

Share and Share Alike: The e-Knowledge Transformation Comes to Campus

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Every year, as summer turns to fall, thousands of faculty members across the country will think about preparing a first-year calculus class. Thousands more will do the same for English literature. And most of them will not share their work. During the next year, tens of thousands of quiz questions will be written for introductory biology. Hundreds of Web sites will be developed for use by sociology classes. And virtually none will be shared.

By contrast, tomorrow, about 240 Associated Press bureaus will produce over twenty-five thousand pages of news copy. And all of it will be shared, with the author/source receiving due credit in each case. Similar stories can be told in large corporations, government agencies, professional societies, and leading-edge organizations that are practicing an “enter once, use anywhere” approach to knowledge management. ***What is the difference, why is it important, and what is being done about it?***

Penetrating Information and Knowledge Silos

Information is often defined as *data* placed in *context*. Similarly, knowledge can be defined as *information* connected or organized by *rules*, meaning the rules by which information can be understood and applied

Whereas it is easy to share data, it is much harder to share context and rules. This has favored compartmentalization and departmentalization of information and knowledge. It works against sharing in areas where the contextual content of information is high, which includes almost all academic areas. Understanding a statement like “today's high temperature in New York is predicted to be 45 degrees Fahrenheit (7 Celsius)” is based on a more commonly held level of shared meaning and shared knowledge than is required for making sense of a calculus text, biology quiz, or a social psychology research paper. The hurdles to sharing are pervasive and significant and require investment to overcome.

Yet, we cannot afford not to share. We must make that commitment to get the payback.

In the research domain, the boundaries between academic disciplines are increasingly blurred and growing numbers of investigations are being carried out by larger and more geographically distributed teams. Knowledge sharing is the *sine qua non* of collaborative research. If the results of such research are to be applied, they must be captured and disseminated in ways that facilitate their discovery by the people who are in the best position or have the greatest need to apply them.

In the educational domain, we are engaged in massive and senseless duplication of effort. The gains to be had from saving an hour a week by sharing educational material are huge. There are over half a million full-time instructional faculty members in the United States (and over 400,000 part-time faculty members). If we assume an average

salary of \$60,000 (all ranks, all institutions) per year, one hour per faculty member per week equates to over \$800 million dollars per year in the United States alone. Yet cost is not the real issue: foregone opportunity is. Just think of the added educational value that could be derived if every faculty member in the nation could spend one more hour per week working with a student or bringing a unique perspective to a class instead of re-creating existing teaching materials.

The concept is simple: Suppose all of the knowledge content and context currently embedded in texts, course materials and notes, insights on tradecraft, and other proprietary knowledge silos were digitized, tagged, and arrayed in digital marketplaces where it could be stored, repurposed, combined, metered, and exchanged, with due credit given. What if vertical knowledge silos were penetrated by horizontal marketplaces that enabled content and context to be shared, combined, and used by current faculty and learners and by new users? What would that world be like?

Paths to Knowledge Transformation

This future world is portrayed in the new book, ***Transforming e-Knowledge***. We have worked on this manifesto to understand what tomorrow's knowledge-centric enterprises will look like, and how to get there from here. It's not just about "enter once, use anywhere." It is also about achieving a quantum leap in the capacity of individuals and organizations to acquire, assimilate, and share knowledge. Even the manner in which we ***experience*** knowledge is changing in the face of technologies that are in development or already in use. By the year 2010, it is likely that leading-edge individuals and organizations will have succeeded in using their knowledge sharing skills to establish important competitive advantages.

The transformation in how we experience knowledge will have substantial impacts on the process of learning. The patterns and cadences of interactivity among faculty members, learners, instructional development staff, knowledge management staff, and expert practitioners will assume new forms. As the ability to generate just-in-time knowledge becomes more prevalent, so will the reliance on "canned," static knowledge decline. Pervasive, perpetual learning, richly supported by knowledge management, will become the new gold standard for many learner experiences.

If there is such a great incentive to share knowledge and transform learning, why are we not doing it everywhere? Organizationally, the mainstream answer is that we're not ready. And at least three major drivers of change have to evolve further before transformative knowledge sharing is possible.

First, the capacity of the global information/knowledge network must continue to develop. This includes new technologies, interoperability standards, and the development of real e-knowledge repositories and marketplaces.

Second, organizations must develop their enterprise technology infrastructures and bring their processes for digitizing, atomizing, and recombining knowledge to the point where they are automated, routine, and substantially less expensive per unit of content. Moreover, organizations need to change and develop their knowledge cultures and the capabilities of individuals and organizational teams.

