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Dynamics of Supporting Sakai Through Local and Global Collaboration

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A video on YouTube has been attracting attention. “A Vision of Students Today” (<http://www.youtube.com/watch?v=dGCJ46vyR9o>) is the work of Kansas State University students in the digital ethnography class of Dr. Michael Wesch. Superimposed on the opening camera sweep of a worn, grey lecture hall is an overlay of glimpses into the collaborative process that involved 200 students in making the video. The video has spawned its own living dialogue. This example of the highly social, interactive learning process possible today strikes a vivid contrast with the lone sage in the static lecture hall. Replacing the traditional model of one-way communication delivered in a lecture hall is a network of electronic connections interlinking faculty, students, information sources, and project sites.

Among the myriad technologies in common use in higher education are course management (or learning management) systems, most of which are now deployed institution-wide. As more and more institutions opt to put all courses or course materials online, these systems have become digital educational platforms that can reach mass audiences within an institution and across the globe—largely because using them requires little more than basic technical skills. Many institutions are now following the lead of MIT, which in 1999 began making available on the web, at no cost to users, its entire curriculum of courses, with the intent of advancing education around the world (see OpenCourseWare, <http://ocw.mit.edu>).¹ Once an optional part of the classroom, course management systems (CMSs) are part of the higher education landscape.

In 2006, EDUCAUSE established the Catalyst Award. The award recognizes “innovations and initiatives centered on information technologies that provide groundbreaking solutions to major challenges in higher education, or change prevailing conditions in remarkable ways so as to allow new solutions to be developed and deployed.”² The inaugural award went to CMSs because, in the broadest sense, they “enable online instructional environments in which students can work interactively with content, multimedia, instructors, and each other”³ and because they were conceived and developed by innovative faculty (such as Murray Goldberg, University of British Columbia, WebCT) and students (Dan Cane, Cornell University, under the leadership of economics professors Cindy van Es and Deb Streeter, Course Site Generator, the precursor of Blackboard). Other systems were developed for use at individual colleges and universities. Some have resulted in a healthy collaboration between academe and the commercial sector, as limited-use efforts evolved into enterprise-wide systems.

It was against this backdrop that the CMS landscape expanded to welcome open source initiatives such as Moodle, which originated in Australia in 1999, and Sakai, a community source collaboration begun in 2004 by Indiana University, the University of Michigan, MIT, and Stanford University. According to Brad Wheeler, vice president for information technology and CIO at Indiana University, who is known for fostering new models of collaboration within higher education,

Open source software provides a blended model with attributes from both the build and buy approaches. First, open source can provide immediate, low- or

no-cost access to software code, though implementation and other costs make this far from a free approach to systems. Second, the open source code may suffice as a packaged solution like the buy approach, or it may provide a jump start for further local coding to produce a tailored system. Maintenance can be handled internally, contracted to a for-fee vendor in some cases, or it can rely on a broader open source community that addresses maintenance issues. Third, there are no ongoing licensing fees, so the destiny of the system—for better or worse—remains in the hands of the institution or the community.⁴

In 2004, Indiana University (IU), which was using a well-established, homegrown CMS called Oncourse, became interested in Sakai. The term “community source,” often applied to Sakai, refers to the fact that its volunteer developers and supporters come from the community of organizations that use, or are partners in, Sakai. For partners, the burden of development is distributed across multiple institutions, while each institution remains in control of its own system. According to the 2007 Campus Computing Survey,⁵ campus IT leaders show a continuing “affirmative ambivalence” about community source, despite some gains in adoption. While 3% of survey institutions have adopted Sakai as the campus CMS, Moodle use rose from 4.2% to 7.8% between 2006 and 2007, and to 17.2% at four-year colleges.

IU’s decision to be part of community source involved many factors, although expecting to save money was not among them. While the issue of cost advantage is unresolved, community source does offer adopters the security of knowing that long-term economic issues will remain within their control. Because community source places control of the learning environment in the hands of its faculty users, the faculty also retain control of their academic destiny. For IU, the most compelling reason to participate in community source was to deal ourselves in to the unrestrained flow of ideas and innovation in the higher education community, in developing not only Web 2.0 tools but also discipline-specific tools for such areas as math and physics. Because Sakai presents an opportunity to foster an innovative, collaborative environment to meet the needs of campus visionaries, early faculty adopters, and impatient students, Sakai is consistent with the IU culture. IU was highly motivated to develop the collaborative capability that is essential for a highly connected 21st-century institution. All these factors combined to provide a sense of certitude that the financing, developing, and enterprise support of learning and collaboration tools would continue to lie squarely on the shoulders of its users.

