, and answer questions" (http://tinyurl.com/358zj6n). Even though these activities may largely fall within the purview of software developers, his comment points to the variety of activities within open source and, by extension, to the diversity of the types of people who can participate. In other words, not every participant in the open source movement is a software developer.

At first glance, the rights of all users figure prominently in both the OSI and FSF definitions of open source/free software. In particular, the FSF states that "free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software" (http://www.gnu.org/philosophy/free-sw.html). However, examining the terms of this freedom reveals that "user" in this context is actually almost synonymous with "developer". Commercial users have the right to use and distribute the software as desired: "it is the user's purpose that matters, not the developer's purpose." Still, no provisions are made for how this software should be documented or supported, or how user feedback can effect change.

While this focus on the rights of developers makes sense from a definition standpoint, the tendency to forget about commercial and non-technical users unfortunately extends to the community itself. The effect of the disconnect between the user and developer or entrepreneur is that open source software becomes software by developers, for developers only. Translation: the needs, wants, and feature suggestions of the user are not necessarily represented, and the resulting software may thus not correspond to market desires (http://chris.pirillo.com/users-vs-developers/).

When these users are also referred to as "leeches, vampires, or freeloaders" for using source code without contributing any in return, the level of animosity directed toward this key part of the open source community can further alienate its members (http://tinyurl.com/kunn5n). The same type of discrimination is aimed at software developers who provide software at no cost but do not follow open source principles in their licensing (http://tinyurl.com/3x2ap46), with the same result.

**Negative Consequences of Disunity**

As is already apparent, the negative results of infighting within the open source community are manifold.

One example is wasted energy when proponents and organizations spend time attacking each other instead of uniting to focus on common goals like better licenses and public education. For example, when FSF and OSI disagree on licenses and terminology, this can create an image of internal dissension and instability that can lead to an increased perception of risk on the part of potential commercial users.

The negative attitudes of "ideological 'believers'" toward groups within and on the fringes of the movement similarly scare away prospective businesses and source code contributors who are "too afraid of running afoul of the 'open source community'" (http://tinyurl.com/2bwdnkd).

In terms of application support for non-technical users, several companies have now emerged to provide support for certain software packages and the situation is improving. However, this type of user can still be left helpless when trying to "compile your own version" is the best option available for an immediate bug fix (http://tinyurl.com/3y2v742).

**Promoting the Open Source Movement Within and Without: Keys to Success**

As can be seen clearly from the successes of the feminist movement, pursuing changes to current legislation and having strong voices support the need for these changes are central to the expansion of the open source movement. One example of a way to promote open source through law is by using "copyleft", an alternative to copyright that makes a program open source and "says that anyone who redistributes the software, with or without changes, must pass along the freedom to further copy and change it" (http://www.gnu.org/copyleft/).

Prominent voices like Michael Geist have noted that current copyright laws including Bill C-32 (2010) in Canada pose challenges to open source software by prioritizing digital locks over the rights of the user (http://www.copyright.michaelgeist.ca/). FSF frontman Richard Stallman also notes the difficulties with patent and copyright law as they impact open source programs and intellectual property in general (http://tinyurl.com/a7yo8u).

Unfortunately, there is no clear consensus as to which changes need to be made to current laws, but the key elements are in place for future efforts. With the help of other powerful voices like Lawrence Lessig, Harvard professor of law and founding member of Creative Commons, as well as other open source proponents like Eric S. Raymond, the main focus should be on determining a clear message and direction to convey to politicians who can help effect these changes. If there is too much fracturing in the message due to polarized opinions, the result will be far less effective.

Once a clear direction is determined, having prominent figures educate and work with political figures in positions of power about the realities of open source and the legal needs of copyleft licenses is one way to ensure that open source becomes better represented in future copyright and intellectual property laws. In Canada, one example of an MP who has shown interest in copyright concerns and could be a powerful ally to the open source movement is New Democrat Digital Affairs Critic Charlie Angus (http://charlieangus.ndp.ca/node/107).

In addition to the promotion of open source issues through public figures and legislative changes, the following activit-

ies can also assist with the continuing development of the open source movement:

- encouraging increased collaboration between the FSF and OSI and other open source organizations to develop better licensing criteria and public campaigns

- educating potential users and contributors of the benefits of open source software from the perspective that all forms of participation are valid and desired

- promoting positive attitudes toward inclusiveness and acceptance of other paradigms among open source proponents to decrease the perception of fanaticism and bigotry

- conducting extensive consultations with target markets to understand the user's perspective before determining the functionality and interface of a software product

- developing better application support systems to improve the usability of open source software by non-technical users

The above activities would create an image of solidarity and strength within the movement, as well as an openness to the needs and concerns of users, contributors, and other groups. This positive image will encourage consumer confidence, promoting the adoption of open source software to a wider market than at present.

**Concluding Thoughts**

While the feminist and open source movements may at first glance seem to be two entirely distinct interest groups, a comparison of the internal issues each has faced shows a common perspective of inclusiveness from which to achieve greater success.

With the above lessons in mind, the open source movement can develop a better understanding of its community and how it should present itself to the wider community of commercial users, buyers, and software developers at large. In this way, entrepreneurs and other open source proponents can generate increased positive visibility and heightened consumer confidence in open source software.

*Teresa Jewell is a researcher in Women's Studies at York University. She holds Bachelor's and Master's degrees in English with a focus on Medieval Studies. Her current projects include TheQueery.com (http://thequeery.com), a research website dedicated to questions of culture and identity related to gender and sexuality.*

*"In our view, at this early stage research and theory building on open source software development should be receptive to debates in several fields and attempt to make linkages with important work done in other disciplines."*

Georg von Krogh & Eric von Hippel

Open source theory and practice is inherently interdisciplinary. Viewing the challenges faced by open source communities, businesses, and contributors through the lenses of different disciplines can yield novel solutions. This article reviews select lessons from the diverse fields of fashion, gaming, and scientometrics. It examines the way these other industries have addressed issues that are of relevance to the open source community and suggests ways to put these lessons to good use.

**Lessons from the Fashion Industry**

In a recent talk at TEDxUSC (http://tinyurl.com/3xm3bwy), Johanna Blakley shocked a largely technically-focused audience with an ingenious examination of the impact of the fashion industry's lack of copyright protection on its ability to rapidly innovate. She argued that, "because there is no copyright protection in the fashion industry, fashion designers have actually been able to elevate utilitarian design, things to cover our naked bodies, into something we consider art. Because there's no copyright protection in this industry, there's a very open and creative ecology of creativity."

Much like the practice in open source software communities, fashion designers can take ideas and designs from their peers and incorporate them into their projects, reusing them in novel ways to serve their own purposes. This rehashing gives designers a broad palette to work with and can act as a springboard for advancement since new innovations can be built upon existing foundations of style. In some areas of innovation in fashion, the practice is not unlike the development of extensible stacks of open source software, working together to serve a purpose. In one instance, the purpose is more artistic, and in the other, more functional, but the commonalities are sufficient in the innovative process itself that it deserves a further analysis.

Blakley explained that one of the most useful side effects of a culture of copying was the establishment of trends. These trends are hashed out of the remixing that naturally emerges when people try to define their own clothing styles. Very few people will wear clothing by one designer alone. Instead, they will wear pants by one designer, a shirt by another, shoes by yet another, and so on. Their style is as much defined by the individual articles of clothing as the combination. Different people have different needs and value different things in clothing design, from visual appeal to functionality, on a sliding scale depending on their personal preference. This model is nearly identical to that of the open source bazaar, where different users have different needs and they value different things. Very few users have a computer that has software from one vendor alone. Trends emerge when users find a useful feature or design idea in a piece of software that another vendor picks up and incorporates into their offering.

Perhaps the most stunning supporting evidence of the impact of the creative liberty of the fashion industry was a comparison of the gross sales of goods of major industries that have copyright protection and those that do not. Blakley showed that there are many industries that thrive with low intellectual property protection for designs, including the food, automobile, furniture, and fashion industries. Gross sales in these industries greatly exceed those in industries with copyright protection, such as films, books, and music.

Blakley wraps up with a cautionary note on creative industries and the evolution of the legal frameworks that govern them: "The conceptual issues are truly profound when you talk about creativity and ownership; we don't want to leave this just to lawyers to figure out. They're smart, but you want an interdisciplinary team of people hashing this out, trying to figure out, what is the kind of ownership model, in a digital world, that's going to lead to the most innovation. Fashion might be a really good place to start looking for a model for creative industries in the future."

This TEDx talk can serve as a lesson for open source communities as it demonstrates that many older and larger industries have struggled with the timeless challenges of encouraging innovation, creating and maintaining competitive advantage, and deciding whether to protect intellectual property or not. These industries have found ways to integrate the realities of their cultural and legal environments into their processes and corporate structures. Open source communities, and companies that have traditionally held their intellectual property close to their chest, may want to look closely at whether these strategies could help increase their revenue or competitive advantage.

