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This issue of the OSBR provides many examples of using open source principles to enable innovation. These innovations go beyond code creation and address the diverse issues of: declining computer science enrollment, a lack of affordable publishing tools for online exhibitions, the rising costs of text books, the need for process automation in developing countries, easy-to-use and accessible solutions for the not-for-profit sector, adding open source to a proprietary Fortune 500 company's business strategy, and reducing duplicated costs.

Readers will find many references for further research and plenty of thought-provoking content. As always, we look forward to your feedback.

Dru Lavigne

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Dru Lavigne is a technical writer and IT consultant who has been active with open source communities since the mid-1990s. She writes regularly for O'Reilly andDNSStuff.com and is the author of the books BSD Hacks and The Best of FreeBSD Basics.

Enabling innovation is the theme of the December issue of the OSBR. This issue includes examples of innovations that flourished in environments of open values, open processes, and open assets.

Individually, each article tells a compelling success story of innovation. Collectively, they argue that innovation in open environments is effective and sustainable across a broad range of circumstances. The agents of innovation can be dedicated individuals, profitable companies, and not-for-profit organizations. The ultimate beneficiaries are end-users, as consumers of better products and services, students and educators with better access to higher quality learning assets, and empowered user-innovators continuing the virtuous circle of community innovation.

Leslie Hawthorn from Google's Open Source Programs Office examines the origins of Google's Summer of Code program, how students benefit by participating, and how Google views this investment in the F/LOSS community and its potential to improve the overall progression of Computer Science as a discipline. The Google Summer of Code program provides mentorship and stipends to college and university students contributing to open source software projects.

Tom Scheinfeldt from George Mason University describes Omeka, an open source platform for online publishing of museum exhibits and cultural heritage collections. Omeka builds on commonly recognized web and metadata standards to interoperate with other museum-centered projects and benefits from an active community of users and user-developers.

David Wiley from Brigham Young University presents an innovative alternative to rising textbook costs. Flat World Knowledge leverages the principles of openness to bring high-quality textbooks back into reach of all students, creating significant social value in a manner that will sustain itself over the long-term.

Steven Muegge from Carleton University and Chukwuemeka Afigbo from SW Global describe a for-profit private sector company that creates high-impact value at universities and governments in developing countries through an innovative business model anchored around service subscriptions, open source software, and open content.

Fred Dixon from Blindside Networks and Jill Woodley from Volunteer Ottawa share the experiences of a unique community/university partnership to bring accessible technology to a non-profit community.

Jon Weigelt, National Technology Officer of Microsoft Canada, discusses Microsoft's commitment to interoperability and collaboration with the open source community. The article also discusses the role that service oriented architecture and interoperability can play in keeping an organization innovative and competitive, and the benefits of embracing openness as part of an organization's business strategy.

Michael Grove of CollabWorks proposes "Open Innovation 2.0" as a way for companies to share IT infrastructure and business solutions within collaborative enterprise networks in ways that reduce costs, improve effectiveness, and enable innovation.

We invite readers to share their comments regarding the issue theme or individual articles on the OSBR website and blog (http://osbrca.blogspot.com/). Please enjoy the contents of the December issue.

Steven Muegge

Guest Editor

Steven Muegge is a faculty member of the Department of Systems and Computer Engineering at Carleton University, Ottawa, Canada. Professor Muegge teaches within the Technology Innovation Management program. His research interests include open source software, open innovation, and open source ecosystems.

"Participation [in Summer of Code] also encourages teamwork. These new developers must be collectively trained on the project's preferences with respect to languages, coding practices, patterns, and other conventions throughout the duration of the program...In the end, you're making a long-term investment into the future of your project and hopefully encouraging students to remain involved as new core developers."

http://my.bzflag.org/gsoc/bzflag_gsoc2007_post_mortem.pdf

Computer Science seems to no longer hold sway as the career of choice among North American undergraduates. A variety of reasons for the steady decline of enrollment–-down 60% in the United States since 1999 (http://www.cra.org/CRN/articles/may05/vegso)--have been explored. These include economic factors such as concerns about job security and the accompanying increase in off-shoring of information technology roles. Further, studies have noted that Computer Science as a whole simply doesn't look like much fun to today's incoming student populations. There's a general perception that Computer Science means spending one's day chained to a keyboard and monitor, scraping by as a "code monkey." In particular, students cite a lack of a social element as a major deterrent to pursuing a career in Computer Science (http://portal.acm.org/citation.cfm?id=1121352).

In this article, we examine the Google Summer of Code (GSoC, http://code.google.com/soc/) program, the world's first global initiative to introduce College and University students to free/libre open source software (F/LOSS) development. Over the past four years, the program has provided a model that allows College and University students to more deeply engage with the joys of computing.

The experience of our participants stands in sharp contrast to the generalizations mentioned earlier. We will discuss the origins and evolutions of the program, as well as its structure. We will also discuss how students benefit by participating in GSoC, focusing on some select success stories. Finally, we discuss how Google views this investment in the F/LOSS community and its potential to improve the overall progression of Computer Science as a discipline.

A Bit of History: The First Summer of Code

Early in 2005, Google faced a challenge well-known to software companies looking to expand their business offerings: planning the rapid and long-term growth of its engineering staff. The progression of software development, both as an industry and an art, requires a constant flow of new inputs and ideas to push the existing technical bounds of products and services. When searching for these fresh perspectives, Google heavily recruits from the recent graduate populations of the best software engineering schools worldwide.

Larry Page, Google's Co-Founder, had an idea that evolved into a pragmatic approach to getting more College and University students interested in the art of software engineering: coding during their school holidays. Larry noted that many students weren't able to find jobs that developed their programming skills. In turn, this dearth of employment opportunities meant that they were missing the opportunity to focus on improving their knowledge, not to mention the opportunity to spend time writing good code simply for the love of solving a particular problem.

Larry asked Chris DiBona, Open Source Programs Manager at Google Inc., for help. After some brainstorming, the idea of GSoC was born. Chris reached out to his social network with an interesting proposal, aptly titled "welcome to the experiment." Chris proposed pairing college students with mentors from F/LOSS projects and paying the students a stipend for writing F/LOSS code. Google would claim no rights to the source code created and required that it be publicly published and licensed under an Open Source Initiative Approved License (http://www.opensource.org/licenses). During the first GSoC in 2005 (http://code.google.com/soc/2005/), forty projects and many dedicated mentors joined Google in achieving the goal of introducing students to the world of F/LOSS development. Applications were solicited globally and 400 students were accepted into the program. Participants in the first GSoC came from 49 countries.

The experiment continued in 2006, expanding to include more than 90 F/LOSS projects, over 600 students and 1,200 mentors from 90 countries. In 2007, we were joined by participants from every continent (except, of course, Antarctica), welcoming more than 900 students and 1,500 mentors from 130 F/LOSS projects. In its fourth year, 2008, the program grew to include participants from 98 countries, more than 1,100 students, 175 F/LOSS projects and 2,500 mentors.

Making Time for the Social Side of Software

In 2007, we made a change to the timeline of the program to improve the learning experience of our students. We added approximately six weeks at the beginning of the program for students to learn more about the online community they had just joined.

This Community Bonding Period (http://googlesummerofcode.blogspot.com/2007/04/so-what-is-this-community-bonding-all.html) has been very well received. Many newly accepted GSoC students use this time to learn more about the fundamental tools of software engineering such as: i) using version control systems; ii) submitting code for peer review; iii) working with a variety of Integrated Development Environments (IDEs); and iv) putting the finer points on their learning of a new programming language. (For more information on how Google chooses from the applicant pool, see http://groups.google.com/group/google-summer-of-code-announce/web/notes-on-organization-selection-criteria.) It's also the ideal time to subscribe to the right mailing lists and learn who are the "go-to" people in the project for questions about a particular area. The Community Bonding Period also gives the project's newcomers the opportunity to observe how the project's committer team works together. They can become familiar with the project's engineering practices. This makes them more efficient contributors more quickly.

Not surprisingly, we've found that this extra time has helped students to feel more engaged. Projects widely report that this time spent getting to 'know each other' results in more students who continue to contribute to their projects over time. Many projects report that they have gained new core developers, known as committers, through participating in GSoC. One example is the FreeBSD project (http://www.freebsd.org), which has seen more than a dozen of their GSoC students join the project as full committers. Many students choose to attend their F/LOSS project's developer conferences, often sponsored by their project's community members. Frequently they are invited as speakers presenting the results of their GSoC work, which helps their professional development.

Universally, students report that these conferences are an enjoyable opportunity to both learn from expert developers and have fun hacking with their friends.

How Google Summer of Code Works

Since it has proved a useful model for encouraging contributions to F/LOSS (http://google-opensource.blogspot.com/search/label/summer%20of%20code%20meme), it's worth examining how the program works in a bit more detail. First, Google's Open Source Programs Office (http://code.google.com/opensource/) selects F/LOSS projects to act as mentoring organizations to would-be student participants. For more on how mentoring organizations apply to the program, see http://code.google.com/opensource/gsoc/2008/faqs.html#0.1_org_app. Each organization accepted as a mentoring organization designates one or more individuals to act as organization administrators (org admins). Org admins perform all the administrative functions necessary to keep things running smoothly, such as vetting mentor applications, collecting and publishing status reports, and providing additional guidance to students when their mentor(s) are not available. Mentors include any project member who would like to volunteer their time and which meet their organization's selection criteria, which vary across projects. It's worth noting that many community members regularly step up to provide guidance to their project's GSoC students though they do not formally mentor any particular student on a regular basis.

Once organizations have been accepted and have published a list of ideas (suggestions for development that would benefit the project), would-be student participants apply to work with the mentoring organization(s) of their choice.

While many students have done excellent work on an idea proposed by their mentoring organizations, the nearly universal feedback we've received from the participating F/LOSS projects is that the best student projects are those which the students draft themselves with community guidance.

Once a student is selected to participate, she executes her proposal with the help of her assigned mentor(s) for a three month period. Mentors and students are asked to provide mid-term and final evaluations of work completed to date, and historically 5-10% of students do not pass their mid-term evaluations. The most common reasons cited for students failing their evaluations include a lack of sufficient time and focus on the project, lack of communication with their mentors and, as a result, the creation of a buggy and non-functional code base. Should a student not pass an evaluation, Google's financial sponsorship of the project ceases. Students are encouraged to continue their work on the project even if they fail an evaluation. In a few cases, great work has resulted from a student taking some time away from the program and returning to complete the project some months later.

Assuming that the student continues to make progress throughout the term of the program, she receives a 4,500 USD stipend, with payments structured to provide tiered incentives at the beginning, middle and end of the program term. Those students who successfully complete their projects also receive a program t-shirt and certificate of completion. Success is defined as completion of the project to the satisfaction of the mentor, and it is common practice for mentors to solicit feedback from their wider project community and the student when making their evaluations.

Google provides guidance when asked or in cases where project goals may not have been fully met. In very rare circumstances, a student feels their evaluation did not fully reflect their accomplishments. When this happens, an engineer from Google's Open Source Programs Office performs an independent code review and the company's Program Administrators make the final call on whether the code produced meets the goals stated in a student's application. Recognizing that software development is an iterative process, Google expects that goals can change over time and that the initial project plan may differ greatly from the final work produced. What is most important from our perspective in defining success is that the student participant learns more about real world software development practice. Of course, it is all the better if the student bonds deeply with their project community and continues working with the project long after the conclusion of the program, and this does happen frequently.

