

Cover sheet for proposals

E-learning Tools for Learners and Teachers
Distributed E-learning ProgrammeName of lead institution/organisation **The University of Oxford**Name of proposed project **Skills Profiling Web Service (SP-WS)**Project partners **The University of Liverpool, The University of Leeds****Full contact details for primary contact**

Name: **Dr Adam Marshall**
 Position: **Senior Developer**
 Email: Adam.Marshall@computing-services.ox.ac.uk
 Address: **LTG, OUCS, 13 Banbury Rd, Oxford. OX2 6NN**

Tel: **01865 283357**

Fax: **01865 273275**

Programme area(s) of proposal

Personal Development Planning Web Service, Skills profiling, Lifelong Learning, Medical Logbooks, Teacher and Learner Support,

Length of project and total cost to the JISC over its life **9 Aug 2004 – 31 March 2005.**Cost of proposal to the JISC **£109,759.64**Project start date **9 Aug 2004****Outline project description**

Extend the Personal Development Planning (PDP) web service currently being developed by the WS4RL project and, by creating a portable skills framework, add a sophisticated skills reflection and guidance service. This service will be integrated into the Bodington VLE and tools developed to help teachers deploy and manage the service. The work will be exemplified in a medical context.



Overview of Project

1. Background

We propose to extend the Personal Development Planning (PDP) web service currently being developed by the WS4RL¹ project and, creating a portable skills framework, add a sophisticated skills reflection, profiling and guidance service. This service will be integrated into the Bodington VLE and tools developed to help teachers deploy and manage the service. The work will be exemplified in a medical context.

The project is a collaboration between The University of Oxford (Computing Services [OUCS] and Medical Sciences), The University of Leeds (Learning Development Unit [LDU] and Medical School) and The University of Liverpool (Centre for Lifelong Learning [CLL] and Medical School).

FE and HE need a situation where all the lifelong PDP partners have a common PDP skills framework so that levels of attainment in the different skill areas are reasonably unambiguous and agreed. It is not the *process* that needs to be similar – (quite apart from anything else each different institution or employer, etc. is likely to have their own priority in skills development) - it is the *information* that needs to be compatible.

Every learner at any time needs to have a well-defined personal development profile. The complexity of the profile depends on the level of detail of the PDP skills framework. One scenario is that the learner needs to have an attainment level or stage, at each component skill, to serve as the parameter which, when supplied to the individual organisation's PDP programme decision system, comes up with a prescription of the most important things to do as the next PDP activity.

One major benefit of this formal approach is the ability to automatically link to useful resources for personal development. The PDP service can recommend the next thing to do, based on things like whether any evidence has been assembled for a given skill area, or whether the need is felt to do something about it. (This last point indicates that it is not necessarily always an objective diagnosis that is required, but sometimes a subjective sense of whether the level of skill is satisfactory to the learner himself or herself.)

For this kind of reflection to be used effectively, there needs to be a simple way for teachers to create suitable learning resources; an easily accessible body of good practice needs to be built up by experts in the field.

2. Aims and Objectives

We will provide an example of a skills framework defined in terms of IMS specifications. The framework will be shown to be useable by populating it with several 'generic' key skills (eg, IT, Communications etc).

In addition we aim to demonstrate the framework in use by pitching it in a medical context. We will show how new (medical) skills can be added to the framework and will provide instructions on how to do so.

A PDP web service will be developed, this will offer a skills profiling service. In order to demonstrate the use of this service we will provide and exemplar application within the Bodington VLE. Bodington's logbook facility will be enhanced to allow tutors to deploy the web service via a point and click interface. The service will also offer a search facility whereby a learner's competency map is used as the basis for a repository search.

¹ Web Services for Reflective Learning – JISC funded project in e-Tools strand.

The overall aim of the project is to demonstrate how a user agent (Bodington VLE) can be integrated with a service from the Learning Domain. We will also show how previously developed services can be used as building block for new services.

3. Overall Approach

Describe the overall approach you will take to achieve the objectives outlined above, including:

- Strategy and/or methodology and how the work will be structured
- Important issues to be addressed, e.g. interoperability
- Scope and boundaries of the work, including any issues that will not be covered.
- Critical success factors.