It is true that Web 2.0 is gaining significant attention for providing some of the major tools, including wikis and blogs, which encourage social networking and support collaborative learning. But Web 2.0 is not a substitute for the CMS. Online structured learning environments must be able to connect to student data, registrar information, scheduling, and other enterprise information systems. Itself an enterprise system, the CMS provides the framework on which to innovate; it offers cohesion to the flurry of innovations developing around Web 2.0 and the core institutional systems and data to which they must link.

Taking a macroeconomic view, colleges are cooperative in nature. The open source model capitalizes on their culture of sharing. Such a culture positions them well to leverage the efficient systems of production present in the 21st century: the Internet provides a means of communication at little cost, and open source itself is a means of producing software that uses to its advantage the vast range of expertise distributed across universities.

Institutions considering participation in Sakai might ask whether the benefits of multi-institution collaboration really outweigh the considerable challenges. What are the secondary effects of these collaborations? As a founding partner in Sakai, IU became completely engaged in all levels of the collaboration. While the project served very specific faculty needs across 25,000 courses, the early years of creating a world-scale community carried great challenges. This bulletin discusses the adjustments that the IU information technology (IT) organization, University Information Technology Services (UITS), made, and continues to make, to support membership in Sakai. Although making those adjustments has been challenging, it has also been transformational in terms of software development, managing change, staff professional growth, the faculty-IT relationship, and the ability to engage the considerable opportunities of Web 2.0. While institutions that contemplate taking part in community source may choose differing levels of engagement, they will likely find in this bulletin experiences that can help them visualize the adjustments, resources, challenges, and rewards that participation can involve.

Highlights of Supporting Sakai

The Sakai online learning and collaboration environment today comprises some 20 generic collaboration tools, as well as specific teaching and portfolio tools (specified at <http://www.sakaiproject.org>). Begun in 2004 and funded by a two-year grant, Sakai has grown to an organization of some 98 academic partner institutions and 13 commercial affiliates that reach from New Jersey to New Zealand. Funding comes from voluntary partner contributions and the support of the Andrew W. Mellon Foundation, which has backed Sakai from its early days.

Sakai partners share the work of developing tools, with partners contributing from their areas of expertise. There are roles for all aspects of development, including developing software, designing architecture and tools, testing usability, writing documentation, providing support, assuring quality, managing releases, fixing bugs, developing and responding to frequently asked questions, and hosting conferences. Sakai provides a close link between developers and users. The strength of community-developed software over build-it-yourself solutions is that the aggregate of partner abilities is much greater than that native to any one institution.

From 1998 to 2004, IU developed its own CMS, known as Oncourse. Challenges came when faculty members began to request more complicated and diverse functionality, which placed growing pressure on IU's small development team. Software grows more complex, user expectations increase, and competition from the marketplace adds palpable pressure. To maintain a single development team equal to these growing

challenges requires sustained, dedicated funding, recruiting and retaining talented developers, and keeping pace with user demands for innovation. Taking part in community source also requires funding and commitment, and in some ways it makes development more complex. While going it alone means higher cost but developing for a known, local audience, there is strength in numbers in the Sakai community. For IU, the opportunity to share development and draw on a distributed pool of expertise justified the complexity of collaboration.

In 2004, IU cofounded the Sakai collaboration. Three years later the impacts of this decision are palpable across UITS. A decision to simply change the way we developed course management software turned out to be the catalyst for a profound cultural shift. What caused that shift parses out into what it took to support Sakai. The effects of IU's decision—the unexpected, the challenging, and the delightful—form the topic of this bulletin.

Structuring for the Collaboration

When IU joined the open source movement, it became a member of a collaboration. If one academic institution is complicated, a collaboration of many compounds that complexity. A collaboration, like a relationship, takes careful nurturing. To manage one well means nurturing the relationship as well as the deal. IU viewed gaining “collaborative advantage” through communication as key to the health of the collaboration,⁶ so made internal communication an institutional priority and part of the organizational culture. IU constructed visible communication channels and set the expectation that people would use them.

Internal Communication

User input is key to developing Sakai. Sakai collaborators must attend to two kinds of communication: internal, to the institution, and external, between the IT organization and the Sakai community. Because feedback from faculty, staff, and students across IU drives enhancements of the local implementation of Sakai, known as Oncourse CL (Collaboration and Learning), IU put in place several vehicles for capturing and assessing user feedback. These serve various communications functions.

