

## eLearning Roadmap Committee October 2010 Report

From August 2009 to October 2010, the eLearning Roadmap Group has focused its energies on investigations related to the Learning Management System environment, with the intent to identify future directions for Duke after the current Blackboard 8 contract expires in June 2012. This report provides a recommendation for a successor to that platform along with supporting documentation. The eLearning Roadmap committee recommends choosing Sakai as the successor to the current Blackboard 8 implementation to best meet Duke's immediate and long term needs.

### EXECUTIVE SUMMARY

The eLearning Roadmap Group gathered data and feedback about teaching needs and LMS products, and narrowed our scope of investigation to three potential LMS products: Blackboard 9.x, Moodle and Sakai<sup>1</sup>. The eLearning Roadmap Group reported this finding in May 2010 and continued a more extensive analysis of the options in four key categories:

- **Functional analysis** – The committee analyzed the capacity to meet the functional requirements of the institution. The committee determined that each option could meet these needs.
- **Technical analysis** – Each system was reviewed to determine if it was capable of meeting the essential technical criteria set by the committee. While there is some variability in the capacity of the options, each system met the requirements at the most essential levels.
- **Cost analysis** – The committee attempted to determine the cost associated with implementing a system that would meet the community's functional and technical needs. This included exploring the option of contracting with a service provider for external hosting in addition to the cost associated with a Duke managed installation. Total implementation costs varied for each option, with ranges of costs provided to address potential staffing changes associated with supporting open source systems. Based on the available information, costs for external hosting were lower than local hosting for each option. Final determination of the overall cost of implementation would need to be determined once a decision has been made.
- **Strategic analysis** – Each of the systems was reviewed to determine how it could meet the institutional strategic goals. Each system could meet those strategic needs with some strategies influencing the cost and support model associated with each option.

It is important to note that the analyses were based on an assumption that the functionality available in the current implementation does not fully meet the functional needs of the institution. The recommendation assumes extending the functions of the LMS to meet those needs which in turn requires a larger commitment of resources from Duke.

As a result of the review of the various analyses, which included numerous discussions with peer institutions, the eLearning Roadmap committee recommends choosing Sakai as the successor to the

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<sup>1</sup> Among the list of applications reviewed are the following: Blackboard 9.x, Sakai 2.x/3, Moodle 1.x, Cisco Collaboration Suite – (Quad, Show & Share, Pulse), Fuqua World – (locally developed application), Desire2Learn, and eCollege. The committee also investigated the “best in breed” scenario of integrated services.

current Blackboard 8 implementation. The committee believes Sakai places Duke in the best position to support both our immediate and long term goals. Key factors associated with this recommendation are:

- The flexibility of an open source framework.
- The larger number of service options available from a variety of developers/service providers than the proprietary Blackboard system offers.
- Significant cost savings in license fees as Duke expands the number of affiliates accessing Duke resources at globally disparate locations.

The committee also recommends that we implement an externally hosted system. This option would take advantage of the expertise already in place from service providers who have years of experience supporting Sakai. It would also release local resources to other strategically important services once Duke has completely migrated to the new system. This does not preclude bringing the service in house after some evaluation of the external hosting model if it does not meet our service needs.

## eLearning Roadmap October Report

### Charge of the committee

The eLearning Roadmap Committee is charged with the ongoing assessment of the eLearning needs of the campus community and identifying the tools, support and infrastructure that should be centrally provided. The committee will gather extensive input and feedback from the broad campus community of stakeholders, with a special focus on faculty and students, and will use the public eLearning Roadmap Committee web site (<http://elearning.duke.edu>) to provide regular updates on the process and findings.

In the fall of 2009, the eLearning Roadmap Group was asked to focus its energies on investigations related to the Learning Management System environment, with the intent to identify future directions for Duke after the current Blackboard 8 contract expires in June 2012. The group was asked to submit a recommendation to senior leadership for review at the end of October 2010. The CIO, the Provost and the Executive Vice President will review the recommendation and will make a final decision in consultation with the deans and faculty leadership.