Before any meaningful development work can be started, we need to define the structure of a skills framework that is suitable for use in HE. This framework will take into account the work by other bodies in this area, for example, subject benchmarks², General Medical Council's Tomorrow's Doctors (2003)³ scheme, and the agreement on common educational purposes and learning outcomes⁴ which has already been achieved by the Northern Medical School SSC Consortium. A possible form of the skills framework is given in Appendix A.

An instance of the framework⁵ will be created based on the LUSID⁶ model of skill definition. This instance will be further enhanced by the addition of a selection of Medical Skills which will be developed by the medical schools as part of this project. The framework will be realised using IMS RCDEO.

For the purposes of this project the framework will be constructed by hand. In the future, it is envisaged that a tool such as RELOAD could be used; the construction of the interface is beyond the scope of the project. This fits with the WCKER bid being prepared by The University of Oxford's Technology Assisted Lifelong Learning (TALL) department. The tools they develop could be used to help author skills framework elements.

The skills profiling service proposed here will extend the existing LUSID web service (WS4RL) and use the skills framework as a basis to profile the skills knowledge of the learner. This survey will be used to build a 'competency and knowledge map'. The survey will probably be realised using IMS QTI plus XFORMs for results processing.

The service will also use existing software (JAFER and MDC (Middleware for Distributed Cognition))⁷ to configure a repository search to return resources⁸ that can be stored by an individual and used within a Personal Learning Environment (PLE) for personal development. Also, the service can also be used to perform skills-based reflection on a proposed, ongoing or completed activity.

Teachers will be able to use the service to specify the intended skills coverage of a given activity (learning outcomes) so the student can monitor what skills a particular activity should evidence. (This is particularly pertinent to a clinical environment where students must demonstrate and record evidence of competency in a number of activities in order to progress.) Tools to achieve this will be developed to integrate the service with the Bodington VLE.

Bodington has a Log Book that has recently been piloted by Leeds second year Medical students as a reflective diary. Based on the staff / student feedback, the following features are currently being

² <http://www.qaa.ac.uk/crntwork/benchmark/benchmarking.htm>

³ *General Medical Council (2003) Tomorrow's Doctors: Recommendations on Undergraduate Medical Education (London, GMC)*

⁴ Murdoch-Eaton D, Ellershaw J, Garden A, Newble D, Perry M, Robinson L, Smith J, Stark P, Whittle S. (2004) Student-selected components in the undergraduate medical curriculum: a multi-institutional consensus on purpose. *Medical Teacher* 26(1): 33-38

⁵ IMS VDEX and IMS RDCEO

⁶ Liverpool University Student Interactive Database (see <http://lusid.liv.ac.uk/>). LUSID is a well-developed web-based PDP system. It currently supports an internal skill-based reflection scheme that will form the basis of the service proposed here. By the time this project commences it will also offer a basic PDP web service

⁷ The JAFER toolkit (see <http://www.lib.ox.ac.uk/jafer/>) and the code developed as part of the current MDC (Middleware for Distributed Cognition) e-Tool strand.

⁸ Reading List Interoperability (see <http://www.imsglobal.org/rli/index.cfm>)

added as part of an FDTL project⁹: improved privacy, peer-sharing and artefact repository (for use as evidence for achieving a learning objective). The learner can use the collation (e-portfolio) facilities of Bodington to present the logbooks for review by tutors and peers.

The PDP web service will supplement the existing Bodington logbook by allowing learners to profile their evidence in terms of skills demonstrated. All log entries can be collated and an evidenced knowledge and competency map created for an individual learner. This map, expressed in terms of the skills framework can be supplied to the PDP web service so that remedial advice can be supplied.

In order that this process is easy to administer, we intend to enhance Bodington to have a number of pre-defined and configurable resource 'patterns' (collections of blank VLE content) which teachers can easily share and 'drop into' their courses. This will eventually mean, for example, that the creation of a best-practice logbook / discussion room / pigeonhole / competency map Bodington room will be as simple as clicking on a link. For the purposes of this project we will concentrate solely on logbook patterns (with associated skills profiling).