At the close of the program, Google provides a 500 USD donation per student to each F/LOSS project participating in the program, regardless of the student's success or failure. Each mentoring organization decides whether these funds go directly to the mentors or are disbursed in a different fashion, such as to cover the costs of a developer conference. In most cases, mentors are not paid for their efforts and contribute their time for the reward of teaching and sharing knowledge, as well as the promise of decreasing their project's bus factor (http://en.wikipedia.org/wiki/Bus_factor).

Select Success Stories

While we may speculate about the long-term impact of the program, there have already been substantial achievements over the past four years.

Some of the greatest success stories that emerge from GSoC share the same theme: former students choose to mentor other students for the program. Each year, a few dozen former students join the ranks of our mentors; as most of them are still enrolled as students, choosing to mentor means forgoing the 4,500 stipend. They often comment that the opportunity to give back to their project's community through mentoring means more to them than financial benefit. Since there are so many wonderful stories of this kind to tell, I'll just touch on two students turned mentors living in Canada.

Angela Byron joined the Drupal project (http://www.drupal.org) in 2005 as a GSoC student and had never contributed to a F/LOSS project before the program. Today, she's the maintainer for the next major release, Drupal 7, and sits on the Board of Directors for the Drupal Association. She's also a published author and accomplished speaker. From 2006 on, Angie acted as an organization administrator for Drupal and did much to organize her community for GSoC. She mentored GSoC student Andrew Morton in 2007 and Jimmy Berry in 2008. Andrew created a metrics system to quickly crowd source (http://en.wikipedia.org/wiki/Crowd_source) data to determine which software modules were most useful, and Jimmy created a module for performing usability tests of Drupal. Angie works from home in Montreal for a boutique software training consultancy specializing in Drupal and other open source software.

Steffen Pingel began his contributions to the Eclipse project (http://eclipse.org) as a GSoC student in 2006. He created software that allowed developers using Mylyn (http://www.eclipse.org/mylyn/), a task-focused interface for Eclipse, to

access the very popular open source issue tracking and project management software package, Trac (http://trac.edgewall.org/). Since then, Steffen has given numerous talks on Mylyn at various international conferences. He returned to the program in 2008 to mentor Jingwen Ou, who added a wiki-based task entry system to Mylyn. Steffen works with his former mentor at a boutique software consultancy and lives in Vancouver.

Angie and Steffen are just two examples of students who have gone on to accomplish great things. More than half of the nearly 200 F/LOSS projects who have mentored for GSoC report that they have gained new committers through the mentoring process. Most projects report that at least one or two former students who do not continue to contribute extensively will still answer basic questions on mailing lists and contribute occasional improvements to the project's code base. Each mentoring organization has their own success stories to tell, and those interested should check the individual projects' websites for more details. Links to this year's participating projects can be found at http://code.google.com/soc/2008/.

Careers in Computing: Benefits to Students that Benefit Industry

The impact of the GSoC program in the software development world speaks volumes. Graduates from the program consistently let us know that participation in GSoC is viewed favourably when they seek employment in the industry. One mentor told me that his first interview question for new candidates for Now Public, a crowd sourced independent public media site, is "Were you a Google Summer of Code student?" While many of our student participants are still enrolled in College or University, many that complete the program report that they have accepted internships or full-time employment with major software development firms like Apple, Cisco, Hewlett-Packard, IBM, Intel, Nokia and RedHat. Many others have joined or founded boutique software design firms. Google has hired some GSoC participants, but only a handful. Less than 2% of our mentors and students have ever interviewed with the company.

Researching Technology, Developing Programmers

We're often asked about our motivations for running the GSoC program. Simply put, we want more College and University students writing code. Over the past four years of the program, 2,400 students have produced ~6 million lines of source code. That's a lot of people experimenting with technology, learning from one another, and creating new and useful things.

The greatest benefits we receive from running GSoC are the same as those that the rest of the world receives by Google's investment in the program:

- more F/LOSS code available for everyone
- better trained software developers taking positions throughout industry
- a stronger F/LOSS development ecosystem

The most accurate way to characterize GSoC is as a Research and Development partnership with the F/LOSS community. Google provides infrastructure and financial incentives for engagement and the community provides the social and technical expertise. Together, they create a solid foundation in the social and technical fundamentals of the art of software design for more than two thousand of the world's future technologists.

At the very least, this investment yields more available source code. At the very most, this foundation provides some of the best and brightest thinkers with the opportunity to focus their talents on solving critical problems in computing. The resulting acceleration of their own development should improve the efficiency and health of Computer Science in general, with requisite benefits resulting for Google, wider industry, and the extended F/LOSS community. We are confident that the impact of the program will be felt long into the future as more code is written and as those trained through the program continue to contribute their hard won knowledge back into the field.

Those who wish to learn more about or get involved with the Google Summer of Code program should visit http://code.google.com/soc/ or visit our IRC channel, #gsoc on IRC at http://freenode.net.

Recommended Resources

GSoC Frequently Asked Questions
http://code.google.com/opensource/gsoc/2008/faqs.html

Planet SoC
http://planet-soc.com/

Summer of Code Mentoring HOWTO
http://www.gnome.org/~federico/docs/summer-of-code-mentoring-howto

GSoC Information on Google's Open Source Blog
http://google-opensource.blogspot.com/search/ label/gsoc

Leslie Hawthorn is a Program Manager for Google's Open Source Programs Office, where she's the Community Manager for the Google Summer of Code community. She recently conceived, launched and managed the Google Highly Open Participation Contest, the world's first global initiative to get pre-university students involved in all aspects of open source software development. When not facilitating open source conferences and hackathons at Google's Corporate Headquarters in Mountain View, California, she's usually speaking about open source, F/LOSS in education, and community building or writing for the Google Open Source Blog. Leslie holds a Honors B.A. in English Language and Literature from U.C. Berkeley. Her personal website is http://www.hawthornlandings.org.

"The potential of digital projects to present information in new and important ways seems limitless. Currently, however, digitization remains plagued by confusing standards, changing technologies, and doubts about the long-term viability of digital files."

Trevor Jones, Illinois
Digitization Institute
http://images.library.uiuc.edu/resources/introduction.htm

Well into the second decade of the web, many collecting institutions and aspiring digital humanists still find it difficult to mount online exhibitions and publish collections-based research because they lack either technical skills or sufficient funding to pay high priced web design vendors. The digital libraries and archives fields have produced high quality repository and collections management software, but these packages carry too much technical overhead and pay too little attention to web presentation and end user interface for most digital humanities projects. Commercial blog packages have made it easy for digital humanists to publish materials to the web, but the blog's structure of serial text posts does not allow them to present deep collections or complex narratives.

That is why the Center for History and New Media (CHNM, http://chnm.gmu.edu) at George Mason University, in partnership with the Minnesota Historical Society (http://www.mnhs.org/), has created Omeka (http://omeka.org/). From the Swahili word meaning "to display" or "to lay out for discussion," Omeka is a next generation web publishing platform for academic work of all kinds, one that bridges the university, library, and museum worlds through--and by helping to advance--a set of commonly recognized web and metadata standards. Omeka is free and open source.

It offers low installation and maintenance costs--appealing to individual scholars and smaller cultural heritage projects and institutions that lack technical staffs and large budgets. It is standards based, extensible, and interoperable--insuring compliance with accessibility guidelines and integration with existing digital collections systems to help digital humanists of all stripes design online exhibitions more efficiently. Omeka brings Web 2.0 technologies and approaches to digital humanities websites, fostering the kind of user interaction and participation that are central to the mission of digital humanities, and providing the contribution mechanisms, tagging facilities, and social networking tools that audiences are coming to expect.

Introduction

Collecting institutions such as museums, archives, and libraries have two faces. One is the face they present to the world through their public events, education programs, and gallery exhibitions. The other is the private face of their collections store rooms, of the behind-the-scenes world inhabited by curators, registrars, and collections managers. Indeed, individual scholars often have these same two faces: the overflowing file cabinets of their offices contrast mightily with the svelte prose of their journal articles and the flowing speech of their lectures.

During the past twenty years, cultural heritage professionals have come to enjoy a relatively wide range of software choices to help them manage the digital resources in their care. Libraries, in particular, enjoy many good choices in picking an integrated library system (ILS, http://en.wikipedia.org/wiki/Integrated_library_system) to manage collections, patrons, and even financial information.

These choices include both commercial products such as SIRSI (http://www.sirsidynix.com/) and Voyager (http://www.exlibrisgroup.com/category/Voyager) and open source packages such as Evergreen (http://evergreen-ils.org/) and Koha (http://www.koha.org/). Archivists enjoy many of these same tools in addition to several well developed digital archives management packages such as CONTENTdm (http://contentdm.com/) or the open source DSpace (http://www.dspace.org/) and Fedora Commons (http://www.fedora.info/). Museum curators choose from a strong catalog of collections management systems, including The Museum System (http://www.gallerysystems.com/products/tms.html), KE EMu (http://www.kesoftware.com/), MultiMimsy (http://willo.com/mimsy/), and for smaller museums, PastPerfect (http://www.museumsoftware.com/). A new initiative, CollectionSpace (http://www.collectionspace.org/), aims to build an open source competitor to these established commercial products for museums.

Even individual scholars have good software choices when it comes to managing personal research archives, including well established commercial bibliographic management tools like EndNote (http://endnote.com/) and RefWorks (http://refworks.com/) and Web 2.0 and open source newcomers like LibraryThing (http://librarything.com/) and Zotero (http://zotero.org/), an extension for the Firefox web browser produced by my home institution, the CHNM at George Mason University. Each of these packages has its strengths and weaknesses, but taken together, they represent a robust marketplace of options for cultural heritage professionals needing to sort, organize, describe, and maintain digital resources. Each offers a real solution to the digital needs of the more private, collections-focused work of cultural heritage.

Strikingly, however, not one of these packages seriously addresses the other face of cultural heritage, the more public facing work of dissemination and education. Well into the second decade of the web, most cultural heritage institutions and aspiring "digital humanists" (humanities scholars with a digital bent) still find it difficult to mount online exhibitions and publish collections-based research because they lack the right tools. Some of the repository and collections management packages mentioned above offer something in the way of online presentation tools, but their web outputs consist of little more than searchable lists of collections records. They are not (and arguably should not be) concerned with providing facilities for structuring collections in narrative exhibitions, for creating and communicating meaning through collections. Where sophisticated online publishing occurs in the cultural heritage and scholarly fields, it usually occurs only through high priced web design vendors.

In contrast, Omeka is an open source, next generation web publishing platform for collections-based research of all kinds. It bridges the scholarly, library, and museum worlds through, and by helping to advance, a set of commonly recognized web and metadata standards. Omeka aims to put serious web publishing within reach of all scholars and cultural heritage professionals.

Design

Despite the lack of web publishing tools designed specifically for scholars and cultural heritage professionals, one form of web publishing has taken off among these groups in recent years: blogging. Many museums, libraries, archives, and individual scholars now maintain blogs as a way of reaching out to stakeholders, relaying results of research, and building online communities.

Some of these have gained significant traction, increasing the reach of larger, well established institutions and scholars and introducing less well known institutions and individuals to new audiences. While popular blog software such as Movable Type (http://movabletype.org/), Blogger (http://www.blogger.com/), and the open source WordPress (http://wordpress.org/) have made it easy to publish textual content to the web, a blog's essential structure of chronological, serial text posts does not allow one to meet certain challenges. A blog cannot provide multiple pathways through an exhibition or tell the kind of multi-threaded stories that are a hallmark of the way audiences experience physical exhibits. Blogs are very well suited to communicating words to museum visitors, library patrons, and archives users, but they are ill-equipped at tying words to digital collections, which is the ultimate aim of collecting institutions in particular. Because of the more textual nature of their work, scholars can go further with a blog, but if they want to expose their readers to the primary source documents, artifacts, and multimedia materials that support their text, the blog falls short. Our aim with Omeka was to build a piece of web publishing software with the ease of use and audience-centeredness of a blog but one that puts collections and collections-based research and exhibits front and center.

