

Contextual Resource Evaluation Environment Project Plan JISC Portals Programme April 2004

Overview of Project

1. Background

The emergence of the JISC Information Environment has been paralleled by significant interest in, and adoption of portal technology across the Higher Education sector and beyond. Each development addresses, in part, similar questions: How do users relate to, organise and work with the vastly increased number of resources and information systems available to them? How does an organisation ensure that the substantial investment they make in these services achieves the maximum possible take up and use? Portals – of whatever type – seek to address these questions by presenting the user with a coherent view of disparate resources, data and applications. When linked to identity management services, a portal targets delivery of these services to the user in a granular, potentially personal, manner. By adding profile services, a portal may enable a greater or lesser degree of user choice and selection of the services available, and the priority in which they are presented.

Yet much within this emerging landscape remains unknown. Despite an increasing tendency to resolve tight bundles of service functionality into more discrete services, and base these services around common standards and specifications, islands remain where integration is difficult or impossible. The user, then, is frequently faced with a contextual “jump” *which is driven by limitations in systems themselves*, rather than by user need. These “jumps” may range from institutional portal to VLE to Library System, and to the broader range of subject, media and community portals available in the Information Environment and externally. It is no surprise that many users express bewilderment at the number of web “starting points” and “one-stop shops” with which they are presented, and turn instead to generic search tools such as Google for resource location.

A major reason for the success of search engines is the open and interconnected nature of the web. By contrast, scholarly data is typically accessed under licence, and is stored in a form inaccessible to standard web crawlers. While a number of publishers have individually indexed the full text content of their holdings to make it searchable, the coverage of each is necessarily limited to their own material, and does not provide the joined-up picture required for scholarly use. Publishers may come to realise, however, that full indexing, with exposure of document snippets, provides the best possible advertisement for their wares. In the longer term, the main problem may be to find a sustainable business model for both providers and consumers that would make the application of search engine technology to the whole scholarly corpus practical. In the short term, a number of issues surrounding technology and user requirements need to be addressed.

Standards have recently emerged which may provide technical solutions for portal and broader system interoperability. A Java Community Process standard, Java Specification Request (JSR) 168, describes a common method of rendering a “portlet” (a portal component frequently also referred to as a “channel”). In supporting remote execution, JSR 168 complements the OASIS Web Services for Remote Portlets (WSRP) standard, which enables remote application functionality to be accessed and used from a “local” portal. JSR 168 and WSRP are being rapidly adopted by the vendor community. Details of adoption are provided as annex 1 of this proposal.

Taken together, these standards potentially offer a great deal of flexibility in the integration of nationally and locally provided services. But whilst these developments *suggest* a means of providing a measure of integration to portals within the Information Environment, and to an institutional portal *technically*, little evidence is available to support *why* users might want this, or *how* they might want it to appear in practice in the daily context of learning, teaching, research and administration.

The WSRP standard is both new and complex. In effectively syndicating portal application functionality, WSRP, for example, requires both a consumer and producer element, thus increasing the complexity of any test environment. Issues surround the WSRP use of SAML (Security Assertion

Markup Language) and how this might integrate with local or national identity management services, such as Athens. The interface of WSRP (and Web Services Standards generally) with existing technologies employed within the JISC Information Environment Architecture, such as z39.50 and SRW, OAI, OpenURL and RSS, together with those supporting newer Learning Object repositories such as ICONEX, JORUM+ and the NLN, are likely to be of similar complexity. An extensive period of testing by the community in a variety of contexts will be required for exploration of these issues. This testing, however should be driven squarely by user need and experience, rather than by simple technical feasibility. Investigation and elaboration will be required if the promise of portal and Information Environment interoperability and integration is to be effectively realised.

It should be noted that WSRP and emerging JSR 168 best practice enable control of portlet look and feel by transformations applied by the host portal. This impacts not only “branding” issues, enabling visual integration and consistency, but also those around accessibility for individuals with disabilities. CREE will investigate and document these aspects of JSR 168 and WSRP functionality. This action will build on established work by the University of Hull in adapting the uPortal framework for accessibility¹.

