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Kuali OLE:
A Collaborative Community Model for Software Development

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Kuali Open Library Environment (OLE) is perhaps best known as an Andrew W. Mellon Foundation-funded project to create an open source, next-generation library management system. Since our initial investigatory OLE Project in 2009 found that the academic and research library community supported the goals and concepts of a community supported and developed library management system, Kuali OLE has worked to engage this community with our vision for community sustained software for library management—software for libraries and by libraries.

Important to that vision is a service-oriented technical architecture that provides adopters with format-neutral, document-oriented persistence, rules-based workflow, accessible metadata indexing, enterprise-strength financial processes, and a rapid interface development environment. The Kuali OLE technology stack gives libraries control over library process workflows and provides an application development toolkit that lets adopters extend OLE to their specific needs—leveraging their descriptive metadata, finances, and workflows to build more tightly integrated management workflow solutions for research libraries.

Previous discussions and presentations of Kuali OLE have often focused on the technologies, roadmap, and project status as we have cast our vision into community-sourced software. The evidence of these maturing efforts can be readily found, monitored, and test-driven at the Kuali OLE website or in the sheer amount of code developed, which can be tracked at our Oloh site. Visitors can find archives of our presentations, descriptions of our technologies, expectations for deliverables for each release, and our current release test-drive and driver's manual. Further, the OLE website provides opportunities to interact with partner participants to gain further understanding of our approach to OLE as a solution platform for academic libraries.

While much attention is concentrated on our technologies, organization, and roadmap, less attention and discussion has been focused on the innovation that is most critical to our success: the Kuali OLE collaborative community model. Based on work from the Kuali Foundation and their initial success in developing Kuali Finance and Kuali Student, Kuali
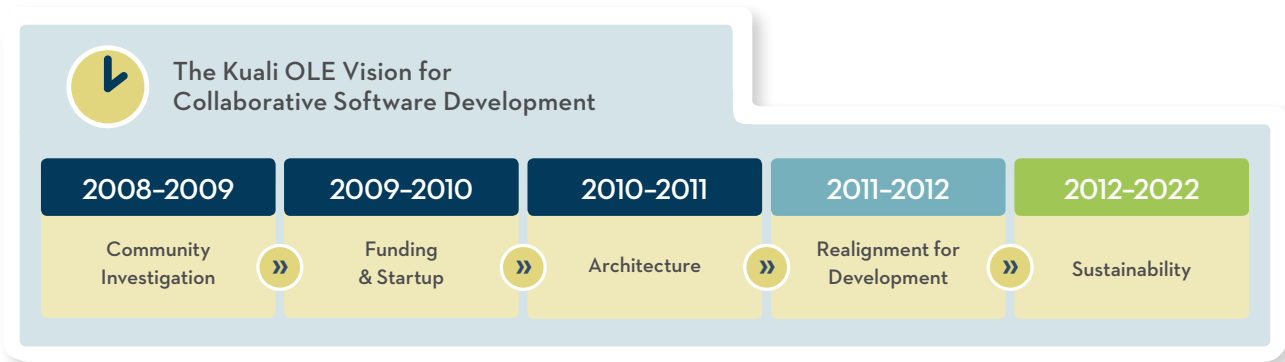
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OLE has worked to adapt this model to a library centric environment. We are a collaboration of partner institutions that have developed a shared vision for library management software, invested significant cash resources, and expended the ingenuity and dedication of our staff in this effort. While the motivations of each partner are born of our individual institutional priorities, we have evolved into what Hilton and Wheeler define as a collaborative community in order to find an open, common, and shared solution. We have not simply invested in a software development project, but in a strategic engagement of collaboration based on our institutional similarities and our willingness to leverage our work as one large-scale project.

The Kuali OLE Collaborative Community

The Kuali OLE collaborative community has been an evolution of vision, focus, and organization. We began this journey, not as a community fully formed by similar interests, but as an investigation. As the OLE Project, a group of libraries joined with Duke University with funding from The Andrew W. Mellon Foundation to investigate the approach and requirements for building an open source, next-generation library management system for academic and research libraries based on the principles of service-oriented design. Critical to this investigation was a determination of whether there was enough interest and support in the academic library community to provide the resources that would be necessary to undertake a large software development effort, and if so, how such an effort would be organized. By the end of the OLE Project in 2009, through many engagements with the academic library community, we had validated the concept of a community owned and developed software application framework. Further, we had investigated the benefits of joining an existing organization as a host for a software development project, rather than developing a niche not-for-profit organization. The Kuali Foundation provided a model to support and sustain the ambitious conclusions in the OLE Project final report. In Kuali, we found a robust organizational and technical architecture that provides a legal entity, supported development environments and tools, an existing host for the Kuali Rice middleware framework that would become critical to our software development, and an active and committed commercial affiliate program that can provide critical commercial resources for development, consulting, and operational services normally beyond the reach of typical, unaligned open-source projects.

