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# Editorial

## Chris McPhee and Tony Bailetti

**From the Editor-in-Chief**

***The editorial theme for this*** issue of the OSBR is Collectives. We have invited authors from Carleton University and the Government of Canada's Policy Research Initiative to contribute to this issue. I am pleased to welcome our Guest Editor Dr. Tony Bailetti, the Director of Carleton University's Technology Innovation Management program (http://carleton.ca/tim).

***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 May issue is Women Entrepreneurs and the deadline for submissions is April 15th. For subsequent issues, we welcome general submissions on the topic of open source business or the growth of early-stage technology companies. Please contact me if you are interested in submitting an article (chris.mcphee@osbr.ca).

**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.*

**From the Guest Editor**

***The articles in this issue*** of the OSBR focus on collectives that harness diversity to produce significant system-level outcomes. These collectives support members that belong to different groups and carry out activities in three different horizons: today's business (Horizon 1), the next generation of emerging businesses (Horizon 2), and the longer-term options out of which the next generation of businesses will arise (Horizon 3).

***In the first article, James*** Makienko and Antonio Misaka provide an update on the Keystone Off-The-Shelf (KOTS) project. KOTS integrates open source applications with proprietary products and services of innovative companies into a platform designed to support collectives that harness diversity to create jobs and enable small innovative companies to grow their revenue. The article describes the goals and the advantages of KOTS, the components that make up KOTS, as well as an overview for the first application of KOTS.

***Next, Ludovico Prattico and I*** describe the first application of the KOTS platform, which is the Carleton Entrepreneurs program. This unique program helps graduate and senior undergraduate students transform their ideas into compelling opportunities and successful businesses and strengthens the entrepreneurial spirit at Carleton University. KOTS is the engine behind the program's website and will support a collective comprised of students, mentors, internal and external reviewers, top managers of technology university spin-off companies, academics, and friends of Carleton. Members of the collective operate initiatives in all three horizons.

# Editorial

*Tony Bailetti*

***Michael Ayukawa answers the question:*** "What is a good deal?" by reviewing the literature on deals and deal-making processes. His answer to this question was used to define the business rules embodied in a component of the KOTS platform named Make a Deal (MAD). A key contribution from this paper is that deal goodness can be separated based on a Me-We construct: the impact to each and every stakeholder of the deal and the impact to the entire collective (not just the deal stakeholders).

***David Péloquin, Jean Kunz, and*** Nicola Gaye provide an approach to risk management that can be generalized to any situation where social actors respond to and manage risks in a multi-player environment. The authors describe how different social actors assess risk differently and introduce the "social management of risk" approach. The approach focuses on the involvement of potential actors in pursuing societal objectives in relation to risk. They use the approach to discuss the role of the community sector in the social management of risk.

***Michael Weiss discusses a model*** for company-led open source projects around two dimensions: the level of control over the project and the diversity of applications derived from the project. The article then explores how the model can be interpreted from a product line engineering perspective. The article reflects a recent trend towards collectives of companies that develop shared assets in the form of open source projects.

**Tony Bailetti**

**Guest Editor**

*Tony Bailetti is an Associate Professor in the Eric Sprott School of Business and the Department of Systems and Computer Engineering at Carleton University, Ottawa, Canada. Professor Bailetti is the Director of Carleton University's Technology Innovation Management program and the Director of Ontario's Talent First Network. His research, teaching, and community contributions support these programs.*

# A Progress Report on the Keystone Off-The-Shelf Project

James Makienko and Antonio Misaka

*"Imagination is more important than intelligence."*
Albert Einstein

In this article, we provide an update on the Keystone Off-The-Shelf (KOTS) project. We begin by presenting an overview of the goals and the advantages of KOTS. Next, we describe the software components that make up KOTS. Finally, a blueprint for the first application of KOTS is described along with the plan to launch a collective of technology companies and a non-profit organization that will use, support, and evolve the software.

**Introduction**

The objective of this article is to provide an update on the KOTS project, which was introduced in the OSBR six months ago (Bailetti, 2010; http://tinyurl.com/2danndh). During the last six months, the KOTS team has developed and tested the KOTS platform, which is targeted at keystone operators that focus on supporting the launch and growth of technology businesses. The KOTS software platform enables an organization to operate as the keystone of a collective that exists for the purpose of achieving system-level outcomes (e.g., a collective that will create 100 jobs and attract $5 million investment per year; a collective that will close 30 deals per year among companies located in six capital cities each over $100,000; and a collective that will help student entrepreneurs evolve their ideas into compelling opportunities and successful ventures). The platform was designed to:

1. Accelerate the number, diversity, and size of deals among members of a collective.

2. Improve member productivity.

3. Attain system-level outcomes.

4. Increase trust in the keystone organization.

5. Enhance reach of members.

The need for KOTS arose with the market crash of 2008. The external environment for small technology companies has drastically changed and old thinking no longer works. The KOTS project provides a keystone operator with a software platform that includes functionality that no firm or organization can develop on its own. Some important advantages are that KOTS:

- uses free/libre open source software (F/LOSS) components to reduce the costs the keystone operator faces when making changes

- reduces the costs of information technology (IT) administration, development, and maintenance

- allows the keystone operator to focus on competing using unique business models anchored around Model C. The Model C approach brings

together different stakeholders to a platform that allows them to self-organize and create value through their links (Bailetti, 2010; http://tinyurl.com/2danndh)

- brings together many keystone operators to achieve outcomes that they could not achieve on their own

**The KOTS Stack and Services**

Table 1 shows the key software components of the KOTS platform. The KOTS software stack integrates F/LOSS applications with code developed by Carleton University students, their industry partners, and independent contractors. The code developed for the project will be released under a permissive open source license, such as the MIT, BSD, or Eclipse Public licenses.

Notably, the Make a Deal (MAD; http://tinyurl.com/4a99gsx) application was developed and tested as part of the KOTS project. MAD embodies the business rules required to close a deal (e.g., transactions that transform ideas into a compelling opportunity and into a successful venture) and manages the user interface into SugarCRM.

The services provided by KOTS can be grouped into communication, collaboration, content management, and scheduling. The first two categories will enable the keystone to increase the number of deals among members, while the last

**Table 1. Key Software Components of the KOTS Platform**

| Component | Description | License |
|---|---|---|
| **WordPress**<br>http://wordpress.org | • manages website<br>• publishes blogs and forums<br>• provides access to tools, educational resources, information, and social networks | GPLv2 |
| **BigBlueButton**<br>http://bigbluebutton.org | • enables web and voice conferences | LGPLv3 |
| **Make a Deal (MAD)**<br>http://tinyurl.com/4a99gsx | • supports steps required to transform ideas into opportunities<br>• enables uploading/downloading of files<br>• showcases program's outcomes | Likely MIT, BSD, LGPL, or Eclipse Public License |
| **SugarCRM**<br>http://sugarcrm.com/crm/ | • provides customer relationship management | AGPL v3 |
| **LimeSurvey**<br>http://limesurvey.org | • creates surveys<br>• invites participants<br>• analyzes survey responses | GPLv2 |
| **Moodle**<br>http://moodle.org | • provides a learning content management system | GPLv2 |

two categories will increase the productivity of members. The communication component will provide unified messaging. BigBlueButton will provide a scalable and extensible solution for communications. The collaboration component is handled by a customized instance of WordPress and BuddyPress, which enables blogs and forums. The MAD tool enables collaboration around a shared object for the purpose of evolving the object to its next state. SugarCRM is used to store information about members of the collective and the deals they close. Moodle manages the files produced. Finally, scheduling and event management is provided by a Google Calendar instance, which allows members of the keystone to plan and coordinate their events.

A keystone operator can customize and brand the provided resources and content to tailor the business offering to the collective it supports. A keystone operator can access KOTS by downloading the software from the Internet as a bundle of open source software or it can access a cloud service provider that hosts KOTS. Users will interact with the KOTS front end through standard LDAP and SOAP protocols.

**First Application: Carleton Entrepreneurs**

The first application of the KOTS platform will support the Carleton Entrepreneurs program. Carleton University's senior administrators launched Carleton Entrepreneurs in 2010. The goals of the program are to:

1. Brand Carleton University as an exciting place that welcomes student entrepreneurs.

2. Identify students working on innovative projects across all faculties and develop their entrepreneurial skills.

3. Provide experienced mentors and reviewers who are willing to help students transform their ideas into compelling business opportunities.

