



"For both students and faculty, the orientation towards personal work spaces for individuals and teams allows us to support capabilities that we see as fundamental for the next generation of online tools. Resources and workspaces are organized around the activities and needs of students and faculty members, rather than focusing only on the administrative needs of individual courses or research projects. The environment does not appear when a course begins and disappear when the course ends. The tools and online content remain available across courses, research projects and administrative terms, allowing us to support student and faculty portfolios throughout a person's career, not just within the boundaries of an administrative calendar. The OKI architecture allows us to do this."

Carl Berger, Director of Advanced Academic Technologies

OKI - A Recipe for Integration

The University of Michigan's *Chef* Development Project

The University of Michigan is a long-time believer in the importance of building tools to support learning and teaching, not simply to support course administration. Michigan is now using OKI as an architectural base for developing *Chef*, their next generation of online teaching and research tools.

The goal of *Chef* is to provide each individual in the university with an online educational and research environment organized around the communities, research projects, and courses in which that individual participates. *Chef* allows all students and faculty members to create customized work spaces to support teaching, learning, and research. Course sites, research spaces, and personal portals are assembled from a set of tools that can be selectively excluded or included in any work space. Content and tools may be shared across work spaces, crossing the boundaries of research projects and courses.

From its inception, *Chef* was envisioned as a component-based architecture. The synergy between this vision and OKI led Michigan to become an active partner in the OKI alliance. Michigan is contributing to OKI and is rapidly adopting the OKI APIs into *Chef* as they become available. Michigan's extensive experience in designing and implementing learning technology is valuable to the development of OKI, and at the same time OKI supports the development of new technology at Michigan. *Chef* allows new tools to be developed and made available to users at any time, provided they meet the interoperability requirements of the OKI-based architecture.

"We intended to enable an open source community that supported innovation and the sharing of components and tools within the university. The evolution of OKI in parallel with our work was a remarkably valuable development for us. We were designing a new framework and a set of interoperability APIs, and here came a group committed to the same vision, but planning to define a set of APIs that are common across all of higher education." **Joseph Hardin, Deputy Director, Media Union; Head of CHEF Project**

A Community of Developers

A key part of the Open Knowledge Initiative is capturing the knowledge of a community of experts committed to developing a common architecture and sharing solutions.

Terry Weymouth, Associate Research Scientist at the University of Michigan, is a key player in the development of *Chef*, and he's excited. *"The OKI architecture brings together the best thinking of a lot of very smart people who have been working on this challenge for a number of years. This architecture allows developers of online tools and content to concentrate their development efforts on their particular area of expertise. They know precisely how to fit their work into the larger infrastructure, and they can now effectively share their work with other developers across campus, or across the ocean."*

About the Open Knowledge Initiative

Innovation. Integration. Cooperation.

The Open Knowledge Initiative (OKI) defines an architecture that precisely specifies how the components of a learning technology environment communicate with each other and with other campus systems. By clearly defining points of interoperability, the architecture allows the components of a complex learning environment to be developed and updated independently of each other. This leads to a number of important benefits:

- Learning technologies appropriate for a *range of teaching and learning requirements* can be integrated together into a common environment. For example, the needs of the Math department are not those of the English department, and tools that work well for new users may not be adequate for seasoned users.
- Learning technology and content can be more *easily shared among schools and departments*. This provides a catalyst for cooperative and commercial development.
- There is a *lower long term cost of software ownership* because single components can be replaced or upgraded without requiring all other components to be modified.
- Modularity makes learning technology *more stable, more reliable, and able to grow with increased usage*, and allows components to be updated without destabilizing other parts of the environment. OKI is based on technologies that have proven to be scalable and dependable in large scale enterprise computing environments
- The architecture offers a *standardized basis for learning technology software development*. This reduces development effort and encourages the development of specialized components that integrate into larger systems.

At the core of OKI is a set of application programming interfaces (APIs) that realize the OKI architecture. OKI is providing Java versions of these APIs. These Java APIs are provided for use in Java-based systems and also as models for other object-oriented and service-based implementations. OKI's partners and developer community are providing open source examples and reference implementations of learning technologies that make use of the APIs.

Higher education leaders recognize that learning environments are a core component of their information technology infrastructure. These environments must successfully support faculty and students, and they must be flexible enough to adapt to a range of instructional requirements and styles. The technologies must be robust and must scale up to support an ever-increasing demand.

OKI is being developed by and for higher education. OKI was started with Mellon Foundation funding and has grown as partners have received additional funding for specific OKI-related projects and activities. Institutions of higher education can take concrete steps to move OKI forward. These include making OKI part of procurement and product definition cycles and participating in the OKI development community. This will help direct the efforts of the vendor community and will help campuses move more quickly to a stable and scalable learning technology infrastructure that effectively supports their educational processes.

The OKI Partners

The Massachusetts Institute of Technology leads the project in close collaboration with a growing community of partners, including Stanford University, the University of Michigan, the University of Cambridge, Dartmouth College, North Carolina State University, the University of Pennsylvania, the University of Wisconsin-Madison, and the University of Washington.

To find out more about OKI, visit our web site at <http://web.mit.edu/oki>, or email oki-info@mit.edu.