Capturing suggestions. Links on every page of Oncourse encourage users to record suggestions for practical improvements. Any user can move seamlessly from using a feature to proposing changes.

Analyzing input. IU established the Functional Requirements Committee (FRC) to review input from key stakeholders, including teaching consultants and academic, library, and technology service providers. This group catalogues input by functional area—syllabus, grading, discussion, and the like—and ranks it by importance or urgency. It then clusters the suggestions into logical groups in a feasibility report to the faculty Oncourse Priorities Committee (OPC). With development team input, the FRC specifies how many development hours the enhancements would take, along with definitions for new functionality, tools, and user interfaces. A development team member

sits on the FRC to manage the information flow and maintain clarity between the committee and developers.

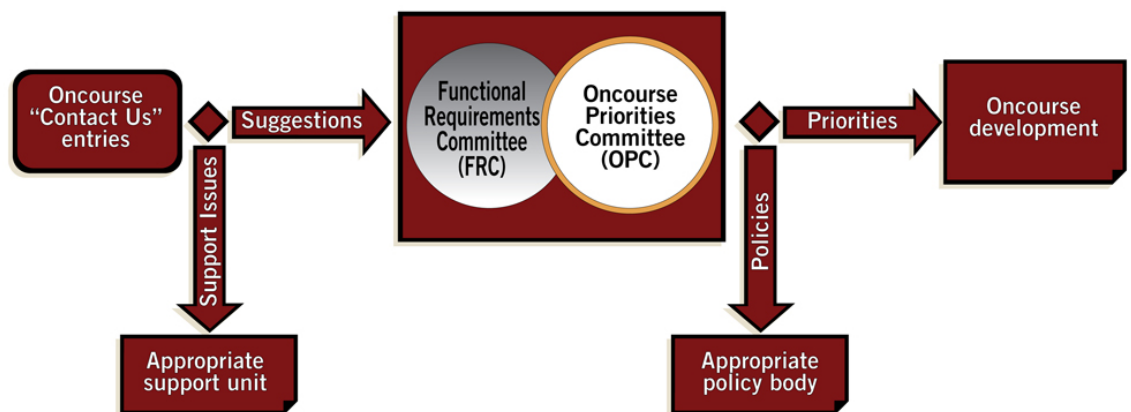
Prioritizing development. Oncourse CL development priorities are set by the OPC, whose membership comprises faculty teaching with Oncourse CL. UITS established this committee to formally vest faculty with this responsibility. Not only does this committee make tangible the faculty-UIITS partnership, but because it interfaces with developers, it puts faculty and developers at the same table.

These committees answer key questions:

- Do the enhancements exist elsewhere in the wider Sakai community?
- If not, could they be developed in collaboration with open source partners?
- What effect would they have on the user interface?
- What's the time/cost analysis for developing or acquiring them?

A user suggestion at IU follows this path: An instructor asks for statistics on how students use the Oncourse CL site for her course, using the suggestions link on a page of her course site. The request goes to the FRC, which recalls that other faculty have made similar requests. It passes the request to the OPC, which assesses it in the context of other priorities and available resources and endorses it. The OPC learns from the development team that another Sakai partner institution has developed a course statistics tool. IU developers work with that institution to integrate the new tool into IU's installation of Sakai, ensuring it can scale to IU's 100,000 users. The IU faculty member who requested the tool called this outcome a "home run." Once enhancements are approved, the development team takes primary responsibility for coding the enhancements and overseeing their technical implementation. Figure 1 maps the process for prioritizing Oncourse suggestions.

Figure 1. Process for Prioritizing Oncourse Feedback



Development

IU's membership in Sakai changed the way IU developers work. In the past they focused on local priorities, working at a distance from faculty. Now their local efforts involve direct contact with faculty, while they take into account the broader Sakai community. While IU considerations are their priority, they write code for Oncourse CL so it can be incorporated into the Sakai generic code base. This has local and external benefits. Any IU code that is useful to the Sakai community increases the overall value of the software. As well, sustaining an internal/external focus reduces the local customizations that need to be maintained over time because IU's contribution is part of the Sakai core code.

External Communication

No matter how diligently an institution structures its internal communication processes, external communications also play a role in how smoothly a collaboration functions. There are some understandable challenges in communicating with Sakai. It is a worldwide community. Its membership, its products, and its strategies for communicating with and among members are continually evolving. The Sakai foundation itself has few dedicated resources to handle administration and workflow, so it relies heavily on the community's contributions. Because community members report to their local institutional managers, their energies must focus on issues close to their stakeholders.