The service will be exemplified in a Medical context. The project will define and implement a small number of medical skills and express them, along with a set of transferable skills (IT, Numeracy, Information Accessing etc.), using the skills framework; domain experts can add other skills in the future.

A series of resource patterns will be created for medical and other use from within Bodington.

We will use J2EE technology in order to integrate as simply as possible with the underlying applications. We will use SOAP for the transmission of data, WSDL and WSDD for the relevant WS definition and will ensure compliance with [WS-I guidelines on WS interoperability](#)¹⁰. The following open standards will be considered for use: IMS RDCEO, IMS QTI, IMS VDEX, z39.50, SRW, XPATH, WSDL, IMS RLI, SOAP and IMS LIP¹¹.

The proposed web service is anonymous and authorisation will not be tackled in any great detail.

All software produced (including the LUSID servlet¹²) will be available as Open Source.

System Overview

The following diagram represents the eventual system and user interactions. The 'Domain Experts' are responsible for 'stoking up' the Learning Object repositories, adding skill definitions and creating the 'pro-forma' for the logbooks.

Teachers and learners use the logbook, feedback and e-portfolio facilities of Bodington for data entry and communication.

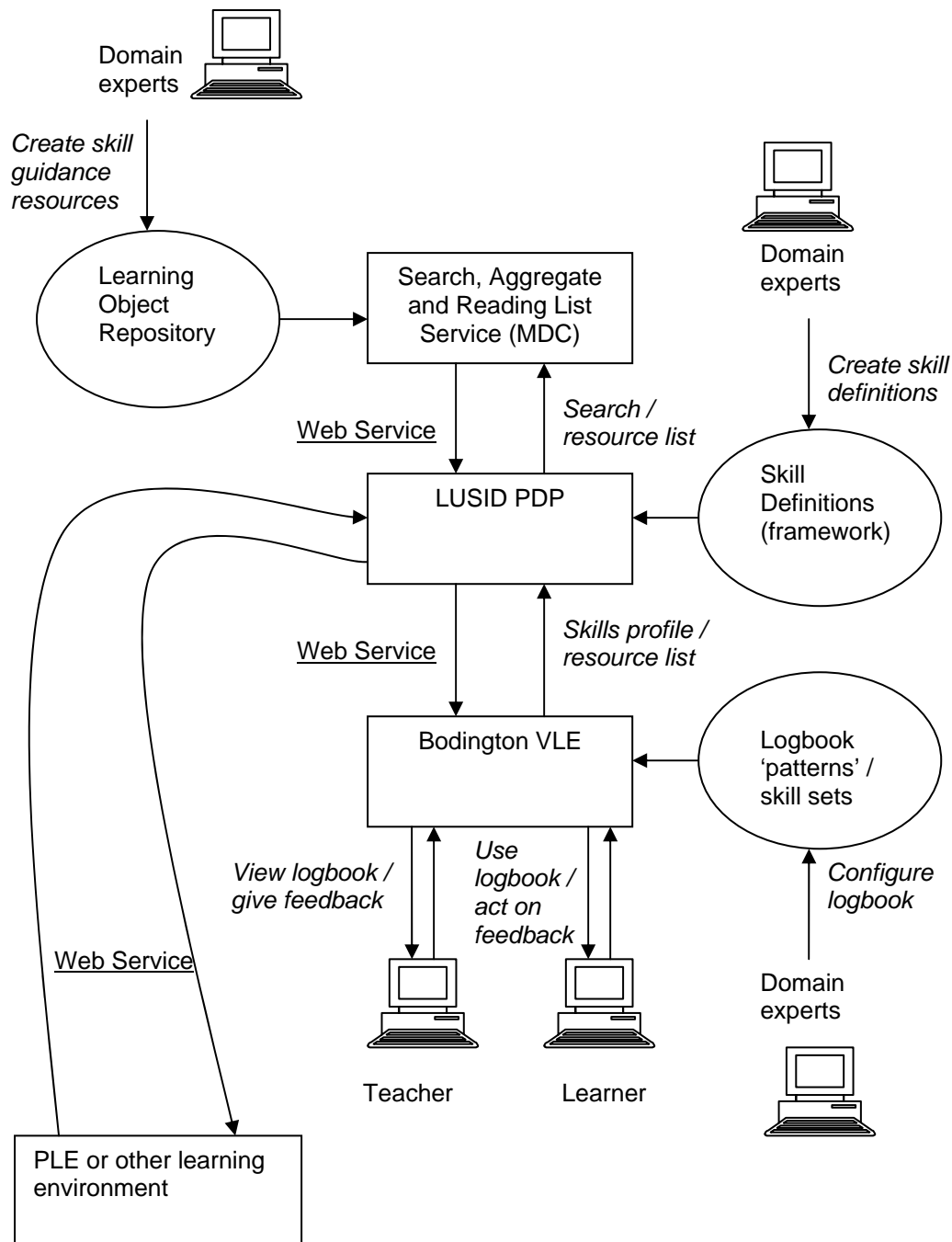
Bodington uses the LUSID PDP web service as part of the logbook and LUSID uses the MDC web service to return 'further reading' which will help with skills development.