### Information gathering

To reach its recommendation, the eLearning Roadmap Committee conducted a series of [events](#), extensive interviews, and focus groups to develop a series of [user profiles](#), feature sets and an overall inventory of teaching and learning needs that can be addressed by eLearning tools. Based on that information, the committee then developed a set of [guiding principles](#) and [functional requirements](#) that was vetted with the Duke community for validation. Based on these principles, requirements and the LMS landscape at peer institutions, the committee narrowed the scope of investigation to three potential LMS products: Blackboard 9.x, Moodle 1.9 and Sakai 2.7. Several other LMS products were evaluated, including Desire2Learn, and eCollege, and although each had distinctive strengths the aforementioned products were considered to be the best potential candidates for our environment.

In addition to conducting full-day demos of the three competing LMS products, the committee divided into four sub-groups to complete detailed investigations of the products in four categories: functional, technical, strategic, and cost analysis. The sub-groups conducted extensive [LMS reviews](#) of available information, with additional inquiries to peer institutions and software providers, to develop reports in each of their sub-areas. The recommendations of the working subgroups, along with feedback from other sources, were developed into a draft summary recommendation by the end of September. This summary was reviewed by the entire committee and finalized into this report.

### Assumptions, Analysis and Recommendation

The data gathered from the Duke community led to several assumptions that influenced the recommendation of the eLearning Roadmap committee:

1. The set of functions currently provided by Blackboard 8, in combination with the current additional building blocks and add-ons, does not fully meet the functional needs of the institution. Any proposed system will need to extend the feature set beyond the current installation, which may influence the overall cost of implementation.
2. The eLearning landscape continues to change rapidly, both in the number of systems offered and the feature sets provided by each system. Any recommendation from the committee will most certainly need to be revisited within the next 3 – 5 years, as the committee makes a continued effort to identify emerging tools to support the needs of the Duke community.
3. The assumption that a single LMS system will provide all of the needed functionality is not realistic and does not reflect the current range of tools already in use across the institution. In addition, new models of access to learning tools are developing and gaining maturity. The so-called “best in breed” model, in which a collection of loosely-integrated tools could be provided through a web “front end” which pulls them together, may allow us better flexibility by meeting user needs with the best tools possible, rather than providing a “monolithic” system. This approach is already in place at multiple institutions, with a prominent example being the CUNY Academic Commons (<http://commons.gc.cuny.edu>).
4. Any desire to implement an open-source/community developed learning management platform will require a cultural shift (see pages 10-11 for details) from the current models of reliance on proprietary systems to support systems serving a large percentage of the Duke population. This includes commitments to increase not only technical resources (staff) for application development, but active participation in open source community activity.
5. The committee would review both locally managed and externally hosted systems.

With these assumptions, the committee came up with the following findings:

- **Functional analysis** – The committee determined that each system had the capacity to meet the functional and strategic requirements. While none of the systems could meet those needs within the base application, there appeared to be documented systems for add-ons and/or integration that extended the services to meet all of the critical needs. Blackboard 9 is distinct in that content migration from Blackboard 8 would be the least complicated. Also, faculty and students who are current users would be more familiar with it based on prior use of Blackboard 8, which could potentially minimize faculty and student time required to transition to a different LMS. (See Appendix A)
- **Technical analysis** – Based on the data gathered, each system was capable of meeting the essential technical criteria set by the committee. Blackboard 9 and Sakai had extensive technical documentation publicly available and large organized professional communities involving technical support and development staff. It was somewhat more difficult to make the direct case for Moodle, based on existing technical documentation about that system. However, there are multiple Research I institutions as well as third-party hosting providers that have been able to run Moodle in a way that appears to meet our essential technical criteria. (See Appendix B)
- **Cost analysis** – Determining the cost associated with implementing a system that would meet the community’s functional needs was difficult. For Blackboard 9, the license model provided more defined costs for both a locally managed and externally hosted systems. The

differentiators from the current support model would be based on the infrastructure (staff, technology) requirements to support additional functionality, increased end user support and a higher level of involvement in the Blackboard strategic roadmap. For both Sakai and Moodle, there are significant savings on licensing costs associated with the main LMS. However, these would likely be offset by the additional staffing required to support open source applications if the local hosting options were recommended. Certain contractual information cannot be shared publicly; therefore this data will not be available in the public version of this report.