**Lessons from the Gaming Industry**

In a recent article for *Forbes* (http://tinyurl.com/2eduq85), Elliot Noss, President and CEO of Tucows (http://www.tucowsinc.com) discussed what he has learned from playing video games, and how they have shaped him into a better leader. Tucows Inc. is one of the largest domain name providers. It is actively involved in Internet governance issues and is a strong supporter of open source principles, practices, and communities. Noss noticed the similarities between the workplace and player-organized events in World of Warcraft. He explains that when people are coming together to achieve a common goal, such as defeating a difficult dungeon, it is "really easy to see how valuable are skills like managing the social dynamic, making sure there is the right level of preparation, and making sure that there is a clear hierarchy in terms of who is performing what roles. Each action, even a small task has a purpose and fits into a broader framework." He noted the analogy to the management of Tucows, where each employee has a job to do that feeds into the whole, supporting the company's goals. By promoting an open dialogue with his employees around the way the company is run, its history, and its challenges, he found that employees have a better understanding of what they do and have greater job satisfaction. Feedback suggests that "it helps people feel they are part of something bigger."

The analogy holds for open source communities as well. Applying these lessons to community development efforts could help promote involvement, improve communication, promote a sense of belonging for developers, and possibly even reduce community fractures. Research by Bonaccorsi and Rossi (http://tinyurl.com/2fuj538) has shown that open source participants frequently contribute to projects to promote a sense of belonging in the community. This parallel from the gaming community supports this notion and prescribes a means of improving that sense of belonging. Community managers could learn how to motivate participation and focus effort by observing the top guild leaders. Perhaps most importantly, approaching open source development like one approaches a game could lead to participants having more fun. As Lakhani and Von Hippel observed (http://tinyurl.com/2b9n25u), open source participants who enjoy what

they are doing may contribute more readily to projects, leading to benefits for the whole community.

Another lesson from the gaming industry comes from the Humble Indie Bundle project (http://wolfire.com/humble). The project's goal was to bring together independent game developers and charities to offer a game bundle in exchange for donations. The bundle consisted of five games and gamers could donate any amount of money above one cent to get all of the games. In addition, all the game developers agreed to release their games under open source licenses at the end of the project. This strategy is comparable to one of Frank Hecker's open source business strategies: "sell it, free it" (http://hecker.org/writings/setting-up-shop) and provides a good case study of this model in practice. In Hecker's model, the product is initially offered for sale and is later released as open source at the end of its life cycle. The strategy in the Humble Indie Bundle project is somewhat different in that the open source release occurred one week later, while the products were still commercially viable.

The project was a great success with nearly $1.3 million donated in just over one week. Over 130,000 people contributed an average of $9.18 each. Self-reported Linux users donated an average of $14.49 each, while self-reported Windows users donated an average of $8.05 each. The donation system allowed contributors to choose how their donation was distributed. Approximately 30% of the total donation amount was allocated by users to the following charities that are well known in gaming communities: EFF (http://www.eff.org) and Child's Play Charity (http://www.childsplaycharity.org). The remainder was allocated to the five game developers, who split the amount and each received over $160,000. The project demonstrated that the "sell it, free it" model can be an effective open source strategy. It also highlighted that creativity and community involvement are essential tools for success using this revenue model.

**Lessons from the Field of Scientometrics**

Scientometrics focuses on quantifying and qualifying scientific achievement. Since the early days of academia, people have sought to measure achievement, and these measurements have a broad range of applications. Measures of achievement are often considered when determining promotions, awards, funding, tenure, and recognition of contribution to a field as a whole.

Quantifying the health of an open source ecosystem is a challenge faced by many communities. There are many ways of measuring the individual contributions of participants, but it is not clear which ones are most closely correlated with ecosystem health. The communities and the projects upon which they build are so diverse and their goals are so distinct that it is a challenge to find uniform measures. This challenge is similar to that faced in scientometrics, where different scientific fields are so different that uniform assessment is complicated. Yet, over the past century, there have been many advances in the field, and measures have been developed that address these challenges. Open source communities could benefit greatly by applying these lessons to the assessment of contributions to their projects and ecosystems.

The major step in the task of measuring achievement is attempting to distill a unit of measure from the array of types of contributions. In science, numerous measures have emerged, including numbers of papers accepted to peer-reviewed journals, number of citations by peers in

the field, number of projects or students supervised, number of patents granted, number of keynote presentations at conferences, impact of research, number and amount of grants received, number of chapters or books published, complexity of problems solved (especially in mathematics), commercial viability of research, and institutional involvement. These many measures have emerged due to the diversity of scientific research, and certain measures are more applicable in particular situations than others.

By contrast, in open source ecosystems, the number and types of measures of contributions are still fairly limited. The common measures include number of lines of code contributed, number of bugs reported, number of features coded, and perhaps amount of development on a project, especially for older projects where seniority is valued. These measures, while useful in some contexts, fail to capture the full range of types of contribution to open source ecosystems. They focus almost exclusively on contributions made by programmers. What about the contributions made by community organizers, evangelists, users, complementary projects, retailers, researchers, artists, editors, reviewers, and some of the many other important roles in open source communities? These roles are essential to community health and growth, but are not well measured. Open source communities could learn from the scientometics research to find ways to better quantify these types of contribution and the overall health of an ecosystem.

The Eclipse Foundation (http://eclipse.org) has been researching ecosystem health measures for some time. Donald Smith, the Director of Ecosystem Development for the Eclipse Foundation, deduced (http://tinyurl.com/379cfqa) that there are three major, relevant measures of ecosystem health: i) productivity, or how much value is being created in the ecosystem; ii) robustness, or how readily the ecosystem can adapt to external events; and iii) niche creation, or the ability to expand the ecosystem with meaningful diversity. These measures are extremely complex and cannot be easily assessed. They also focus on the community as a whole, as opposed to individual contributions to that community. The question remains how to measure individual contributions to the goals of increased productivity, robustness, and niche creation.

In a recent special feature (http://www.nature.com/news/specials/metrics/index.html), *Nature* investigated the use of metrics for quantifying scientific contribution. Richard Van Noorden discussed the emergence of specific measures such as the h-index to quantify the impact of a particular researcher's contribution to the field. The h-index uses a two-dimensional assessment that has number of publications on one axis and number of peer references as the second axis. The result is a numerical score. An author that has published 10 articles that have each been referenced in another article 10 times would have an h-index of ten. This measure is useful for balancing number and relevance of publications, but has many limitations. One limitation is that the measure can remain static over time as the research presumably becomes stale and less relevant, that it can never go down, and that it focuses only on publications and ignores other types of scientific contribution. The analogy of this measure in open source is the number of lines of code contributed along one axis, paired with the number of times those lines of code are reused in other open source projects. Such a number could be useful for assessing the impact of a particular programmer, but may be much less useful for quantifying other types of open source contribution.

The field of Scientometrics has also borrowed lessons from webpage ranking algorithms, such as those used by Google for its search result rankings. Filippo Radicchi and his colleagues analyzed the entire publication archive of the journals published by the American Physical Society, comprising more than 400,000 papers. Their end result was the Phys Author Rank Algorithm (http://www.physauthorsrank.org), which ranks the diffusion of credits across journals in a field. Such an algorithm could be developed to track the diffusion of code snippets across projects hosted on SourceForge and rank the value of such contributions. Yet, again, such a measure would focus on code.

Most recently, the challenge of quantifying different contributions has been examined by analyzing social media. Mentions of research are tracked across various social media platforms, such as Twitter, Facebook, and blogs to provide a real-time picture of research activity. It is difficult to separate passing mention by someone who is not an expert in the field from reflected commentary by a peer in the field, yet it is exactly this sort of measure that may be the most useful for quantifying non-code contributions to open source communities. For example, it may be well-suited to measuring the contribution of a user who popularizes a particular open source project by posting a story on an influential website. This effect is frequently observed on news aggregate sites such as Slashdot (http://slashdot.org), Reddit (http://reddit.com) or BoingBoing (http://boingboing.net). Someone who has never written a line of code can bring instant fame to an open source project, directing tens of thousands of potential participants to the project by simply crafting a story that explains its use and submitting it to a popular news site. It is obvious that this sort of evangelism can be very important to an open source ecosystem, yet conventional measures would not value this contribution.

Johan Bollen, a researcher at Indiana University, concluded in recent research on the generality of scientific impact measures: "The notion of scientific impact is a multi-dimensional construct that can not be adequately measured by any single indicator, although some measures are more suitable than others" (http://tinyurl.com/29qxn6g). His research suggests - and the lesson for open source communities is - that clearly defining and understanding that which we want to measure is the most challenging task. Metrics can provide useful information, but if it is not clear what is being quantified, metrics can give the illusion of accurate representation of an effect that does not exist.