4. Encourage and support female entrepreneurs in particular.

5. Provide students that have strong opportunities with a chance to connect with potential investors, Carleton University alumni, and friends of Carleton University.

KOTS will start supporting the Carleton Entrepreneurs program on April 12, 2011. The goals of the KOTS platform in the Carleton Entrepreneurs application are to:

1. Recruit entrepreneurially inclined students to Carleton academic programs (e.g., Technology Innovation Management program, B.Comm Entrepreneurship Concentration, and Entrepreneurship Minor).

2. Recruit participants.

3. Manage steps to transform students' ideas into compelling business opportunities.

4. Continuously improve the effectiveness and efficiency of processes.

5. Display the program's progress towards target outcomes.

The MAD engine developed by the KOTS team will be customized to deliver high value to the Carleton Entrepreneurs program. The customized MAD will support the following process:

1. A student (or group that includes a student) submits an idea any time.

2. Once accepted into the program, the student is assigned a mentor.

3. The mentor decides when the opportunity is ready to be examined by internal reviewers.

4. Internal reviewers decide when the opportunity is ready to be presented to external reviewers.

5. The student presents the opportunity to external reviewers face-to-face and receives feedback.

6. The Director of the program decides that the opportunity is ready to be presented to potential investors, Carleton alumni, and friends of Carleton.

7. The student is invited to present the opportunity at a special event.

After incorporating the lessons learned from the Carleton Entrepreneurs program, the platform will be deployed to support the Lead to Win program (http://leadtowin.ca) in Canada's Capital Region and the expansion of the program to cities in southern Ontario. The next major milestone of the KOTS project will be to support 1000 keystone organizations in the province of Ontario.

**Collective Spin-Offs and Non-Profit Organizations**

Validation of the KOTS concept will come through adoption of the KOTS platform by companies interested in making money from its existence. The intent is to spin off from Carleton University a collective comprised of 10 small technology companies and a non-profit organization responsible for evolving KOTS.

As part of the KOTS project, several technology companies have been established, each of which uses the KOTS platform to address a niche market with global potential, or provides components or services to the KOTS collective. In addition, the business plans of various companies were changed to incorporate stronger links to the collective of KOTS adopters and ambassadors as well as the use of KOTS stack in order to deliver their products, services, and solutions.

The collective of KOTS users will use the resources provided to them for free to make money and create jobs. They are not expected to assume full responsibility for the maintenance of the KOTS platform. Thus, a non-profit entity that evolves the code for KOTS is needed. This entity will exhibit the attributes of a keystone given that it will:

1. Enable deals between its members (e.g., providing access, customizing an instance of KOTS, developing new modules).

2. Increase productivity by providing tools for unified communication, learning, and content management.

3. Make available tools that no other organization can maintain.

4. Provide access to a pool of diverse talent.

5. Be trustworthy and transparent at all times.

**Conclusion**

The KOTS project enables the deployment of keystone companies that have the capability to grow a global collective, which will develop and commercialize products, services, and solutions. Each collective will include companies and the organizations that will contribute to the ability of that collective to make deals, increase productivity, achieve significant outcomes, reach globally, and increase trust. As KOTS evolves, there will be more opportunities for businesses and technology professionals to participate and contribute to KOTS and pursue collective-based business opportunities.

We wish to acknowledge the cash contribution of the NRC Industrial Research Assistance Program (IRAP; http://www.nrc-cnrc.gc.ca/eng/ibp/irap.html) and the in-kind contributions of the individuals and organizations involved in the development of the KOTS platform.

# Progress on the Keystone Off-The-Shelf Project

*James Makienko and Antonio Misaka*

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*Antonio Misaka is a graduate student in the Technology Innovation Management program at Carleton University and is actively engaged in the KOTS and TFN 200 projects. He is a former consultant for IBM and P&D researcher for NEC-Brazil. His research interests include software engineering and technology management. He holds a M.Sc. degree in Computer Science and Mathematics.*

# Carleton Entrepreneurs: The First Keystone Off-The-Shelf Application

Tony Bailetti and Ludovico Prattico

*"Opportunity is missed by most people because it is dressed in overalls and looks like work."*
Thomas Edison

In this article, we describe the first application of the Keystone Off-The-Shelf (KOTS) platform (http://tinyurl.com/2danndh). KOTS integrates software applications available under open source licenses with proprietary applications and services offered by small local technology companies, most of which are Carleton University spin-offs.

KOTS is the engine behind the website for the Carleton Entrepreneurs program (http://carleton.ca/ventures). The goals of this unique program are to: i) strengthen the entrepreneurial spirit at Carleton University; ii) help graduate and senior undergraduate students transform their ideas into compelling opportunities and successful ventures; and iii) share the best opportunities with potential investors, alumni, and friends of Carleton University. KOTS will enable the Carleton Entrepreneurs collective to achieve significant system-level outcomes that are not attainable without the platform. This collective is comprised of students, mentors, internal and external reviewers, top managers of technology university spin-off companies, academics, and friends of Carleton.

**Introduction**

Faculty and graduate students in Carleton University's Technology Innovation Management (TIM; http://carleton.ca/tim) program have developed the KOTS software platform to support collectives that harness diversity to deliver significant system-level outcomes. The first out-of-the-lab application of KOTS is the Carleton Entrepreneurs program. The objective of this article is to describe the program and how KOTS will help it achieve its objectives.

The Carleton Entrepreneurs program was launched by the university's senior administrators in 2010. The program aims to provide mentorship and feedback to help student entrepreneurs who are working on innovative projects across all faculties. Experienced mentors and reviewers will help students transform their ideas into compelling business opportunities. The program will also provide students that present compelling opportunities a chance to connect with potential investors, Carleton University alumni, and friends of Carleton University.

A full-time student (or group) can submit an application to participate in this program at any time. The applicant who is selected will receive a number of benefits in addition to feedback from mentors and internal and external reviewers. Most importantly, the program will help a stu-

# Carleton Entrepreneurs: The First KOTS Application

*Tony Bailetti and Ludovico Prattico*

dent establish a professional identity and demonstrate the opportunity's attractiveness. The student will develop confidence in her or his business opportunity, which would increase the motivation to launch and grow a business. The program also expands the participant's knowledge of how to launch and grow a business so that it is more likely to be successful. Through the review process, the student will improve her or his presentation skills as well as their capabilities to field tough questions. The size and diversity of the student's network also will increase.

Carleton Entrepreneurs uses a funnel-like process to conduct careful analysis and assure continuous improvement of the opportunities submitted to the program. In 2010, a total of 63 applications to the program were received from faculty members and students from all of Carleton's five faculties: Engineering and Design, Science, Sprott School of Business, Public Affairs, and Arts and Social Sciences. A four-person committee selected 16 of the 63 applications to be reviewed by three internal panels comprised of experienced Carleton faculty and staff. Internal reviewers examined the 16 opportunities presented by 23 faculty and students in early May, 2010. Two review panels comprised of external reviewers examined 11 of these opportunities at the end of May.

On October 5th, seven opportunities were presented at a special event hosted by Dr. Roseann Runte, Carleton University's President and Vice Chancellor (http://tinyurl.com/3sukk8l). Participants presented their opportunities to David Aronoff, General Partner at Flybridge Capital Partners (http://tinyurl.com/3moygwx), and Charles Chi, Venture Partner at Greylock Partners (http://tinyurl.com/3qfk5dg). Prior to the opportunity presentations, Aronoff and Chi gave presentations to the wider Carleton community titled "Raising Venture Capital for Technology Start-Ups" (http://tinyurl.com/3tp7h5c).

The outcomes of the 2010 program included opportunity proponents: i) establishing links with suppliers of risk capital, potential customers, and organizations that license technology intellectual property; ii) redefining the core of their opportunities; iii) deciding to grow organically versus accepting investment; iv) working with other entrepreneurial groups; and v) identifying suitable mentors and suppliers of complementary market offers.

In early January 2011, Carleton's senior administrators reviewed the responses to a survey sent to the faculty and students who participated in Carleton Entrepreneurs in 2010 and decided to offer the program on an ongoing basis.

**KOTS and Carleton Entrepreneurs**

KOTS is the engine behind the website for the Carleton Entrepreneurs program and will help the program achieve its objectives by recruiting participants, managing processes and communication channels, and showcasing the program's progress.

