

Blackboard Greenhouse Grant Six Month Status Report

Integration of open source social software tools into Blackboard Learning System™ - Vista Enterprise License

Introduction

In July 2007 Deakin University was awarded a Blackboard Greenhouse Grant to investigate the integration of open source software into Blackboard. The grant proposal included two major objectives:

- To further investigate the learning and teaching requirements for the integration of social software tools into an enterprise Learning Management System
- To develop PowerLinks to integrate social software tools into Blackboard Learning System™ – Vista Enterprise License

This six month status report outlines the progress made towards achieving these objectives.

Progress

Background

In 2006 the Institute of Teaching and Learning (ITL) in partnership with the Information Technology Services Division (ITSD) at Deakin University explored using open source software to support teaching and learning. This process led to the identification of five technologies that were selected for use in a 2007 social software pilot production project. These technologies provide support for wikis, blogs, galleries, social networking, and threaded discussions:

1. **Drupal** is a content management system that allows users to publish, manage and organise the content of a website. It facilitates social networking and blog based communication. It also contains the option for users to be notified via email when content on the site is updated. Drupal software affords some control over the look and layout of a site.
2. **MediaWiki**, the wiki engine that powers Wikipedia, is a collaboration tool that allows users to publish, manage and organise the content of a website. The software is predominantly focused on providing a space for information sharing and knowledge base building rather than control over the look and layout of a site.
3. **Gallery2** supports the creation and management of an image gallery. Users can create their own 'album' by posting images. Peer review activities can also be supported as users can post comments about other users' images.
4. **Joomla!-SMF** is a content management system (Joomla!) combined with Simple Machines Forum, a threaded discussion board tool (SMF), to support discussion based activities, social interaction and networking. Joomla! can also be used to publish, manage and organise content to support the discussion activities.
5. **WordPress** is a blog tool that is widely used on the Internet. It facilitates quick and easy website publishing and requires little technical knowledge to use. WordPress can be used to support an instructor managed blog where the staff member can post content authored by students.

Staff across the university had the opportunity to request a total of 50 websites for use in teaching and learning and administration during the pilot throughout 2007. The website could be constructed using any one of the five pilot technologies.

Investigating teaching and learning requirements: results and recommendations

Metrics

At the close of the pilot 48 of the 50 possible pilot sites were installed manually by ITSD staff at Deakin. MediaWiki proved the most popular option followed by community software (Drupal and Joomla!-SMF respectively) as shown in Table 1.

Table 1 Installation statistics - 2007 pilot production social software sites by technology.

PRODUCTION SITES BY TECHNOLOGY				
Drupal	Joomla!-SMF	MediaWiki	Gallery2	WordPress
13	7	24	2	2
27%	15%	50%	4%	4%

Support arrangements

During the pilot staff were supported by an initial consultation and face to face training session provided by ITL. ITSD provided ongoing back end technical support whilst ITL provided functional support via a telephone and email service which was complemented by online support manuals and videos.

Pilot feedback

Feedback was solicited from staff in a variety of ways including interviews, email surveys and anecdotally through support services. General themes were positive and supported the use of social software for teaching and learning:

- Staff felt that social software promoted flexibility in delivery and opportunities for implementing authentic learning environments for teaching and learning
- Social software allowed staff to provide learning environments that supported constructivist, social, experiential and problem based learning activities that extended the functionality provided by Blackboard
- The training and support provided by ITL, ITSD and faculty support staff was well received and met staff needs. Staff found that managing a social software site was fairly straight forward, if time consuming
- At Deakin Blackboard is only accessible by Deakin staff and students. Staff noted that social software had given them the opportunity to engage external experts from industry and students and staff from other institutions in learning activities that would otherwise not have been possible
- Opportunities were identified by pilot participants for further research, development and dissemination of:
 - Efficient and flexible assessment and feedback strategies
 - Effective moderation and engagement practices
 - Reducing administrative load through efficient time management practices for teaching online with social software in conjunction with Blackboard

Some staff members solicited feedback from students about their experience using social software for learning. Overall feedback was positive with students appreciating the opportunity to share, collaborate and network with their peers.

Features of the suite of technologies that the staff and students valued included:

- **Drupal:** The delivery of notifications about new content to staff and students on a daily basis
- **Drupal:** The ability to manage “buddy lists” - quick links to the profiles and blogs of favourite site users
- **Drupal:** The ability to create social presence with avatars and profiles
- **MediaWiki:** Quick and easy collaboration where contributions of group members could be tracked
- **Gallery2:** The ability to create an album of images to share with the class and the support of peer review activities

Staff also highlighted some of the disadvantages of the software:

- **Joomla!-SMF and WordPress:** Integration was not possible with the university authentication system. Consequently, staff needed to create and manage student accounts
- **Gallery2:** The software supported the main objectives of the unit that trialled Gallery2 (student upload of imagery and peer review). However, advanced functionality such as hotspot image tagging and side by side comparison of any photo from any album was not possible

Recommendations

The feedback gathered from pilot participants indicated that SMF was a valuable tool for teaching and learning, but that the manual creation of accounts was cumbersome and detracted from the experience. Therefore, one of the recommendations from the pilot was to trial integration of Drupal with SMF to determine whether it could support authentication against the university authentication systems.