**Finding Further Interdisciplinary Lessons**

The examples described in this article illustrate the power of searching outside of one's own field of study for inspiration. In many cases, these lessons arrive by serendipity. But how can interdisciplinary lessons be actively sought out? The amount of information and the sheer number of fields from which to draw lessons is prohibitively large. A carefully considered approach should be used to find the most relevant lessons, which can be broken down into thought exercises that narrow down the focus to the most salient options.

1. Clearly define the objective. Is it to generate more revenue for the company, create more features in the product, promote the product to a broader audience, receive a grant, strengthen complementary assets, or increase user satisfaction? The objective frames the search for a solution and sets the stage for generating ideas to find it.

2. Generalize the problem. Nearly all problems have existed in a similar form elsewhere. It is highly unlikely that the problem is so unique that a completely novel solution is required. Creating an abstraction of the core problem by removing detail specific to the context makes it easier to see similar problems in other fields.

3. Look for patterns of similarity across fields. Active observation can happen during exposure to other fields during daily activities, such as reading and networking. Often, similar problems - and different approaches to resolving them - can be found where they were not noticed previously. Actively looking for patterns increases the chances of finding relevant lessons.

**Conclusion**

By examining the lessons learned in other fields, open source communities can adopt strategies to help improve their innovation, social development, and revenue. They can also learn to better measure contributions to the health of their ecosystem. Open source champions and community development managers should embrace broad perspectives and consider looking through the theoretical lenses of other disciplines when facing the challenges of growth, relevance, and sustainability of their ecosystems. Uncovering the specific interdisciplinary lessons that are most relevant to a particular community's current obstacles can be challenging and requires a considered approach, but the potential for reward is great.

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*"When creatives form a productive connection based on shared passion, they feed each other's energy and build momentum toward greater achievements than would have been possible independently – something that all talented individuals intuitively understand."*

John Hagel

OpenOttawaLibre (OOL) is a multidisciplinary approach that is being developed to strengthen Ottawa's position as a creative city. Faced with stiff competition from globally dominant mega-centres, smaller cities like Ottawa can compensate for their size by actively bringing together people to exchange ideas, share perspectives, and form new partnerships to solve existing and emerging problems. OOL will make it easy to organize these events and lower the risk by developing an ecosystem with experienced facilitators, physical resources, and proven processes. OOL is anchored by Ottawa's cultural planning group and aims to make Ottawa a global magnet for creative industries and talent.

**Background**

The OOL approach is motivated by a notion that Ottawa is already a creative city, but it does not perceive itself as such. The City of Ottawa has looked for ways to both demonstrate the creative potential of the city and to harness its power. Over the last few years, a number of discussions, proposals, and groups coalescing in different sectors have revealed a common desire to create a dynamic and exciting place for creative innovation that would be unique to Ottawa. There is now an opportunity to bring these groups together and to start a wider dialogue towards meeting this challenge.

The catalyst for OOL began two years ago when the City of Ottawa, in partnership with Simon Fraser University, hosted a symposium on creative spaces. Creative hubs were a focus of much discussion at that event and staff from the City of Ottawa wanted to find a way to bring that model to Ottawa. As a further benefit of interdisciplinary discussions during the symposium, the City's cultural staff began to network and share ideas with organizations that foster innovation and creativity. From these discussions, they became aware of an event called OPEN 09.

**OPEN 09, Sandbox, Turtles, and RED**

OPEN 09 was held in November 2009 in Preston, UK and catalyzed OOL's approach to event facilitation for creative industries. As described on the event's website (http://www.open09.com): "Open 09 breaks with the normal conference model and creates a new participatory experience to explore, inform and create change in the Digital and Creative sectors. OPEN 09 is a facilitated, participant-driven event centred around creativity, innovation and its future."

Two aspects of the OPEN 09 event were particularly innovative: the event format and its facilitation technology. OPEN 09 was created and facilitated by Sandbox (http://www.sandbox.uclan.ac.uk), an initiative from the University of Central Lancashire. Sandbox brings together a wide range of skills and expertise to enable innovative and collaborative ways of working. The event format encourages interdisciplinary interaction by splitting the participants into group sessions, called "Turtles" where group members discuss and debate specific themes that were crowd-sourced (http://en.wikipedia.org/wiki/Crowdsourcing) from the wider group prior to the event. Remixing the participant groups and repeating the Turtles several times over the course of the event serves to build upon each session's progress and maximizes interdis-

ciplinary interactions. This process has been shown to be highly effective in breaking through organizational barriers and polarized thinking in a way that participants find engaging and stimulating.

To improve the scalability of the Turtle concept, Sandbox drew upon their existing toolkit of facilitation technology, including a custom digital facilitation application, called RED, which they had developed. RED allows groups of people to easily capture and share their responses in real time. It allows participants to anonymously and collaboratively communicate, explore, and drill down into topics that require a shared understanding. The technology also captures the output of these interactions for analysis and dissemination following the event.

**Prototype Event**

Following the success of OPEN 09, the OOL team began to plan a similar event in Ottawa and enlisted the help of Professor Simon Robertshaw, the Director of Sandbox. It was decided to first hold a prototype event to gauge the community's interest in holding a larger event and to refine the event format. Approximately 40 people from diverse industries were invited to attend the prototype event, which was held on June 9, 2010. The scope of the prototype was equivalent to one of the Turtle groups of which there were a dozen in the OPEN 09 event.

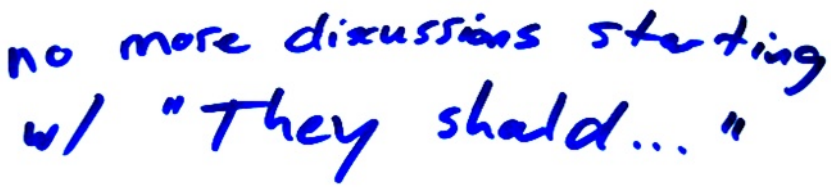
The first question posed to the Turtle participants was "How do we make Ottawa the most creative city in Canada?". In subsequent rounds, secondary questions prompted participants for an actionable response, for example: "How do you make your idea happen" or "How would you spend $500,000?". The process was repeated two more times with two more questions. Participants each captured their ideas and reflections of the group discussions on large sheets of paper, which were later displayed between sessions and analyzed following the event. Detailed harvesting of ideas were done in special sessions using wireless keyboards. RED, facilitation software developed by Sandbox, allowed participants to see all the feedback projected on to a large screen in real-time. The ability to see that information from the larger group fueled even more ideas in the room.

The aim of the prototype that day was to see if people could engage with the process and to see if bringing a diverse group together would stimulate ideas. The prototype event would ask the question: "Should we do this again but on a much larger scale?" The answer was a resounding yes. Much of the feedback noted the need for this type of exchange. Participants felt they need a place to meet, where creative interactions between disciplines can occur. The event also revealed a willingness of the participants to take an active role in addressing issues of common interest, rather than simply passing it off as another person's responsibility. This sentiment is reflected in a sample of the written output from the event (Figure 1.)

**Beyond the Prototype: The OOL Model**

The prototype event helped demonstrate the facilitation approach to selected people in Ottawa, but it also helped the core team to mentally connect it with other organizational models, in particular that of a business ecosystem. The model of OOL as an environment with players, resources, and processes aligned to a shared outcome is entirely consistent with that of business ecosystem platform. Using this framework, OOL can be designed systematically, benefitting from the learning taking place in this related domain.

**Figure 1. Participant Feedback Captured During the OOL Prototype Event**




At the centre of OOL, is the concept of an event: a facilitated session where diverse talent is brought together to collaborate on a topic of common interest in a novel and openly shared process. Essentially, this systemizes the process of an accidental encounter, actively bringing together self-selected creative people from multiple disciplines and focusing their attention on a topic of common interest. The goal is to make these events scalable and easy to organize by establishing the necessary resources, processes, and skills in the ecosystem. By reducing the barriers and encouraging event frequency, a supporting organization could become self-sustaining and anchor a multi-use cultural facility that creates a new capacity for both creation and consumption of cultural works in the city. This facility would provide a cost-effective means of allowing the organization to perform its role of fostering collaboration between multidisciplinary teams from science, medicine, engineering, academia, and government.

**The OOL Approach**

The activities of OOL use a consistent approach where self-selected stakeholders participate in interactive group discussions of their choice and work collaboratively towards meaningful and actionable output. Half-hearted participation is a lose-lose proposition that should be discouraged.

The OOL process follows a path from interactions in an online environment that culminate in a face-to-face group event. The online forums and face-to-face event are structured to be highly complementary. The strength of an online forum is its ability to cast a broad net of participation, allow time for introspection, and efficiently harvest small slices of attention. In contrast, a face-to-face event is intense and time constrained. OOL has chosen to adopt the Turtle format, which has been shown to be effective in breaking through organizational barriers and polarizing thinking in a way that participants find engaging and stimulating.