The semi-annual Sakai conferences and regional working meetings provide a structured forum for discussion. Faculty and developers discuss what tools to improve and where the gaps lie and agree on pedagogical goals. But challenges remain in how to structure for follow-through. It falls to member institutions to strike the appropriate balance of attending to development demands at home while keeping up with and maintaining connections with and contributions to the global community.

The communications model embraced by the Open Source Portfolio, a working group within Sakai, suggests an effective system. As institutions develop local priorities, they communicate them to the Sakai community. Community members identify overlap and form project teams around shared goals. As long as they sustain interest, these groups remain alive, and they decline when interest wanes. The formula: shared interests plus some determined collaboration enables great accomplishments.

Implications for the Organization

When an IT organization decides community source is the answer to buy, build, or borrow, it will need support at the highest institutional levels. Sakai membership sets up a complex set of new relationships, reaching deep within the IT organization and extending outward to the full span of the Sakai community. Being actively involved in Sakai affects the IT organization as a whole, and in many ways.

The organization, and its parent institution, must understand what it means to share intellectual property and must be willing to do so. In more realms than software development, the organization will need to balance its own needs with those of the Sakai community. This may bring about a cultural shift, generating new operating practices

and processes, especially in the areas of change management. To realize the full benefit and collaborative strength of a community source development effort requires most IT organizations to adopt a new paradigm.

Staffing

When IU joined Sakai, it opted to take part in all aspects of the partnership: software development, design and usability, quality assurance testing, and user support. This required a new support model that involved all stakeholders, from developers to help desk consultants.

Once designers define the functional requirements for a tool, and developers write and test code, support staff must be ready to prepare training workshops, instructional materials, and online self-help resources. Support center and help desk staff must be trained and ready to address first-point-of-contact calls. Coordinating these activities requires a keen focus on communication and collaboration between in-house developers and support staff and with the Sakai community.

An agile and flexible communication model will help position the IT organization to provide both routine and just-in-time communication. Staff will need processes for quickly reviewing and disseminating all kinds of communication, including alerts of new features and functionality, tips and hints, how-to and support information, workshops, and general information.

Faculty As Partners

Most administrative software meets the prescribed need of a finite, homogeneous audience. The registrar's office typically owns student systems; the human resources office owns HR systems. To operate those systems, users follow a defined set of instructions.

Teaching is a creative act; no two people do it exactly the same way. The heterogeneous population of university faculty is a key stakeholder in Sakai. Supporting Sakai's users-owners means inventing an entirely new institutional support model. This model gave rise to a cultural shift at IU that revolutionized the relationship between faculty and UITS. Faculty became partners with UITS in setting priorities for development and in guiding IU's collaboration with other participating institutions.

Change in one part of an interlinked system ripples out to the whole. The new "elevated" status of faculty empowered teaching-center consultants as partners in the community source effort. They work closely with faculty on using Oncourse CL in the classroom so are keenly aware of faculty needs and requirements. As faculty advocates and IT staff, they're in an ideal position to help shape and test the design and behavior of Sakai tools.

The new relationship between faculty and UITS was an important, positive step forward. To nurture the relationship and increase its visibility among faculty in general, IU created a high-level academic position to serve as a faculty advocate within UITS. The new associate dean of learning technologies represents the open source initiative across IU and represents faculty interests across academic and administrative realms. The

associate dean also serves as chair of the faculty OPC; a key priority is setting the tone and substance of communication with faculty and student users. Among those reporting to the new associate dean is the director for academic and faculty services, who also chairs the FRC.

Faculty acknowledge the improved relationship with technologists. Julie Freeman, senior lecturer, School of Liberal Arts, Indiana University-Purdue University Indianapolis, commented,

The Oncourse Priorities Committee is a vital collaborative effort driving the enhancement of Oncourse CL. By partnering with academic, library, and technology service providers, we are identifying the development requirements most important to faculty. I am pleased to have a voice in this decision-making process and in helping to shape an online collaboration and learning environment that will ultimately impact thousands of students and faculty across the IU system and beyond.

Change Management

As the institution's relationship with the Sakai community matures, it sets in motion a cultural shift that is based on faculty ownership of the application. As partners in Sakai, faculty play a major role in defining functional requirements for the application, which then has an impact on how development hours are allocated. As the relationship matures, so does the opportunity for building institutional needs into principles for software development. The CMS at IU is a core, interconnected, enterprise university system. It interfaces with the university portal and with student systems and registrar systems; it provides a gateway to other university-wide systems including the university podcast portal and iTunes U. With such interconnectedness, it's easy to imagine the impact on change management. A holistic approach to managing change helps avoid disruptions in university business. At the same time, the approach must be collaborative enough to support the internal expectations of the institution and those of the Sakai community. That requires commitment and buy-in at the highest levels of the institution.