In 2009, building on the cooperative recommendations of the OLE Project, a proposal was developed to attract collaborative academic library partners to join in a software development project to build the Open Library Environment. To build a new community required the project to attract committed and diverse partner libraries, procure sufficient funding to underwrite the effort, and find an organizational home for the project. Collaborative communities can arise where the goals and interests of the participants are aligned; through this alignment, partners find the trust and structure for sharing vision, knowledge, effort, and scrutiny. The proposal had to lay out a clear and compelling set of goals that potential partners could evaluate against their own goals, be explicit about the resources required for the project and what a partner's contribution would be, and provide a project organization that could support a shared approach to software functionality. The proposal to form the Kuali OLE project attracted seven founding partners that could

The Kuali OLE Vision for Collaborative Software Development

2008–2009		2009–2010		2010–2011		2011–2012		2012–2022
Community Investigation	»	Funding & Startup	»	Architecture	»	Realignment for Development	»	Sustainability

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develop deep collaboration and shared commitment. As the partnership was coming together, the proposal was further developed to attract funding from The Andrew W. Mellon Foundation and matched with partner cash commitments; this provided sufficient funding for the start-up phase. With our commitment and funding, our partner institutions joined the Kuali Foundation as the Kuali OLE project, ready to collaborate in building on our shared vision.

With the nascent Kuali OLE community in place, we set about designing our technical architecture and establishing our software development strategy. Much of the work done during this phase of our project focused on investigating, evaluating, and selecting technical approaches and software for building Kuali OLE. We organized our partners around requirements for major functional aspects including Select and Acquire, Describe, Deliver, and Relationship. These groups developed the basic scope of needed services against which our technical architecture could be designed and evaluated. We recognized the need to balance deliverables that could not only manage traditional library workflows, but also could extend to new workflows to incorporate new demands on libraries to manage a wider set of content types and services. It was our collective knowledge and estimation of a rapidly changing and disruptive future that fueled innovations in Kuali OLE technologies including a service oriented design using Kuali Rice middleware, enterprise-strength financial processes that will power new models for information acquisition, Apache Jackrabbit and Solr to provide future-proofing for changing descriptive metadata practices, and Kuali Identity Management to support multi-institution populations of patrons for library services. The diversity of outlook, deep domain expertise, technical skills, and visionary insight embedded in our collaborative community has shaped the innovative and extensible design of Kuali OLE.

Realignment of priorities and organization is a challenge to any organization; it requires insight into needed changes and the fortitude to effect these changes. The Kuali OLE community required such realignment as we transitioned from our architecture phase into a software development collaboration that needs to produce working code and deliverables. During the summer of 2012, Kuali OLE reorganized our development practice and changed functional council leadership, brought on a new project manager, streamlined redundant technical resources, and reformed our specification writing practice. These changes were quickly conceived and deployed through the consensus of our community that progress on code required more direct interaction of our community subject matter experts with our contract software developers. We stripped away barriers to direct communication about requirements, which has significantly improved the velocity of development and provided a more holistic understanding of software priorities and directions. The trust, born of shared vision and effort within our community, allowed for agile recognition and action.

Kuali OLE is now moving towards its milestone 1.0 release in 2013. While we are deeply focused on software development, we have already begun, as a community, to develop strategies and processes for implementation of Kuali OLE. As can be expected with any community-sourced software, there will be early adopters and the community is preparing to be a resource and partner in their implementations. In the next couple of months, we will see at least one Kuali Commercial Affiliate (KCA) offer services to implementing libraries. But our early implementers will also have substantial community support. Our shared core teams, as well as staff from our partner libraries, are working with the implementing libraries to assist in planning, gap analysis,

technology staging, and training. Within the Kuali OLE collaborative community the success of these early adopters is critical to all partners. These deployments will not only validate our efforts to develop software, but will shine a light on deployment and integration patterns that all of us will need for our own implementations. Again, partners gain advantage by committing to the community.