⁹ <http://www.eportfolios.ac.uk/>

¹⁰ <http://www.ws-i.org/>

¹¹ Lifelong learning implies that students will study at multiple institutions either consecutively or concurrently as they undertake a diverse range of learning and skills development. It is highly desirable that all personal records created in the Bodington VLE should be able to interoperate with other systems (using IMS LIP) unfortunately it is beyond the scope of this project to LIP-enable Bodington – this is something we gave serious consideration to but feel it would involve too much effort to be included here. The framework for interoperability is in place by the use of Open Standards; the mechanisms can be added at a later date.

¹² Currently closed source



4. Project Outputs

The deliverables will be available at the end of the project and are shown in detail later. To summarise, we will deliver:

- Example of a skills framework using IMS RCDEO and IMS VDEX
- Instance of framework for transferable key skills
- Instance of framework for newly transcribed medical skills
- Skills framework evaluation reports (including examples)
- IMS QTI survey to profile skills knowledge / usage delivered as web service.
- Web service to accept IMS LIP competency map (gap!) and return appropriate resources.
- Creation of a number of Learning Objects to support the skills framework and associated services.

- Provision of author tools in Bodington
- Best-practise examples of logbooks (including clinical logbooks)
- Enhanced Bodington (supports resource creation tools, new logbook ‘patterns’ and skills web service) plus user guide (all available as open source)
- Open source LUSID
- Extended PDP web service interface (+ SDK)
- Use case report
- Final project report (will include references to the work undertaken, a dissemination report, evaluation, statements about IPR and copyright, details of open source software, how-to guides and comments on all work packages).

Virtually all the work packages will give rise to documentation meant for public consumption. It will be possible for others to retrace our steps and do exactly what we have done but with different skills or with a different user agent (or write their own skills framework if they are feeling adventurous!). We feel that many of the output will be useful on their own as stand-alone reports.

5. Project Outcomes

LUSID, one of the most innovative and well-known PDP tools will be enhanced to provide the service and will be Open Sourced as part of this proposal. (This will have the effect of introducing a freely available and standards-compliant web-based PDP tool into the UK HE and FE sector. The installation of LUSID will help a lot of institutions to satisfy the Dearing recommendation that PDP be available in all institutions by 2005¹³.)

The extension of Bodington to consume PDP web services will provide an Open Source e-Portfolio / VLE / PDP tool that supports much of the pedagogy desired by Medical Schools and other departments throughout the UK (learning logs, artefact repositories, reflection, peer-reviewing of work using collaboration tools, personal development etc.). Both Bodington and LUSID are easy to install and both run on a Linux / Tomcat / Postgres open source platform.

The development of a skills framework will provoke discussion amongst the UK academic community, may exercise a couple of the less common IMS specifications (VDEX and RDCEO), and will get the ball rolling in the area of skills interoperability. We see this framework as being a prototype from which a generally accepted framework can be developed. LTSN-01 see the value in this work are keen to support us.