Omeka has been called "WordPress for museums" or "WordPress for collections." Though Omeka doesn't share any code with WordPress, and bears only a passing technical resemblance to the popular open source blog platform, several core members of the Omeka team are avid WordPress hackers and WordPress has frequently provided a useful point of analogy and common touchstone in Omeka design and development meetings. In particular, Omeka has taken three cues from WordPress.

First, like Wordpress, Omeka offers low startup and maintenance costs which appeals to individual scholars and smaller cultural heritage organizations that lack technical staff or funding for outside web design services. Like WordPress, Omeka is available as a free installable download for the standard open source LAMP stack (http://en.wikipedia.org/wiki/LAMP_(software_bundle)). Its five-minute setup makes launching an online exhibition as easy as launching a WordPress blog. One of the reasons WordPress has gained such traction is that it has lowered the start up costs for running a powerful self-hosted web application. Omeka has sought to match that ease of installation and use.

Second, Omeka provides a modular software architecture, allowing the core code base to be extended easily through plugins and themes. Omeka's rich application programming interface (API) empowers people with a range of programming skills to participate in its open source community and expand its capabilities. Plugins extend Omeka's core functionality, bringing Web 2.0 technologies and approaches to academic and cultural websites that foster the kind of user interaction and participation that are central to scholarship and cultural heritage. Among those currently available or in the works are plugins that enable geolocation of collection items, user contributions, user tagging, Creative Commons licensing for collection items, and several multimedia display wrappers. Theme switching makes changing the look and feel of an Omeka website as easy as choosing or tweaking one of the many expertly designed templates from Omeka's online themes directory, or devising a new one of your own. Readers experienced in hacking WordPress themes or with even modest HTML, CSS, and PHP skills should have little trouble getting started with Omeka's simple, yet flexible, theme API.

Third, just as WordPress has provided easy to use yet powerful graphical interfaces for producing quality, well designed online text, we have been especially keen to focus on user interface design in building Omeka's backend administrative interface where collections and exhibits are created. Too much cultural heritage software has privileged functionality over usability. Omeka's clean and intuitive user interface incorporates the kinds of features and workflows that scholars and cultural heritage professionals expect. It is designed with end users in mind, allowing them to focus on content and interpretation rather than configuration or programming. Where we have anticipated or users have encountered problems, or where routines are necessarily complex, we have produced extensive wiki-style online documentation (http://omeka.org/codex/Documentation) and screencast tutorials (http://omeka.org/codex/Omeka_Tutorials).

Just as important, however, are the ways in which Omeka diverges from WordPress and other content management platforms. First, Omeka's data architecture is designed to adhere to prevailing digital archival metadata standards and to enable interoperability with the back office digital collections management and repository software discussed at the beginning of this article. Omeka's Dublin Core metadata structure (http://dublincore.org/), Resource Description Framework (RDF, http://www.w3.org/RDF/), Open Archives Initiative (OAI, http://www.openarchives.org/), Categories for the Description of Works of Art (CDWA-Lite, http://getty.edu/research/conducting_research/standards/cdwa/cdwalite.html) implementations, and its upcoming suite of data migration tools enables interoperability with existing digital collections systems.

Moreover, Omeka's adherence to the U.S. government's Americans with Disabilities Act accessibility standards (http://www.section508.gov/) allows ordinary scholars and cultural heritage professionals to design fully accessible online exhibitions efficiently.

Second, the experience of working with Omeka is substantially different than blogging. Workflows in Omeka begin with collections rather than texts. When building an Omeka website, a user starts by uploading and describing items in his or her research collection, adding Dublin Core metadata, tags, and other item-level information through the step-by-step administrative add-item dialog. Once the collection is established, the user can then turn to building narrative exhibits that draw on these collections, placing items of choice alongside label text in pages and sections to form multilayered exhibits.

Finally, Omeka's end user outputs are both more variable and more structured than most blog powered websites. Full access to research collections as well as curated exhibits, multiple exhibits for a given set of collection resources, and the ability to separate archive design from individual exhibit design all set an Omeka website apart from a blog. Moreover, the greater complexity of the data found in described collections and exhibits rather than simply posts and pages requires a more powerful and configurable search interface. To meet this need, we have included an iTunes-style query builder for use on both public themes and the backend administrative interface.

Adoption and Roadmap

Omeka received its initial funding from the United States Institute of Museum and Library Services (http://imls.gov/) in October 2007.

Supplemented with funding from the Alfred P. Sloan Foundation and based on work done previously at CHNM, the Omeka team was able to release its first public beta in late-February 2008. In its first nine months of general release, Omeka has been downloaded more than 3,000 times and is being used by a diverse range of small and large universities, museums, libraries, and archives including the New York Public Library (http://exhibitions.nypl.org/exhibits/eminent), the Missouri School of Journalism (http://archive.poyi.org/), the University of Arizona (http://digitalcommons.library.arizona.edu/x/exhibits/), the University of California School of Information (http://okapi.wordpress.com/projects/omeka-theme/), and the Hawaiian Historical Society (http://huapala.net/). Examples of CHNM sites built with Omeka include the Hurricane Digital Memory Bank (http://hurricanearchive.org/), the Bracero History Archive (http://braceroarchive.org/), Gulag: Many Days, Many Lives (http://gulaghistory.org/), and Making the History of 1989 (http://chnm.gmu.edu/1989/). A showcase of these and other Omeka powered projects can be found on the main Omeka website (http://omeka.org/showcase/).

Omeka's website is home to lively user forums and wiki-style documentation which provide community-based support for the product. We learned early on, both with the Omeka project and in our earlier work on the Zotero project (http://www.zotero.org/), that aside from a good product, active community building is the most important part of running a successful academic open source project. We strongly believe that Omeka's robust open source developer and user communities will underwrite its long term stability and sustainability, and we are committed to growing and nurturing these communities.

Several members of the Omeka team at CHNM are dedicated full- or part-time to community building activities, both among end users of the software and among the developer and hacker community. We actively encourage community members to donate their expertise, enthusiasm, and code (themes, plugins, patches, and additions to the core) back to the community through several channels on a top-tier "get involved" section of the Omeka website (http://omeka.org/get-involved/).

Early in 2009, Omeka will obtain its 1.0 release. Soon afterwards, we will begin work on a low cost, browser based subscription service. Here again the analogy is WordPress, where users can choose to download a server installable package at WordPress.org, or they can choose a hosted blog at WordPress.com. Likewise, Omeka.net will launch in late 2009, opening up the possibility of serious web publishing to even the smallest and least technically equipped museums, libraries, archives, and scholars.

We are also planning to provide federated search facilities for Omeka users interested in making information about their collections and exhibits discoverable through a unified search and browse service on the Omeka website. In the future we hope to expand these federated search capabilities to provide centralized open access downloads and long term preservation of distributed Omeka collections. We are also working to collaborate with other museum-centered open source projects such as CollectionSpace (http://www.collectionspace.org/) and OpenExhibits (http://openexhibits.org/). Finally, we plan to continue building and supporting the development of new features, new plugins, and new themes to help the Omeka community keep moving forward.

Conclusion

Until now, scholars and cultural heritage professionals looking to publish collections-based research and online exhibits required either extensive technical skills or considerable funding for outside vendors. By making standards based, serious online publishing easy, Omeka puts the power and reach of the web in the hands of academics and cultural professionals. The Omeka team has worked to produce a platform that reproduces the ease of use and low barriers of blog software, but that incorporates the unique requirements of cultural heritage collections and more complex demands of scholarly narrative and exhibition. Readers interested in trying Omeka are encouraged to try it out in our open sandbox (http://omeka.org/codex/Try_Omeka_Before_Installing) or to contact us through the Omeka user forums.

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"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete."

Buckminster Fuller
http://en.wikipedia.org/wiki/Buckminster_Fuller

Article 26 of The Universal Declaration of Human Rights attests that access to educational opportunity is a basic human right (http://www.unhchr.ch/udhr/index.htm). Yet while a myriad of publishing technologies flourish around us, the staple of classroom teaching, the textbook, is becoming so expensive as to be increasingly inaccessible. In this article we describe how Flat World Knowledge (FWK, http://flatworldknowledge.com/) is leveraging principles of openness to bring textbooks back into reach of all students, creating significant social value in a manner that will sustain itself over the long-term.

Declining Access to Curriculum Materials

Basic literacy and numeracy are the foundations of economic self-reliance, meaningful participation in government, and moral and ethical development. In other words, education is a cornerstone of civilized society. Education is, therefore, a critically important area in which to create social value.

Access to education is by no means universal. According to a recent UNESCO report, over 72 million primary school age children are not enrolled in school, and millions more cannot attend regularly (http://unstats.un.org/unsd/mdg/Resources/Static/Products/Progress2007/UNSD_MDG_Report_2007e.pdf). Girls and children from rural or poorer families are the least likely to attend school. Challenges with primary school create further difficulties with secondary and higher education.

For many who are enrolled in school or who attend a university, curriculum and other educational materials are unavailable or of poor quality. This contributes to enrollment and attendance problems.

Textbooks are the backbone of most collections of curriculum materials supporting formal educational experiences. While it may be argued that a sufficient number of physical copies of textbooks are available from publishers, it does not necessarily follow that sufficient student access to textbooks exists. In fact, just the opposite seems to be true: due to problems with textbook prices, access to this staple of the traditional classroom is actually in decline.

Problems with Textbooks

Just how high are textbook prices? The average US student spends about $900 on textbooks each year, with textbook prices currently growing at about four times the rate of inflation (http://www.maketextbooksaffordable.org/newsroom.asp?id=44596). Textbooks account for as much as 72% of overall student spending – including tuition – for students attending two year schools (http://www.gao.gov/new.items/d05806.pdf). The higher publishers price their textbooks, the harder students look for alternatives to their high priced offerings. Used book markets flourish, peer-to-peer textbook trading markets spring into existence, and grey markets emerge with lower priced international editions of books making their way back into the US, displacing higher priced US sales.

Why are textbooks so expensive? Because none of the afore-mentioned alternatives provide publishers with revenue, publishers are forced to charge even more for the books they do sell in order to meet market expectations.

Extremely aggressive release cycles for new editions are adopted in order to outdate books in the used, peer-to-peer, and grey market channels, driving new book sales. And the faster publishers release new editions that are more expensive than the last editions, the harder students look for alternatives.

Thus, textbook publishers find themselves in the midst of a vicious downward spiral. Because U.S. student enrollments exceed 17 million with 15% growth projected through 2015, and enrollment growth outside the U.S. is even stronger, one would expect that textbook publishers are benefiting from the rising tide of new customers. Instead, the industry is contracting and showing signs of crisis. Despite annual price increases of nearly 9%, unit sales growth has been negative for four straight years, and revenue growth continues to slow.

Given the critically important role of education, the importance of the textbook in education, and the obviously broken state of textbook publishing, FWK saw an opportunity to leverage principles of openness to create a significant amount of social value in a manner that would be sustainable over the long term.

What is Openness?

Openness refers to the copyright licensing status of a creative work that allows individuals other than the rights holder to access the work and make a variety of uses of the work without the need to secure additional permissions or make payments. In the Open Education License Draft (http://opencontent.org/blog/archives/355), this author summarizes the four main types of activity enabled by openness:

1. Reuse: use the work verbatim or exactly as you found it.

2. Revise: alter or transform the work so that it better meets your needs.

3. Remix: combine the (verbatim or altered) work with other works to better meet your needs.

4. Redistribute: share the verbatim work, the revised work, or the remixed work with others.

In practice, openness is about using copyright and contract law to make the sharing of creative works and derivatives of creative works free, easy, and legal. Open licenses are used to extend the permissions provided by copyright and contract law.