In closing, a note on the strength of the Kuali OLE collaborative community would be incomplete without a mention of our newest partners. A measure of community vitality is how it grows and sustains its activities. During the last year, Kuali OLE has added two new partners to our community: Villanova University and North Carolina State University. Both new partners bring considerable experience with open-source software development, discovery tool integration, and cooperative interactions. Our community is in discussions with other libraries now and will likely bring on board additional partners before the end of the year. Our code base continues to grow and the shape of core modules of functionality is coming into resolution. We have proposed a third year of funding from The Andrew W. Mellon Foundation and are hopeful that this grant will be awarded. The Kuali OLE Board has approved continued funding from their own resources as we complete development and begin to realign to deploy, functionally extend, and sustain our software and our community.

During this past year, Kuali OLE has partnered with JISC Collections in the United Kingdom, with funding from JISC and from The Andrew W. Mellon Foundation, to develop the Global Open Knowledgebase (GOKb). GOKb is critical infrastructure for Kuali OLE deployments to support electronic resource management. But our vision is that global information is a community resource and should be open and supported by the community of users. GOKb will depend on community cooperation to build and sustain this open data resource that will be helpful to Kuali OLE, to JISC's Knowledge Base+ project, and to the wider academic library community. These activities demonstrate how our community vision continues to resonate within our collaborative community, but also is relevant and attractive to new and potential partners, funders, and the wider library community.

The Collaborative Community Investment

In recent years, we have seen many library management systems (LMS) vendors merge and realign mainly due to the influx of private equity funds into the library management system marketplace. This has, according to Marshall Breeding, continued to create an environment that allows a "smaller group of larger firms [to] dominate the library automation marketplace. They are largely international, diversified, and privately owned. The mergers and consolidations that

marked the recent history of the industry have absorbed the weaker products and companies." This is the way that the marketplace should work; however, the critical component here that does not play out so well in the academic and research institution marketplace is that this has an effect of promoting single system solutions that are still based in purchasing software or in purchasing LMS services from privately-held cloud environments.

What does this mean for mid-size to large-size research libraries? It means a lack of options in managing library business practice and workflow. It also means that many staff work cycles are put in service of developing, along with this smaller and smaller pool of library management system vendors, the new systems that are being put into place as software as a service (SaaS) or service platform systems. Libraries that are early adopters often put hundreds of thousands of hours of analyst effort in implementing a newly developed system. The good part about this opportunity is that it shapes the development of the new system. The bad part is that this effort from the library technology and technical services staff will never be regained, and cannot necessarily be shared with other peer libraries due to the siloed nature of proprietary software and services.

In the Kuali OLE Community, we are not against vendors or profit-based service options but we exist to propagate a new business model within the library community that seeks to develop long-term, deep-collaboration across institutional boundaries that can leverage this time, work effort, and expertise so that it can be shared across institutional boundaries. This can happen because our software is open source and our institutions can work together to build a shared system that is affordable, scalable, and enabled for new management options for digital content and for changing methods in the information supply-chain lifecycle. This model thus enables a scope and vision for a library management system that does not have "need quotas" for new customers in order to reach defined profit margins; it can be sustained by a smaller like-minded community. Does this mean we do not want new partners? No, it means we know what it will take to sustain our software, and it means that once we hit a certain mark in terms of long-term partners, we can achieve sustainability for our software as well as supporting an ecosystem of fee-based services that can enable new installations and new users, as well as provide needed services for our software services platform.

The other key component that keeps our library investment within the higher education and the academic library community is our new business model that is derived from the Kuali Foundation model of leveraging local

solutions for use with multi-institutional common problems. In Kuali OLE we look at local issues but always in terms of how that issue can be leveraged for use at other partner sites. This does not mean that we are looking for solutions for all academic libraries; however, in most cases that turns out to be true once we have vetted a solution for our rather representative group of mid- to large-size academic library organizations.