This project will build upon the following previous work:

- the current WS4RL¹⁴ JISC project that lays the foundation of a PDP web service,
- the current MDC JISC project that uses the (JAfer)¹⁵ library.
- PORTOLE project¹⁶
- the LUSID PDP system¹⁷
- the Bodington VLE¹⁸
- PROSPERO (Processes for Support of Personal Development Records Online)¹⁹ Queen Mary College
- APIS (Assessment Provision through Interoperable Segments) project²⁰
- the Newcastle, Leeds, Sheffield, Dundee e-portfolios FDTL project²¹
- the work of the MLEs for Lifelong Learning support project²²²³

¹³ [Recommendation 20](#): “We recommend that institutions of higher education, over the medium term, develop a Progress File. The File should consist of two elements: a transcript recording student achievement which should follow a common format devised by institutions collectively through their representative bodies; a means by which students can monitor, build and reflect upon their personal development.”

¹⁴ Web Services for Reflective Learning – JISC funded project in e-Tools strand.

¹⁵ The JAfer toolkit (see <http://www.lib.ox.ac.uk/jafer/>) and the code developed as part of the current MDC (Middleware for Distributed Cognition) e-Tool strand.

¹⁶ <http://www.leeds.ac.uk/portole/>

¹⁷ <http://lusid.liv.ac.uk/>

¹⁸ <http://bodington.org/>

¹⁹ <http://prospero.old.qmul.ac.uk/>

²⁰ <http://ford.ces.strath.ac.uk/APIS/>

²¹ <http://www.eportfolios.ac.uk/>

²² <http://www.cetis.ac.uk/members/PDPcontent>

²³ http://www.recordingachievement.org/downloads/UK_LP1_1B_Final.pdf

We will feed back and useful findings to the above projects.

6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
The University of Oxford (OUCS)	Want to integrate LUSID with Bodington and gain experience of service oriented architectures and JISC's e-learning framework	High
The University of Liverpool (Centre for Lifelong Learning)	Want to increase the uptake of LUSID by making it open source.	High
Centre for Recording Achievement	Will be able to advise about skills frameworks, building PDP web services to PDP community	High
Bodington.org / University of Leeds LDU	Integration of web services / added functionality to VLE / enhanced usability for teachers and learners	Medium
CETIS LIPSIG	Will be able to report outcomes to IMS and disseminate to interested parties. Have wanted to do work on a skills framework for a while	High
The University of Oxford (Medical Sciences Division)	Want to use more advanced version of Bodington logbook	High
The University of Liverpool (Medical School)	Would like to use LUSID for reflection on medical skills	Medium
Leeds University (Medical School)	Want to further improve their current logbook	Medium
UK Academic Community	Will have a totally free (and open source) VLE / e-portfolio / PDP platform which will satisfy Dearing's Progress File recommendations. More steps down the road to UK Progress File interoperability.	High
CETIS	Demonstrable use of IMS VDEX and IMS RCDEO, extension of UK LeaP application profile (with interoperable skills information)	Medium
JISC	Integration of different layers of e-learning framework	High

7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Staffing	2	3	6	Have not yet got enough developers – are working on the problem and expect a solution very soon. It is not envisaged that any key staff members will leave during the project.
Organisational	1	1	1	Excellent relationships exist between consortium and all members are very keen for the work to progress.
Technical	2	2	4	There is a lot of experience in Oxford and Leeds with this type of work which can be drawn upon. The consortium also has good connections with similar initiatives both in the UK and the US.
Timescale	3	3	9	The project is short for the amount of work to be done. We will have to do some development in

				parallel which may mean a longer than usual integration phase. We will address work in all the areas stated in the project plan – if we need to revise the number of use cases covered then we will do this in conjunction with JISC and will ensure that the major thrusts of the project are still covered.
Legal	2	1	2	The copyright of LUSID is held by the crown. The software was originally funded by the DFEE and it is felt that they will give consent to release it as open source.
Preceding work	3	2	6	We may discover that work we hope to use is either not of good enough quality or has not been completed, if this is the case we will have to either apply a quick fix ourselves or try to find other software that achieves the same end result.
Academic cooperation	2	2	4	We feel that we have sufficient project members to survive even if we fail to engage other colleagues.