- **Strategic analysis** – The Duke strategic themes influenced both the functional and technical requirements. The committee took great care to integrate these considerations into the process of recommending a system. Each of the systems reviewed could meet the institutional goals in some fashion. (See Appendix D)

### **Recommendation of the committee**

Based on the analysis of the eLearning Roadmap Committee, of the three LMS choices, Sakai or Blackboard seem to best fit the requirements for an LMS at Duke at this time. Moodle was determined to be a less viable option for Duke for a number of reasons, including reduced levels of technical documentation, unclear development roadmap, less organized open source community development and a more constrained organizational models for content organization within course sites.

In determining whether to recommend Sakai or Blackboard 9, the committee weighed the value for Duke of using an open source flexible and responsive LMS against the benefits of an established commercial LMS product with a mature support organization behind it, as well as the investment existing users have in the current system. Additionally, the committee weighed the value of a competitive market for hosting and support of Sakai against the single resource option for Blackboard services and support.

**In the end, the recommendation is that Duke should implement an externally hosted Sakai system.**

The following factors and assumptions lead to this conclusion:

- Although Sakai and Blackboard both seem able to meet university requirements (if appropriately supported and configured), Sakai offers an open source application framework, which has the potential to allow more flexibility in the types of services and tools provided within that framework. The committee feels this flexibility will become more strategically important in the coming years, and the benefits of providing a flexible system outweigh the costs of switching to that system.
- With Sakai, Duke can develop services/tools that can integrate with the Sakai source code independently, or within the consortium development model, without the restrictions that are set by proprietary software companies. Duke may also independently contract with external developers to create those services with a higher level of control over the delivered product. Sakai also provides a greater opportunity in future to leverage other eLearning application options, pursuing something like the “best in breed model,” with fewer limitations than proprietary systems may present.

- Duke is also already beginning to become involved in a number of other projects that are moving the institution into the open source application service model. The Library's participation in the [Open Library Environment \(OLE\)](#) project has been a leader in that movement. The Provost's funded faculty data project is planning to pilot the [VIVO](#) collaborative web application with a goal of increasing the level of participation in the overall project. These projects, among other open source application standards at Duke (e.g. Wordpress, Drupal, Symfony), signal a shift away from proprietary services.
- Sakai offers a lower license cost option in support of the strategic development of a global Duke presence. With the increase in the number of Duke affiliated programs on globally disparate locations, the potential licensing costs associated with an increasing FTE count may be significant. The open source Sakai system potentially reduces the effect of that growth.

The rationale for choosing an externally hosted Sakai system is to leverage existing expertise with support for this service while Duke focuses on making a cultural shift to supporting open source enterprise applications more broadly. Previously mentioned open source projects (OLE, VIVO) are in the early stages with no production services scheduled to be released soon. However, an initial Sakai installation would need to be operational within the next 6 – 9 months to allow a phased transition to the new system to occur with the least amount of disruption to Duke faculty, staff and students. Post-transition, a portion of the resources allocated to supporting the current Blackboard 8 technical infrastructure can be re-allocated to other projects and services. In addition, the cost analysis indicated that external hosting may be the most cost-effective way to implement Sakai.

If a decision is made to move to Sakai with local Duke hosting, we may need at least one additional year to prepare a transition, given the need to develop local expertise in setting up, configuring and supporting Sakai as an enterprise system. This would require a significant investment in training and development for local IT staff and would mean that it would be Spring 2012 at the earliest before we could make Sakai available for use by any Duke faculty and students. It would also require an extension of the existing Blackboard contract, to allow enough time to run that system in parallel while we prepare the Sakai implementation for ongoing, broad scale use.