When the phrase “open source” was chosen in 1998 to describe a method of developing and distributing software, the phrase was embued with a very specific definition. The current definition describes in detail ten criteria by which a software license will be measured in order to determine whether or not it qualifies as an open source license. Summarizing from the open source definition (http://opensource.org/osd/):

1. Free redistribution: the license cannot restrict people from giving others copies of the software for free.

2. Source code: access must be provided to the source code of the software.

3. Derived works: the license must allow the revising and adapting of the source code.

4. Integrity of the author's source code: the license may restrict source code from being distributed in modified form only if the license allows the distribution of patch files with the source code for the purpose of modifying the program at build time.

5. No discrimination against persons or groups: the license must not discriminate against any person or group of persons.

6. No discrimination against fields of endeavor: the license must not restrict anyone from making use of the program in a specific field of endeavor, like business or the military.

7. Distribution of license: the rights attached to the program apply to all to whom the program is redistributed.

8. License must not be specific to a product: the rights attached to the program must not depend on the program's being part of a particular software distribution.

9. License must not restrict other software: the license must not place restrictions on other software that is distributed along with the licensed software.

10. License must be technology-neutral: no provision of the license may be predicated on any specific technology.

When this author chose the phrase "open content" in 1998, he did not provide such a comprehensive definition, but rather extended the ideas of open source software to creative works other than software. The Open Publication License (http://opencontent.org/openpub/), a license made primarily for printed materials like books, journals, and articles, operated within a framework of three requirements:

1. Attribution: when material from the open content is reused, the original author must be given credit.

2. Commercial uses: the licensor can choose whether or not to prohibit the for-profit sale of printed copies of the open content.

3. Derivative works: the licensor can choose whether or not to prohibit the revision or adaptation of the open content.

The Creative Commons licenses (http://creativecommons.org/), currently the most popular open licenses for creative works, have adopted and adapted this same three-part framework.

By using open licenses, individuals or organizations can grant a variety of rights--such as reuse, revise, remix, and redistribute--in a creative work to anyone and everyone. Open licenses can include some restrictions, like prohibiting commercial use or the creation of derivative versions of the work, but should do so without discrimination towards any individual, group, or field of endeavor.

Leveraging Openness to Create Value

With the importance of education and textbooks described, and the meaning of openness discussed, we can now explain how FWK leverages openness to solve problems of access to textbooks and education.

FWK is an open textbook company. Open textbooks are textbooks that are available online, for free, to everyone. In the specific case of FWK textbooks, these are licensed with a Creative Commons Attribution-NonCommercial-ShareAlike license. This means that FWK grants everyone the four rights of open content (reuse, revise, remix, redistribute) for their textbooks. It also requires that those who exercise any of the four rights: i) give credit to the textbook author(s) as the original source; ii) refrain from selling the textbooks or derivatives of the textbooks for profit; and iii) share any revised versions of the textbook they create with the world under the same license terms.

FWK utilizes a textbook development model including a single expert author or small number of expert authors, as well as artistic support, editorial support, and support in the development of supplemental materials. The resulting textbooks are of extremely high quality.

Given the previous discussion about the lack of access to quality educational and curriculum materials, it should be clear that providing the four open content rights to such high quality textbooks creates a great deal of value. Students and anyone else with access to a computer now have access to very high quality online textbooks at no cost. Rather than "how does FWK leverage openness to create value?" the primary question of interest becomes "how does FWK leverage openness to sustainably create value?".

Creating Sustainable Value

FWK provides access to online textbooks at no cost, using an open license that prohibits others from selling printed or derived versions of the textbooks for profit. This license restriction creates an opportunity space in which FWK can sell printed versions and derivative versions of the textbooks in order to sustain the business, publish new books, and create additional social value. While at first it may seem counterintuitive that anyone would pay for a printed version of what they can get online for free, imagine trying to read 300 pages on the screen. A number of experiments have already demonstrated very clearly that books whose full text is published digitally sell very well in print. Examples include Lessig's The Future of Ideas (http://the-future-of-ideas.com/), Benkler's The Wealth of Networks (http://www.benkler.org/Benkler_Wealth_Of_Networks.pdf), and Doctorow's Down and Out in the Magic Kingdom (http://craphound.com/down).

Given the opportunity to choose a format that suits them, many students are willing to pay for other versions of the text even though the full text of the book is available for free online. Some prefer an audio version they can listen to while driving or exercising. Some prefer an inexpensive paperback version while others prefer a hardback, full-color copy of the book they can take with them from college into the workforce for reference. Given a palette of choices and reasonable prices, people will pay for the value provided by these additional formats. It is by providing this additional value through alternate formats that FWK sustains its business.

Alongside opportunities to sell books in printed and other formats, a significant opportunity exists to sell optional study materials that support student learning of the content within the books. These materials are usually shrinkwrapped with traditional textbooks as a way of justifying their exorbitant costs. FWK comes back to the principle of choice – disaggregating these resources and leveraging the capabilities of the Internet to sell and deliver digital supplemental materials individually or in discounted bundles. These materials are a second way to generate the revenue necessary to sustain the business and continue creating value.

Conclusion

Applying principles of openness to the problems of the textbook market has been a tremendous catalyst for the creation of value. Innovative business models akin to those employed by businesses built around open source software provide a sustainable stream of revenue capable of supporting the business over the long term. Relying on openness and innovative business models has given FWK a way to create sustainable value.

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"The private sector is the engine of innovation and growth providing incomes for rural and urban populations. It is also a tremendous repository of organizational and management expertise that can increase the effectiveness of service delivery. Where possible, countries should therefore draw on the private sector to complement governments in designing, delivering and financing interventions to achieve the [United Nations] Millennium Development Goals [for the betterment of all]."

Recommendations of the
MDG Africa Steering Group

SW Global (http://www.swglobal.com) is an African-based application service provider (ASP, http://en.wikipedia.org/wiki/Application_service_provider) of information technology (IT) infrastructure and software. This article describes how SW Global, a for-profit private sector company, creates high-impact value at universities and governments in developing countries through an innovative business model anchored around service subscriptions, open source software (OSS), and open content.

Origins and Context

Dr. Aloy Chife was a director at Apple (http://www.apple.com) in Silicon Valley during the early days of outsourcing software development to firms in India. According to Dr. Chife: "I surmised that Nigeria and India shared much in common. I thought that the time had come to grow the talent in Africa, and I saw an opportunity to set-up a visionary software company that could focus on automation." With financial and advisory support from the World Bank (http://worldbank.org), he founded SW Global (originally called SocketWorks) in 2002 in his home country of Nigeria.

Dr. Chife found the need for process automation to be particularly strong at publicly funded universities, colleges, and vocational schools throughout sub-Saharan Africa. Processes were typically manual, consisting of filing cabinets of paper records in separate departments with different areas of focus. Existing electronic records were often word processing documents or spreadsheets. Few public universities were connected to the Internet, and many faculty and senior administrators had never touched a computer.

However, he concluded that a traditional software business model would not be effective in this context. First, there was no established market for proprietary software. The use of computers was not widespread, and organizations were not familiar with the concept of paying for software licenses. Second, the upfront costs of deploying information and communication technology (ICT) systems were beyond the means of governments and publicly funded universities. Third, network connectivity was very expensive. A single VSAT (http://en.wikipedia.org/wiki/VSAT) satellite connection providing 1Mb/s of downstream bandwidth could cost between three and four thousand dollars per month.

SW Global became a market maker where no market yet existed. Rather than sell ICT products, they chose to offer configurable bundles of automation services used by administrators, faculty, and students. Working in collaboration with local IT departments, they built on existing systems where possible and deployed new ICT infrastructure, network connectivity, and learning content where needed. Their vendor-financed ASP model provides infrastructure at no cost to the university, then recovers costs through student fees. The university owns the systems and infrastructure while SW Global provides continuous training with the expectation to transition administration and first-level support to local IT staff, further empowering the university community.

Dr. Chife describes the value proposition to the university: "We're willing to invest our money to create efficiencies for you. You don't have to pay us a dime. We make money when your customers pay you – a service charge of pennies on the dollar." These access fees are distributed across the many users of the system. Annual access fees for students in Nigeria are comparable to the local cost of telephone talk-time for the average Nigerian student for a month.

The underlying software systems are built from an assemblage of software components, many of which are open source, along with high-value proprietary elements not available elsewhere. The adoption of OSS is pragmatic and business-driven to offer the highest possible customer value at the lowest possible cost.

SW Global currently employs more than 400 people in Ghana, Nigeria, Kenya, Sierra Leone, Liberia, India, Sri Lanka, South Africa and Uganda, and is in the process of opening new offices in six other countries in Africa.

Service Offerings

SW Global service bundles can comprise several software and content components. The CollegePortal bundle is an integrated groupware, intranet, back office and e-learning platform. It includes student facing systems (such as course registration, results checking, and personal data management), administrative systems (such as human resources, finance, and operations), document management and learning systems, a library management system, and communication tools for an active eCommunity. SW Global hosts the application servers, provides infrastructure and maintenance, and dedicates support resources.

SW Global's Enterprise Knowledge Management (EKM) software combines a learning management system (LMS, http://en.wikipedia.org/wiki/Learning_management_system), a content management system (CMS, http://en.wikipedia.org/wiki/Content_management_system), and a collection of eLearning content that includes the eGranary Digital Library (http://www.widernet.org/digitallibrary), MIT OpenCourseWare (http://ocw.mit.edu), Wikipedia (http://www.wikipedia.org), Project Gutenberg (http://www.gutenberg.org), and more than 1,200 other websites. Students and faculty can access this high quality content from local servers without accessing the Internet–-an enormous efficiency when thousands of users may share a single low-bandwidth satellite link to the Internet.

cPortal is the SW Global Enterprise Portal Server, providing interoperability with other software such as legacy financial accounting systems, or new software packages such as open source LMSs.

These service offerings leverage OSS and open content to drastically reduce deployment costs. Much of the server-side software stack, especially middleware, is open source. Likewise, the software development environment is comprised of open source tools, and the eLearning content of the EMK package is largely a compilation of open content and open educational resources.

Three Service Deployments

The second section of this article provides brief descriptions of three SW Global services deployments: i) a software deployment at the University of Benin in Nigeria in 2004; ii) a software and ICT infrastructure deployment at

Yaba College of Technology in Nigeria in 2006; and iii) a software, infrastructure, and learning content deployment at Makarere Business School in Uganda in 2007.

University of Benin

The University of Benin (http://www.uniben.edu/) was the first Nigerian University to take its core processes online in a bold initiative by the university administration during the 2003/2004 academic session. It is a federally owned university located in the western region of Nigeria, with an enrolment of approximately 30,000 full- and part-time students across various degree- and certificate-granting programs at the undergraduate, post-graduate, and vocational levels.

Unlike many universities in sub-Saharan Africa, the University of Benin had some existing ICT infrastructure in place consisting of approximately 260 networked computers distributed across 8 digital centres with two VSAT links to the Internet (providing combined bandwidth of 2Mb/s down and 512Kb/s up), and Internet cafes located around campus. Student registration, admissions, and other record-keeping functions were distinct manual processes. The Central Records Service Processing Unit (CRSPU) was tasked with collating results and processing electronic data across the university.