KOTS will help recruit entrepreneurially inclined students to the Carleton Entrepreneurs program and to Carleton University's academic programs (e.g., Technology Innovation Management, B.Comm Entrepreneurship Concentration, and Entrepreneurship Minor). The program wishes to attract graduate and undergraduate students who are working on innovative projects. KOTS will also help recruit other types of participants, including mentors and reviewers, potential investors, donors, alumni and friends of Carleton, sponsors (i.e., senior administrators, Deans, Directors), and associates (i.e., individuals of organizations that provide material support).

The KOTS engine also manages the steps to transform students' ideas into compelling business opportunities. The use of the KOTS engine allows the program to continuously improve process effectiveness and efficiency, while operating

a dynamic, elegant, simple-to-use, and state-of-the-art website. The engine manages the program's workflows and enables communications among participants (e.g., email, voice and Web conferencing, blogs and forums, social networks including Facebook, Twitter, LinkedIn, and RSS feeds). KOTS includes tools to survey participants and analyze their responses. It also supports content creation and links to educational resources (e.g., opportunity profile template, excellent content) and relevant information (e.g., sources of government funding, events).

As a showcase for the program, the website will display the program's progress towards target outcomes, such as yearly statistics on the number of applications, admissions, and opportunity presentations. It will also display the mean of experience items rated by participating students and dollars attracted. Finally, it serves as a showcase to display the products and services used in the website that were developed by innovative companies and open source projects.

Faculty and students in the TIM program will work with their community partners, including Carleton spin-off companies, technology companies in the Lead to Win program (http://leadtowin.ca), and new immigrants. These partners will help evolve KOTS to benefit the Carleton Entrepreneurs program.

**Harnessing Diversity**

KOTS supports diverse companies and organizations working together to achieve system-level outcomes that could not be achieved by any organization working on its own. The collectives supported by KOTS operate initiatives in three different time horizons: today's business (Horizon 1), the next generation of emerging businesses (Horizon 2), and the longer-term options out of which the next generation of businesses will arise (Horizon 3). Collectives that support activities in these three horizons are expected to grow faster than collectives that only support activities in one horizon (Baghai, Coley, and White, 2000; http://tinyurl.com/3eeaqwv).

For the Carleton Entrepreneurs program, KOTS will focus on supporting participants across the time horizons marked with an X in Table 1. (However, note that KOTS is flexible enough that it can support the other combinations if required for other applications.) Below, for each participant type, we provide a profile and an overview of responsibilities and benefits expected to be derived from participating in the program.

**Table 1. Time Horizons Supported for Each Type of Carleton Entrepreneurs Participant**

| Participant Type | Horizon 1 (Today) | Horizon 2 (Next Generation) | Horizon 3 (Long Term) |
|---|---|---|---|
| 1. Students | | X | X |
| 2. Mentors and reviewers | X | X | |
| 3. Top managers | X | | |
| 4. Academics | | | X |
| 5. Friends of Carleton | X | X | X |

# Carleton Entrepreneurs: The First KOTS Application

*Tony Bailetti and Ludovico Prattico*

**1. Students**

The Carleton Entrepreneurs program targets graduate and senior undergraduate students developing technologies, products, services, and processes that are new and different, in an interesting, unusual, or inventive way. The opportunities should offer to deliver major increases in performance to solutions of known problems or solve important problems others have overlooked.

Students expect to monetize their innovations. Most students who participate will be carrying out Horizon 3 activities; a few students will be carrying out Horizon 2 activities with external partners.

*Responsibilities of students*

The Carleton Entrepreneurs program expects students to incorporate a mentor's advice and reviewers' feedback into their plans to launch and grow successful businesses. Students are expected to work systematically and within agreed timelines to meet mentors' and reviewers' deadlines. The program expects students to be well prepared for meetings with mentors as well as internal and external reviewers. Finally, the program expects students to increase their performance as entrepreneurs.

*Benefits to students*

1. Efficient access to sources of specialized expertise

2. Reduction of the time, cost, and risk of transforming ideas into compelling business opportunities and successful ventures

3. Expansion of knowledge around launching and growing a business

4. Acquisition of presentation skills and capabilities to field tough questions

5. Strengthening of confidence in a business opportunity and increase in motivation to launch and grow a business

6. Increase of size and diversity of student's network

7. Establishment of a professional identity through demonstration of opportunity's value

8. Development of a stronger brand for their company and potential market offers

9. Increasing the likelihood their company will be successful

**2. Mentors and Reviewers**

Mentor and reviewers include: i) experienced individuals with diverse entrepreneurial, business, scientific, and engineering backgrounds; ii) effective communicators and advisors; and iii) those who are willing and able help students advance and assess their business opportunities.

*Responsibilities of mentors and reviewers*

A mentor is expected to spend four hours per month advising and counselling a student and reporting on the student's progress. Internal reviewers are expected to spend four hours per month providing online feedback to various students. External reviewers are expected to spend four hours twice a year, providing feedback to students who deliver face-to-face presentations to external reviewer panels.

Mentor and reviewers are expected to provide honest and informal advice, counsel, or feedback that helps Carleton students transform ideas into compelling opportunities and successful ventures. They will help students overcome anxieties and barriers when defining their compelling opportunities and launching new businesses. They will also respond to online surveys designed to improve the Carleton Entrepreneurs program.

Mentors and reviewers must agree not to disclose confidential information about students' business or personal affairs without consent. They also cannot hold financial interests in the ventures of the students they mentor and must immediately report any real, potential, or perceived conflict of interest.

*Benefits to mentors and reviewers*

1. Personal satisfaction from being a very important student resource, giving back to others, and motivating and helping students achieve their goals

2. Enhancement of their people, coaching, communication, relationship-building, and leadership skills

3. Acquisition of new knowledge from exchanging ideas and perspectives with talented students

4. Expansion of their network through relationships with talented students and other mentors and reviewers

**3. Top Managers**

Top managers include founders and senior managers of innovative companies who provide tangible support to the students or the program. For example, they may contribute software to operate the program or products that complement student entrepreneurs' market offers. Top managers must be willing and able to collaborate with student entrepreneurs.

*Responsibilities of top managers*

Top managers are expected to pull and complement early market offers of students' companies, and to enhance students' capabilities to work with top management teams. They will help student entrepreneurs overcome barriers to venture success by providing the appropriate assets, technology, processes, relationships, and culture. They will also share the risks with student entrepreneurs.

*Benefits to top managers*

1. Opportunity to brand their company and showcase their companies' products

2. Enhancement of their people, coaching, communication, relationship-building, and leadership skills

3. Opportunity to gain a competitive edge in the marketplace by collaborating with student entrepreneurs

4. Acquisition of new information through exchanging ideas and perspectives with talented students

5. Expansion of networks by developing relationships with talented students and other top management teams

**4. Academics**

Academics include faculty members and lecturers who are: i) contributing to programs in innovation and entrepreneurship; ii) credible with the business community; and iii) able and willing to operate and evolve the infrastructure required to operate the program.

*Responsibilities of academics*

The program expects academics to champion entrepreneurship at Carleton University by establishing and growing a healthy collective comprised of student entrepreneurs. Academics will recruit students working on innovative projects across all faculties and help develop their entrepreneurial skills. They will also attract experi-

enced mentors and reviewers who are willing to help students transform their ideas into compelling business opportunities. Academics will help students, mentors, reviewers, friends of Carleton, and top management teams achieve their goals and objectives.

In addition to their direct involvement recruiting and working with participants, academics will match the needs of entrepreneurial students with best of class academic programs. Some will also operate and improve the software and hardware system required to deliver the Carleton Entrepreneurs program.

***Benefits to academics***

1. Opportunity to ensure currency of teaching and research

2. External affirmation of expertise and relevance

3. Greater peer recognition

4. More external funding

**5. Friends of Carleton**

Friends of Carleton include individuals and organizations who wish to donate money to Carleton University or invest in student opportunities. They will foster a collegial, entrepreneurial culture on the Carleton campus.

*Responsibilities of friends of Carleton*

Friends of Carleton make a one-time or annual donations and pledges up to five years, fund student scholarships, sponsor and host events, invite potential investors, mentors, and alumni to support student entrepreneurs, and provide corporate matching gifts.