8. Standards

The following open standards will be considered for use:

- IMS RDCEO – to express skills framework
- IMS QTI – to express skills survey (and build up competency map)
- IMS VDEX – for use with skills framework
- z39.50, SRW – to search repositories (JAFER)
- XFORMS – to transform QTI learner answers into an instance of the framework which is used as basis as the search query (maybe!)
- WSDL – for description of web services
- IMS RLI – this is what the JAFER bean will return
- SOAP – for transmission of service data
- IMS LIP – for expression of competencies (or lack thereof)
- UK LOM – for learning objects meta data

9. Technical Development

We will use J2EE technology and will develop within an IDE such as Eclipse. Wherever relevant we will present easy-to-digest UML diagrams of classes and the different systems. We will make use of the usual array of tools on offer such as AXIS for web services, TOMCAT (and maybe JBOSS) as containers and Apache libraries (eg, XERCES, JAXP, commons etc.).

10. Intellectual Property Rights

We acknowledge that any software components of the deliverables are released under appropriate open source licences to ensure that they can also be freely shared with organisations and communities with which the JISC has close working arrangements. All software that is developed will be made available free of charge to the education community in perpetuity and all code developed will be made available through open source models such as LGPL and GPL licences:

The issue of the IPR and copyright for LUSID (software and resources) is fairly complex and will be clarified during its transition to open source.

All other XML and java source code (including Oxford additions to LUSID) will be placed within an open source repository initially with public read only access using an appropriate license (LGPL wherever possible) as mandated under paragraph 30 of the 03/ 04 call.

We will utilise an IP registry to ensure any code submitted to projects is available under the same license. We will utilise a CVS system (e.g. Source Forge's) to ensure we track all changes to the software developments.

Enhancements to Bodington will also be housed on Source Forge and will have the general Bodington (Apache-like) licence.

Project Resources

11. Project Partners

The project is a collaboration between:

- The University of Oxford – contact Adam Marshall (adam.marshall@oucs.ox.ac.uk)
 - Oxford University Computing Services
 - Medical Sciences Division
- The University of Leeds – contact to be confirmed (Medical school)
 - Learning Development Unit
 - Medical School
- The University of Liverpool – to be confirmed (CLL)
 - Centre for Lifelong Learning
 - Medical School

Members of the proposed project team have been involved with [CETIS LIPSIG](#)²⁴, the [Centre for Recording Achievement](#)²⁵ (CRA) and the work that has been completed as part of the [Developing Learner Profiles across FE and HE](#)²⁶ initiative funded under the [Managed Learning Environments \(MLEs\) for Lifelong Learning](#)²⁷ JISC project and have been instrumental in the mapping of the PDP domain to the IMS Learner Information Package (LIP) specification. The team also has other relevant experience; this includes the [JAFER](#)²⁸ project, MDC, the e-Science programme engineering task force, and the design of certain web service standards (UDDI and SRW). There is also a lot of experience in skills development and curriculum design from the Medical schools which will be essential in defining the medical skills and skills guidance.

A consortium agreement will be prepared and signed during the first few months of the project.

12. Project Management

The following personnel will make up the project team. Their contact details will appear on the project website:

- **Simon Grant** (consultant) PDP and interoperability expert.
- **Roger Clark** (The University of Liverpool) member of original LUSID team, learning technologist
- **Janet Strivens** (The University of Liverpool) experienced PDP practitioner.
- **Trish Lunt** (The University of Liverpool) has a skills development expert.
- **Adam Marshall** (The University of Oxford) LUSID and Bodington Developer
-
- **Colin Tatham** (The University of Oxford) JAFER and Bodington Developer
- **Howard Noble** (The University of Oxford) Interoperability expert.
- **Peter Dangerfield** (University of Liverpool) is a Senior lecturer in Medicine.
- **Nick Bunyan** (University of Liverpool) experienced learning technologist
- **Steve Bickerstaff** (The University of Liverpool) is a Finance and Contracts Officer
- **Jon Maber** (The University of Leeds) Bodington expert and founder
- **Trudie E Roberts** (The University of Leeds) expertise are in the areas of assessment, professional competence, inter-professional education and widening access and participation.
- **Deborah Murdoch Eaton** (The University of Leeds) interested in curricular innovation.