Migrating to Sakai

Large-scale migration—whether to a vended solution or a community source one—takes high-level support. The deputy CIO at IU deployed high-level support to manage IU's migration from legacy Oncourse to Oncourse CL. A director-level position established and led the Oncourse Support and Implementation Team of cross-divisional communication and support stakeholders. The team roster included faculty support professionals who understood the application and strategies for empowering good pedagogy; training professionals to develop workshops, documentation, and online training; help desk consultants armed with the most current information and able to resolve frontline user contacts; and application experts who could rapidly address issues behind the scenes. All were poised to quickly support their audiences. The support toolkit included help desk, online knowledge and documentation, Flash videos, and online and printed training materials for self-study. Faculty also had access to instructional designers for one-on-one consultation. Local technical support

professionals had direct access to application experts. Online communication forums provided opportunities for peer-to-peer sharing and discussion.

The transition from a legacy system to a new CMS begins with a commitment to provide the core functionality users already know. For IU, participation with the Sakai community—and the resources such a community brings to the table—provides the institution with a platform for innovation into the foreseeable future.

What It Means to Higher Education

The impact of the Sakai model at IU is significant and far-reaching. While some of the challenges we faced may sound daunting, the investment has already delivered broad payoffs, beyond higher-functioning software.

Taking part in Sakai can mean big adjustments in support, in business processes, in managing enterprise systems, in managing change, and in how the organization works with its clients. The local support model must involve all stakeholders and many arms of the technology organization. Sustaining the partnership requires communication and collaboration at every layer of the initiative. Supporting Sakai can seem like trying to change a tire on a moving car. Because Sakai is never considered finished, support teams must be nimble to make sure help resources are in sync with new tools. Some technology units may find themselves working with entirely new groups and discover that silos are breaking down. IT divisions become interdependent. Supporting such a collaboration requires new approaches to enterprise-wide system management and change management. The payoff is that many technologists emerge with a fresh appreciation for their colleagues.

The Sakai experience provided a gateway for making partners of faculty and technologists. The faculty OPC and the new high-level positions that represent faculty interests are signs of that change. Faculty now provide developers with a rich pool of ideas for innovation. This new model continues to encourage faculty to get involved in specifying new features, testing usability, and defining best practices. Beyond that, it suggests directions for further collaboration between the IT organization and campus populations. The university IT organization often straddles the academic-administrative divide. It's sometimes an uneasy hybrid, whose involvement in either camp is never enough to suit either. An organization that has ever been accused of being bureaucratic or out of touch may find that the spin-off effects of open source participation can help reverse that perception.

Sakai is a highly dynamic community where experimentation and innovation are part of the culture. For those so inclined, Sakai offers a source code repository called Contrib, a type of living lab, where contributors are free to develop as they wish and where institutions can choose code to run in their applications. As tools mature in Contrib, they are identified for possible inclusion in the product. Some standard tools, including Site States and blogging tools, were born in Contrib.

Community source does introduce complex, pedagogically driven development issues. The flip side is that Sakai offers richness and flexibility that enable institutions to build learning systems around their unique local needs. The Sakai pool of developers and their skills is as large as the ever-growing Sakai membership. All participants benefit from that richness.

The international membership of the Sakai community prompts us to think beyond the U.S. educational system. Developing for England and Japan and Finland puts international educators at the table, where the discussion maps a wider path. As more faculty join the community, the opportunity for cross-pollination of ideas and methodology expands. IU's relationship with Sakai encourages faculty involvement in global distance education and positions us for the global arena.

The Sakai model demonstrates that a worldwide community can develop for a broad population and at the same time provide the flexibility to customize locally. In seeking a community source model for CMS development, we have contributed to an innovative platform for teaching and learning, brought about major organizational change, and opened our doors to closer relationships with our clients and campuses.

Key Questions to Ask

- What would it require for my institution to handle the associated organizational changes that may come with Sakai membership?
- How would my executive leadership respond to a proposal to involve our IT organization and our university in the open source community? Who would lead the decision-making process within the university?
- What is my institution's position on risk and change?
- To what areas of Sakai would my institution be likely to contribute?
- What channels for communication with faculty currently exist within our IT organization?

Where to Learn More

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