**The OOL Technology**

To prepare for a given event, it is important to gain a critical mass of commitment and engagement to make the event meaningful and productive. This requires several things to come together:

1. People need to attach themselves to a problem worth solving.

2. The problem must be sized and shaped by the group to make it realistic to attack with resources available.

3. The group must gain sufficient critical mass and diversity to unleash the value of the process.

There are two major technological elements that are part of the OOL environment before, during and after the events: the online website and the event platform.

The website includes a multi-user blogging and forum environment with plans to support a self-organizing group formation engine. Using the online forum, OOL participants can join discussions around selected event themes. The goal of the forum is to bookend the physical event with open and shared discussions that shape the input to the Turtle themes. The forum is also used to later interpret the Turtle output for the benefit of the broader online community.

The event platform is currently based on the RED application from the Sandbox toolkit, with a goal to extend support to remote Turtles using a derivative the BigBlueButton (http://www.bigbluebutton.org), an open source web conferencing application.

**Next Steps**

The OOL team is in the process of planning a large event to be held in late 2010 or early 2011, but is also acting to realize its wider vision. But what has only recently been surmised, is how by creating OOL, Ottawa could more effectively compete against larger centres. OOL creates an artificial environment where we actively assemble a density of creative talent that have established trusted relationships and have them participate in a facilitated process that results in innovative and actionable output. In this way, OOL will foster collaboration amongst diverse disciplines, enable partnerships, and generate new possibilities to help build Ottawa as a creative city. The next steps will be driven by the intent to harvest creative energy and resources in order to:

1. Foster stronger discourse and collaboration aimed at generating ideas that solve problems and that can lead to innovation.

2. Nurture and connect Ottawa's local cultural and digital media industries.

3. Identify community needs, gaps and opportunities that can be addressed through policy, process and product development.

**Conclusion**

OpenOttawaLibre is an opportunity for both the City of Ottawa and as a model for other regional cities to consider adopting to deliver a higher quality of life alternative for creative talent and industries. It does this by systemizing the serendipitous process of encounters and creating a trusted but open environment that enables individuals from diverse backgrounds and points of view to collaborate on issues of mutual interest and shared passion. This is done by actively shaping the local environment to better deliver the desired outcomes.

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*Julie DuPont is a Cultural Planner for the City of Ottawa (http://www.ottawa.ca), she has a degree in fine art and a diploma in fine metals. Julie has been working in project management of Public Art for the last 20 years. She has a keen interest in digital technology and creative ideas.*

# DEAL DEVELOPMENT IN BUSINESS ECOSYSTEMS

*"Let's make a deal!"*

Monty Hall

This article describes a project to develop a platform that promotes transactions between customers and suppliers within a business ecosystem. A web-based platform is being developed to track customer interactions and manage the flow of deals through development stages. The solution will be implemented using an open source customer relationship management (CRM, http://wikipedia.org/wiki/Customer_relationship_management) tool that will be customized to suit the particular needs of a business ecosystem.

**Introduction**

A key indicator of a healthy business ecosystem is its ability to generate revenue for all the players involved. In his June 2010 OSBR article (http://tinyurl.com/32jlwm7), Tony Bailetti defined a business ecosystem as "a community of companies, organizations and individuals that share a desire for achieving high-impact, system-level results and deliver benefit to their customers, partners and community members from their interactions using a multi-sided platform." Within this community, deals are the key revenue generator. This article examines how a platform can promote ecosystem health by encouraging more deals to be created and closed.

In the Technology Innovation Management program (TIM, http://carleton.ca/tim) at Carleton University, a lead project is underway to develop a deal development platform for business ecosystems. Using a local technology business ecosystem, Lead to Win (http://www.leadtowin.ca), a prototype framework is being developed that can be extended to other business ecosystems. The first half of this article defines a deal flow process. The second half of this article describes the implementation of an open source CRM tool to track customer interactions and manage deal flow, with functionality customized to the particular needs of business ecosystems.

**Lead Project Overview**

The goal of the deal development project is to provide a web-based prototype solution tailored to business ecosystems. The project began in June 2010. Development of the deal flow platform is proceeding through the following steps:

1. Define deal players and their responsibilities.

2. Define stages of ecosystem deal flow.

3. Specify technical requirements.

4. Implement technical solution.

5. Deploy the prototype to be tested by lead users.

6. Evolve as necessary.

The following sections describe the project's progress to date through each of these steps and the lessons learned.

**Players and Their Responsibilities**

A typical deal supported by the platform will have the following players:

1. **A customer**: a company or individual that brings a problem to be solved.

2. **An orchestrator**: a company that will serve as a middleman between the customer and the rest of the ecosystem to simplify interactions with the customer and coordinate the actions of the suppliers.

3. **A primary contractor**: an entity responsible for delivering most or all of the solution.

4. **Suppliers**: other companies who will be delivering parts of the solution.

Without a customer and their problem, there is no deal. Customers bring the problems that need to be solved and they contribute feedback to the development of the proposed solutions. Importantly, they also bring the money.

The primary responsibility of an orchestrator is to mediate between the ecosystem and the customer. An orchestrator should find companies within the ecosystem with the necessary skills to craft a solution to the customer's problem. The orchestrator should also interact with the customer to ensure that changes to requirements are passed along to the primary contractor and suppliers. Any ecosystem player could theoretically become an orchestrator. However, orchestrator selection will usually favour the most qualified, experienced, well-connected, and trusted players. In special circumstances, a customer may orchestrate their own deal, which is more likely when the customer has participated in the ecosystem long enough to become familiar with the way deals operate within it.

The primary contractor is responsible for performing most or all of the work. It advises the orchestrator of the required timescales, resources, and services. It may also help the orchestrator find contractors with the skill sets necessary to build a solution for the customer, particularly if specialized skills are required. There are no formal requirements for primary contractors. The selection is made by an orchestrator based on the primary contractor's level of trust, reputation, and technical skills.

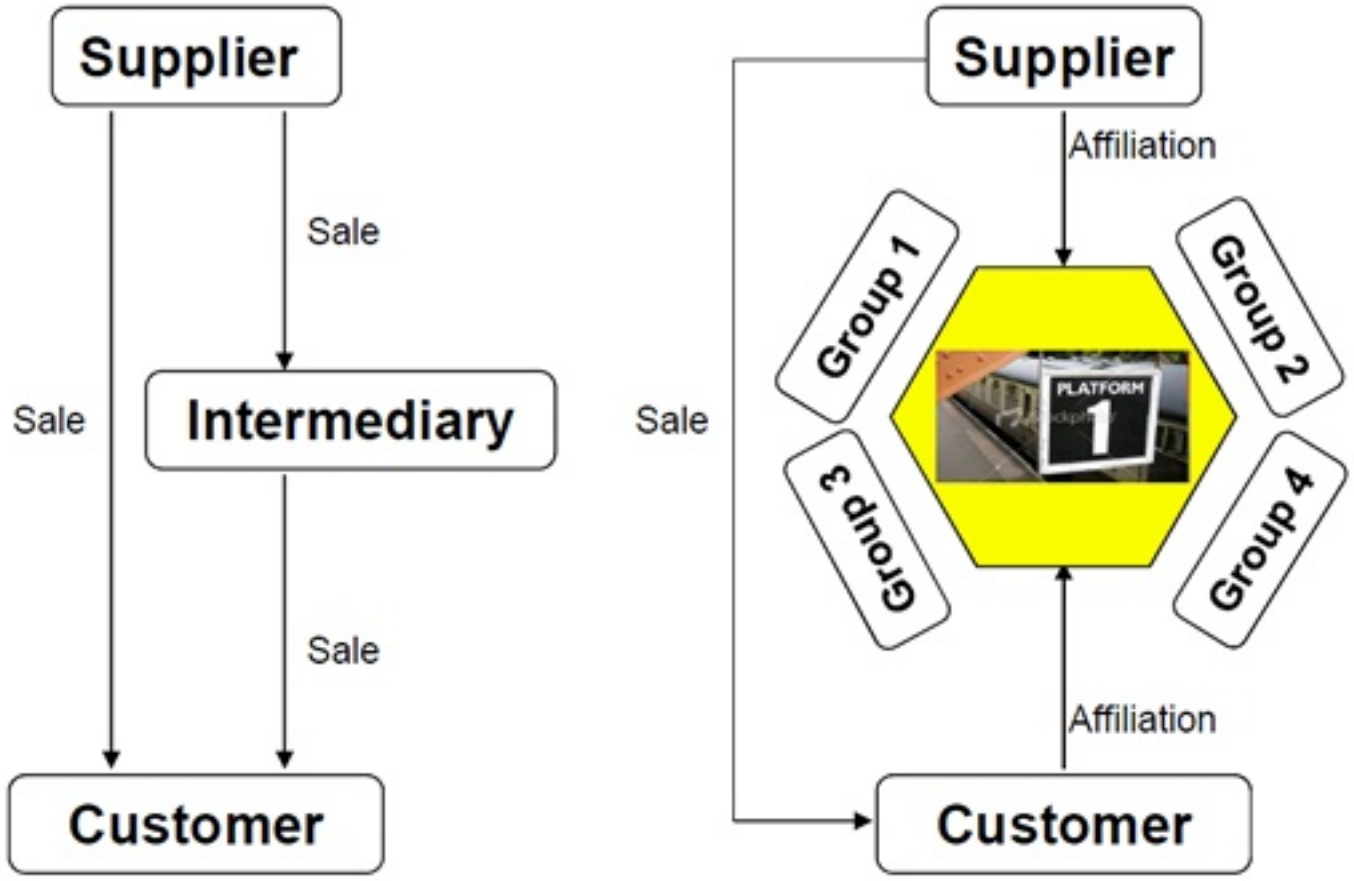
Suppliers are typically small companies that cannot reach customers directly or have a limited view of the big picture of a customer's problem even when the customer is already affiliated with the ecosystem. These companies need a channel to go to market and the deal development platform provides this channel. Suppliers may be contracted directly by the orchestrator or by the primary contractor depending on the requirements of the solution.