Building on top of the existing infrastructure, SW Global deployed new software, services, and training. MyUniben (http://www.myuniben.com), a customized portal built on SW Global's CollegePortal technology, managed records for the university's internal programs. Processes taken online included admissions, course registration, payment, and student results reporting. Three new support staff provided first level support for staff and students, and liaised with second level support provided by SW Global.

Online fee payments were enabled and streamlined with cards available for purchase from designated banks.

This was the first deployment of SW Global's CollegePortal software in a production environment. Two of the original developers, including one of the authors of this article, lived on site for two months of testing, customizing, and developing enhancements to ensure that services were robust to real life situations.

The deployment was a resounding success. One year later, the student database comprised records on 13,000 students, 6,000 part-time undergraduate students had successfully registered for their courses online, grades for 5,000 undergraduate part-time students had been successfully uploaded, the admission process was fully online for all internal programs, and payment of school fees was online for all programs. The introduction of CollegePortal brought about an increased awareness of ICT across the university, especially among users who had not previously used a computer.

Yaba College of Technology

SW Global's services deployment at the Yaba College of Technology (http://www.yabatech.edu.ng) was an ambitious multi-year project comprised of several phases. It required new ICT infrastructure, an expanded portfolio of services, and brought in a third partner for financing, the Zenith Bank (http://zenithbank.com), a leading Nigerian financial institution.

Yaba College of Technology is one of 47 polytechnics owned and operated by the Nigerian federal government. It is located in the Yaba area of Lagos state, the commercial capital of Nigeria. It offers more than 150 programs to a population of 17,000 students.

Unlike the University of Benin deployment, but typical of publicly funded universities in Nigeria, the initial ICT infrastructure in was inadequate. The school's local area network was restricted to the administrative building and the computer science department. Too many records were in non-electronic formats, and maintained in stand-alone systems by various departments in different locations on campus. The few digital records that did exist were in multiple incompatible formats.

To deliver value quickly, the project to upgrade ICT facilities and automate core processes was structured in several phases, beginning with an authoritative student and base record database, a web portal interface, and automation of student fees collection. Later phases included course registration and other services. New infrastructure included a digital centre containing 200 thin client computers and a campus-wide wireless network as a temporary connectivity solution while the fibre optic network was being deployed. This was the first production deployment of an enhanced version of the CollegePortal solution that supports real-time online payment using debit cards and online vended personal identification numbers. This solution was powered by the switching company ETranzact (http://etranzact.com). The Yabatech project was also significant for SW Global because it was the first three-way business partnership – a model subsequently reproduced in many other SW Global deployments.

One year later, more than 16,000 student records were gathered, more than 13,000 fee payments were processed, all departments were fully networked and connected to the Internet, a temporary campus wide network was established using radio links, and deployment of the optical fibre ring was proceeding on schedule.

Makarere University Business School

The Makarere University Business School (http://www.mubs.ac.ug) at Makarere University (http://www.makerere.ac.ug) in Kampala, Uganda, was the first SW Global deployment outside of West Africa. The president of Uganda launched the project in 2007. In addition to a full deployment of CollegePortal, it includes a human resource management system and interoperability with the school's existing accounting system. New infrastructure included two digital centres with 200 thin client computers and a link to the Internet. This deployment also featured SW Global's first proof of concept of the eGranary Digital Library to provide offline educational content to students and staff.

The Future

Dr. Chife sees the existing SW Global business of automating university processes as a stepping-stone to the future. "I think that the ASP model is going to transform itself into a consumer aggregation model of offering software for use for free to a community, and making money from advertising and content. Africa is far away from that right now, but it's how I see the future. The differentiators of a company like ours will continue to be content, because that's what is most lacking here in Africa. We have a team looking beyond eGranary, Open Courseware, and Project Guttenberg. We can add a lot of value there."

Conclusions

A June 2008 report from the Millennium Development Goals (MDG, http://www.un.org/millenniumgoals) of the Africa Steering Group (http://mdgafrica.org) concluded that the education sector in Africa remains heavily underfunded at all levels.

Tertiary education is critical for increasing economic growth, and requires additional financing beyond the funds currently committed. With under-resourced governments and schools unable to pay for ICT infrastructure and services, innovation from the private sector has an important and complementary role to play.

SW Global provides an illustrative example of a for-profit company combining an innovative business model with a service offering anchored around OSS and open content to improve the lives of people in developing countries. For at least one for-profit company in sub-Saharan Africa, innovation is good business.

The authors thank Dr. Aloy Chife, CEO of SW Global, for providing an interview during the preparation of this article.

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"Support, encompassing traditional installation, desktop, and software lifecycle support, is a significant issue for NFPs [not-for-profits]."

Jason Cote and Julian Egelstaff
http://www.osbr.ca/ojs/index.php/osbr/article/view/403/364

Much of the currently available off-the-shelf software offers too many features and does not meet the unique usability needs of non-technical or disabled users using old hardware. When leveraging open source components to rapidly build products for not-for-profit organizations, the speed of development doesn't reduce the need to make the product accessible by the users.

This article shares the experiences of a unique community/university partnership to bring accessible technology to the non-profit community in the National Capital Region.

Creating a Partnership

In 2006, Volunteer Ottawa (VO, http://www.volunteerottawa.ca/), a charitable non-profit volunteer centre which increases the capacity of organizations through the use of volunteer energy, recognized that it needed to build a more efficient internal system to manage its staff and volunteer resources.

Because of its focus on community capacity, and mindful of the hundreds of community organizations it supports, VO decided that it would look for innovative solutions that the non-profit community as a whole could share. Once VO secured individual donor support for a community tool, it began thinking about how to best leverage this financial support into a secure, useable and sustainable system for itself and for the sector at large.

Through investigating possible administrative solutions, VO realized it was really searching for an external program delivery model that supported internal administrative pieces. A central part of a volunteer centre's role in the community is helping potential volunteers find volunteer opportunities and helping community organizations advertise their volunteer needs. Individuals, school groups and corporations need to make quick and easy connections with community organizations. A system that provides online volunteer applications, tracks volunteer activity to help with recruitment strategies, and provides backend administrative reporting and organizational management would provide significant support to the non-profit community throughout the region.

Carleton University was looking for ways to bridge the university to the community. Coralie Lalonde, an angel investor and community volunteer, immediately saw the possibility for a partnership that would create that very bridge. "I knew that the volunteer centre would make a perfect conduit for community needs to flow to Carleton and for the technology solutions to flow back out," she says. Open source was proposed as the most efficient means to provide maximum functionality with minimum associated costs.

Technology Needs

VO hired a staff member to research community needs and to provide social support to organizations to ensure the technology was actually usable. "When talking about technology and the non-profit sector, it isn't enough to believe that if you build it they will come. Non-profit staff and volunteers are focused on delivering hands-on programs. They simply do not have the time to invest in chasing down every possible tool that comes along, and it is really important that not only is the tech solution easy to use, but that it is clear how the individual, the organization, and most importantly, the client service will improve through using the technology," Jill Woodley, communications manager at VO, points out. A Carleon graduate student and VO set to work on figuring out the best option for the first task of the partnership – building a community volunteer website.

The website had a number of requirements. It needed to be:

- easy to navigate and straightforward for volunteers to apply for opportunities
- accessible for people with disabilities who use various programs to help them navigate on computers, such as screen readers
- expandable, as the partnership had many plans for numerous applications
- easy for community organizations to post their volunteer needs onto the site

VO insisted that organizations also be able to run reports showing them useful data such as the number of applications they received directly through the website or the number of individuals who clicked through to their organization's homepage from their profile at VO.

VO needed a host of administration functionalities, as keeping track of over 300 community organizations and thousands of volunteer requests required simple but extremely reliable reporting. VO needed some way of knowing not just how many applications were being made, but which volunteer opportunities were not receiving applications.

This would allow VO to focus scarce staff resources to work more closely with those organizations to provide additional recruitment support. Finally, all of this had to happen in both English and French as VO is a bilingual organization.

VO settled on an open source application, a service provider and a basic design layout. As the back-end for community groups was built, Jill continually tested the functionalities with various organizations to ensure community needs were being met and that what was being built could be used by organizations with older hardware or slow Internet connectivity. By testing functionalities continually, Jill gathered useful information about community needs and created buy-in for the technology work VO was engaging in.

The community site was officially launched during National Volunteer Week in April, 2008. In the months since, over 4,000 potential volunteers applied to volunteer positions through this website. Currently, VO is focusing on building a volunteer management application that community organizations can use to manage their volunteer programs. This application will be available and supported through VO's community website.

Communications Technology

Ontario's Talent First Network (http://www.talentfirstnetwork.org) had created an open source web conferencing product called BigBlueButton (http://bigbluebutton.org/), which was being used to teach remote students in their TIM program. It had also spun out a new company called Blindside Networks to provide commercial support for BigBlueButton. BigBlueButton provides high-quality voice conferencing using asterisk (http://www.asterisk.org), a popular open source implementation of a private branch exchange.

Wondering if free conference calling would be of interest to non-profit organizations, a connection was made with VO who immediately saw the huge benefit this service would be to the community. Blindside Networks offered its professional services to the project, and Carleton's Foundry (http://carletoninnovation.com/foundry) program, led by Luc Lalande, offered to host a voice conference server and provide the necessary phone lines.

While developers are good at providing software that solves technical problems, in-house customization is often needed to ensure the application is accessible to a vast array of users. Any successful project needs to proceed through the core phases of requirements gathering, planning, implementation, testing, and deployment.

Blindside started gathering VO's requirements and found that:

- end users had to be able to schedule a conference from their web browser
- the interface had to be really easy to use
- the interface had to work with various levels of outdated hardware and be accessible to persons with disabilities
- the product needed to be integrated into VO's existing web site in both official languages
- the conference server had to send out an e-mail with the instructions for joining the conference

During the planning phase, the project was broken into four main steps, with the intent that VO could see and test the solution with community organizations after each step. These steps were:

1. Setup a voice conference server using asterisk and its MeetMe module.

2.Provide a simple interface to schedule a conference as MeetMe's web interface, Web MeetMe, was too complicated.