WordPress was not widely used as part of the pilot. Consequently, Drupal configuration was adjusted to determine whether it could fulfil the same functions as WordPress. The outcome was positive paving the way for Drupal-SMF, MediaWiki and Gallery2 to be recommended for continuing support.

The pilot also recognised that installation of 48 separate websites was a time consuming and costly practice. Consequently, it was recommended that software farming, where multiple websites are hosted using a single set of source code (depicted in Figure 1), be trialled. It was envisaged that farming software would facilitate efficient security and functionality upgrades and streamline social software backup and management processes.

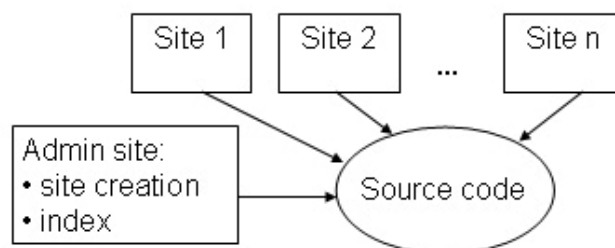


Figure 1 Farming social software allows many sites to run off a single set of source code. Installation is managed by an administration site known as an index.

The major recommendations resulting from the pilot were that:

- MediaWiki and Drupal-SMF be farmed and supported as production technologies
- One MediaWiki and one Drupal-SMF farm be integrated into Blackboard
- Gallery2 be maintained and enhanced if no more suitable gallery application comes to light

- Deakin develop procedures to allow external participants to access social software sites quickly and easily

Integrating social software into Blackboard

Two major steps were identified as being critical to the process of successfully integrating social software into Blackboard:

- Farming social software to create a scaleable, largely automated installation process
- Developing a PowerLink to provide single sign on and automated installation of sites within the farm

In addition to these two steps the pilot recommendations required that ITSD attempt to integrate Drupal with SMF. The integration was achieved in November 2007.

Farming social software

In August 2007 ITSD and ITL staff worked to develop a farmed MediaWiki to support teaching and learning. A farmed configuration of MediaWiki was developed and piloted successfully from September to November 2007. Feedback gathered from pilot participants indicates that no technical difficulties were experienced and that students and staff alike found the wiki farm easy to use with no discernable functional difference between the farmed wiki and a stand alone wiki.

In November 2007 Drupal-SMF was also farmed. The Drupal-SMF farm hosts demonstration sites used for training and testing purposes at present. Preliminary evaluations based on current usage indicate that the farmed configuration works as required.

Developing a MediaWiki PowerLink

In early 2007 contact was made with Stephen Vickers of Edinburgh University who was developing a generic PowerLink to support authentication of external applications against Blackboard. In July 2007 Stephen Vickers generously agreed to share his PowerLink with Deakin for development as part of the Greenhouse Grant project.

The proposed PowerLink development aims to achieve application bridging that would allow students and staff who had access to a specific unit section in Blackboard to have access to a MediaWiki by clicking an icon on their section homepage. Users should be able to access the wiki assigned to their section without needing to authenticate again. The wiki should be restricted to only users authorised to access the specified Blackboard section, as depicted in Figure 2.

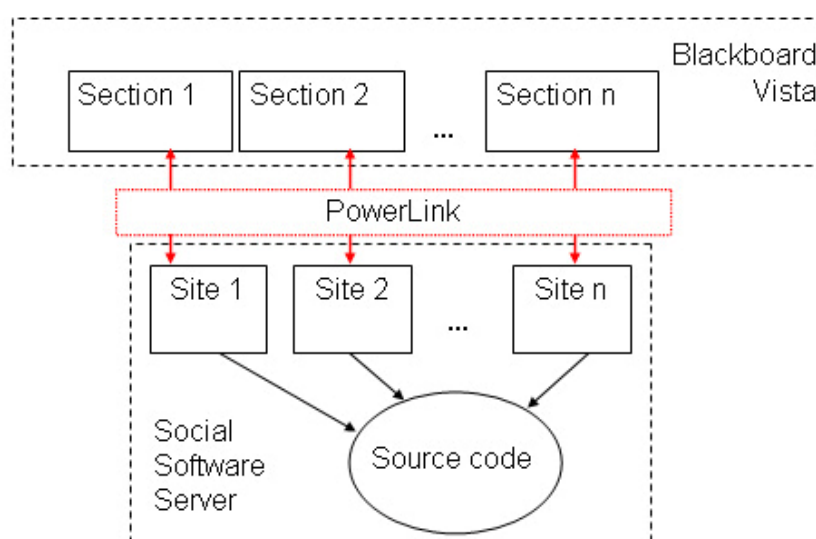


Figure 2 The proposed PowerLink design supports single sign on between Blackboard unit sections and corresponding wiki sites.

In September 2007 research began to support the development of Stephen Vickers' Login2 Generic Authentication PowerLink¹ at Deakin University to attempt integration of a MediaWiki farm with Blackboard. Stephen had previously integrated stand alone MediaWiki installations into Blackboard using this PowerLink.