*Benefits to friends of Carleton*

1. Effective match of their philanthropic goals with Carleton's needs

2. Invitations to President's events for student entrepreneurs

3. Year-round recognition on the Carleton Entrepreneurs' website

**Conclusion**

The KOTS project promises to change the way student entrepreneurs worldwide develop and commercialize their products, services, and solutions and shorten their "time to cash". The KOTS project offers to become a powerful agent for economic development.

We wish to acknowledge the cash contribution of the NRC Industrial Research Assistance Program (IRAP; http://www.nrc-cnrc.gc.ca/eng/ibp/irap.html) and the in-kind contributions of the individuals and organizations involved in the development of the KOTS platform. We also wish to acknowledge the many contributions to the Carleton Entrepreneurs program made by Carleton's senior administrators, faculty, staff and students as well as members of the business community and economic development agencies.

# Carleton Entrepreneurs: The First KOTS Application

*Tony Bailetti and Ludovico Prattico*

*Tony Bailetti is an Associate Professor in the Eric Sprott School of Business and the Department of Systems and Computer Engineering at Carleton University, Ottawa, Canada. Professor Bailetti is the Director of Carleton University's Technology Innovation Management program and the Director of Ontario's Talent First Network. His research, teaching, and community contributions support these programs.*

*Ludovico Prattico is a graduate student in the Technology Innovation Management program at Carleton University. His current responsibilities include operations, external content, and overall support of the Carleton Entrepreneurs program and recruiting candidates for the Lead To Win program. Most recently, he worked at Nortel Networks and Bell-Northern Research, where he led the Optical Networks architecture and standards development team, and the high capacity OC-48 hardware team with the responsibility for the development and introduction of the dense wavelength division multiplexing product. Mr. Prattico graduated from McGill University with a Bachelor of Engineering (Electrical).*

# Defining Good Deals in Business Collectives

## Michael Ayukawa

*"My father said: You must never try to make all the money that's in a deal. Let the other fellow make some money too, because if you have a reputation for always making all the money, you won't have many deals."*

J. Paul Getty

In the context of a current project at Carleton University to create creating a deal-making platform, this article presents the results of a recent review of the literature to determine: What is a good deal? This is question is asked from the perspective of the stakeholders in the development of a software-based collaboration tool that is designed to help streamline deal development between members. The stakeholders include the creators, the users, and the investors. We answer this question by examining several streams in the literature, all centered on understanding deals and deal-making processes. These streams explore the concept of a win-win deal, how value may be seen differently, and the group processes involved in deal making.

A key contribution from this review suggests that deal goodness can be separated based on a Me-We construct: the impact to each and every stakeholder of the deal and the impact to the entire collective (not just the deal stakeholders). This implies one can separate the platform management problem into actor-centric (Me) and linkage-centric (We) domains. This is consistent with the notion of players balancing their self interest with the other stakeholders in the deal (Me-We). This is also consistent with the prospect of managing ecosystem health based on player and network-based metrics.

**Introduction**

As described by Makienko and De Baets in the August 2010 (http://tinyurl.com/4a99gsx) issue of the OSBR, a project is underway in the Technology Innovation Management program (http://www.carleton.ca/tim) at Carleton University to develop a software-based collaboration tool that is designed to help streamline deal development between members.

This deal-centric collaboration tool has the following features:

1. Deals can be made between multiple players and firms in a business collective.

2. Deal can be made between players who are located around the world and across multiple time zones.

3. Player reputation is captured as part of the deal making process, thereby providing feedback to the collective.

4. Players can instantly see the status of a deal and actions they can take that will move the deal forward.

# Defining Good Deals in Business Collectives

*Michael Ayukawa*

The objective of this article is to explore the concept of "What is a good deal?" from the perspective of designing and managing a deal-centric business collective using this tool. The deliverables of this review are a set of principles that can be applied to promote the generation of good deals in a business collective.

The notion of designing and operating a business ecosystem around the concept of a deal seems new to the online searchable English language North American and European management literature in business ecosystems. It is therefore felt that many readers of the academic literature in business ecosystems would have interest in the concept of a deal-centric approach and subsequently would have interest in answering the fundamental question: What is a good deal? However, for pragmatic reasons, our our view of relevance is focused on those who have something at stake in making the platform successful (i.e., individuals who stand to gain or lose through their involvement). These stakeholders are the creators, users, and investors in the platform.

This remainder of this article has four sections. In the first section, we introduce the concept of ecosystem health and how we have connected it to a deal-making model. In the second section, we review three streams of relevant literature. In the third section, we present the lessons learned. In the fourth section, we conclude by describing the contributions of this literature review.

**Ecosystem Health**

The concept of ecosystem health was introduced by Iansiti and Levien (2002; http://tinyurl.com/4on8gyx). Hartigh and colleagues (2006; http://tinyurl.com/4qo42qm) transformed their concept with a proposal to measure health separated into two orthogonal metrics: partner health and network health. This transformation aligns the decision process of Haigu (2009; http://tinyurl.com/4gckxh7) to expand the ecosystem horizontally (grow the network to grow network health) or vertically (grow the business to improve partner health) with a means to measure it. Hartigh goes on to propose an ecosystem health metric tool to influence ecosystem partner firms to manage their businesses along these dimensions of partner health and network health.

We consider measuring the health metrics of Hartigh by examining the individual deals closed by the partners in the ecosystem, rather than through a retrospective analysis of financial reports. This shift in perspective gives a very different view to designing and managing a business ecosystem. As a result, it transformed our thinking from "What is good governance for a business ecosystem?" into the question of this literature review: "What is a good deal?".

One might question why a shift of examining a business ecosystem from the perspective of discrete deals is interesting. In some ways it is more of a response to the apparent complexity of managing multi-sided platforms. Boudreau and Haigu (2009; http://tinyurl.com/4jctktr) raise concerns about the high number and complexity of instruments used by multi-sided platform owners and how the scope of strategy is wider than that of normal firms. By examining the platform as a deal-making engine, this gives us the opportunity to consider understanding rules that govern local behaviour (i.e., rules around the deal) and then derive system-level behaviour from the results of many deals. This approach is consistent with that of complex adaptive systems, where seemingly complex behaviour emerges from large collections of simpler components (Mitchell, 2009; http://tinyurl.com/6fuue76). It is also consistent with the principles of swam intelligence and stimergy (Garnier et al., 2007; http://tinyurl.com/6jux34e) where simple, local rules can drive self organization and coordination.

By looking at the problem of how to manage a business ecosystem from this perspective it has given us a local instance in space and time (a deal) that we can actively manage to be consistent with our goals for system-wide behaviour. In this sense, the fundamental deliverables of this literature review are to provide a foundation set of principles for tool development to manage a business ecosystem. We are however doing this in the context of exploring the question: What is a good deal?

**Literature Review**

Our review is centred around deals and deal making. We are targeting deals that require a level of collaboration between players and that go beyond the execution of simple transactions. The first literature stream involves discovering and balancing the needs of all stakeholders in a deal (i.e., win-win situations) through a process of negotiation. Given that stakeholders may value the outcome of a deal in different ways, a second literature stream on "value setting" serves to provide perspectives in this area. The third literature stream examines how groups of people make decisions in a social setting where trust, reputation, and credibility are important factors.

**Win-Win Negotiations**

The concept of win-win is intrinsically linked to that of cooperation, which itself is linked to the question of trust or confidence in your partner. Cooperation theory is often examined in context to the classic game-scenario decision in the prisoner's dilemma of cooperation or defection (http://tinyurl.com/4eb9c8z). Axelrod (1984; http://tinyurl.com/4gq9r3n) identified a successful prisoner's dilemma strategy called tit-for-tat, in which an individual cooperates on the first move and then simply reciprocates their opponent's last action. This work showed the power of a very simple strategy based on a pattern called reciprocal cooperation. This strategy can lead to behaviour that yields a higher net benefit. Beyond the value of a simple strategy, it highlights two factors of importance: the need for a player to identify an individual and the need to track the history of interaction with that individual.

The need to identify and track the history of interaction is based on the need to reward good behaviour and punish bad behaviour. As well, there is a need to have visibility of the defection and that punishment was made. Finally, there is a stated need for the meta-norm of punishing, non-punishers to help to promote long-term cooperation in the population (Mitchell, 2009). In a similar way, Boyd and colleagues (1987; http://tinyurl.com/4n5gxm6) challenged Axelrod's position that reciprocal cooperation and collective stability is by necessity evolutionarily stable by showing how a rogue player (mutation) can invade the population depending on the attributes of the non-nice variants. He identifies that other mechanisms are likely needed to punish non-cooperation, other than simple reciprocity in tit-for-tat.

