

Peer to Peer Collaboration with Connexions

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Abstract

Connexions encourages collaboration between instructors and authors in developing shared content to promote knowledge growth. This leads to direct, peer-to-peer interactions, offering an alternative to traditional publishing. Content licensing to accommodate sharing is a critical consideration. This presentation will look at these issues as they have been addressed by Connexions.

1. Issue:

With the advent of the Internet, communications between colleagues working in common fields has led to increased global collaboration, with data and research easily shared electronically. This increased communication and collaboration is also leading to new cultural norms. Communications are becoming less formal since they can occur much more frequently with e-mail. Written electronic communications are beginning to approximate dialog. Jointly authored papers can quickly evolve as authors pass “the token” to each other during revision cycles. Geographic location is no longer a barrier to participating in research and publishing the results. Sharing knowledge is valued rather than keeping it hidden until research results are published in peer-reviewed journals. The result is increased collaboration, more rapid dissemination of research results, and more frequent breakthroughs occurring internationally.

Within the academy, an additional benefit of sharing knowledge electronically is the ability to include new knowledge in the curriculum to ensure that students graduate with the most current knowledge available in their field of study. A greater challenge, however, is providing the infrastructure that researchers, authors, instructors and students need to easily facilitate shared communications. Reliance on traditional publishing means has, until recently, been the standard means for continuing to exchange information, even as the collaboration has increased with the availability of the Internet. This paper presents a new framework to better enable rapid knowledge exchanges and collaboration without relying on traditional peer reviewed journals and textbooks to mediate between members of these knowledge communities.

2. Description of the Connexions Project:

The Connexions project began in the fall of 1999 as an idea, building into a vision, for moving teaching and learning from a static, linear progression through a set of topics to a dynamic “ecosystem” of shared knowledge. In Connexions, communities of instructors, authors and learners share knowledge, continually updating it and weaving together various concepts to provide a greater view of how topics across disciplines interrelate. Today, Connexions hosts a repository of openly licensed knowledge modules, with over 1,500 modules available for free. The goals of Connexions are to enhance teaching, learning and research by (1) facilitating collaborative development of educational and research content in a broad range of disciplinary communities; (2) providing free access to distributed repositories of educational and research content and curricula; and (3) empowering diverse cultural communities to join in the development of knowledge.

Achieving these goals requires a solid core of enabling technologies that provide a foundation for supporting the needs of Connexions participants. Connexions has been available to anyone to use since the project's inception, but in January 2004 the project announced Release 1 of the system, signaling a maturity and level of functionality available in the software to ensure its robustness and scalability. The Connexions roadmap, course composer/instructor interface, and authoring interface tools, along with a powerful knowledge repository provide an environment to encourage knowledge sharing and reuse, supporting collaboration and building of communities across geographic, cultural and disciplinary boundaries.

By collaborating both within and across disciplines, communities of authors work together to pool their expertise so that courses, created by stringing together knowledge chunks, are authored by many, with each author receiving attribution for his or her contributions. Information can be modified under an open license to tailor the material for the audiences of learners. This approach invites contributions by authors, whether they are senior or novice, recognizing that each may have valuable insights that will advance overall knowledge and learning. In this environment, the peer review communities collaborate directly with each other, modifying contributions as they go and keeping the knowledge current. Authoring becomes a much simpler task. Rather than write an entire book or article, individuals can write on a single topic in which they are expert. Reuse of knowledge is encouraged and new ideas can readily evolve without waiting for the long pre-publication peer review process to take place. While initially focused on creating customizable courses, the Connexions concept works just as well for the publication of research articles. As new findings are published, the relevant concepts can be picked up by multiple disciplines that may be affected and can be quickly integrated into the curriculum or used in further research activities to promote new discoveries at an increasing pace.

Intellectual Property Issues

"Open" is not always easily achieved. Current copyright laws automatically "protect" content at the time it is presented for anyone to see. Connexions has addressed licensing issues in 3 areas:

- Open Source license of software tools
- Open Content Licensing
- Site License for Connexions

The team has worked closely with leaders in open source and open content licensing to address the licensing needs for the project.

Open Source license of software tools

As discussed earlier, all software for the Connexions project is released under open source licenses either through existing open source projects or through Connexions for newly developed Connexions software tools. Through the porting of Connexions to the Plone content management system, the Connexions software development team has contributed significant functionality to this existing open source project and all contributions have been incorporated into the existing open source license adopted by Plone.

The annotations capability developed for Connexions was released as an update to the open source Annozilla project. As the open source development community continues work on annotation capabilities, Connexions will benefit from the improved annotation capabilities.

The Connexions Roadmap component is an example of software developed specifically for the project. It has an explicit open source license associated with it as part of Release 1 of Connexions.