²⁴ <http://www.cetis.ac.uk/groups/20010801124300/viewGroup>

²⁵ <http://www.recordingachievement.org/>

²⁶ http://www.jisc.ac.uk/index.cfm?name=project_cra

²⁷ http://www.jisc.ac.uk/index.cfm?name=programme_buildmle_hefe

²⁸ <http://www.lib.ox.ac.uk/jafer/staff.html>

- **Louise Cunningham** (The University of Leeds) Lecturer in Clinical Skills .
- **Will Robley** (The University of Leeds) expert in skills mapping.
- **Andy Pellow** (The University of Leeds) e-learning strategist.
- **Scott Hennessy** (The University of Leeds) project officer for e-Portfolios and peer-assessment projects.
- **Vivien Sieber** (The University of Oxford) is the Senior Learning and Teaching Officer for the Medical Sciences Division

It is not envisaged that we will need much if any training. The consortium has wide experience and it is hoped that enough experience will be available internally.

It is felt that due to the disparate nature of the project (effectively six separate centres) and the tight timing, there needs to be one person at each institution constantly prodding the team members to ensure that they deliver on time. The medical aspect of the project is pretty separate to the development side so it seems sensible to have one manager keeping a beady eye on each partition.

There will be an overall project manager (Adam Marshall, Oxford) a site manager at Leeds and a coordinator at Liverpool. The overall manager will coordinate Leeds and Liverpool. The Leeds manager (probably Andy Pellow,) will ensure that the Bodington enhancements and the logbook work run smoothly and are completed in time and will manage the medical effort. The dual management of this project acknowledges that there is very little time for slippage due to tight time constraints; it is felt that a very tight managerial eye must be kept on each piece of work

Jon Maber also has a very small amount of management time allocated to him – this is to acknowledge that he will have to spend some time instructing the Leeds developers on what the best strategy is for enhancing the Bodington VLE. See below for details.

The Liverpool coordinator will have more of an administrative role and provide an easy point of contact for the other institutions, (this is important as it is known that the Liverpool staff are notoriously difficult to contact!).

The Leeds manager will prepare a fortnightly report of progress and submit to the project manager.

There will be a number of face-to-face meetings between partners – at least 4 meetings will be held.

An internal steering group has been set up at Oxford to monitor progress and offer technical help, the steering group will comprise:

- **Matthew Dovey** (The University of Oxford) web services expert.
- **Stuart Lee** (The University of Oxford) Head of Learning Technology Group
- **Francisco Pinto** (The University of Oxford) experienced java developer

13. Programme Support

We will contact the program manager for support as and when it is needed. The project team has extensive experience in some areas (IMS QTI v1, IMS LIP, IMS VDEX) but we may need to receive guidance on the usage of some of the other IMS specifications, notably v2 of IMS QTI, UK LOM and IMS RLI.

14. Budget

See below.

Modifications to original budget

PC Hardware

We have removed the provision for 3 PCs as JISC do not fund equipment purchases of this nature.

Management Structure

We have explained the management structure in section 12 (there was a query about this in the 'Conditions' letter from JISC).

Workshops

There was a specific question about the three workshops. These workshops will take place over lunchtime and include a demo of the logbooks and skills profiling service to peers. All staff from the hosting institutions will be welcome. Lunch plus refreshments will be available. We estimate that 20 - 30 people will attend.

We estimate the cost of room and equipment hire plus refreshments plus a 'per head' charge would come to about £1,000 per workshop. We may also want to reimburse key staff members travelling expenses if they have to travel from a different site. There will also be a certain charge for materials – we will use a questionnaire and so forth.

The workshops will involve an on-line demo plus talk about the whole concept.

Evaluation of the work demonstrated will be collated by the leader of the workshop and will be sent to Leeds for generation of the evaluation report.

The cost for the workshops includes provision for the booking of a room with facilities to allow the projection of the demo plus a sufficiently tasty spread of food to entice staff to attend.