The lead partner in CREE, the University of Hull, has demonstrated considerable commitment to analysis of user requirements across a broad range of potential resources made available through its institutional portal, port.hull. These resources have consistently been located within a broader context. The documentation which initiated the development of the Hull portal and established the internal Digital University Project in 2001, noted prominently that resources integrated with the institutional portal included those

“...such as library electronic resources available by subscription, or resources provided by national subject gateways and the developing DNER².”

Work undertaken in the University of Hull and UKOLN led PORTAL Project (Presenting natiOnal Resources To Audiences Locally, FAIR Programme) which in part analysed user requirements of institutional portals in terms of both external and internal resources, produced a considerable response from users in both the HE and FE Sector (around 650 responses to a web-based questionnaire alone). The research based on the results of this survey, together with face-to-face focus groups and interviews, has received a very positive reception from the national and international community. PORTAL has demonstrated a clear commitment to the widest possible dissemination of these results, and engagement with the community, in an extensive range of presentations and publications which may be accessed from the project Web site³.

CREE will build on this established work, which generated considerable data regarding *which* services users wished to access, by extending it to the domain of *how* they wish to access and use those services, and *where* those services might best be surfaced best in a series of specific and generic demonstrator contexts. The evaluation strand of CREE will encompass user research in both search and portal based community-building services. User requirements research will incorporate the distinct requirements of FE by the involvement of an FE partner (Newark and Sherwood College) at each stage of development. This strand of activity will be extended to community education (both formal and informal) in the context of an Heritage Lottery Fund supported project based at the University of Hull, which integrates a rich range of archaeology-based resources⁴.

The development strand of CREE will address search, and resource-push services facilitated by WSRP in detail, including issues surrounding the integration of WSRP and four toolkits (BALSA, Xgrain, Heirport, JAFER), together with work around education-specific deployment of the Google APIs and cross-search functions. Particular attention will be given in this strand of development to examination of the potential for embedding service discourse within WSRP enabled business logic,

¹ Summarized in “Accessible to All” (2.22MB ppt) Ian Dolphin and Robert Sherratt JA-SIG Summer Conference, June 2003 available at <http://www.hull.ac.uk/imedia/presentations.html> (verified November 28 2003 ID)

² <http://www.digital.hull.ac.uk/downloads/bdup-may01.pdf> (verified November 28 2003 ID)

³ http://www.fair-portal.hull.ac.uk/pubs_and_pres.html (verified November 28 2003 ID)

⁴ A brief description of this project is included in this proposal as annex 2

providing both significant data *and* re-useable components to enrich the further development of both national services and institutional portals.

Given the relative lack of user familiarity with community aspects of national or local portals⁵, development activity in this area will focus on the production of a technical feasibility study based on results obtained from the user research strand of the project.

2. Aims and Objectives

CREE Will:

- Assess, test and document user requirements of portal-embedded and non portal-embedded search and resource-push interfaces, together with other aspects of JISC portal functionality and integration, in a broad range of user contexts. Ensure that the results of these actions are disseminated effectively to the HE/FE community.
- Investigate and document generic aspects of adapting a range of existing search tools and toolkits (JAFER toolkit, BALSAs, Heirport, Google APIs, cross-search) to be conformant with the WSRP and JSR 168 standards, thus facilitating their integration with any conformant national or institutional portal. Ensure that the results of this activity are disseminated effectively to both the HE/FE community and relevant standards bodies.
- Investigate in detail, test and document the practical integration of these tools with reference portal implementations. Further test this integration with a broad range of users, evaluating the effectiveness of different modes of searching using combinations of embedded and dedicated interfaces. CREE will actively seek other national and institutional portal reference implementations with which to test software components.

3. Overall Approach

CREE will undertake parallel strands of activity in the areas of user needs evaluation and demonstrator development. As far as possible these strands are organised to reduce dependencies and potential stop-points on the critical path. CREE recognizes from the outset that, although the project strand dealing with user needs analysis will be rooted in traditional methods of desk-based research, including a synthesis of the outputs of current portal projects, the area under examination is in many senses *new*. Actions to gather first-hand data from a range of users in order to provide a measure of verification and elaboration of their requirements are therefore an essential complement to desk-based activities, and of particular significance in testing and verifying the re-usable software components produced by CREE partners.

