



## **Bodington III PLE Edition Project Plan**

### ***Overview of Project***

#### **1. Background**

Bodington version 2 has been open source for some time. However, it stands as a single software product, albeit with tools as modules within that product. It is highly desirable that future tools can be plugged into a framework. The adoption of web services is one important part of the move towards greater interoperability but web services require user interfaces and these need to be placed in application frameworks. The framework for the next version of Bodington, working title Bodington III, is to be developed in this project together with test/demonstration/exemplar tools. The framework will be suitable, given different configurations, to act as a framework for any of PLEs, PLE servers, and VLEs.

#### **2. Aims and Objectives**

The aim of the project is to build a third generation eLearning application framework based on lessons learned from Bodington version 2 and exemplar Bodington 2 tools.

Specific objectives are to:

- Create an extension to the Java Web Application Specification which suits the needs of collaborative working environments in general with a strong emphasis on collaborative learning environments that are sometimes used off-line.
- To develop a framework that implements extended Java Web Application Specification containers and incorporates file system, authentication and collaborative work facilities
- To create test/demonstration/exemplar tools for use within the container implementation.
- To demonstrate a basic personal learning environment using the framework and tools.
- To provide a migration path, either directly, or via a clearly specified path, for the deployment of Bodington 2 tools in the new framework.

#### **3. Overall Approach**

The bounds of the work undertaken will be defined by the functional requirement of the PLE described in the University of Leeds project proposal.

The general high-level architecture is known. This architecture will be implemented using stable open source components that are interfaced to each other. Some of these components will need to be modified at a source code level to achieve suitable integration. Other components may have to be implemented.

Time and resource does not allow for major effort in component implementation. Wherever components have to be implemented, clearly defined interfaces will be provided, and simple and direct schemes will be used to provide well-engineered prototype components. The interface specifications will enable later performance-improved implementations.

Suitable open source components are in the process of being identified. One centrally important component will be a modified version of Apache Tomcat, running an open source webDav extension.

#### **4. Project Outputs**

Outputs divide into two areas; specifications (including API specifications), and software.

**Specifications and API specifications**

***XML Indexer Java API Specification***

The new XML Repository, CWEFS, will be capable of indexing a file system containing any arbitrary XML files.

***CWEFS Java API Specification***

The Collaborative Working Environment File System (CWFS) Java API will provide a layer on top of a host disk file system. The layer may endow that file system with Bodington features; object oriented inheritance of template files, access control, etc.

***Container Specification***

A specification of the extended Java Web Application Specification for collaborative eLearning use.

**Software**

***XML Indexer Reference Implementation***

***CWEFS Reference Implementation***

***Bodington III Framework***

Based on Apache Tomcat, this will interface to CWEFS, and authentication functionality, and will incorporate webDav functionality. The webDav functionality will be configurable at build time either as a client (for a PLE), or as a server (for a VLE, or for a PLE server).

***Test/Demonstration/Exemplar Bodington III Tools***

Suitable tools will be created to test the framework, to demonstrate its use, and/or to serve as tool exemplars.

**5. Project Outcomes**

- Realisation of the aims and objectives in section 2.
- In the short term the project will provide Universities and Colleges with a framework for the implementation of VLEs and PLEs.
- In the medium term the Bodington III application server framework will provide a basis for production of eLearning tools whether they are themselves fully functional tools or if they are thin tools based on web services.
- Long term the specifications arising from the project will allow the production of alternatives to Bodington III that are compatible with tools created for Bodington III.

**6. Stakeholder Analysis**

<b>Stakeholder</b>	<b>Interest / stake</b>	<b>Importance</b>
Universities and Colleges that have deployed Bodington 2, including the Universities of Manchester and Leeds	<ul style="list-style-type: none"> <li>• Rely on Bodington 2 for delivery of campus based and distance learning.</li> <li>• Have invested time and funds in development of eLearning based on Bodington.</li> </ul>	<ul style="list-style-type: none"> <li>• The stakeholders need to be able to migrate to a new and improved framework for course delivery develop tools quickly and cheaply and do that with the aid of published APIs.</li> <li>• A future version of Bodington based on widely accepted specifications will lead to the availability of a diverse tool set from various providers. This will better ensure independence from large software companies and make it easier and quicker to match VLE functionality to needs.</li> </ul>
Universities and Colleges that have deployed or will deploy Bodington.	Need to be confident that investment of time in developing e-learning environment is protected.	A version of Bodington based on published specifications can result in alternate conformant frameworks and interoperability of tools in those frameworks. Universities and Colleges will be empowered to acquire tools and if necessary port them to alternate application frameworks.