As compelling as the prisoner's dilemma results might seem, Ostrom (1986; http://tinyurl.com/4coadol) challenges the validity of generalizing the prisoner's dilemma work to human collectives based on the observation that the premise of the prisoner's dilemma game assumes no communication between the prisoners, no history of previous engagements, no anticipation of future engagements, and no ability to promise, threaten, or retaliate. As stated by Ostrom, the prisoner's dilemma game is structured in a way to prevent cooperation and is thus limited in its value to study cooperation.

Expanding the scope of the win-win scenario beyond that of the deal (contract signing) and to include the outcome is the centerpiece of Billings-Yun's (2010; http://tinyurl.com/4g4z79z) work in *Beyond Dealmaking*. She argues from the perspective of a historian and

builds on the work of win-win negotiation from Fisher and Ury (1981; http://tinyurl.com/3y3v5sk), clarifying that the deal (contract) is a promise and not an outcome. If the goals are win-win outcomes, you must think beyond the signing and ensure that the negotiation goals extend beyond a transactional mindset and builds a solid relationship that can be resilient to the issues that will invariably arise during the execution of the contract. In contrast to Billings-Yun's focus on the relationship aspect of deal making, Fisher and Ury almost take the opposite approach and emphasize the need to separate people from the problem. They highlight the importance of using objective criteria for assessing the options to ensure that the decision will be accepted over time.

**Value Setting**

The literature stream of value setting can be connected back to the prisoner's dilemma game with the Ostrom's (1986) challenge to the long-held belief of the "tragedy of the commons". Through her exploration of the attributes of collective-based governance on several long-standing, self-governing commons around the world, she identified principles, some of which are paraphrased below:

- Rules are established.
- The conditions of the commons is monitored.
- A graduated system of sanctions is available.
- Members have access to a low-cost conflict-resolution mechanism.
- Punishment is assigned.
- Rights to the commons are not fully marketable.

She goes on to identify the dimensions of the rules for a collective:

**1. Position rules:** what positions participants may, must, or must not hold

**2. Boundary rules:** what characteristics participants may, must, or must not have to enter positions

**3. Authority rules:** the authorized actions participants may, must, or must not take independently

**4. Aggregation rules:** the formula that participants may, must, or must not use for decision making when multiple persons must decide

**5. Information rules:** the information that participants may, must, or must not reveal to others

**6. Scope rules:** the states of the world that participants may, must, or must not affect

**7. Payoff rules:** the rewards or penalties which may, must, or must not be assigned to actions or outcomes

These rules for collectives are interesting at another level: they may be transferable to influence the behaviour of players in a deal (i.e., deal rules). By tying it to the deal, we can tie it to the role in a deal, rather than to a membership class in the collective as a whole. This allows us to discriminate between deal rules that affect local behaviour (the health of players) and collective rules that affect the management of the ecosystem (the health of the network).

Collectives such as La Via Campesina, an international movement of peasant farmers and workers that defends small-scale agriculture (http://viacampesina.org/), demonstrate that

you can have different rules for operation within and outside a collective. Effectively, relationships are non-capitalistic within the collective and are based on the principles of reciprocity, but members operate in capitalistic relationships externally. Reputation is not for sale, nor can it be purchased in a non-capitalistic collective.

The concept of value domains also extends to norms. Ariely (2009; http://tinyurl.com/4bghbd4) explains that within the domain where social norms operate, no money is involved and reciprocity in not immediately required. Social norms are linked to purpose, mission, and pride. But you can quickly transition from a world of relationships to that of transactions by putting money anywhere in the equation. Attaching a price to a gift is a good example. Ariely points out that in a world of relationships, any violation of trust is deadly. In a monetary world, it is shrugged off as “just business” or “you get what you pay for”.

**Team Processes**

The prospect of having to keep processes driven by social or monetary norms separate in stages of a process adds considerable complexity to defining a deal making flow. At some point in a deal, money can and should become part of the equation.

Work in the creative domains also show that taking money out of the equation helps to direct attention to finding creative solutions or new insights. When payment is involved, the level of payment also turns out to be critical. Ariely and colleagues (2009; http://tinyurl.com/4p8lwg2) document where people who are not paid at all exert more effort than those paid a small amount. He then demonstrates how the worst performance in creativity, memory, and motor control always occurred with very high level of rewards.

In a similar conclusion Fisher and Ury (1981) recommend separating inventing from deciding. They posit that the processes associated with judgment block imagination through the mental separation of creative acts from critical ones. In their words, invent first, decide later.

Taking money out of the equation does not mean making it free. It seems to mean that one has to get to a level of trust and financials where players accept and assume they will be paid (or will appropriate) a fair and business-sustaining share of the proceeds.

The final perspective on decision-making processes is examined in *Planning with Complexity* by Innes and Booher (2010; http://tinyurl.com/4cpj4cx). They take a critical view of decision making and negotiation in setting public policy. They find that success depends on processes that start with shared concerns, not goals. The process must follow a path that creates a common view between all stakeholders and forms a basis for decision making. The common view ensures that complex and interdependent issues are understood by everyone and there is sincerity in the reality being described. It is a social, non-linear, and iterative process that involves both independent experts and stakeholders.

Innes also acknowledges and supports the Fisher-Ury principle of developing your own "best alternative to a negotiated agreement" (BATNA). To negotiate effectively, each party must work out what is the best they can do without a negotiated agreement (i.e., their BATNA). This helps make sure they know when to leave the negotiation.

**Lessons Learned**

1. A good deal is the outcome of a well-designed process. In the context of a deal-making environment, this is akin to building a factory where it is hard to make mistakes and produce a low-quality product.

2. There are reasons to keep processes driven by social norms separated from market norms. This is related to the ability of the process to take money off the table during the process of discovering a creative solution. One such way may be to establish the trust that net proceeds will be fairly distributed and that sufficient proceeds are structured into the deal.

3. A collective needs to have rules to survive and thrive. They must define what is expected, required, and prohibited. They should cover Ostram's (1986) rules for a collective.

4. The evolutionary stability of the collective has the requirement to identify and manage bad behaviour. This can include the requirement for meta-norms (i.e., punishing the non-punisher).

5. Rights in the collective are not fully marketable and reputation is not marketable at all.

**Conclusion**

We may be able to abstract Ostram's "Rules for the Commons" into a set of "Rules for Deal Stakeholders". As well, by defining rules for the deal players, we can tie it to their role in a deal, rather than to a membership class in the collective as a whole. This allows us to discriminate between deal rules that affect local behaviour (the health of players) and collective rules that affect the management of the ecosystem (the health of the network). This puts us on a path to separate platform management into aspects of the deal that are focused on creating player net wealth (a Me view) from those focused on creating net relationship wealth through strengthened linkages (the We view). By doing this we are also effectively separating deal goodness based on ME-WE.

The effect of this separation would be consistent with the principles of complex adaptive systems (http://tinyurl.com/4sy942), where local rules drive actor behaviour and system-level patterns emerge. This has the benefit of being able to define simple rules that are more likely to be understood and acted upon by the actors in the collective. However, this emphasizes the need for careful and active monitoring of the collective to detect the emergence of undesirable system level patterns and also a means to address the situation in a timely, effective, and appropriate manner.

In a deal-making platform, we may find that large collectives will fragment into multiple smaller collectives, driven by aspects to constrain deal diversity for scalability. By breaking free of the winner-take-all model and encouraging the ongoing birth of new collectives, there will become a need to support trust transivity (http://tinyurl.com/cwj5qo) for members between collectives (i.e., members can transfer their reputation between collectives). This coordination between collectives supports the notion of a collective of collectives that could address this need. Having a common set of principles for deal making may help the process of establishing the reputation of a collective and its ability to cultivate good deals.

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# The Social Management of Risk


## David Péloquin, Jean Kunz, and Nicola Gaye


*"As we know, there are known knowns: there are things we know we know. We also know there are known unknowns."*

Donald Rumsfeld
U.S. Secretary of Defence, 2001-2006


In this article, we discuss a conceptual framework on the social management of risk and highlight the role of the community sector in that process. We introduce the topic of risk, illustrate how it is distinct from the concept of uncertainty, and show how different social actors assess risk differently. Next, we introduce the "social management of risk" approach, which takes a broad view of the potential actors involved in pursuing societal objectives in relation to risk. Finally, we discuss the role of the community sector is the social management of risk. While this framework is presented in the context of social policy, it can be generalized to any situations where social actors respond to and manage risks in a multi-player environment.