Open Content Licensing

The project team has proactively addressed licensing issues associated with providing content that is free, modifiable, reusable and easily distributed so that sharing knowledge is easy and

desirable. Through our collaboration with Creative Commons, we have provided a framework to allow authors and instructors to associate their materials with a Creative Commons open license that clarifies the rights associated with content. At the time Creative Commons launched in 2002, Connexions was the largest contributor of openly licensed content using the Creative Commons licenses.

Educating faculty about what openly licensed content means and why it is beneficial has been a role of the Connexions team as the project has progressed. An initial workshop on the subject was held at Rice in the fall of 2002. Planning is currently underway for a larger, more highly visible workshop on content licensing in the Spring of 2004.

At present, the content commons only supports material licensed with the Creative Commons attribution license, which allows full use, including for commercial purposes, provided adequate attribution is made. Various other Creative Commons licenses are available for authors to specify whether they want attribution for the work when it is used, whether the work can be used for commercial purposes, and on what terms the work may be modified. Depending on the choices an author makes in each of these 3 categories, one of 11 machine readable licenses is offered to the author to attach to a work so others will know what they are or are not allowed to do with it. Additionally, Creative Commons provides a means for authors to contribute their works to the public domain. When the copyright is donated to the public, no license is involved. Connexions plans to support multiple content licenses in future releases of the system. Support for additional licenses will provide even greater flexibility for contributors who are not comfortable with the attribution license or want to incorporate materials in their modules that are already copyrighted under other licenses.

When an author creates a new module in Connexions, they must first agree to the Creative Commons Attribution license for the module. That license is then associated with the module and displayed whenever the module is displayed. Whether the module is displayed within Connexions or just in a browser as a result of a Web search, the license will be available letting users know that they are free to modify the material, distribute it, and use it for commercial purposes provided they attribute the author each time.

Site License for Connexions

As with most Web sites, users of Connexions are bound by the project's site license. The project team worked closely with Lawrence "Larry" Rosen, a renowned open source attorney who is the general counsel and secretary of the Open Source Initiative (OSI), and served as its executive director. OSI reviews and approves major open source licenses, several of which were written by Larry. OSI manages and promotes the Open Source Definition for the good of the community, specifically through the OSI Certified open source software certification mark and program. Larry and Rice's general counsel worked to develop a Connexions site license that would be acceptable to users and maintain the spirit of the open source community. Whenever a user requests an account on the system (authors and instructors), they must agree to the site license. The license is available for review to all users of the system, whether or not they have an account. Only those with accounts must explicitly acknowledge agreement to the site license.

Post-publication peer review

With a view to incorporating "lenses" that will filter the content according to a preferred view (e.g., recommendations of a professional organization or recognized authority), Connexions challenges traditional publishing models by relying on post-publication peer review. While this approach is not new to the software development community where it has proven to be successful in open source software development, it is new to content. How will someone be able to confirm the validity of the content if anyone can contribute? For peers in a scholarly discipline, it is easy to collaborate and judge materials in their field. After all, they are the peer review process that has already been in place for traditional publishing. For the public at large, however, the availability of trusted lenses for looking at materials in the repository will be important.

3. Outcome

The Connexions content commons is in its fourth year as an available open repository of shared knowledge. Connexions has been “real” at a time when many others simply espoused a desire to achieve the same goals. Now with over 1,600 knowledge modules, more than 35 full courses, and a fully supported set of tools available in Release 1, the enabling technology of Connexions is poised for even more significant growth. The content commons is regularly searched by all of the popular web search engines, exposing knowledge and the authors of that knowledge to a wide variety of communities. Connexions has been cited in numerous publications throughout the past year, including *Wired* and the *Chronicle of Higher Education*, further signifying its rise in popularity. The Connexions site is linked in numerous locations across the web as a site for high quality educational content. Without any significant effort at publicity, the project is receiving recognition as a unique and empowering resource for authors, instructors, and learners around the globe.

Additional enhancements to further lower barriers to adoption of Connexions will support even wider dissemination of the technology. New domains of knowledge are planned for inclusion in the content commons, including knowledge modules and courses in art history. There will be increased participation internationally as Connexions establishes a center of excellence in Europe at the International University of Bremen.

4. Importance and Relevance to Other Institutions:

Connexions has not grown by top down declarations of institutions dictating to their faculty that they will use this technology. Rather, it has been a grass roots movement, starting with the shared knowledge that comprised two courses in Electrical and Computer Engineering at Rice University in the fall of 2000. As people discover the knowledge, they discover the technology that enables its sharing and collaboration. The excitement of Connexions users is contagious; when someone in a discipline discovers its power, their colleagues come on board and spread the excitement while building the knowledge base. These people find their rewards not in hoping for royalties they'll receive from a textbook that took them years to write, but in being able to openly share their knowledge for free, while continuing to receive credit when their original works are modified and even more widely disseminated.