Other players may be involved during different stages of a deal development process to provide their expertise and services. For example, subject experts acting as service providers may be involved during the screening of potential opportunities to help to help determine whether there is sufficient capability within the ecosystem to solve the problem. Later on in the process, a contract may require legal and intellectual property experts to ensure that it fully covers the rights, responsibilities, warranties, and liabilities associated with the deal, as well as the relationships of other companies who participated in creating a solution for the customer.

**Why Deals Within Business Ecosystems Are Different**

The roles described in the previous section and the nature of interactions between the players represent a significant shift from the traditional customer-supplier relationship, where the supplier interacts directly with the customer or through an intermediary to make the deal. In a business ecosystem, both the suppliers and customers are affiliated with the ecosystem. Tony Bailetti discussed this shift in his June 2010 OSBR article (http://tinyurl.com/32jlwm7) and his illustration of these relationships is reproduced here as Figure 1.

**Figure 1. Traditional Supplier-Customer Relationships Versus the Business Ecosystem Approach**




The business ecosystem approach takes advantage of shared affiliations to connect suppliers and customers to intermediaries, orchestrators, and other members through the deal development platform. The existence of the platform creates advantages for all members over the traditional model and brings players together through their common interest in making a deal. Efficient deal making, reduced transaction costs, and greater opportunities for collaboration and co-creation are expected.

**Deal Flow Stages**

As a deal progresses, it moves through several defined stages (Figure 2). In the first stage or the proposed deal flow, a potential deal begins when a customer submits a problem. The problem is then evaluated to determine whether it represents an opportunity for a deal. To proceed, a problem must be feasible and a good fit for the supplier capabilities in the ecosystem. Once a problem is qualified as an opportunity, it progresses to

the next stage, where orchestrators submit proposals to solve the problem.

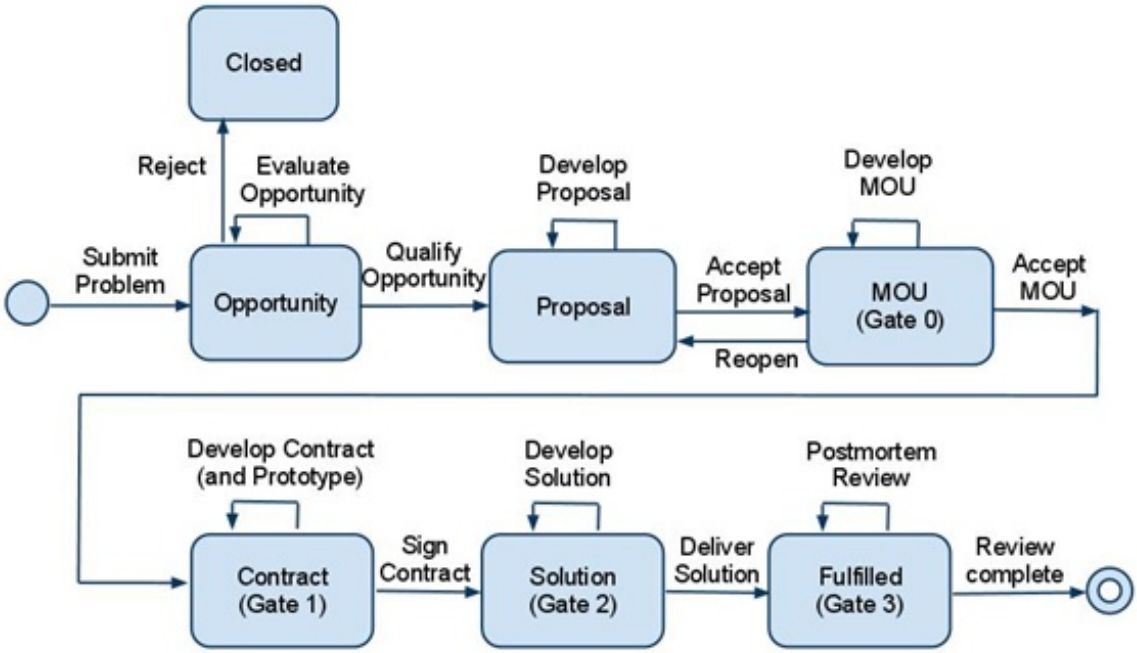
During the proposal stage, iterative improvements may be suggested based on customer feedback. Once the customer accepts a proposal, a memorandum of understanding (MOU) is created by the customer and the orchestrator. The MOU is not binding; if subsequent progress is unsatisfactory, the customer can re-open the problem for additional proposals.

The MOU stage is also known as Gate 0. Gates are points in the process where certain conditions must be met before the deal can proceed to the next stage. For example, the condition for moving through Gate 0 is acceptance of the MOU by all sides.

Next, the deal moves to the contract development stage, where the objective is to pass through Gate 1 by completing and signing a contract. The contract is developed between the customer, the orchestrator, and the primary contractor. In parallel, the primary contractor and suppliers will also work on the prototype solution, which may be complete by the time the contract is signed and the deal passes through Gate 1.

Once the contract is signed, the deal moves into the solution delivery stage, where the solution is developed and then delivered. Once it is delivered, the deal passes through Gate 2 and is considered to be fulfilled. Finally, Gate 3 signals the completion of postmortem reviews, undertaken to capture feedback and to evolve the deal flow mechanism.

**Figure 2. Deal Development Stages**



**Implementing the Platform**

Up to this point in the project, the focus had been on the players and the procedural stages that a deal passes through until completion. The next step is to implement a platform for managing this process. The previous steps provided insight into the technical requirements of a platform:

1. All ecosystem members must have access to the platform.

2. All proposal and deal documentation must be stored in a common database.

3. All interactions between players must be tracked.

4. The status of a each deal must be tracked, including the details of its progression through each stage of the deal flow.

5. Different levels of access privileges must be implemented to prevent access to confidential information by members of the ecosystem who are not part of that deal.

6. An individual may have different access privileges for different deals, depending on their role in each deal.

The parallels between the proposed deal flow and the activities involved in managing customer relationships in a single company pointed to a customer relationship management tool as the preferred starting point for implementing the platform. Considering the diversity of players that need access, a web-based solution was required. Finally, the need to customize the application to suit the unique context of a business ecosystem suggested that an open source solution should be used.

In the following section, the traditional use cases for CRM and its related tools provide the necessary background to understand the key functionality of these tools and how they may require customization to suit business ecosystems.

**Traditional CRM Use Cases**

CRM has been well studied and practiced for over a decade. All commercial CRM tools support processes for lead management, sales, marketing, and support. They enable the user to efficiently manage the flow of each customer account through each of these processes. A typical CRM use case is in support of sales force automation and call center management.

Many proprietary and open source CRM tools are available and they are now commonplace in traditional business settings. However, the presence of a CRM tool and related IT technology does not automatically achieve good CRM practice and outcomes. Most off-the-shelf CRMs support marketing and sales processes very well, but they are limited to these activities. To be effective, the technology must handle all of the customer information management processes necessary to achieve end-goal performance for the organization.

The ideal approach is to establish a customer-centric culture and management approach and then select and modify the technology to provide the necessary support. The processes should be evolved over time based on feedback from the outcome performance, which is measured relative to the goals of the company or platform. An organization's CRM must be focused on managing the entire customer lifecycle relationship rather than being solely concerned with transaction-based relations or one-on-one relations.

In other words, a strategic approach is required to achieve the goals of the firm. A good CRM tool is of little use if the data are not being used for strategic planning or if it is not known how data from the tools and CRM processes relate to end goals of the company. This approach requires an ongoing and evolving process for managing customer relationships. Feedback from past performance informs new strategies for the organization to provide value to the customer.

**Adapting a CRM for a Business Ecosystem**

While a CRM system can be a useful tool in streamlining the way that a company interacts with customers, deploying such a tool for ecosystems presents significant challenges. Existing CRM applications are made for single companies. In an ecosystem, there are many players interacting with other members and customers. During deal making, each of the players should be able to see the content relevant only to deals in which they are participating. This requires an extended system of access privilege control and additional account features. Similarly, a process for deal development within an ecosystem is different from traditional contract development between one company and another. In order to develop such a process, ecosystem researchers should work together with orchestrators, suppliers and customers, as well as legal experts and other users of the processes, creating opportunities for multidisciplinary work.