**Introduction**

Risk is endemic in our world and forms a powerful influence, both constructive (as an enticement to positive gains) and destructive (as adverse events beyond our control undermine our well-being). People are exposed to (or concerned by) many of the same risks. The management of these risks has long been a preoccupation for us as individuals, and for our families, and the larger communities and societies in which we live.

While the last century saw unprecedented improvements in our collective ability to deal with many of the adverse risks encountered over the course of our lives, it also saw the emergence of new risks that we continue to grapple with. As well, it revealed that our perception of risks is at least as important as – and often at variance with – the ostensibly objective properties that we can also attribute to them.

If anyone needed a reminder that the pattern of risk and risk perceptions is not constant over time, they need only look at the world-wide financial and economic turmoil of recent years, and a seemingly regular stream of epidemics and both natural and man-made disasters. It is undeniable that significant progress has been made in our ability to manage a wide range of specific risks. There are, however, many more risks over which we still have limited mastery, including many poorly understood systemic risks that ensure that something akin to the "mutation" of risk (e.g., the tendency for mastery of specific risks in one area to spawn increased risks in others) will continue to exist and will

need to be addressed. It is even arguable that the technical distinction often made in the academic literature between “risk” and “uncertainty” may need to be rethought.

**Risk Versus Uncertainty**

Much of the finance literature on risk management rests on a technical distinction between "risk" and "uncertainty" that can be difficult to make in practice. In particular, "risk" is viewed as involving quantifiable probabilities that are believed to be sufficiently stable that patterns of gains and losses associated with particular events - typically frequently occurring events - can be reliably predicted with a fair degree of accuracy, making "risk management" instruments (such as insurance and many other forms of contingent financial derivatives) viable business propositions and defensible policy options for governments. "Uncertainty", however, is usually used to refer to situations where the probabilities of adverse or positive events (or of their intensities, public perceptions, and other attributes) are not known and not readily knowable in advance, making the assumption of responsibility for managing the fall-out from inherently uncertain events a distinctly more hazardous undertaking.

Though this distinction between "known unknowns" and "unknown unknowns" (in Donald Rumsfeld' s now famous phrase) in principle marks the boundary between ostensibly scientific "risk management" strategies and more chaotic "muddling through" strategies that inevitably characterize coping with genuine uncertainty, in many cases it itself rests on assumed realities that may be unknown and unknowable. This is particularly true of situations that can be characterized as complex systems in which there are many independent and interacting players and whose behaviour, as described by chaos theory (http://wikipedia.org/wiki/Chaos_theory), is inherently difficult or impossible to predict. In such cases, even seemingly long periods of relative stability and equilibrium within particular, familiar sub-systems (and the seemingly predictable probabilities of positive and adverse events that accompany them) may be subject to violent discontinuities triggered by developments in other, less well understood, sub-systems. The inherent difficulty of disentangling "risks" (that can be managed) from "uncertainty" (that one has to muddle through) is undoubtedly a major issue in risk management.

**Objective Versus Subjective Assessments of Risk**

Much of the academic literature on risk effectively bears on a distinction between “objective” and “subjective” assessments of risk. Different people (and, by implication, different social actors) view risks differently – and in ways that can result in their having (and acting on) quite different interests in how risks are “managed,” including the appropriate balance between *prevention* of adverse risks, *mitigation* of impacts when those events nevertheless occur, and *coping* with residual impacts.

Where different people have different perceptions of (and levels of aversion to) risk - as well as different capacities to bear such risk - opportunities may be created for socially beneficial innovations by both private and public policy entrepreneurs.

For example, success in offering instruments and strategies to manage adverse risks that are objectively and reliably less costly to produce than the perceived benefits that accrue to beneficiaries generates potential risk arbitrage opportunities. In other words, it generates a potential surplus in the form of either profits (in the market sector), public recognition (in the case of community-based action), or heightened public satisfaction with risk-management policies offered by governments.

In all these spheres, the successful underwriting of risks accruing to others depends on three key conditions being met:

1. a greater capacity to bear adverse risk on the part of the underwriter than on the part of beneficiaries (those whose risks are being underwritten);

2. a level of risk aversion on the part of the underwriter that is lower than that of beneficiaries (and of alternative underwriters); and

3. a greater ability on the part of the underwriter to accurately assess or control the objective probability of adverse events.

While governments almost invariably have substantial capacity to bear risk (because of their ability to pool risk over large numbers of people, including both present and future taxpayers), family members, members of the broader community and market sector actors may at least sometimes be less risk averse or have a greater capacity to assess or control risks.

**The "Social" Management of Risk**

The "social management of risk" (hereafter referred to as SMR) refers generically to an approach that takes a broad view of the potential actors involved in pursuing societal objectives in relation to risk. Though by no means limited to thinking about social policy, Figure 1 illustrates SMR's distinct approach to meeting social challenges, notably through a wide range of interventions by a diverse "ecosystem" of actors working sometimes autonomously, and sometimes in conjunction with others.

In particular, the SMR approach acknowledges that a wide range of social actors have always played a significant role in helping individuals manage a wide variety of risks and that direct interventions by governments have long been supplemented – and, in fact, predated – by the efforts of:

- individuals themselves;
- their immediate and extended families;
- their local communities and broader social networks (ranging from local community-based organizations to the broader voluntary sector – including unions, profession-based associations, religious communities – as well as informal networks of friends and acquaintances both "in real life" and, increasingly, online); and
- market sector organizations (including employers and intermediaries in the insurance and broader financial sectors).

Since the SMR approach involves a sometimes uncoordinated and sometimes orchestrated coming together of a large number of actors and their multiple efforts, it has a somewhat broader conception of the role of government policies. In particular, direct interventions by governments may not always be dominant (or even particularly central) elements in an SMR strategy. For example, governments may be better placed to mobilize resources and orchestrate large-scale responses to more-or-less homogeneous challenges that occur simultaneously. But families and informal social networks of which individuals form part (as well as formal organizations in the community and market sectors) may be better placed than governments:

- to take measures – tailored to the circumstances "on the ground" – to prevent risks that are idiosyncratic (or very localized in nature) from materializing
- to identify when such risks nevertheless materialize

**Figure 1. The SMR Approach**


- to mobilize resources from the family or community to respond quickly and in context-appropriate ways to mitigate damage or help cope with the situation

- to use the more immediate reciprocity of family or community support to build stronger social networks (and directly enhance well-being more generally)

- to experiment with a wide range of alternative strategies and adapt quickly to changing circumstances on the ground

Moreover, the relative strengths and weaknesses of various social actors (or, at least, our understanding of those strengths and weaknesses) are themselves evolving. This may be particularly true as increasing numbers of perceived risks may be the manifestations of complex processes that resist the one-size-fits-all solutions that governments have traditionally been most comfortable with, while others may have systemic aspects requiring large-scale interventions.

For these reasons, an SMR approach may imply the need for government policy makers to pay at least as much attention to facilitating interventions by others (those better placed to play key roles in particular circumstances) as they pay to how they themselves intervene directly in support of citizens (Figure 1).