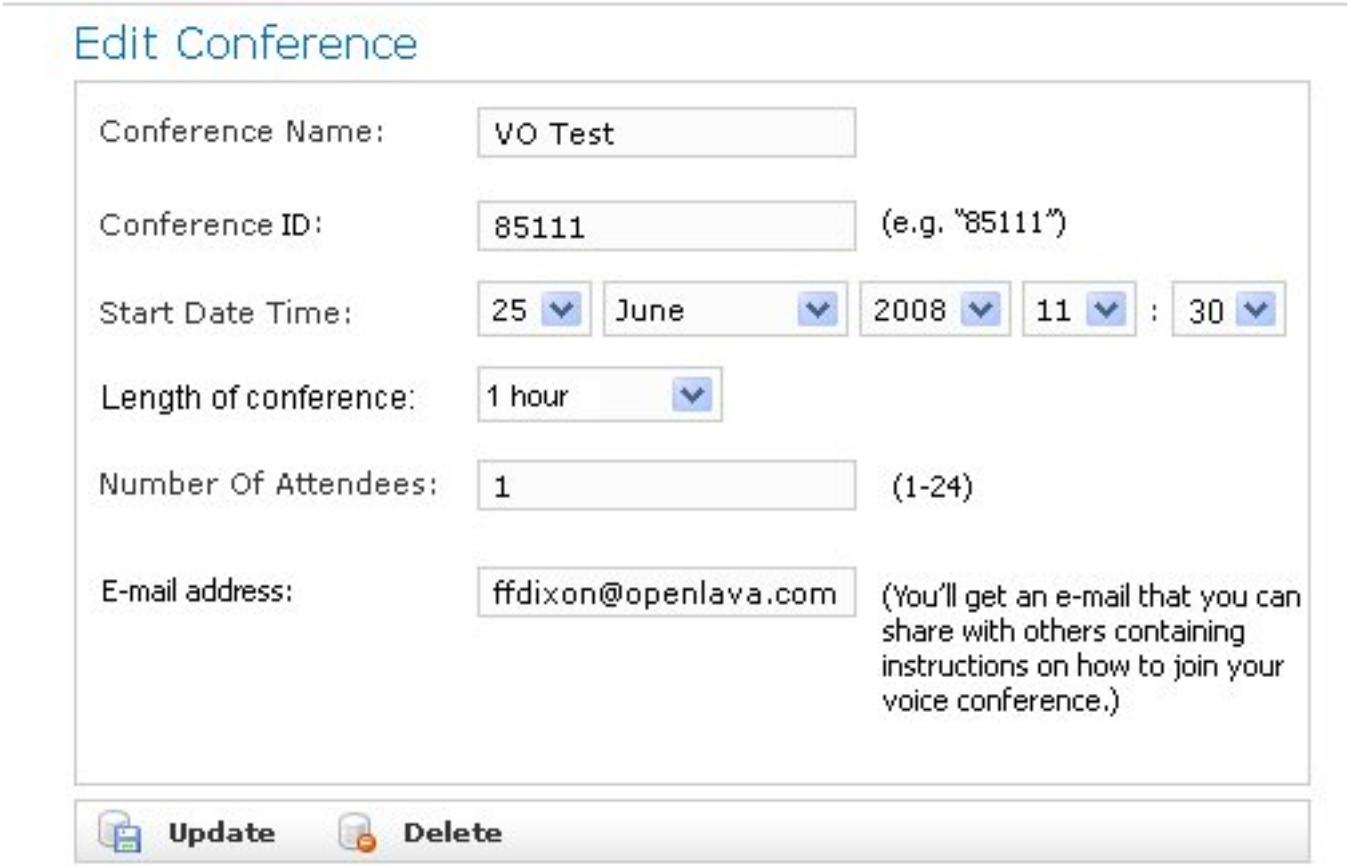
3.Integrate the server with VO's existing web site.

4.Create training material for self-support.

Creating an alternate interface was important as VO was certain that end users would be overwhelmed by the default interface. VO knew that anything that was perceived as complicated would simply not be used by the community. Figure 1 illustrates the interface which is used to edit an existing conference.

Writing a simple interface is, not simple. Most open source developers have little expertise in user interface (UI) design and there is clearly a market for UI designers that are skilled in working with open source projects. For this project, there were two choices: i) rework the PHP based MeetMe interface to be much simpler; or ii) develop a custom application. The second option was chosen, largely because another open source project, Grails (http://grails.org/), provided a rapid development toolkit for creating database driven applications. Within two weekends, a working interface for scheduling conference calls was completed and available for testing.

Figure 1: Simplified Interface



User feedback showed that the UI still needed to be easier to use. What seemed like small tweaks were incorporated, and all were important in reducing the steps necessary to book and invite attendees to a conference call. “If it takes three steps, especially if those steps require moving between browser and email programs, people give up at step 2,” Jill noted. “We continually run up against the sad state of technology hardware and Internet support most organizations are struggling with, which really forces us to keep everything very streamlined, clear and clean. It means more time in development but if it increases an agency’s capacity to devote more resources to client care, it’s worth it from VO’s perspective.”

VO’s site was built on open source software called EZ Publisher (http://ez.no). This was helpful for integration as we could look at the code and leverage its existing web services interface for authentication of third-party software. When a user clicked on “Schedule a Conference” at the VO site, the URL would need to pass a session token to the voice conference server, which would then connect back to EZ Publisher and get the user’s e-mail address. Because we had access to all the code for both applications, integration was fairly easy to implement.

The final step provided an interesting challenge. With three hundred organizations served by a small staff, VO does not have the capacity to handle large numbers of support requests. VO delegates time to share information about the new application to the community and to run group information sessions about the new service, but it is critical that the application be intuitive for users.

Videos are an effective way to introduce new software, and a 2 minute video was created that shows how to schedule a conference.

However, even when the video was offered in both the Adobe Flash and Windows Media Video formats, many community organizations did not have the plug-ins or players to view the video. Those that did have the software often reported that their bandwidth made it impractical to watch a video. Finally, the internal capacity was not available to also provide a video in French. The decision was made to keep the video available for those who were able to view it, but more traditional screen shots and text were made available to everyone.

In the end, VO was excited about this application and initial feedback from site trials has been garnering positive feedback. There is still work to be done, but clearly this will be an extremely useful tool for its community.

Lessons Learned

Everyone involved in the partnership learned a few lessons about using open source software at not-for-profit organizations:

Don't assume technology capabilities. Regardless of their size, many non-profit organizations struggle with software, hardware, and Internet support. Sometimes even the larger, established organizations capable of carrying out complex local, national or international programs are lagging in technology.

Just because you build it doesn’t mean they’ll use it. Anyone who communicates with the non-profit sector appreciates the vast number of organizations, services and approaches comprising its community. Some organizations have literally no paid staff, while others have hundreds. Some have state of the art hardware and no support services while some have state of the art everything and no time to learn how to use it.

The key is support: technology support and also the social support that takes a peer-to-peer approach and is able to meet the organization where it is at in terms of technology. Support increases the use, and therefore the community impact, of a technology solution.

Be prepared to integrate. Complete solutions require the integration of multiple open source applications. Having access to the source code makes integration possible.

Be prepared to extend. Blindside ended up writing its own web interface for scheduling voice conferences. Fortunately, they had a pretty deep knowledge of asterisk, so most of the time was spent on UI design.

Be prepared to simplify. What is easy for developers is often not easy for everyone else. Non-profit staff and volunteers have varying levels of comfort with technology, but even the most savvy have limited resources to learn new systems. For non-profit organizations to invest time in learning new technology, there must be a high return on investment with minimal effort.

Be prepared to rework some parts. Blindside thought they had done a good job at planning, but could have done at least one more UI mock-up before implementation. There's a bit of a trade-off, as it's always quicker to iterate designs on paper, but the best user feedback comes from interaction with a real UI. Fortunately, the use of Grails enabled us to iterate our web interface fairly quickly.

Conclusion

Cote and Egelstaff, in the beginning quote, were right. The issues of support and sustainability in developing technology solutions are very important for a not-for-profit. The real challenge for this partnership is not implementing software, but in adapting the software to end users. By working with a non-profit organization which is already supporting the capacity of hundreds of other non-profits, Carleton University was able to adapt some of its cutting edge thinking to the needs of the non-profit sector, increasing the sector's capacity for service delivery. That's enabling innovation using open source.

Fred Dixon is CEO of Blindside Networks, a company that offers commercial support for BigBlueButton, an open source web conferencing systems for Universities and Colleges. For more information, see http://bigbluebutton.org/.

Jill Woodley is the Manager of Communications at Volunteer Ottawa. For more information, see http://volunteerottawa.ca/.

"The emergence of Web services and services-oriented architectures, and the growing importance of software plus services, makes interoperability a very important capability. The ability to move data and information seamlessly between applications and systems - regardless of platform or vendor - is a key requirement for our customers. Microsoft's interoperability principles will give developers the technical foundation and information they need to build systems that support more seamless data exchange and portability across products and platforms."

Bob Muglia, Senior Vice President,
Microsoft Server and Tools Business

Today's difficult economic environment provides a time of change where information technology (IT) matters more than ever. As business and service delivery leaders look to become even more effective and efficient in meeting their client's expectations, they are increasingly looking to electronic channels as an integral element of their business strategies. Regrettably, the ever increasing pace of technological change often disconnects the technology from the business requirements. This disconnection hides technology innovations from the business and has a broader impact of preventing business innovation.

This article discusses the role service oriented architecture (SOA, http://en.wikipedia.org/wiki/Service-Oriented_Architecture) and interoperability can play in keeping an organization innovative and competitive. We also discuss Microsoft's interoperability principles, its commitment to its open source community, and the benefits of embracing openness as part of an organization's business strategy.

Separating Need from Method

Maintaining a close relationship between business and technology remains the key to innovative services delivery. This connection is often best achieved through SOA which allows different applications to exchange data with one another as they participate in business processes. By defining the business requirements and services capabilities needed to meet the organization's service delivery objectives, a direct link can be made between the business imperatives and the information technologies that support them. A short few years ago, there were significant challenges in allocating business requirements to technology solutions using SOA, especially in organizations that had deployed a variety of technologies. With an increased emphasis on interoperability in the IT industry, many of these difficulties have been resolved. Coupled with the dramatic transformation that the technology community is undergoing today, services delivery and business leaders have more flexibility and choice than ever before in delivering innovation to their clients.

Business leaders are seeking opportunities to drive savings throughout their organization. This emphasis is providing an opportunity for IT to change its perception from a cost centre to a saving centre. IT is becoming a key business enabler since IT fueled business transformation ultimately results in a more efficient and productive organization. More often than not, these transformations address a number of business or policy imperatives at the same time. While cost effectiveness may be the principle driver behind many of today's initiatives, the business capabilities put in place also have positive impacts on productivity, service efficiencies, knowledge transfer and environmental sustainability.

The direct linkage between the IT enabled business capability to corporate (or government) priorities not only helps sustain the IT program but also helps drive innovative solutions for today's toughest business challenges.

Many organizations have taken an enterprise architected approach to their service delivery to more closely align their business and technology capabilities. By emphasizing the business requirements, organizations gain a more comprehensive understanding of their business. An important insight occurs when a business realizes that they can satisfy their requirements with a collection of "technology independent" business capabilities. Abstraction to the granularity of business capabilities allows an organization to be agile in the face of technology changes because it permits the implementation of any technology so long as it meets the expected service levels. The separation of the "need" from the "method" of delivery provides the business with considerable flexibility to select from a variety of approaches to satisfy their business need.

As an example, consider a well-understood business capability such as employee pay. Organizations need to pay their employees and have a good understanding of the service levels needed for an effective pay solution. By using a capability based approach, an organization can then assess whether an internally provided service or a particular outsourced provider would be best for the organization. If service level expectations aren't met by one provider, there are a number of others that are willing to step in to provide the service. This approach opens any number of opportunities for suppliers to provide innovative solutions to meet business needs and lifts many of the restrictions that had been placed on software developers.

To truly unleash the creativity of developers, there is a strong need for the business capabilities specified by SOA to just work together both in new systems and in the existing environment.

Interoperability

Heterogeneous environments are the reality in IT today, and interoperability is more important than ever to meet the expectations of the business community. The term interoperability is poorly understood and individuals often assign their own interpretation to it. Interoperability should be understood as connecting people, data and diverse systems so that data is more available to those who need it, and processes flow more smoothly, with less burden on IT. This connection is achieved through a variety of ways including the application of standards, translating between two different communities or through bilateral agreement between different organizations. Microsoft understands this, and is changing to be more open – more open in engineering, collaboration, and sharing of intellectual property. This commitment to greater openness is increasing choice and driving advances in real-world interoperability across Microsoft, open source, and various other IT environments. As a result, customer and developers can more easily build and leverage the diverse yet interoperable solutions they need.

In February 2008, Microsoft reinforced its focus on interoperability with the publication of the Interoperability Principles (http://www.microsoft.com/interop/principles/default.mspx). As part of Microsoft's trustworthy computing initiative, these principles apply to Microsoft's high volume products such as Windows Vista, Windows Server and Microsoft Office. These principles can be summarized as follows:

Open connections: provide access to the protocols and application programming interfaces of Microsoft's high-volume products. Developers have access to the details they require to connect with Microsoft products.