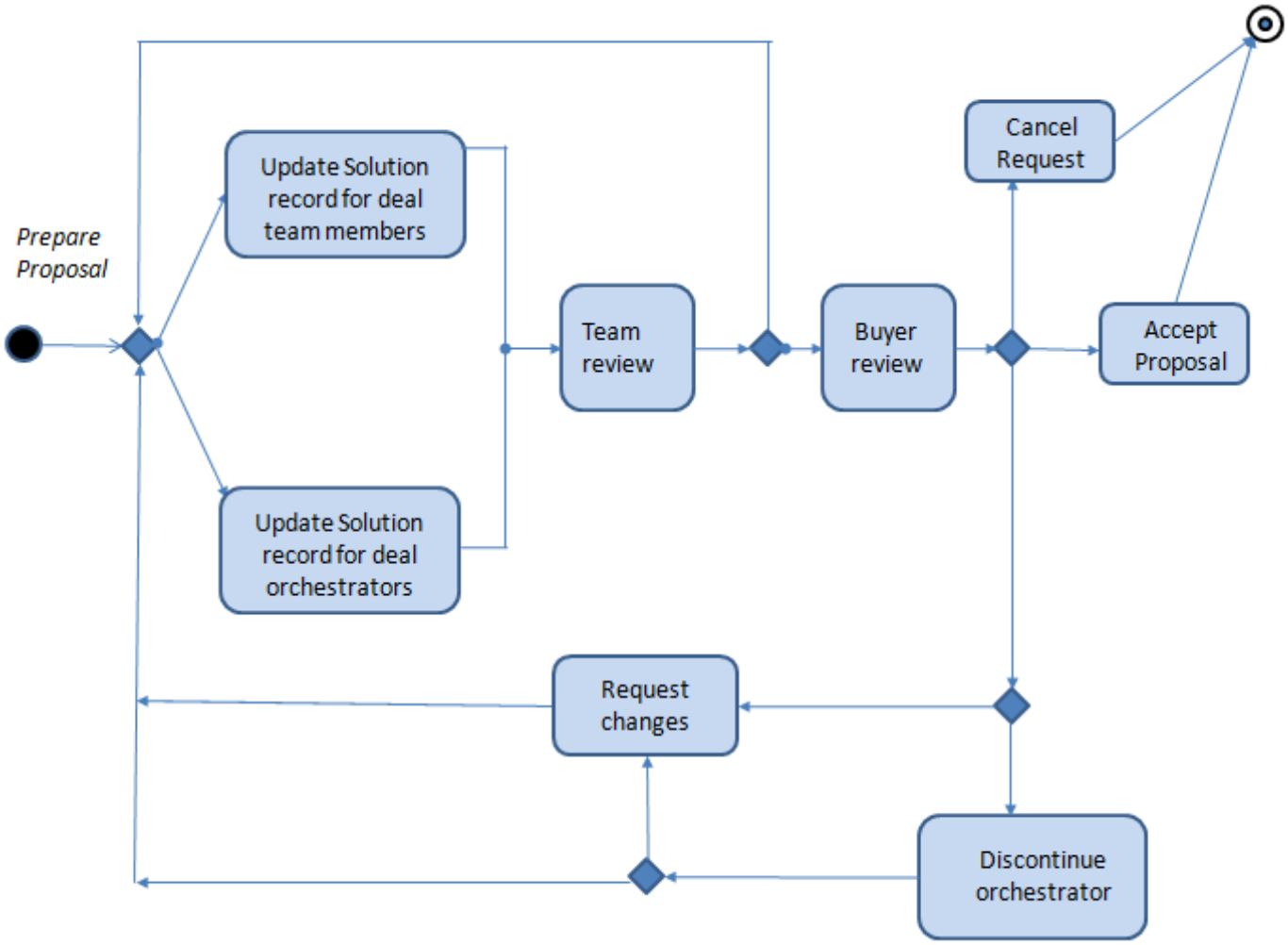
The deal flow has implications for the adaptation of a CRM tool at the level described in Figure 2, but also within each stage of deal progression. Throughout the process, the CRM must log all decisions and interactions between players, along with the documents required for that stage. As the deal progresses within and between stages, the relevant documentation must follow.

To illustrate how the CRM tool may be used, Figure 3 shows the possible activities that comprise the proposal stage (Gate 0). This stage starts with the input of a qualified opportunity and ends when the proposal is accepted or withdrawn. Before starting, teams are assembled and roles are assigned and the team structure and player roles are reflected in the CRM tool. Orchestrators have access to all data, but the access of members is limited by their role. Each update their documents and submit them for review by one or more team members and then the customer. The outcome of the review could result in further changes with or without a change in orchestrators, acceptance of the proposal, or cancellation of the proposal. If the proposal is accepted, the deal has passed Gate 0 and it enters the next stage of the deal flow.

The CRM tracks the progression of the deal and automatic notifications can be sent to all interested parties when a new stage is reached. Throughout the process, the CRM logs all interactions, including emails, voice communications, notes, documents, contacts, and meetings. The data will be used to analyze relationships and inform future strategy planning and performance improvement.

To help users initiate a deal and progress it through the various stages, the CRM tool should provide generic templates for documents and activity flow. In a large ecosystem with a variety of companies supplying products and services for customers, and with participants of various roles contributing towards a final deal, the level of deal complexity and variability is likely high. It is difficult to anticipate what will be required for a "generic deal". For the purposes of this project, a number of case studies will inform the initial template, which will evolve over time. The goal is to make it flexible to support future evolution.

**Figure 3. Activity Flow Within the Proposal Stage**




## Conclusion

A CRM-based deal development platform adds value to a business ecosystem by providing customers with an interface to an ecosystem and reducing their transaction costs. For suppliers, it provides an efficient means to submit proposals and make deals, which ultimately increases their opportunities for revenue generation. A robust deal development platform that simplifies the response to a customer's need, while reducing the cost of going from problem to solution, can provide a competitive advantage for a business ecosystem and its members.

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# A VISUALIZATION TOOL FOR COMPLEX NETWORKS

*"Visualization and belief in a pattern of reality activates the creative power of realization."*

A. L. Linall, Jr.

Faced with an ever-increasing capacity to collect and store data, organizations must find a way to make sense of it to their advantage. Methods are required to simplify the data so that it can inform strategic decisions and help solve problems. Visualization tools are becoming increasingly popular since they can display complex relationships in a simple, visual format.

This article describes Bloom, a project at Carleton University to develop an open source visualization tool for complex networks and business ecosystems. It provides an overview of the visualization technology used in the project and demonstrates its potential impact through a case study using real-world data.

**The Bloom Project**

Bloom was initiated in the spring of 2010 by graduate students in the Technology and Innovation Management program (TIM, http://www.carleton.ca/tim) at Carleton University in Ottawa. The project's mandate is to use open source visualization tools and techniques to develop a platform to visualize the structure and relationships within complex networks. A web-based prototype was developed using a combination of open source tools, including Prefuse-Flare (http://flare.prefuse.org), MySQL (http://mysql.com), Glassfish (https://glassfish.dev.java.net), and Eclipse (http://eclipse.org). These tools were chosen because of their maturity and flexibility. When combined, they enabled rapid development of a new visualization prototype that can be readily customized.