**The Community Sector as Agents of SMR**

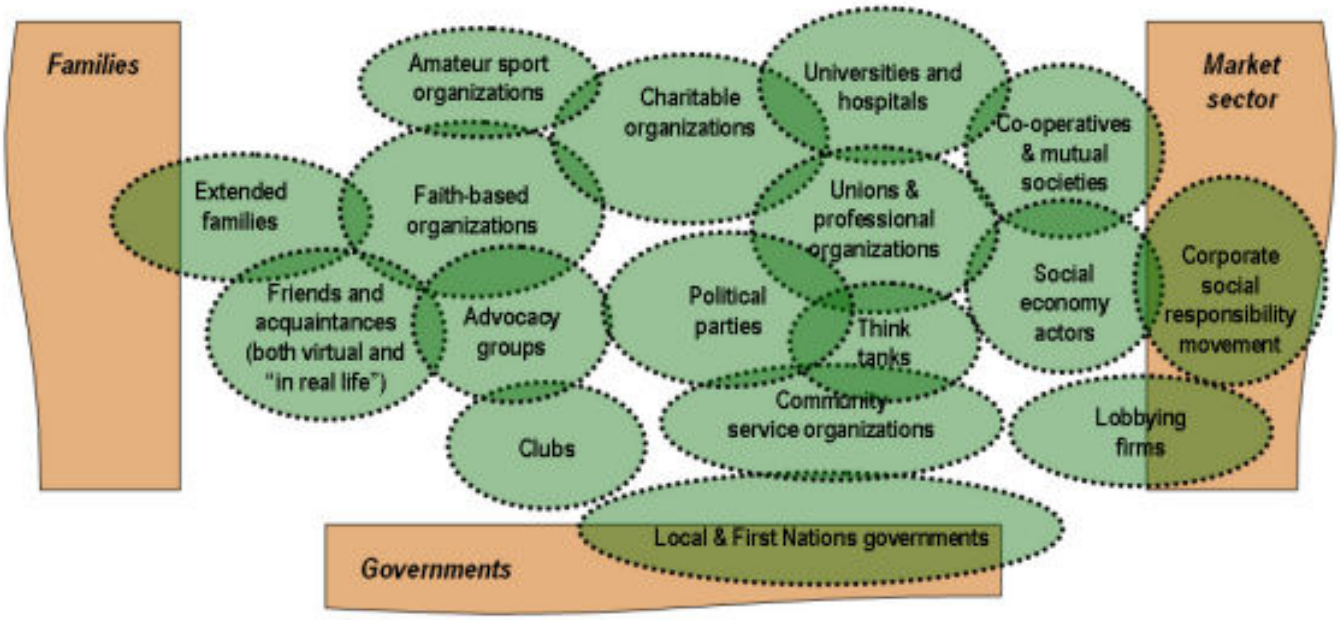
Multifaceted and diverse in its form, function, and scope (though often geographical in range, or "place-based," given the power of face-to-face interactions), the "community sector" constitutes a highly heterogeneous class of social actors that straddles the spaces occupied by families, the market sector, and governments (Figure 2).

Although there are a variety of different ways in which one can classify, organize, and name the sector, it is important to note that it can involve informal networks (interest-based networks of friends, acquaintances, colleagues, co-religionists, etc.) as well as the formal community-based organizations that are often the focus of attention for both policy makers and researchers.

Yet the importance of informal networks as sources of support cannot be underestimated. As a source of help in dealing with many risks, the breadth, depth, and intensity of one's connections and reciprocal obligations to others can be as important as formal community institutions (and typically more so) and even, in many cases, as important as families.

Taken together, community sector networks and organizations occupy a broad (and often unique) range of "ecological niches" in responding to the needs of individuals and society. With membership extending beyond kinship, the community sector can provide social support through a more diversified portfolio of resources than families alone, sometimes with levels of commitment and intensity that can exceed those found within families. The primary social orientation of the community sector also distinguishes it from the market sector, which, although it too can be a major source of self-support and social support, is driven predominantly by the financial bottom line. Often flexible and well attuned to the realities "on the ground," community networks and organiza-

**Figure 2. The Community Sector**



tions are also typically seen as key sources and vectors for social innovation (http://tinyurl.com/4rlvlos). As noted by Gardner (2011; http://tinyurl.com/4j9ahp8), comprehensive community-based initiatives have significant strengths that may make them much more effective than traditional approaches when tackling complex problems.

**Conclusion**

In this article, we have introduced a conceptual framework on the social management of risk, which emphasizes the pursuit of broad societal objectives. While this approach was presented in the context of social policy and was supported by an example from the community sector, it is relevant in any situations where social actors respond to and manage risks in a multi-player environment. In these situations, the diversity of players, acting together with varying degrees of autonomy and coordinated action, provide a distinct and powerful approach to managing risk.

**Further Reading**

For an expanded version of this article, emphasizing the role of the community sector in the social management of risk and its impact on government policies, see the February 2011 issue of Horizons, the research journal of the Policy Research Initiative.

http://policyresearch.gc.ca/page.asp?pagenm=2011_0061_toc

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# Control and Diversity in Company-led Open Source Projects

Michael Weiss

*"Black. White. Green. Red.*
*Can I take my friend to bed?"*
All Together Now
by The Beatles

A majority of open source development today is carried out by companies. Building on open source allows companies to focus their development effort on the points of difference over their competitors. This article discusses the recent trend towards collectives of companies that develop shared assets in the form of open source projects, and creates a model for company-led open source projects around two dimensions: the level of control over the project and the diversity of applications derived from the project. The article then explores how the model can be interpreted from a product line engineering perspective.

**Introduction**

Open source has become an integral part of commercial software development. Company engagement with open source ranges from the adoption of open source development practices, the use of open source development tools, and the use of open source components in products, to active contributions to open source projects and creating new company-led open source projects. Whereas in the past, free/libre open source software (F/LOSS) development was considered to be driven by volunteer effort, a majority of open source development today is carried out by paid developers. For example, over 70% of changes to the Linux kernel and over 80% of commits to the Eclipse platform have been made by developers who are paid by companies to contribute to those projects.

Companies use open source to reduce their development and maintenance cost, and to improve their time to market. Building on open source allows them to focus their development effort on the points of difference over their competitors. The non-differentiating portion of the software can be obtained from external sources, either commercial off the shelf (COTS) or F/LOSS. This has recently motivated networks of companies within the same domain (or collectives) to develop shared assets in the form of open source projects.

Research on product line engineering has also started to examine the relationship between F/LOSS development and product line management. The research differentiates between using F/LOSS in a product line and the adoption of product line practices in F/LOSS. This article is a contribution to the second stream. Its objective is to examine the participation structure of company-led open source projects from the perspective of product line engineering.

**Related Work**

Open source development and product lines are complementary (Chastek, McGregor, and

Northrop, 2007 SPLC Conference). Distinct features of open source are license management, distributed development, and high quality (at least for large open source projects, as a result of peer review and multiple use). Software product lines are, likewise, characterized by asset management, distributed development, and processes to manage quality.

Companies use product lines to manage product diversity and reuse (van der Linden, 2009; http://tinyurl.com/3gnth4x). Product line engineering separates the development of a common platform from the development of applications. Platforms identify points of commonality and variability. Applications are created by binding the variability (Pohl, Böckle, and van der Linden, 2005; http://tinyurl.com/3opqs6c). Both practices are used, de facto, in large open source projects (van Gurp, 2007; http://tinyurl.com/3dl3cjl). Many open source projects are structured into platform and application components.

The product line characteristics of Linux, Mozilla, and Eclipse have been studied already (Chastek, McGregor, and Northrop, 2007; van Gurp, 2007). These projects receive most of their contributions from companies and have, thus, adopted more formal processes than their volunteer-driven counterparts. This article focuses on company-led projects.

**Participation in Company-led F/LOSS Projects**

*Evolution of F/LOSS projects*

Many open source projects start out with a single developer or company with a need. The need is narrowly defined and focuses on resolving an immediate technical challenge (i.e., "scratching an itch") faced by the project initiator. An example of a project started by an individual is Linux; the project started out as a personal project by Linus Thorvalds to build a freely available Unix operating system. An example of a company-initiated project is Eclipse; the project started with IBM donating the codebase for its VisualAge product as open source.

At this point, the project initiator is in full charge of the direction of the open source project. The next stage of evolution occurs when a community forms around the project. Typically, the project initiator is still in charge of the technical roadmap of the project, and the community members (individuals or other companies) create products or services complementary in nature to the project. Growth of the open source project is limited beyond this point, unless it moves from a model where a single entity controls the direction of the project to a model where all community members collectively decide on its course.

Evolution of the project to this model requires that the project initiator is removed at arm's length from the project, as documented by West and Gallagher (2006; http://tinyurl.com/3eb73sq) for a range of open source projects, and joins the community as just another member. The direction of the project is now set by the member organizations. Often, the relationship between the members and the project is also formalized through a neutral organization or foundation, which acts as the legal representative of the project and facilitates between the community members. For example, the Eclipse project is coordinated by the Eclipse Foundation.

The project members join the project with different needs. They leverage the common codebase of the project to develop a diverse range of applications. As a case in point, Eclipse has 13 top-level projects with over 200 subprojects between them, contributed by more than 50 member companies as well as individual members. The majority of the contributions, or 80% of the commits, are made by member companies. Furthermore, the Eclipse marketplace lists over 1000 applications built on top of the Eclipse core.