Staff	Day cost	Num Days	Equiv FTE
Oxford - OUCS			
Developer: eg, Colin Tatham	£191.24	156	0.65
Manager: eg, Adam Marshall	£191.57	28	0.12
Administrator: eg, Judy McAuliffe	£99.56	9	0.04
Oxford - Medical School			
Research Officer (RS3): Vivien Sieber	£212.20	21	0.09
Leeds Learning Development Unit			
Developer 1: tba	£155.00	170	0.71
Manager: tba	£170.00	3.5	0.01
Leeds Medical School			
Research Officer: eg, Andy Pellow	£300.00	35	0.15
Manager:	£170.00	19.5	0.08
Liverpool - Centre for Lifelong Learning			
Research Officer: Janet Strivens	£300.00	11	0.05
Admin Officer: Steve Bickerstaff	£150.00	5	0.02
Coordinator: eg, Nick Bunyan	£170.00	5	0.02
Liverpool - Medical School			
Research Officer: eg, Peter Dangerfield	£300.00	6	0.03
Consultant			
Consultant: Simon Grant	£500.00	30	0.13
		499	

Work package	Partner	Department	Effort	Staff	Day Rate	Value = Effort * R
1 Skills Framework	Simon Grant		30	consultant	£500.00	£15,000.00
	Liverpool	CLL	5	research officer	£300.00	£1,500.00
	Liverpool	Med Sch	3	research officer	£300.00	£900.00
	Leeds	Med Sch	1	research officer	£300.00	£300.00
	Oxford	Med Sch	1	research officer	£212.20	£212.20
2 Framework Instance	Oxford	OUCS	20	developer	£191.24	£3,824.80
3 Medical Skills	Liverpool	CLL	5	research officer	£300.00	£1,500.00
	Liverpool	Med Sch	2	research officer	£300.00	£600.00
	Oxford	Med Sch	19	research officer	£212.20	£4,031.80
	Leeds	Med Sch	14	research officer	£300.00	£4,200.00
4 WS Requirements	Oxford	OUCS	10	developer	£191.24	£1,912.40
5 Bodington Requirements	Leeds	LDU	10	developer	£155.00	£1,550.00
6 Bodington WS Support	Leeds	LDU	60	developer	£155.00	£9,300.00
7 Teacher Tools	Leeds	LDU	100	developer	£155.00	£15,500.00
8 Exemplar Application	Leeds	Med Sch	10	research officer	£300.00	£3,000.00
	Oxford	OUCS	1	developer	£191.24	£191.24
	Oxford	Med Sch	1	research officer	£212.20	£212.20
	Liverpool	CLL	1	research officer	£300.00	£300.00
	Liverpool	Med Sch	1	research officer	£300.00	£300.00
9 Search Service	Oxford	OUCS	30	developer	£191.24	£5,737.20
10 Skills Profile	Oxford	OUCS	60	developer	£191.24	£11,474.40
11 PDP WS SDK	Oxford	OUCS	15	developer	£191.24	£2,868.60
12 Open Source LUSID	Liverpool	CLL	5	administrative officer	£150.00	£750.00
	Oxford	OUCS	20	developer	£191.24	£3,824.80
13 Use Cases	Leeds	Med Sch	10	research officer	£300.00	£3,000.00
14 Management	Oxford	OUCS	28	project manager	£191.57	£5,363.96
	Leeds	Med Sch	19.5	project manager	£170.00	£3,315.00
	Leeds	LDU	3.5	project manager	£170.00	£595.00
	Liverpool	CLL	5	coordinator	£170.00	£850.00
Administration	Oxford	OUCS	9	administrator (5%)	£99.56	£896.04
Travel and subsistence						£3,000.00
Wokshops (3)						£3,500.00
Misc	Oxford					£250.00
						£109,759.64

Partner	Department	Total time	Total cost
Oxford	OUCS	193	£36,093.44
Leeds	LDU	173.5	£26,945.00
Leeds	Med Sch	54.5	£13,815.00
Simon Grant		30	£15,000.00
Oxford	Med Sch	21	£4,456.20
Liverpool	CLL	21	£4,900.00
Liverpool	Med Sch	6	£1,800.00
		499	£103,009.64