Support for standards: Microsoft is committed to supporting standards development in Canada and abroad and working with our customers to prioritize which standards to support in our products. In addition to participation in the development work in the standards community, Microsoft will work with other major suppliers to ensure consistent implementations of standards across different products to ensure that they work together in real world scenarios.

Data portability: provides the ability to use data in a variety of software products. Customers who create data in one application should be able to access that data in another application. Data portability is accomplished by incorporating customer advice on key standards, implementing import/export capabilities and supporting standards work for data formats.

Open engagement: provides open communications and collaboration with customers, IT and open source communities to address their interoperability challenges. A key community for this engagement is the Interoperability Executive Council where over 40 government and industry leaders around the world meet twice annually to help identify interoperability challenges and work with Microsoft to resolve them. The Microsoft Interoperability Forum extends the dialogue and engagement out into the web community. The Open Engagement principle also includes Microsoft's Open Source Interoperability Initiative, which encompasses a variety of activities including plug fests, labs, events, and opportunities for participation in collaborative development.

These principles support the diverse range of interactions that Microsoft has with the community at large and includes a number of elements designed to facilitate the interaction with the open source community.

Microsoft's adherence to the interoperability principles has provided several benefits. Customers realize the benefits of being able to deploy a variety of products from different suppliers with the confidence that these products will work together. In the event that their products don't work together, customers have louder voices through the interoperability initiative to detail how they need the products to work together. By providing open connections to Microsoft products, developers also benefit from the interoperability principles. This openness helps developers be more efficient since they have the detailed descriptions required to gainfully work with Microsoft products and don't need to resort to guesswork to figure out how products function. For Microsoft, the interoperability principles help improve the utility of Microsoft solutions in heterogeneous environments and include functionality that customers demand thereby increasing the potential marketplace for Microsoft Solutions.

Open Source Community at Microsoft

This commitment to interoperability and collaboration with the open source community can be seen first-hand in the work of Port 25, the Open Source Community at Microsoft (http://port25.technet.com). Port 25 provides a venue for ongoing open communications and collaboration between developer communities. Port 25 continues to test and explore real world interoperability challenges between a variety of software applications.

The team that supports the open source community embraces its raison d'être "about having a healthy conversation with customers and the industry wherein people can talk openly about their interoperability challenges, whether on UNIX, Linux, Windows, or among other open source packages." Since its launch over two years ago, over 18 million visitors to the site have learned about the innovative work being done in the lab.

At this year's professional developers' conference, Microsoft launched a number of tools to unleash the capabilities of cloud computing (http://en.wikipedia.org/wiki/Cloud_computing), including the Oslo Services Oriented Architecture Modeling Platform (http://www.microsoft.com/soa/products/oslo.aspx) and the Azure Cloud Services Platform (http://www.microsoft.com/azure/default.mspx).

Oslo provides a model driven development platform which allows application development at a higher level of abstraction so as to engage a broader development community. Its declarative modeling language, codenamed "M", is being built to ensure interoperability with prominent industry standards. The "M" language specification is being released under Microsoft's Open Specification Promise (http://www.microsoft.com/interop/osp/) so that third parties, including open source projects, can build implementations for other runtimes, applications and operating systems.

Built with interoperability as a principle design criteria, the Azure Services Platform is a set of cloud-based technologies that extend software development for both enterprise server and multiple client device applications with services on the Web. Developers can use Java, .Net and Ruby development environments to build new or enhanced applications that leverage cloud services through the use of common standards-based protocols including HTTP, SOAP and XML. Additional developer kits are planned for Python and PHP. This community development approach is not new to Microsoft. Codeplex, Microsoft's Open Source Project Community (http://www.codeplex.com) hosts over 4,000 open source projects and supports over 31,000 users. In addition, there are a number of Microsoft sponsored open source projects on Sourceforge, including the OpenXML to ODF and the OpenXML to UOF translators.

Conclusion

Businesses are seeking every opportunity to improve their services delivery though innovation. Interoperability and openness are fundamental catalysts driving innovation not only in the technology space, but also at the business level. Microsoft's commitment to its interoperability principles provides customers, developers, partners and independent software providers with the insight, access and community to provide innovative solutions that address the challenges faced by business today.

John Weigelt is the National Technology Officer for Microsoft Canada and is responsible for driving Microsoft Canada's strategic policy and technology efforts. Mr. Weigelt is the lead public advocate within the company on key issues such as the development of national technology policy and the use of technology by government, healthcare and education. Prior to joining Microsoft, John held the position of Senior Director of Architecture, Standards and Engineering at the Chief Information Officer Branch of the Treasury Board of Canada Secretariat. John holds a Master's Degree in computer and communications security from the Royal Military College of Canada and is a certified information systems security professional and a certified information security manager.

"In nearly every company, 70-90% of IT takes the form of basic undifferentiated infrastructure."

Nick Carr
http://en.wikipedia.org/wiki/Nick_Carr

The objective of this article is to argue for a new model that guides the efforts of multiple stakeholders to solve a problem. The new model is referred to as Open Innovation 2.0. Its main benefit is to gain competitive advantage through effective spending combined with enterprise to enterprise collaboration instead of traditional instead of cost reduction.

Beyond Cost Cutting

Given these gloomy economic times, I am reminded of Henry Haslett's simple but powerful book, "Economics in One Lesson" (http://jim.com/econ/). His prime lesson is to not judge the economic consequences of what you see but rather to look beyond and consider the consequences that you don't see. Applied to today's economic crises, it is not the amount of business cost cutting that will determine the winners but rather what investments are made. For those who adapt successfully, bad times will yield great good times. As an example, in the past two recessions Southwest Airlines gained market share over their competitors by adding capacity while others reduced theirs. There aim was not to reduce costs, but rather to spend more effectively than their competitors. The winners in today's economy will not just retrench and focus on cost reduction. Instead they will search for ways to better spend resources to gain greater strategic advantages.

In a down or up market the customer is king. The difference in what you do and how much depends on how the customer is responding to market changes. If customer is king, then adaptability to changing customer needs is the key to the kingdom.

So, how does one adapt or transform in a down market? By spending more effectively. Few would argue that eliminating duplicated costs is one way to spend more effectively, yet there is an enormous amount of information technology (IT) spending duplication, with some estimates that duplication exceeds 80%.

Duplicate Spending

Consider implementing a unified communication system or an upgrade to an enterprise resource planning system. Much of the associated costly processes, lessons, and knowledge learned could be shared among enterprises. By reducing duplicated spending, each collaborative enterprise could spend freed up funds on improvements that would foster each participating enterprise to better serve their customers.

This seems logical, however, very little duplicated spending is actually eliminated. After working with CIOs for the past two years we discovered why there is so much "talk" about collaboration but very little "walk". Three barriers are largely to blame:

1. Complexity: it is difficult enough to get groups within one enterprise to collaborate, let alone among two or more enterprises. Who is in charge? How are the resources shared? Who owns what intellectual property (IP)? What about competitors? These are just a few of the issues that create complexity and therefore perceived overhead and risk.

2. Leadership: even if a collaborative project can be defined, what happens if something goes wrong? How is the solution shared beyond the project participants? How can each participant gain a competitive advantage from the project collaboration? Clearly, if each group must find a way to manage this process for each project, there will be more complexity and perceived overhead.

3. Alignment: this last major issue encompasses both timing and "fit". Solving a shared problem only works if each collaborative member can participate at a time when their available resources and internal needs line up with the project.

In observing other collaborative project models, open source software (OSS) continues to demonstrate excellent success.

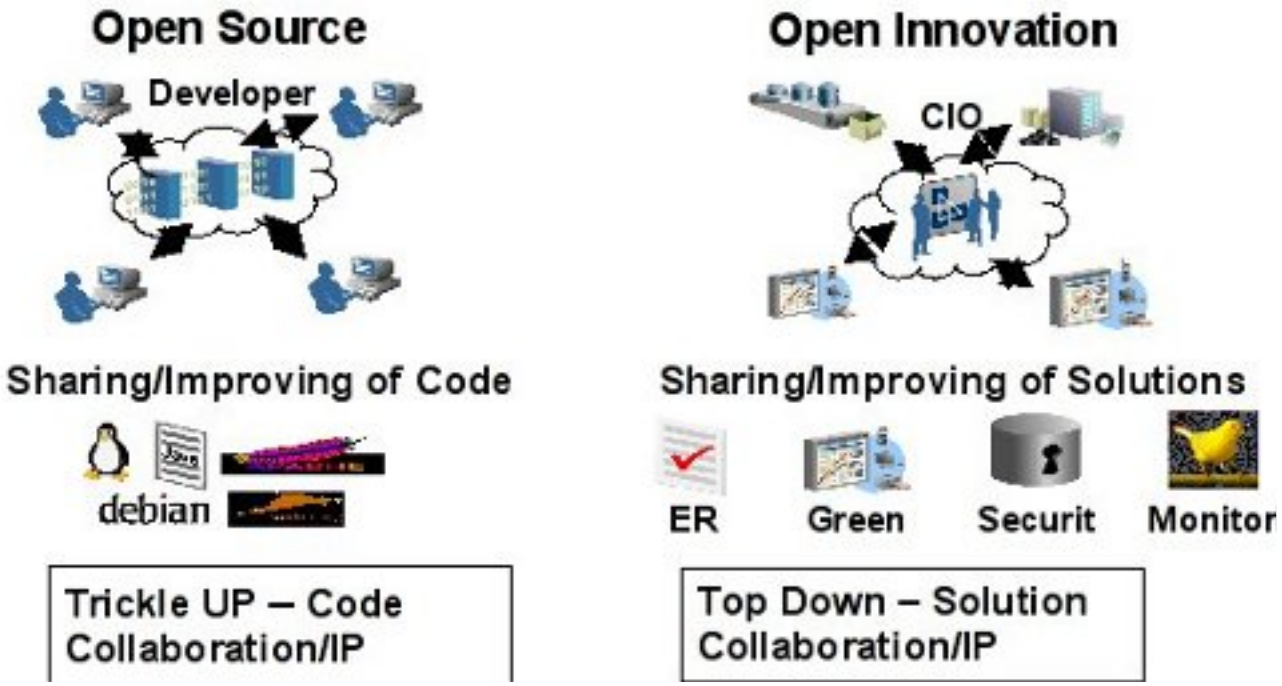
Open Innovation 2.0 Model

Open Innovation (http://en.wikipedia.org/wiki/Open_innovation) is similar to OSS, except the content is IT/business solutions instead of code. Open Innovation is used to describe the business equivalent of open source, where open refers to collaboration and innovation is the result.

In consideration of multiple enterprise collaboration, we extend the Chesbrough model (http://en.wikipedia.org/wiki/Henry_Chesbrough) from research and development to IT and combine the notion of trusted relationships of social networks for business. We use the phrase Open Innovation 2.0 to refer to our model.

Figure 1 illustrates the Open Innovation 2.0 model for enterprise transformation. The model highlights that shared efforts towards innovative solutions replaces duplicated spending. By sharing completed solutions and jointly collaborating on projects, each participating enterprise can reinvest spending and further enhance efficiency. The resources freed up can be spent to more effectively address customer demand.