# Control and Diversity in Company-led Open Source

*Michael Weiss*

*From Green to Red*

Take, for example, project Green. Green is a project in the education space that was started at a university by a single developer and was then spun out into a company. The project initially had a small group of core contributors, and control of the direction of the project was with the spin-off company. A small community has formed around the project consisting of companies and individuals that develop custom features and offer complementary services to the project. But, at this point, something interesting happens.

More companies want to join the community, however, they do not feel that their needs are met under the current project structure. These companies differentiate themselves from each other through their specific application domains, not in terms of the platform they share. This changes the nature of the project, and to reflect this change, a foundation is created to manage the project and the project is renamed into Red. In the Red project, the other companies take a more active role in the project, and the project initiator becomes one of them. The new project is ready to grow in size and diversity in ways that the Green project could never have done.

*How companies participate*

Company-led open source projects differ in significant ways in terms of who controls the project, and the diversity of applications derived from the project. Control refers to decision making, and includes control over the direction of the project, the architecture, commits and releases, and who captures the value created by the project. Control can be hierarchical or shared. In a hierarchically controlled project, a single company makes all the decisions. In a project with shared control, decisions are made jointly by the project members.

Applications can be either in a narrow domain (such as education) or spread across a variety of domains (such as language training and business intelligence). If the applications are in a narrow domain, the project often has an integral architecture, if the project is controlled by a single company. The reason is that the company has little incentives to divide the architecture into modules, as it requires additional effort. However, when other companies are involved in the project, the architecture needs to be modular to some degree.

There are four basic ways for companies to participate in a company-led open source project as shown in Figure 1. This categorization is based on the experience with the case study and an examination of extensible open source platforms conducted by the author (Noori and Weiss, 2009; http://tinyurl.com/3bznh3h). As should be apparent from the earlier discussion, the Green project belongs into the top-left quadrant. In the top-right quadrant, a single company exposes an interface to attract third-parties to create applications, for example, the Moodle learning management system (http://moodle.org). As an example of a company in the bottom-left quadrant, the Zope Europe Association (ZEA; http://zeapartners.org) coordinates a group of open source companies, allowing them to compete for large government contracts (Feller, Finnegan, and Hayes, 2006; http://tinyurl.com/34eppr5). The bottom-right quadrant is reserved for collectives of companies that jointly control a platform, which provides the basis for a diverse range of applications. The Eclipse project is an example of such a collective.

**Discussion**

Hierarchical-wide F/LOSS projects and F/LOSS projects with shared control are organized like product lines: a platform and applications that extend it. Hierarchical-wide and shared-wide open source projects like Moodle and Eclipse

**Figure 1. How Companies Participate in a Company-led Open Source Project**

| Control \ Diversity | Narrow | Wide |
|---|---|---|
| Hierarchical | Single company controls project<br><br>Single company develops application in narrow domain<br><br>*Example:* Green | Single company controls project<br><br>Third parties develop wide range of apps<br><br>*Example:* Moodle |
| Shared | Collective of companies jointly controls project<br><br>Members jointly develop application in narrow domain<br><br>*Example:* ZEA | Collective of companies jointly controls project<br><br>Members develop wide range of apps<br><br>*Example:* Eclipse |

have a plug-in architecture that provides variability through extension points and extensions. As observed by Chastek and colleagues (2007), the products in this product line are new plug-ins and products using existing plug-ins. In Moodle, plug-ins can be added to extend the behavior of the open source platform through preconceived extension points under the control of Moodle.com (http://moodle.com). The Eclipse platform also allows members to define extension points in plug-ins they contribute. Both Moodle and Eclipse support a high diversity of applications. However, the amount of variation supported by Eclipse is much higher than for Moodle.

Shared-narrow projects like ZEA allow small companies to compete for much larger contracts than they could individually by providing the members of the collective with a common brand, pooling their assets, and creating a reliable delivery process. Examples of variation are localization and geographic coverage: member companies of the ZEA collective are distributed across all of Europe.

**Conclusion**

This article develops a model of the participation structure of company-led open source projects. The differences between the participation structures can be interpreted in terms of the product line concepts of commonality (platforms) and variability (applications). Our analysis adds the notion of shared control by a collective. Future work includes validation of the model through a survey.

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# Upcoming Events

**May 2 - 4**

Canada 3.0 2011

**Stratford, ON**

"Canada 3.0 2011 will spark ideas, incite discussions and create connections to advance Canada's digital future. Join us for dynamic keynotes, interactive sessions, informal meet-ups, virtual discussions, webcast get-togethers and more. Start establishing relationships with other visionaries, strategists, and entrepreneurs on the Canada 3.0 Community."

http://www.canada30.ca

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**May 3 - 4**

BCNET Conference 2011

**Vancouver, BC**

"The BCNET Conference is designed for the higher education community including IT professionals, faculty and students. The conference brings together thought leaders in information technology from higher education and industry. The program content is developed by member stakeholders who have an interest in the development of technology to advance higher education."

http://www.bc.net/atl-conf/display/Conference/Home

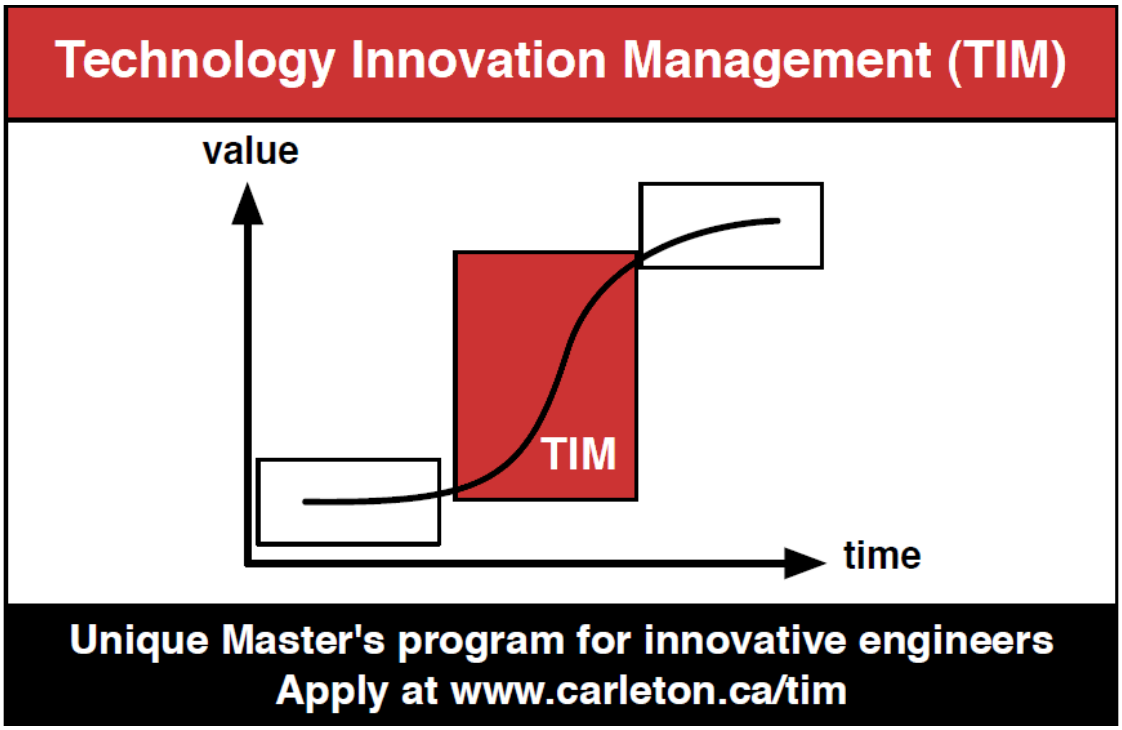
**May 11 - 14**

BSDCan 2011

**Ottawa, ON**

"BSDCan is a developers conference with a strong focus on emerging technologies, research projects, and works in progress. It also features Userland infrastructure projects and invites contributions from both free software developers and those from commercial vendors."

http://www.bsdcan.org/2011/

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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 to any of these questions is "yes," then 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. Formal first-person style (we only) may also be acceptable.

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

**May 2011: Women Entrepreneurs**

**June 2011: Product Development**

**July 2011: Managing Innovation**

# Contribute

**Formatting Guidelines**:

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.