Third, our best practices, business models, and strategies for knowledge must continue to be reinvented. We are in the throes of this process now. Sharing digital knowledge may only be in the proof-of-concept phase, but even today innovators are evolving new practices that will change strategies and business models for knowledge sharing and e-learning. Over the next few years, these new models and strategies will proliferate, stimulating further, continuous innovation.

These three drivers of change are creating interconnected spirals of innovation. These innovations are driving wedges into the existing model and culture of individualistic and proprietary knowledge silos. Over time, the results will be transformative. The seeds of this transformation can be found in the work of the National Learning Infrastructure Initiatives (NLII).

e-Learning, Standards, and the Open Knowledge Initiative

The NLII is justifiably renowned for spawning what is now the IMS Global Learning Consortium. Its goal has been to enable technology components to successfully and easily share information, and its approach has been to develop specifications for encoding information in ways that can be mutually understood by cooperating systems.

Notice that we said “information,” not just data. In fact, the specifications developed by IMS, as well as those developed by other organizations, have as much to do with context as they do with data. Learning Object Metadata (now an IEEE standard) is designed to enable the versatile application of “learning objects” in a range of contexts, which may be digital or non-digital. The Advanced Distributed Learning Initiative's Sharable Content Object Reference Model (SCORM), based in part on IMS work, is designed to allow digital resources to be exchanged among cooperating systems in ways that allow the systems and the content to exchange information about the learner and eventually to adapt the delivery to the context of the learner.

The Open Knowledge Initiative (OKI) is addressing a different part of the problem, that of sharing technological innovations as well as learning content itself. It is creating standardized architecture and interfaces among educational and other components of an academic environment with the goal of greatly reducing the cost of developing and increasing the ease of sharing everything from open source learning management systems to specialized domain-specific educational technologies. OKI is the precursor of even greater efforts to leverage, share, and experience knowledge resources in ways that have never before been possible.

And knowledge management is playing a greater role in e-learning than ever before. Indeed, e-knowledge is all about the *fusion* of e-learning and knowledge management into a new discipline for supporting the pervasive, perpetual utilization of knowledge.

Bringing E-Knowledge to Campus

The frontlines in the efforts to transform e-knowledge are forming in organizations across the globe. To support these efforts, *Transforming e-Knowledge* includes “10 Ways to Accelerate Your Readiness for e-Knowledge,” a full set of initiatives for developing infrastructures, processes, capacities, and cultures for e-knowledge. To illuminate the potential for NLII participants to advance e-knowledge on their campuses let's focus on a

particular challenge: developing the capacity to create and utilize institutional knowledge repositories. Here are a few of the actions that need to be taken.

Digital Asset Management. Digital asset management requires the deployment of technology that supports repositories of knowledge objects and associated metadata, together with context-based search and discovery. At the University of Southern Queensland the use of digital asset management is changing the behavior and culture. Educators are reusing and repurposing existing learning content and communities of reflective practice are sharing knowledge and building knowledge bases. They are demonstrating that the value of knowledge increases as it is shared and are undergoing the transformation from “it's all mine” to “it's all been captured and contextualized and is available to anyone who has a need for it, including me.”

Standards. Academia is an ecosystem of diverse technologies. If these technologies do not interoperate, knowledge exposed by one cannot be of use to another. That is why standards are essential. For example, the eUniversity in the UK, funded to the tune of hundreds of millions of dollars, is building capacity by allowing universities to both contribute course content and deliver courses. What makes this plan work with a broad range of participants is that both the content and the delivery systems must adhere to standards. And the eUniversity is not alone. Large government-education partnerships in the European Union, Canada, and Australia are relying on standards and standards-based products to create distributed yet interoperable learning content repositories.

Digital Rights Management. To effectively exchange content and knowledge, it is necessary to come to grips with digital rights. Attempts to put large quantities of educational or scholarly literature online all run into the inadequacies of existing rights management approaches. This is why, for example, the Australian Department of Education Science and Training funded a demonstration project that shows how rights management can be integrated with learning management systems and library e-services. In the United States, legislation like the TEACH Act gives an incentive for institutions to get serious about both digital asset management and digital rights management, something that the most forward looking institutions are already doing around the world.

Conclusion

Leading-edge institutions world-wide are transforming themselves from knowledge silos to communities of knowledge sharing. They are doing this through technology and through cultural change. The educational world has the opportunity and indeed the imperative to play a leadership role in the rapidly emerging e-knowledge transformation. Those who answer the call will gain a competitive advantage for themselves and their institutions by living by the motto of “share and share alike.”

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