Project deliverables will take the form of documentation and software components. In a project of this duration and nature, it is important to recognise that whilst extended consolidated documentation is of value, the requirement to rapidly iterate interrelated strands of user needs analysis and technical development requires more concise documentation at frequent intervals. Document deliverables are therefore divided into categories of summary and extended, enabling the rapid dissemination of salient information at regular and frequent intervals. This approach closely follows the IDEAL (Initiating, Diagnosing, Evaluating, Acting, Learning) model adapted from the Carnegie-Mellon Software Engineering Institute Capability Maturity Model (CMM)⁶. A project website will be established at the outset of CREE to facilitate dissemination and communication. Existing mailing lists, such as

⁵ This is determined three factors: (i) Many national HE/FE community-based portals are at an early stage of development (ii) Many institutional portal developments regard community aspects as a secondary priority (iii) Many of the features which support community building around an institutional portal (such as threaded messaging capability) are either locked within a closed VLE, or at an early stage of integration and unavailable in a granular manner across the portal development.

⁶ <http://www.sei.cmu.edu/ideal/ideal.html> (verified November 28 2003 ID)

Portals, JISC-Development, JASIG-Announce, JASIG-UK and Educause portals will be widely utilised for further dissemination.

4. Project Outputs

A series of short documents will be produced and consolidated at appropriate points in the project lifetime

S1D1	Literature Review
S1D2	Criteria for evaluation of existing use (Questions)
S1D3	Card Sort toolkit adaptation (survey)
S1D4	Criteria for focus groups
S1D5	Focus groups test s/w components
S1D6	Criteria for community-based portal functionality
S1D7	Additional survey based on S1D6
S1D8	Focus groups results analysis
S1D9	Survey results analysis
S1D10	Survey revision and iteration
S1D11	Visualisation / demonstrator
S1D12	Extended literature review
S2D1	Summary investigation JSR168/WSRP for all toolkits
S2D2	Initial investigation JSR168+WSRP Oxford (JAFER)
S2D3	Initial investigation JSR168+WSRP EDINA (XGRAIN)
S2D4	Initial investigation JSR168+WSRP EDINA (BALSA)
S2D5	Initial investigation JSR168+WSRP ADS (HEIRPORT)
S2D6	Feasibility Study, JSR168+WSRP for community aspects
S2D7	Extended study, above
S2S1	Adapted tools & toolkits JSR168+WSRP Oxford (JAFER)
S2S2	Adapted tools & toolkits JSR168+WSRP EDINA (XGRAIN)
S2S3	Adapted tools & toolkits JSR168+WSRP EDINA (BALSA)
S2S4	Adapted tools & toolkits JSR168+WSRP ADS (HEIRPORT)

5. Project Outcomes

There is a scarcity of documented user needs and requirements analysis of search tools within the Higher and Further Education communities. CREE will help to guide future development activities within the sector by undertaking extensive, and often ground-breaking work in this area.

Although the range of portal-embedded services and tools is growing steadily, the integration of library and other search tools is often limited. CREE will provide four toolkits to enable resource search based around this protocol to be embedded within common specification (WSRP and JSR168) conformant portal frameworks. The flexibility of this approach will enable the granular composition of rich search tools in close proximity to common user tasks. This has potential impact on any user of either an institutional or other portal, including those users engaged in learning, teaching and research. Given current developments in the decomposition of monolithic clusters of services to support e-learning into more granular services ranged behind a portal framework, the toolkits provided are particularly valuable in enabling a richer, and closer integration of search and resource discovery activity within the context of online teaching and learning.