An Ecosystem for Vended Services

The Kuali Foundation provides a set of services that benefits all of the Kuali projects, including Kuali OLE. The Kuali Foundation is a locus of our collaborative community. Along with providing an umbrella organization for Kuali projects, the Kuali Foundation is the legal entity that manages the intellectual property for Kuali software, organizes the Kuali Spring Workshop and the annual Kuali Days Conference, hosts development environments for Kuali projects, and directs development of Kuali Rice. In addition to these services, the Kuali Foundation oversees the Kuali Commercial Affiliates (KCA) program that provides an ecosystem of services for delivering Kuali software systems. The KCA program allows commercial service providers to join in the Kuali Community and contribute to governance and development of the community. KCAs can build profitable business models around service, rather than offering a complete solution. With one or more KCAs, a library can provision planning, implementation, data migration, hosting, or support services. In an open and collaborative community, there is less likely to be vendor lock-in for services around a software product. In establishing Kuali OLE with open access to the intellectual property of our code base, libraries as well as service providers have the same access to our code.

We see several advantages to a managed ecosystem for open source code with complementary commercial services. Libraries can choose what services they require or fund a development for a unique functional need. Where a library finds value, it can invest independently or it can seek like-minded partners to underwrite extensions of functionality. Finally, because the Kuali OLE collaborative community owns the intellectual property, investment of resources stays in the community and remains focused on our shared goals—rather than being diverted to external goals—and new knowledge or processes can be easily shared among community partners.

A Start for Global Partnership

Another component of the Kuali OLE partnership emerging to help sustain long-term growth is the growing global library collaborative community. The world of research and academic libraries is becoming a global community that is easily accessible through online communication (Skype, WebEx, GoToMeeting, unified communications systems, etc.) This type of community building, while often formed through these virtual communications, can be grown through in-person interactions at international library and cultural heritage conferences that often rotate back and forth between parts of Europe and North America. Through these venues and contacts, the Kuali OLE community has found that the needs of academic and research libraries are similar the world over and we are primed for our next steps to include more international collaborative partners to our community.

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In terms of specific global cooperation, Kuali OLE has established a long-term cooperative alignment with the Joint Information Systems Committee (JISC) in the UK. Early in our discussions, we knew that we wanted to work together because we saw so many common overlaps in the work we were establishing in the areas of library management systems and electronic content management. However, we knew that arriving at a point of collaboration and not just cooperation would take particular attention to scope, timing, and aligned vision. This occurred after two years of cooperation last spring when we launched our Global Open Knowledgebase (GOKb) Initiative that is a spin-off project aimed at developing infrastructure that will support GOKb in the Kuali OLE community and KB+ in the JISC and JISC Collections Communities. Our first large-scale project working together has enabled new ties for the Kuali OLE community as well as for JISC and JISC Collections. We are leveraging current meetings in each of our countries to optimize face-to-face communications while also taking advantage of current Internet technologies to make our project work as one global partnership.

This growth will inevitably lead to an expansion of our communication strategies that will require more world presence. However, this is not new territory for higher education communities; we see many scoped opportunities for leveraged software development that have occurred with groups in the higher education sector such as Sakai, Kuali Finance, Open Grid Forum, and others that leverage shared resources across institutional boundaries for the common good. It will require continued communication and commitment to partners who might live in far-flung time zones and speak different languages, but that can build continued community for long-term sustainability.

Standards and Community

The Kuali OLE collaborative community has a natural affinity with the open standards efforts organized by organizations like NISO and EDItEUR. These organizations promote standards that drive innovation, integration, efficiency, and economy. Standards define components of target platforms that support data interchange, metadata representations, or accounting practices. Standards seek to lubricate interoperation of different systems and, in doing so, encourage sufficient scale across libraries, software systems, and shared service. Standards-based interoperability tends to prove effective in representing explicit knowledge resources not held in proprietary walled gardens. The cumulative impacts of standards are to push for innovation by exposing community-critical knowledge and lowering risks for innovators and adopters as well as for public and private cooperatives. Similarly, a collaborative community, like Kuali OLE, supports

directed collaboration as a means of driving innovation and lowering risks. The Kuali OLE shared vision, knowledge, and effort powers our collaboration and strengthens our community. This is not simply a convenient way to pool our resources, like a buying club for materials or a technology cooperative. Our community is an alignment of goals that provide the structure for collective action, influence, and impact reaching beyond simply delivering a software package. The Kuali OLE partnership demonstrates that our partners have more in common than they have differences. Harnessing this alignment supports our development efforts, can prove attractive to other like-minded libraries, and builds a collaborative community for innovation and impact that proves bolder than institutional or geographic boundaries. | IP | doi: 10.3789/isqv24n4.2012.06

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