Universities and Colleges that don't intend to adopt Bodington but are reviewing e-learning provision.	Are interested in acquiring tools that can be moved between alternate platforms.	If suitable specifications for collaborative working environments emerge that allow tools to be installed in any of a number of application frameworks it will be possible for universities and colleges to create tailor-made environments from a mixture of commercial, open source and home grown tools. It is crucial that the frameworks and therefore the associated specifications do not restrict working practices.
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## 7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Technical difficulty	Unknown	Unknown	Unknown	<ul style="list-style-type: none"> <li>Some alternate component selections may mitigate this risk.</li> <li>The team is in contact with a large body of Bodington developers via mailing lists etc. and can draw on considerable technical support.</li> </ul>
Under-estimation of work.	Unknown	Unknown	Unknown	<ul style="list-style-type: none"> <li>The original University of Leeds Project Plan outlined a possibly ambitious project output, and this project plan is a slight modification of that plan.</li> <li>If all goes to plan and the above risk proves to be negligible or insignificant we expect to produce significant and possibly all scheduled output.</li> <li>However, under the contractual arrangements the technical resource is fixed and there is no mitigation for this risk should it prove to be significant.</li> </ul>
Under-staffing relative to grant-enabled resource levels	Exceedingly low	low	Exceedingly low	<ul style="list-style-type: none"> <li>Contractual staffing arrangements (yet to be formally confirmed) have been inherited from the project while it was being led by the University of Leeds.</li> <li>Grant-enabled staffing levels with suitable architectural and implementation skills are currently met, with the exception that as of 12 Oct. 2004 we have to receive a formal (as opposed to an informal) offer for Wykeen Seet's time.</li> </ul>

## 8. Standards

<b>Purpose</b>	<b>Specification</b>	<b>Notes</b>
Transfer of content from client tools to PLE.	WebDAV RFC 2518	This specification is supported by a wide variety of client software tools.
Hosting server side tools.	Java Web Application Specification 2.4	This would also provide support for 'thin' tools that consume web services. Creating tools for the collaborative working environment will involve similar expertise to the creation of standard Java web applications.
Data persistence.	XML 1.0, Java Entity Beans	Deployment of multiple tools from various suppliers into one environment will be easier if data is stored in XML files rather than in database tables. The XML indexer will provide high performance searching capability.
Authored formatted content.	XHTML 1.0 Strict	XHTML is easier to parse and process than HTML and is therefore a better choice for use with client and server side tools. This choice will also ensure that authored content can be indexed by the XML indexer.

## 9. Technical Development

Technical development will be modular and incremental. A local Concurrent Versioning System (CVS) will be used to manage source code. This will not only allow collaborative work but will allow the project manager to monitor programming effort on a day to day basis if necessary. At a suitable stage, the source code will be migrated to sourceforge to allow also provide open and public access to work in progress. Bodington developers world wide will then be invited to undertake informal evaluation of work package outputs via the developers' mailing list.

## 10. Intellectual Property Rights

Inputs to the project will come from Bodington and Apache. The former is open source and owned by the University of Leeds and the latter owned by the Apache Software Foundation and also released as open source. Both licenses allow unlimited use and development of the source code and allow redistribution of modified source code given certain basic conditions which protect the good names of the originators.

Code generated within this project will be released under an open source license so it will be available to all.

## **Project Resources**

### **11. Project Partners**

The project will be led by The University of Manchester School of Computer Science and implemented using the services of two contractors:

- Melandra Ltd. will contract to provide one of the key software designers.
- The PEVE-IT Unit in the School of Computer Science at the University of Manchester will contract to provide technical management, key software design effort, and programmers.

Both contracting entities will start work on 1 November 2004. They will be contracted to the School of Computer science using formal contracts whose form already exists.

### **12. Project Management**

- The project is managed by the two grant holders, Dr. Mark van Harmelen (responsible for all technical matters) and Ms. Alexandra Walker (responsible for all other matters). They will collaborate in working closely in the overall direction and management of the project.
- All technical staff members report to the technical project manager.
- Different team members are experienced with different appropriate technologies and may train other members of the team in these technologies at the direction of the technical project manager.

### **13. Project Staff**

#### **Grantholders and Management Roles**

***Mark van Harmelen (Technical Manager, 0.25 FTE of 0.5 FTE committed to project), Alexandra Walker (Administrative Manager)***

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#### **Technical Staff**

##### ***Peter Crowther***

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##### ***Stuart Anderson, Chris Page, Wykeen Seet, Mark van Harmelen***

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#### **Technical Staff Roles**

Architecture: Crowther, Page, van Harmelen  
Implementation: Anderson, Page, Seet, van Harmelen  
Quality Assurance: van Harmelen

## **Detailed Project Planning**

### **13. Programme Support**

Support requested from the Programme Manager: Close liaison with the technical Project Manager regarding risks, and any allied changes in scope.

### **14. Budget**

Please see the Bodington III PLE Budget document.

### **15. Workpackages**

*Please see the Bodington III PLE Project Plan.*