### **Caveats and assumptions**

Duke must be prepared to support a transition to an open source mentality for our LMS, a shift which may be beginning with the projects listed above. In an open source service model, appropriate levels of staffing resources are required to successfully maintain and grow the services. The approach outlined represents a shift from relying on a commercial vendor for enterprise academic tools to one where Duke adopts and integrates open source tools.

In addition, Duke should participate actively in the Sakai community. While the level of participation can vary depending on the level of Duke's investment, the partnerships that could be developed with peer institutions support several aspects of Duke's strategic goals. Such partnerships could also save Duke time and money by building on the work of others who have already made similar transitions. For example, UNC-Chapel Hill's decision to move from Blackboard to Sakai presents opportunities for deep collaboration around planning, training and support.

Changing to Sakai would be a significant transition for LMS users, particularly faculty. To help facilitate a successful transition, we recommend a phased implementation, which has worked well at several other institutions. This type of managed transition would help us gain an understanding of the best way to configure the system and support end user needs.

Faculty are particularly concerned with any change in system that teaching and learning content they have spent years organizing in Blackboard not be lost. While migration tools have been developed, there is not a 100% automated migration process to completely replicate Blackboard sites in Sakai. Therefore, if we move to Sakai, resources (personnel) will be needed to help mitigate this transition to the extent possible (including providing individual consultation and support where necessary to migrate Blackboard content to Sakai).

Committee research has shown that there are a number of desired functionalities that Duke has not chosen to implement in our current Blackboard 8 service, including better content management, learning outcomes tracking and assessment, full integration with PeopleSoft gradebook, real-time integration with PeopleSoft for course and enrollment management, and others. Our community also expects functionality currently in Blackboard to be available in the future LMS, this includes continued integration of library resources. Given the benefits these tools and features would provide to the Duke LMS user community, we would strongly recommend that resources be allocated to provide these resources through Sakai.

### **Recommendations for implementation**

There are four major recommendations for implementation:

(1) Focus our efforts on an initial implementation of Sakai 2.7 and transition to the recommended hybrid Sakai 2.x/3 system when it is practical to do so.

(2) Identify by January 2011 the desired timelines for making Sakai available to early adopters and testers (phase 1) and for having the full system up and running in ongoing production mode.

(3) Identify by January 2011 the project manager and associated team for developing an implementation plan to meet the timelines noted above.

(4) Charge the implementation team with creating a project plan to accomplish the following deliverables:

- Selection of hosting provider
- Development of overall project timeline and resource requirements to meet established service delivery dates as well as technical and functional requirements
- Identification of checkpoints during the implementation for validating good functioning of the new system and for determining key parameters of the overall LMS service model (e.g. the long-term hosting strategy)

- Development of a phased implementation plan, with the assumption that Phase 1 is an initial implementation for tuning the system, developing support and governance models, and mapping out and/or building functionalities
- Development of communications and end-user outreach service model for the transition
- Development of overall service model for the production service

(5) Develop a support strategy for Blackboard during the transitional period, including an end-of-life plan. Such a strategy would include very limited or no further enhancement to our current Blackboard installation, so we can shift our resources to Sakai planning and implementation.

## **Cost estimates**

Cost estimates were developed for six optional recommendations. They include Duke maintained implementations of Blackboard 9.x, Sakai 2.7 or Moodle 1.9 as well as externally hosted implementations of the same applications. The cost estimates for externally hosted systems were solicited based on the functional and technical requirements developed by the committee.

Each of the estimates assumes a more extensive LMS deployment than the current Blackboard 8 implementation. There are a number of categories that are included in each estimate, with an itemized list of options in each category.

- Software license fees and a software development budget – license costs associated with LMS modules and known plug-ins/integrated applications
- Staff – staff positions associated with various functions supporting the LMS
- Training and Support – training and support provided by Duke or a system provider
- Project/Implementation
- Other – includes travel, membership dues, and escrow services among other items

Estimates on staffing levels were based on a number of factors:

- FTE assignments associated with the current locally supported LMS system
- Marginal FTE increase for development in support of externally hosted options
- Estimates on the number of additional FTE required to support the open source alternatives with a high level of development and community participation

The itemized lists within each category do not necessarily apply for each optional recommendation. For example, there are fewer anticipated expenses for certain categories of staff if decision is to implement an externally hosted system. In addition, proposals from externally hosted system providers are not itemized in same manner.