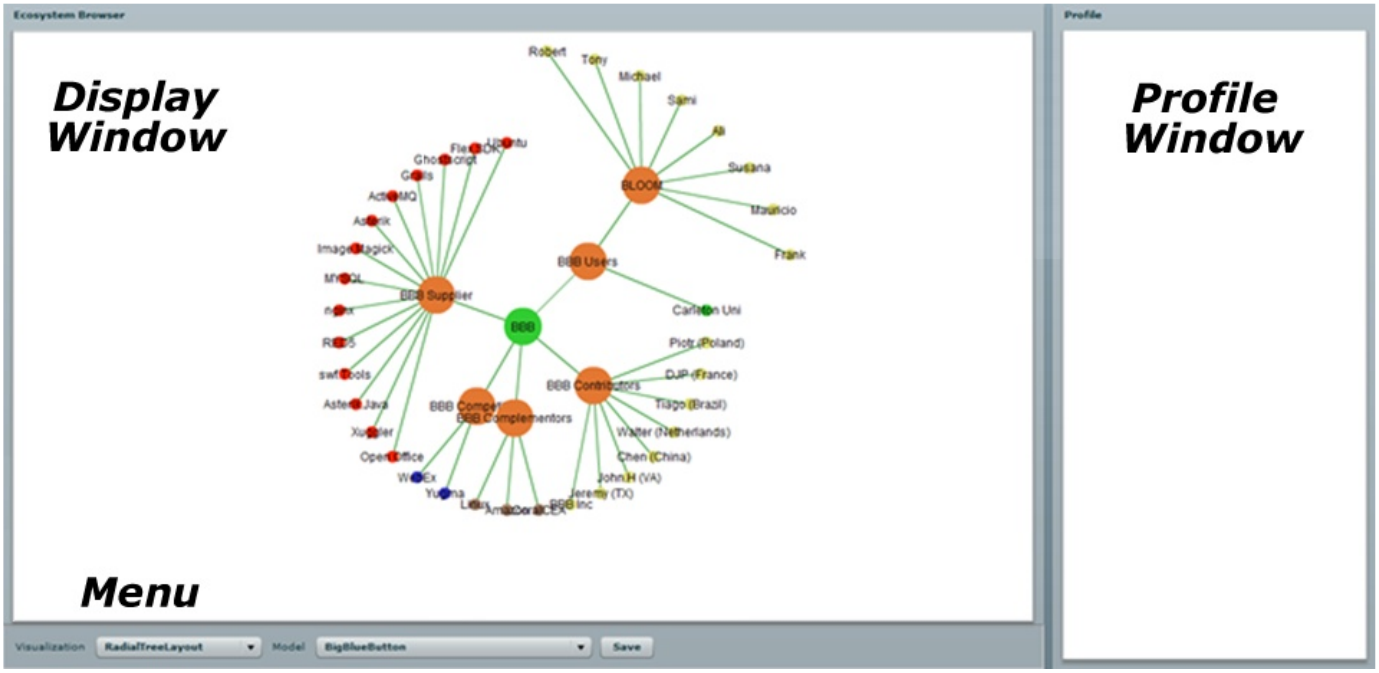
The main component of the platform is Prefuse-Flare, an open source visualization project that began at Berkeley University. As described on the Flare website: “Flare is an ActionScript library for creating visualizations that run in the Adobe Flash Player. From basic charts and graphs to complex interactive graphics, the toolkit supports data management, visual encoding, animation, and interaction techniques. Even better, flare features a modular design that lets developers create customized visualization techniques without having to reinvent the wheel.” Flare provides the baseline visualization capabilities to which customizations will be added as the project proceeds and its technical requirements are refined.

**Prototype Overview**

To test the platform prototype and its capabilities, data were gathered from the business ecosystem surrounding BigBlueButton (http://bigbluebutton.org), an open source web conferencing solution. Here, these data are used to demonstrate the basic functionality of the visualization tool (Figure 1).

The interface is separated into three main areas: the display window, the profile window, and the menu. In the display window, the data are visualized and the user can explore the output by selecting items on the displayed structure. The profile window displays relevant information regarding the selected item. At the bottom of the screen, the menu provides options for changing the display type and data source. Figure 1 shows the Radial Tree layout. Other available display types include: Circle (Figure 2), Indented Tree (Figure 3), and Node Link (Figures 4 and 5).

**Figure 1. Bloom Prototype: Visualization Tool Interface**

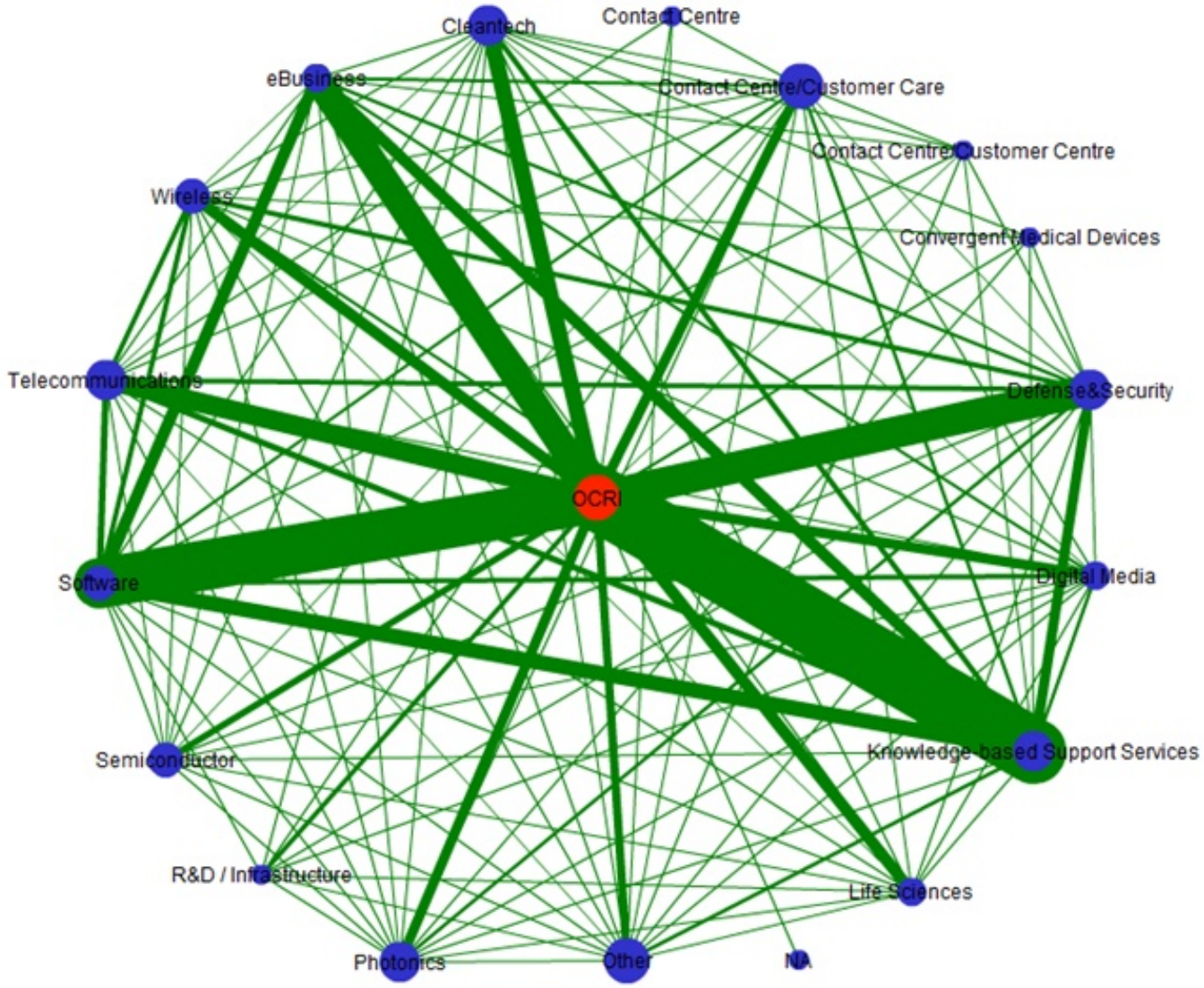



**Case Study**

A case study was developed in collaboration with the Ottawa Centre for Research and Innovation (OCRI, http://ocri.ca). This presented an opportunity to assess the scalability of the tool by creating a visualization of a large, complex network. OCRI maintains a database of 1,900 members, representing over 7,000 registration records. The case study also provided direct interaction with users; their interpretations and feedback would allow the team to focus further refinements of the tool. Following a positive case review with members of OCRI's executive team, subsequent sessions were scheduled to drive refinements of the tool to meet their specific needs.

Figure 2 shows OCRI's network of 18 high tech industry sectors, displayed using the prototype visualization tool. Each circle represents a sector and is sized according to the number of connections to other sectors. For example, the Contact Centre sector has fewer interconnections than the Cleantech sector and it is accordingly smaller in the visualization. The width of the lines that connect the sectors increase based on the number of companies that are included in the relationship. The Knowledge and Support Services sector has the largest number of relationships, while Contact Centre is one of the smaller sectors. The visualization also shows that there are strong ties between the Knowledge Support Services sector, the Software sector, and the eBusiness sector.

**Figure 2. Bloom Prototype: Circle Display of OCRI Member Relationships**



This case study demonstrates the capability of the tool to display and manipulate information. For example, a user can select different displays to explore the data and choose a representation that matches their own conceptual model. By selecting an industry sector and dragging it across the screen, a user can highlight and extract information specifically related to that sector. As shown in Figure 3, the Cleantech sector has been selected and now shows the strength of its relationship to other industry sectors.