6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
Learners	Facilitated access to physical and electronic learning materials in the context of a range of tasks	High
Educators	Facilitated access to physical and electronic learning materials in the context of a range of tasks	High
Researchers	Facilitated access to physical and electronic research materials	
Learning Technologists	Facilitated access to physical and electronic learning resources, ease of integration with curriculum renewal processes	Medium
Systems Integrators	Facilitated integration and provision of rich service layer, both internal and external	High
VLE/LMS Providers and Creators	Facilitated flexible and modular access to local single /clustered instantiations of VLE/LMS	High
Libraries	Facilitated provision of Library resources	Medium
National resource providers	Facilitated integration and provision of rich service layer, together with potential for increased take-up and usage	Medium
Higher and Further Education Managers	More efficient use of resources, opportunity to specialise and share resources, technology to underpin a layer of reach-out activities	Medium

7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Staffing	2	2	4	All staff but researcher in place Prepare back-up subcontractors.
Technical	2	2	4	Spread risk through use of multiple toolkits and portal frameworks
External suppliers	NA	NA	NA	
Legal	NA	NA	NA	

8. Standards

z39.50, as the most widely accepted protocol for querying Library and OTHER resources is of particular significance to CREE. The project will aim to provide three z toolkits, adapted to the portlet specifications JSR168 and WSRP, readily embeddable within a conformant portal framework. It should be noted that whilst most portal frameworks are moving towards adoption of both these specifications, there remain non-Java frameworks where WSRP may be of particular significance

9. Technical Development

The approach taken by CREE centrally closely follows the IDEAL (Initiating, Diagnosing, Evaluating, Acting, Learning) model adapted from the Carnegie-Mellon Software Engineering Institute Capability Maturity Model (CMM). Further details available at <http://www.sei.cmu.edu/ideal/ideal.html>

10. Intellectual Property Rights

IPR issues are not likely to significantly impact CREE.

Project Resources

11. Project Partners

Lead Partner: The University of Hull e-Services Integration Group, Academic Services

Project management and co-ordination. User requirements analysis lead. Adapt generic criteria for user requirements to institution. Production of overall portal functionality demonstrator.

Institutional portal framework integration – Testing search tools/toolkit adaptations with two portal reference implementations – uPortal, Sun ONE/JES Portal Server.

Aspects of this work will be subcontracted to Subcontractor 1, im+m, and 2, the JAFER development team.

Partner 2: The University of Oxford (Computing Services) - User requirements analysis participating partner. Adapt generic criteria for user requirements to institution.

Partner 3: The University of Edinburgh (EDINA)

Investigation of integrating BALSAs search tools with portal via WSRP; Investigation of integrating of Xgrain cross search of abstracting and indexing (A&I) databases within portal channel via WSRP.

Partner 4: Newark & Sherwood College

User needs analysis participating partner. Adaptation of generic criteria for user requirements to institution. Co-ordinate liaison with FE Community.

Partner 5: The University of York (Archaeology Data Service) – Investigation of integrating z39.50 HEIRPORT search tool with portal via WSRP.

Subcontractor 1: IM+M (Instructional Media + Magic)

Support for generic adaptation of search toolkits to WSRP conformance, support for the specific adaptation of WSRP enabled search toolkits to the uPortal framework. Co-ordinate feedback from the demonstrator strand to relevant standards bodies.

NOTE: im+m is a US-based company, which was founded in 1996. It participated in the early development of the IMS and AICC specifications and in the application of these standards to the development of learning content for U.S. community colleges. Since 2001 im+m has focused its efforts on the JA-SIG uPortal project, providing overall project management and software development. uPortal is an open-source, open-standards enterprise portal for higher education, with at least 100 sites in production globally. It is one of the most successful open-source collaborations in Higher Education, and was recently selected fourth in the InfoWorld “Top 100 IT Projects” of 2003⁷. The breadth of im+m experience in standards conformant software development (particularly portal technology, WSRP and JSR 168) together with their continued involvement with standards bodies and the highly competitive rates they have offered the consortium, make them essential partners in CREE.

⁷ http://www.infoworld.com/article/03/11/07/44FEiw100prof4_1.html?s=feature (verified 27 November 2003 ID)

Subcontractor 2: The JAFER team – Investigation of integrating JAFER z39.50 and configurable cross-search (z39.50-RDN-Google) toolkit with portal via WSRP.