The research process identified that Stephen's Login2 PowerLink required little, if any modification. Rather, a script that resides on the same server as the social software farms required modification to interact with the existing PowerLink code. Consequently, research and development in December 2007 focused on adapting and extending Stephen's server side code to work with Deakin's MediaWiki farm.

Preliminary simulations of the Deakin MediaWiki farm server side script were completed on a social software development server in December 2007. The simulations supported automatic creation of a MediaWiki in the farm and single sign on with MediaWiki. The design of the PowerLink system is depicted in Figure 3.

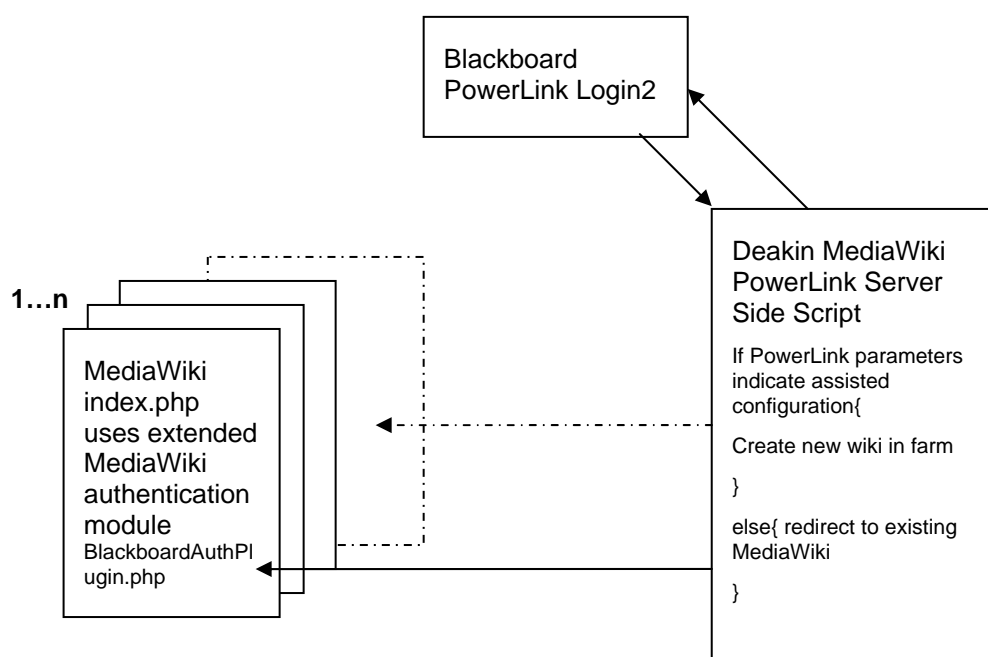


Figure 3 The Deakin MediaWiki PowerLink Server Side Script interacts with the [Login2 generic authentication PowerLink](#) developed by Stephen Vickers.

Project budget

At the time Deakin was awarded the Blackboard Greenhouse Grant the social software pilot was already underway and was funded through to the close of 2007. Consequently, to date grant funds have been reserved for 2008 programming and testing requirements that are presently being negotiated by ITL and ITSD.

Preliminary results

The 2007 pilot found that social software, particularly wikis and community portals allowed faculty to create authentic learning environments that enhanced teaching and learning. The pilot was a success with 48 out of a possible 50 installations being achieved and feedback from participants being overwhelmingly positive.

An unexpected outcome of the pilot was the uptake of social software by Divisions, Institutes and the Library. These areas of the university used social software to create communities that

¹ Vickers, S. (2007) *Community Site: Generic outbound authentication module: Project Info*, The Projects @ OSCELOT website, <http://projects.oscelot.org/projects/login2/>, last access January 18 2008.

enhanced communication and interaction across distributed work groups. Many areas of the university implemented wikis to document work instructions and manage information that supported teaching and learning across the university.

The major challenge facing the university as a result of the pilot is to attract and retain support staff members that have knowledge and experience with open source software. The major benefit highlighted by the project has been the addition of functionality available to educators to support flexible delivery of teaching and learning.

The primary objective of the project is to share the pilot experience with the academic community through Greenhouse Grant project reports, scholarly publications and the release of the documented server side code to the Blackboard community at the close of the project. It is hoped that through sharing the experience and code that other universities may extend this work to integrate other technologies that further enhance teaching and learning online.

Scope changes

The original project proposal listed a major objective as developing a PowerLink to integrate social software into Blackboard. However, collaboration with Edinburgh University has refocused this objective to the farming of social software and the development of a server side script to integrate a MediaWiki farm with Blackboard.

Conclusion

The Greenhouse Grant project has successfully evaluated the requirements relating to social software for teaching and learning. In doing so it has completed one of the two major objectives outlined in the original project proposal. In December 2007 a prototype of a server side script that may support Blackboard integration of a farmed MediaWiki was developed. Negotiations between ITL and ITSD will continue to attempt to achieve testing of this script in conjunction with Stephen Vickers Generic Blackboard PowerLink at Deakin prior to the conclusion of the project in July 2008.