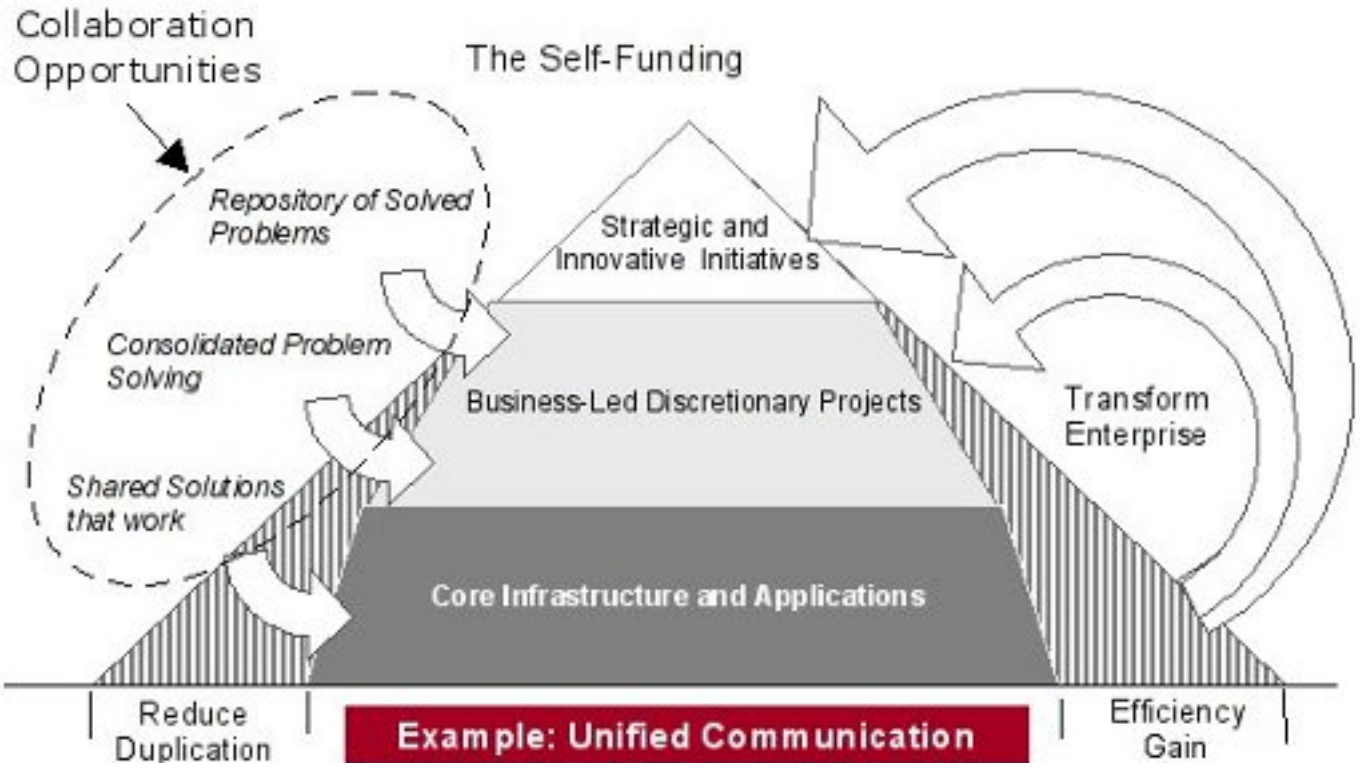
Figure 1: Open Source vs. Open Innovation



Consider an enterprise that successfully implements a unified communications solution that improves employee productivity and reduces vendor spending. As part of a collaborative Open Innovation 2.0 network, they agree to share that solution with two enterprise participants. The original expense to procure, integrate, and implement the solution was $500K. By sharing the solution, issues encountered, and providing expertise to aid in implementation, each participating enterprise saves 50% or $250K. The three companies agree to share in support, upgrade, and security expenses, saving each company another $150K per year. Through this process, the companies build trusted relationships and identify several similar opportunities to reduce duplicated expense. Figure 2 illustrates this example.

This same enterprise network was also able to collectively convince their respective management teams to implement a new "self service" application platform that would allow business units to create many of their own business applications while IT maintained control of the overall process. The collaboration extended to business units of the three companies who were able to build trusted relationships and shared applications and business processes, thus, leveraging the innovation to each company's competitive advantage.

Figure 2: Unified Communication Example



Collaborative Supplier Networks

How do suppliers fit into collaborative enterprise networks? The short answer: there are major advantages for suppliers to participate in Open Innovation 2.0. Traditionally, suppliers develop 1:1 customer relationships and protect those relationships like they would protect core IP. For many suppliers, their customers go through a trust building process before committing to the supplier. Then they proceed with implementation and work through typical issues. Finally, they provide support internally and respond to problems.

Much of this process is duplicated from one customer to the next - typically 80% or more. In addition, most prospective customers don't just accept the benefits described by a vendor sales and marketing teams. To build confidence in their decision, IT executives talk to their peers who have worked with the supplier to gain critical insight.

Following the Open Innovation 2.0 model, suppliers can transform their customers into a trusted enterprise network that shares experiences, knowledge, and requirements openly with the supplier. Customer support forums are common place and create valuable insight for suppliers. However, these forums are designed to aid in solving technical support problems and are not designed to reduce duplicated project spending.

By creating a collaborative network at the business level, customers can share lessons learned, roadmaps, requirements, and skilled sources – motivated to reduce spending and increase innovation directed at their needs.

This network becomes enormously valuable to the supplier as members of the network are encouraged to communicate their experience and value to prospective customers. Since there is peer pressure to be trustworthy, prospects will quickly understand not only the supplier benefits but the issues and limitations of the supplier. This builds trust towards decision making and produces a reduced sales cycle for the supplier.

In addition, the customer network represents a sample or spectrum of the supplier's customer base and the network's consolidated requirements represent inbound marketing without all the noise that occurs with supplier marketing. Trusted customer networks are much more difficult for a competitor to penetrate than a single customer.

The goal of the supplier is to fine tune their customer network so that their customers are motivated to attract additional customers to the benefit of all the participants. This creates organic revenue growing where cash flow oriented business models cultivate customer network effects.

The bottom line is similar to enterprise based networks: fewer processes to solve a problem. This sets up self funded transformation opportunities where duplicated spending is replaced by shared innovative problem solving.

Customer collaboration at the business level opens up new business opportunities for commercial open source companies. Consider a well known venture funded supplier that has been using a traditional open source business model where they offer customers free downloads. The goal is to convert a percentage of users into corporate clients that pay for support and services. The supplier has a very small marketing and sales staff and currently depends on "trickle up" sales to get to positive cash flow. In today's market, this model provides insufficient capital to get to positive cash flow and few options for an exit. By embracing collaboration at the business level, paying satisfied customers can share solutions, new initiatives, and resources not only within IT but at the business level. These customers are motivated to introduce other potential customers to the network because it is in their own self interest. The supplier's business model has transformed from a low level sale to a strategic sale. The trickle up model can co-exit and neither model requires the build up of an expensive sales and marketing team.

Conclusion

Commercial open source companies can also network together and share customer networks and processes for bringing their respective solutions into enterprise wide acceptance. Since these companies already understand the leverage of open source, they have a great opportunity to be early adopters in Open Innovation 2.0. Desperate times are great times for those who are quick to adapt and find new ways to reward their customers. Now is a great opportunity for commercial open source companies to seize the opportunity to break through the inertia of large controlling oligopic suppliers and once again prove the lesson of Henry Haslett.

Michael Grove is the CEO and Founder of CollabWorks. CollabWorks fosters enterprise to enterprise collaboration, thereby collapsing the processes required to solve a problem. He is an author and blogger on topics ranging from Collabsourcing™ to open innovation, open source, and IT 2.0. He was formerly the Founder and CEO of Open Country, a leader of remote systems management for Linux and Windows, where he developed global market penetration including India and China. Prior to Open Country, he founded and is still Chairman of Introplus, a community profile matching engine company. Prior to Introplus, he was the CEO and Chairman of the Board of MicroModule Systems, a Santa Clara company that grew from zero to $46M in revenue in its first five years. He has been an Executive Fellow at Santa Clara University, advising many young companies. His background includes M&A activity as Managing Partner of the Pathway Group and Director of New Commercial Programs at Lockheed. He holds a Masters degree from UCLA and two Bachelor degrees from California Polytechnic University.

Recommended Resources

Open Innovation
http://www.openinnovation.net/

Center for Open Innovation
http://openinnovation.haas.berkeley.edu/

Innocentive
http://www.innocentive.com/

MCETECH Conference on e-Technologies

Ottawa, ON

The 4th International MCETECH Conference on e-Technologies aims to bring together researchers and practitioners interested in exploring the many facets of Internet applications and technologies, with a focus on the technological, managerial, and organisational issues. Submissions are invited in the following areas: inter-organizational processes, service-oriented architecture, security and trust, middleware and infrastructure services, applications, and open source and open environments. Abstracts for papers are due Dec 19, 2008, full research papers on Jan 9, 2009, and submissions to the industrial track on Jan 9, 2008. Workshop and tutorial proposals are also invited. The conference will be held at Carleton University in Ottawa, from May 4-6, 2009.

http://www.mcetech.org/

February 6-8

Enterprize

Vancouver, BC

This conference links young Canadian entrepreneurs with industry professionals by offering a series of interactive workshops, high profile speakers, an entrepreneurial fair, and a variety of other invaluable events. The conference provides a unique opportunity for students to connect with other peers as well as successful entrepreneurs, all while exploring entrepreneurship as a future career.

http://www.enterprizecanada.org

February 18-19

Social Media Marketing

Toronto, ON

Static websites are no longer enough to build relationships with customers using the Internet. Web 2.0 and the growth of social networking have created exciting tools for businesses to find and communicate with customers on the internet. Businesses that aren't aware of these tools could be passing up opportunities to create a competitive edge and risk looking staid to an increasingly savvy and "social" internet population. Attend this conference to learn how to create the relationships that matter most to your business.

http://www.opendialogueinc.com

February 21-22

PodCamp Toronto

Toronto, ON

Podcamp Toronto is a free "unconference" for all those interested in all things podcasting, blogging and new media. Amateurs, pros, newbies and veterans are all welcome.

http://podcamptoronto.pbwiki.com/

November 4

Mozilla Partnership Makes Seneca Canada's Open Source School

Toronto, ON

With the continued success of its partnership with the Mozilla Foundation, Toronto's Seneca College could be the school of choice for budding open source developers and a strong model for other tech programs around the country to follow. Over the past couple years, the Mozilla partnership has given Seneca students the ability to work on key aspects of the Firefox Web Browser as well as other Mozilla-led initiatives such as Thunderbird, Songbird and Bugzilla. The program allows students to beef up their resumes and has even landed a few graduates continued employment with Mozilla.

http://tinyurl.com/67mboh

November 5

Open Source Opens Doors for Small Businesses

Vancouver, BC

Vancouver's growing love affair with open source software (OSS) development is being manifested in a growing community of startups, scores of blogs and monthly events. The city, which has played a prominent role in the OSS movement, is home to ActiveState and Bryght, the former being one of the first commercial OSS developers; the latter being the first company to use Drupal – a popular OSS – as its sole product development platform.

http://www.bivinteractive.com/index.php?option=com_content&task=view&id=1242&Itemid=1

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

January 2009	Enterprise Participation Guest Editor: Donald Smith, Eclipse Foundation
February 2009:	Commercialisation Guest Editor: Robert Withrow, Nortel
March 2009:	Geospatial Guest Editor: Dave McIlhagga, DM Solutions
April 2009:	Open APIs Guest Editor: Michael Weiss, Carleton University
May 2009:	Open Source in Government Guest Editor: James Bowen, University of Ottawa

Formatting Guidelines:

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

Indicate if your submission has been previously published elsewhere.

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

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

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

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

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

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

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

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

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