The cost associated with the committee's recommendation of Sakai would be marginally higher than the current LMS implementation. These estimates are strictly for services associated with the new



implementations. Depending on the duration of the transition from Blackboard 8 to whichever recommendation is chosen, there will be concurrent costs associated with maintaining the current system in parallel.

Certain contractual information cannot be shared publicly; therefore cost estimates provided to senior leadership will not be available in the public version of this report.

## **Conclusion**

The committee felt comfortable with Blackboard, Sakai and Moodle as functionally viable alternatives. However, Moodle did not emerge as a recommended platform by the committee for several reasons. The differentiators between Sakai vs. Blackboard are mainly based on whether Duke is prepared to support an open source system for a critical Duke service, since license costs reductions by choosing Sakai are offset by increased staffing support requirements. The eLearning Roadmap committee recommendation of externally hosted Sakai is dependent on the notion that Duke is prepared to devote the resources necessary in a strategic manner.

## **Addendum - Components of the LMS culture change at Duke**

To successfully implement, operationalize and get the maximum value from an enterprise open source system at Duke, the committee feels we need to successfully change our culture with regard to large systems support. The committee has identified several areas where this cultural shift would be implemented in support of the recommended LMS system.

### **Active participation in the product development community**

- This could vary depending on our resource commitment, but at the least we need to be active in attending Sakai conferences, monitoring and contributing to lists.
- Perhaps be a tester of Sakai 3 when it is available.
- Become a member of product advisory or development committees if these exist.

### **Improved, more robust system governance and development at Duke**

- Implement processes for gathering user input, reviewing and deciding on changes to make, and implementing changes in a timely manner.
- Actively work to develop distributed management options/functionality, and implement when available (allowing sub-system administrators in the various schools some local control over their users' experience).
- Develop internal product management processes to coordinate among sub-system administrators.
- Develop processes for choosing and rolling out new functionalities.
- Resources to pursue product development to meet our needs (either internally at Duke, and/or by contracting with our hosting provider).

### **Ability to comfortably partner with a hosting service provider for a core enterprise product**

- The hosting provider will be responsible for important Duke data.

### **Develop an experimental mindset and ability/desire to change frequently while maintaining a stable system**

- Currently we do major updates only about once every two years.
- In addition, we hesitate to roll out some existing functionality (keeping it "turned off") due to possible political issues, or lack of resources to fully vet and verify the impact of the functionality were it to be turned on.
- Develop expectations of frequent change in our users and technical support staff – the system is never "done" but is always under improvement.

### **Develop appropriate levels of QA and testing within the hosted environment**

- We have QA and testing processes developed over years with our current LMS. In a hosted LMS environment, how much of the testing does Duke do, how much does the hosting service do?

What will we feel comfortable signing off on? Can we control the product update cycle with our hosting provider?

## **Additional components of user transition to Sakai LMS**

Provide and support a phased implementation in parallel with ongoing support of existing system

- The initial phase of the implementation will allow us to gain an understanding of the best way to configure the system and support end user needs and will require at least 1 additional FTE while we continue to support Blackboard 8 as usual. In addition, development resources will be needed to provide necessary system integrations for the implementation.

Provide close support for transitioning materials from old to new system

- Since Blackboard sites don't migrate to Sakai directly, at least some faculty will need dedicated help recreating their sites as appropriate in Sakai.

Provide close training of end users (particularly faculty and staff) in how to use the new system

- Sakai is a different system than Blackboard and tasks are performed in different ways. Course sites are organized differently and with different options for set-up. To effectively use Sakai (as opposed to just trying to tack their approaches learning Blackboard on top of the new system), faculty would need to commit to learning new ways of working in the LMS, and will need substantial training and instructional design resources to get over the initial learning curve.

Coordinated and sustained communications

- Communications through multiple routes to Duke users about the system changes will be required for a smooth transition, particularly if changing to Sakai.