The user can drill down into the data to display additional details regarding the company member registrations in the industry sub-sectors. Figure 4 shows a

**Figure 3. Bloom Prototype: Indented Tree Display of Cleantech Sector**

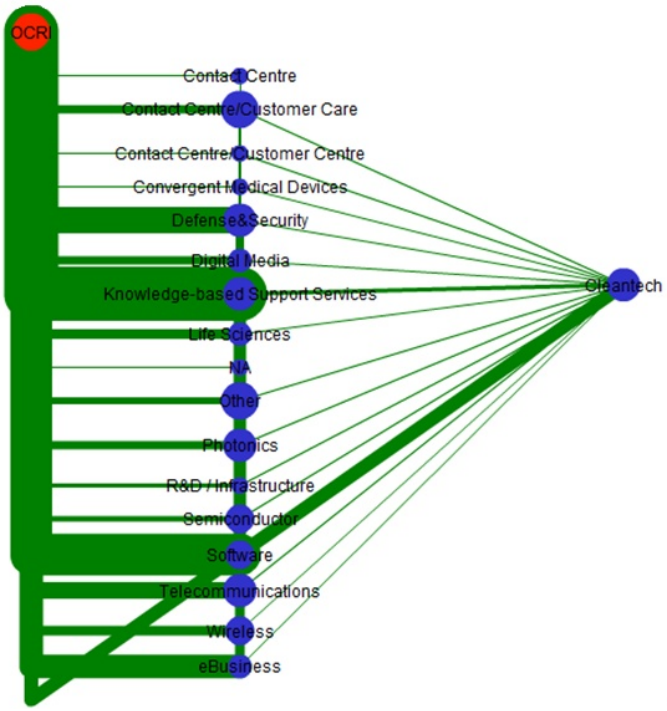



**Figure 4. Bloom Prototype: Node Link Display**

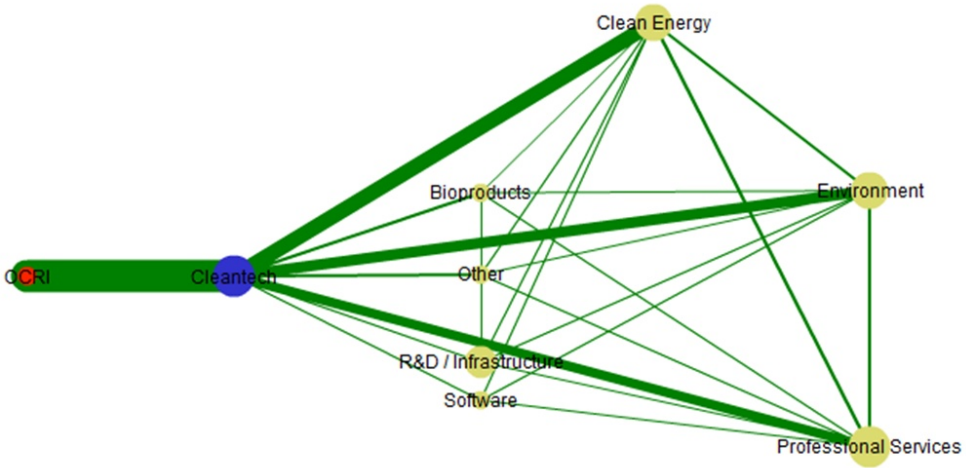
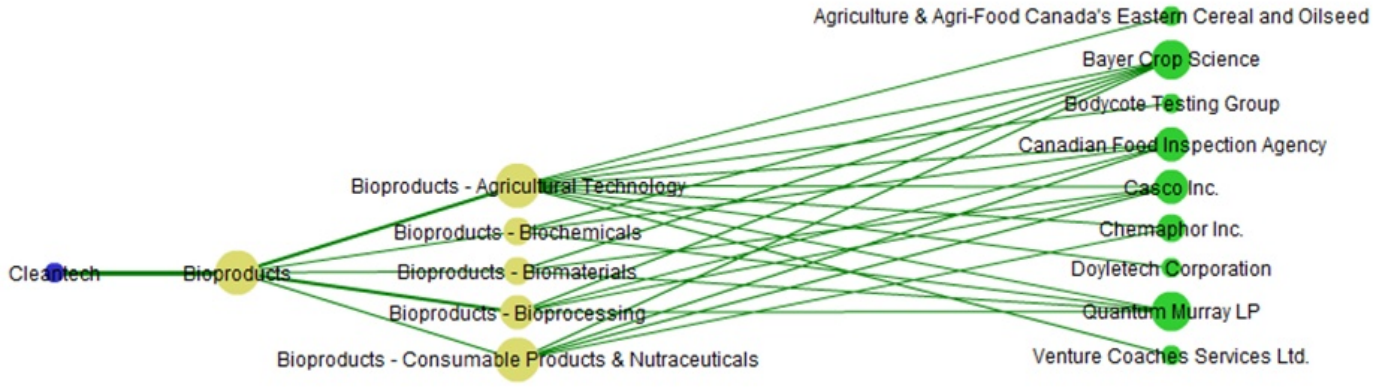


**Figure 5. Bloom Prototype: Node Link Display Showing Member Company Relationships**




Node Link display of the Cleantech sector, which allows the user to see that the Cleantech industry has been subdivided into seven sub-sectors with strong relationships to 'Clean Energy', Environment, and Professional Services.

By selecting the Bioproducts icon, a display is presented that highlights the member companies and their relationships. Figure 5 shows this additional level of detail, again using the Node Link display. In this example, nine companies are registered in this Cleantech industry sub-sector.

## Conclusion

In complex networks, the sheer amount of data and its numerous interconnections prevent decision-makers from easily probing the data and discovering relationships within it. The visualization platform adds value as an enabler in the management and development of these networks. It provides users with the ability to view, assemble, and modify the components presented in the display, and to view a snapshot the network at any point in time, without requiring the technical skills to develop and maintain a database.

The Bloom project team is currently enhancing the capabilities of the visualization tool for use in business ecosystems. Because the concept of creating and maintaining business ecosystems is relatively new, few automated tools exist to assist members in understanding the relationships of the ecosystem being developed. The goal is to retain the value of the visualization tool as a general application to graphically display data in complex networks, while developing its capability to build and better understand relationships within business ecosystems.

*Frank Horsfall is a graduate student at Carleton University in Ottawa who is researching visualization for business ecosystems. He is also the Project Founder and Lead of Bloom and President of EnTeraSec Inc. (http://www.enterasec.com), a security services company in the Lead to Win business ecosystem.*

**Open Source Hardware Draft Definition Version 0.3**

**From the Introduction:**

"Open Source Hardware (OSHW) is a term for tangible artifacts – machines, devices, or other physical things – whose design has been released to the public in such a way that anyone can make, modify, distribute, and use those things. This definition is intended to help provide guidelines for the development and evaluation of licenses for Open Source Hardware.

It is important to note that hardware is different from software in that physical resources must always be committed for the creation of physical goods. Accordingly, persons or companies producing items ("products") under an OSHW license have an obligation not to imply that such products are manufactured, sold, warrantied, or otherwise sanctioned by the original designer and also not to make use of any trademarks owned by the original designer."

http://freedomdefined.org/OSHW

**Canada's Digital Environment for Research, Innovation and Education**

**Copyright:** Canada's Advanced Research and Innovation Network (CANARIE), Canadian University Council of CIOs (CUCCIO), Canadian Research Knowledge Network (CRKN), Canadian Digital Media Network (CDMN), and Compute Canada

**From the Executive Summary:**

"Canada has developed a strong digital foundation but the five organizations participating in this joint submission believe strongly that Canada must move beyond ad-hoc development of the separate elements of the emerging digital environment for RIE and take a systemic view. Canada needs a strategy for an integrated digital environment, together with a vision of how the various elements, and the organizations that provide them, must align. We further assert that the framework presented has the potential to spur broad downstream positive effects across private and public sector domains within the innovation system."

http://www.canarie.ca/DES_Submission_E.pdf

**September 15**

Women Who Tech

**Global**

"The 3rd annual Women Who Tech Tele-Summit will bring together over 600 women from across the US and abroad in the non-profit, political and business world for an incredible lineup of thought provoking panels featuring technology change makers."

http://www.womenwhotech.com

**September 18**

Software Freedom Day

**Global**

"Software Freedom Day (SFD) is a worldwide celebration of Free and Open Source Software (FOSS). Our goal in this celebration is to educate the worldwide public about of the benefits of using high quality FOSS in education, in government, at home, and in business – in short, everywhere! The non-profit company Software Freedom International coordinates SFD at a global level, providing support, giveaways and a point of collaboration, but volunteer teams around the world organize the local SFD events to impact their own communities."

http://softwarefreedomday.org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ucreatemedia.com
catwalk networks
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data bridge
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Accentway
Triple Through Sustainability
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MarkOff Security

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 knowledgable resources available through the OSBR.

### Upcoming Editorial Themes

| | |
|---|---|
| **September 2010:** | Keystone Companies |
| **October 2010:** | Sales Strategy |
| **November 2010:** | Economic Development |

**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.

**Copyright:**


The Talent First Network program is funded in part by the Government of Ontario.


The Technology Innovation Management (TIM) program is a master's program for experienced engineers. It is offered by Carleton University's Department of Systems and Computer Engineering. The TIM program offers both a thesis based degree (M.A.Sc.) and a project based degree (M.Eng.). The M.Eng is offered real-time worldwide. To apply, please go to: http://www.carleton.ca/tim/sub/apply.html.