12. Project Management

CREE will operate as far as possible around consensus building. Full project meetings will take place at six monthly intervals or more frequently if circumstances arise. Specific meetings to address technical or user requirements analysis will be organised as requires. CREE will establish a website to disseminate both project deliverables and activities, and will establish a JISCMail list to facilitate communication between project partners

Project Staff

The University of Hull

Ian Dolphin, Project Manager, i.dolphin@hull.ac.uk

Robert Sherratt, Technical Manager, r.sherratt@hull.ac.uk

The University of Oxford

Archeaology Data Service, University of York

Tony Austin, Systems Manager, ADS (afa2@york.ac.uk)

William Kilbride, Assistant Director, ADS (wgk1@york.ac.uk)

EDINA, The University of Edinburgh

Jon Hunter project manager at EDINA; software development, client jon.hunter@ed.ac.uk

Tim Stickland software development, servers t.r.stickland@ed.ac.uk

Sandy Shaw technical consultant s.shaw@ed.ac.uk

Christine Rees project supervision/liason christine.rees@ed.ac.uk

Newark and Sherwood College

Jackie Hargis jhargis@newark.ac.uk

Stuart Dethick sdethick@newark.ac.uk

Clive Church cchurch@newark.ac.uk

Steve Jeyes jeyesint@ntlworld.com

JAFER

Matthew Dovey, Project Liaison, matthew.dovey@oucs.ox.ac.uk

im+m

Justin Tilton, Project Management/XSLT, jet@immagic.com

Michael Ivanov, Software Engineer, mvi@immagic.com

Jon Allen, UI Design, jfa@immagic.com

13. Programme Support

Indicate if there are specific areas where you would like support from the programme or programme manager.

Identification of further appropriate dissemination points would be appreciated as they arise.

14. Budget

Attached

Detailed Project Planning

15. Workpackages

Attached

16. Evaluation Plan

Indicate how you will evaluate the quality of the project outputs and the success of the project. List the factors you plan to evaluate, questions the evaluation will answer, methods you will use, and how success will be measured. Expand as appropriate on how you will conduct the evaluation.

	Timing	Factor to Evaluate	Questions to Address	Method(s)	Measure of Success
A	>September 04	Toolkit Performance	Does toolkit scale to n000 users?	Automated Software test	Performance matrices
B	>September 04	Usability	Does embedded service meet identified needs	Online survey Focus groups	Positive responses over negative responses
C	>September 04	Survey(s)	Representative sample?	Data analysis	Size of sample Range of user types responding
D	>January 05	Toolkit take-up	Is a sustainable community of use being established?	Data analysis Feedback analysis	Number of enquiries Number of testers Number of implementations

17. Quality Assurance Plan

Explain the quality assurance procedures you will put in place to ensure that project outputs comply with JISC technical standards and best practice, and what will constitute evidence of compliance.

Timing	Compliance With	QA Method(s)	Evidence of Compliance
throughout	Fitness for purpose	A, B Above	A, B Above
throughout	Adherence to specifications	Testing against range of reference implementations	Pass test
throughout	Adherence to standards	Testing against range of reference implementations	Pass test
throughout	Accessibility legislation	Automated testing User testing	Pass test Acceptable to user

18. Dissemination Plan

CREE will disseminate its activities via a project website, papers at appropriate conferences, meetings with key stakeholders and reports submitted to appropriate JISC Committees. These are summarized in the attached timeline spreadsheet, which lists deliverables against likely dissemination points. This list is not regarded as exhaustive, and will be supplemented throughout the life of the project.

19. Exit/Sustainability Plan

Project Outputs	Action for Take-up & Embedding	Action for Exit
Document Deliverables	Effective dissemination Embed in OS community via JASIG	

Project Outputs	Why Sustainable	Scenarios for Taking Forward	Issues to Address
Portlet standards conformant search toolkits	Requirement for foreseeable future	Embed in OS community via JASIG	

Appendixes

Appendix A. Project Budget

Appendix B. Workpackages

JISC Project Management Framework
22 December 2003