CREE
Contextual Resource Evaluation Environment

Summary Overview

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www.hull.ac.uk/esig/cree

CREE (Contextual Resource Evaluation Environment) Project Summary Overview

Introduction and background

Under the aegis of the UK Joint Information Systems Committee's (JISC) Portals Programme[1], one of the main development strands based around the Information Environment Architecture, a range of projects has taken place to investigate the use of portals as the presentation path for a variety of search tools. A major output from these projects has been the development of a portal interface, a web site that users could come to in order to make use of the functionality that the portal provided, particularly searching.

Towards the end of the portal projects it became apparent, though, that the presentation of services through a dedicated web site was just one way in which they could be delivered. Many institutions are now making use of virtual learning environments (VLEs) and a number are starting to implement institutional portals to facilitate the aggregation and presentation of applications, services and information to their staff and students[2]. All universities also work heavily within the general web environment, providing a vast collection of information to users both inside and outside the institution.

These institutional environments offer the capability of bringing information and services to the end-user in the context of their work and/or study and contrasts with the more traditional approach of building dedicated web sites and expecting or requiring the end-user to find and come to these. This opens up new potential avenues for how an institution's Library can deliver the wide range of digital library services and resources available to it.

There remains a frustrating rigidity to the way services are currently delivered to end-users. The user experience is often driven by what the systems can enable rather than how the end-user would like to work. The ability to deliver discrete services and combine them as required to build an appropriate workflow offers far greater flexibility to end-users in their use of technology. This service-oriented architecture approach is in its infancy, but offers huge potential. Within relevant environments, JSR 168[3] and WSRP[4] (Web Services for Remote Portlets) are two standards that start to address this architectural approach by providing a means to wrap individual services in such a way, as portlets, that they can be used in any environment conformant with the standards (e.g., an institutional portal framework)[5].

The advent of institutional environments and the possibilities of a service-oriented architecture approach required a fresh look at the requirements users may have for systems providing search functionality. The CREE project was structured around two main goals in response to these needs.

A. *The investigation of user requirements for the presentation and delivery of search tools through a variety of institutional environments and contexts*. The University of Hull undertook this work in conjunction with colleagues at the University of Oxford and Newark and Sherwood College. The cross-section of institutions allowed variances to be identified between institutions and different end-user groups, but also validation of results in common across the three institutions taking part.

[1] http://www.jisc.ac.uk/programme_portals.html
[2] http://www.jisc.ac.uk/project_mle_activity.html
[3] http://developers.sun.com/prodtech/portalserver/reference/techart/jsr168/
[4] http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsrp
[5] For a description of the difference between the two standards, see Appendix A

B. *The investigation of the JSR 168 and WSRP portlet standards to allow the presentation of existing search tools within conformant portal frameworks (e.g., uPortal[6]).* This work was undertaken primarily by project technical partners at the University of Oxford, the Archaeology Data Service[7] at the University of York, the EDINA National Data Centre[8] at the University of Edinburgh, and instructional media + magic, inc.[9], a software consultancy in Washington D.C., each investigating the use of these standards with a different type of search tool.

Methodology

The two goals of the project were translated into two independent but complementary strands of activity: a user requirements strand and a technical development strand. The major activities undertaken within these strands are listed within Table 1.

User requirements strand	Technical development strand
Literature Review	Assessment of JSR 168 and WSRP standards
Survey	Development of portlets
Focus Groups	Refinement of portlets
User testing	Development of demonstrators

In addition a feasibility study into the use of communication and collaboration tools with JSR 168 and WSRP and user requirements for such tools within institutional environments was carried out to supplement the investigation into search tools. This was carried out through the use of a survey and a series of interviews with technical developers.

The two strands of activity came together at the user testing stage, which utilised a series of full functional interactive demonstrators. One of these was based around the uPortal framework and demonstrated the presentation of search tools that had been adapted for such use using JSR 168 and WSRP. The parallel activities allowed a greater level of development and investigation to take place over the lifetime of the project.

Literature Review – This piece of work took place throughout the project. An initial review of the literature was undertaken to inform the planning of the work. This was supplemented by ongoing monitoring of the literature to encompass what had been missed initially together with new publications. As with the project overall, the literature review comprised two parts: a functional review (looking at the tasks involved in the search process) and a technical review (looking at the technologies used in searching).

Survey – A survey was carried out nationally across the UK. Two areas were primarily investigated: how and why end-users currently searched for information in general; and opinions on the possibility of searching from within another environment. Over 2000 responses were analysed, providing a core set of baseline data.

Focus Groups – Focus groups were held across project partner sites. The focus groups allowed the results from the survey to be tested and validated and they allowed this testing to take place in a group environment, providing reasons and background to the views expressed. Over 60 people attended a series of 13 groups.

[6] http://www.uportal.org/
[7] http://ads.ahds.ac.uk/
[8] http://www.edina.ac.uk/
[9] http://www.immagic.com/

User testing – Three fully functional interactive demonstrators were built to demonstrate the presentation of search tools within a local web environment, a VLE environment, and an institutional portal environment. A series of different types of search tool (e.g., a catalogue, a bibliographic resource, an Internet search engine) were included to examine reaction to these. Over 70 people took part across the three partner sites.

Assessment of JSR 168 and WSRP standards – Each technical partner site independently assessed the two standards to examine how they could be used with existing search tools. This included an assessment of the technologies themselves plus the supporting skills and requirements for implementation.

Development of portlets – Once assessed, JSR 168 portlets were developed for the different search tools being examined and tested within uPortal. Initial versions were proof-of-concept.

Refinement of portlets – Once tested, technical partners refined the functionality available through the portlets, whilst also refining presentation through the use of XSLT. Investigation of the use of WSRP also took place at this stage.

Development of demonstrators – As indicated above, three demonstrators were built for use within the user testing activity. The local web and VLE demonstrators were built as flat web pages, whilst the institutional portal demonstrator used uPortal and the portlets developed.

Results

The following reports and deliverables are available from the project web site at http://www.hull.ac.uk/esig/cree/.

<table>
<tr><th>User requirements strand</th><th>Technical development strand</th></tr>
<tr><td>Literature review</td><td rowspan="2">Technical development report A: initial investigation of JSR 168 and WSRP standards</td></tr>
<tr><td>Survey results and comment</td></tr>
<tr><td>Survey results spreadsheet</td><td rowspan="2">Technical development report B: initial experience in development of portlets</td></tr>
<tr><td>Focus Groups report</td></tr>
<tr><td>Focus Group criteria</td><td rowspan="2">Technical development report C: final development report</td></tr>
<tr><td>User Testing results and comment</td></tr>
<tr><td>User Testing results spreadsheet</td><td>Demonstrator screenshots</td></tr>
<tr><td>Communication and Collaboration Tools feasibility report</td><td>Portlet interoperability testing report</td></tr>
<tr><td colspan="2">Summary overview (this paper)</td></tr>
</table>

Technical development strand

The project has demonstrated that it is possible to take existing search tools (Jafer, Heirport, GetRef, and Google) and present these as JSR 168 and WSRP portlets for use within a conformant portal framework. This development path is feasible, through perhaps not ideal, as experience suggests it would be beneficial to design for a portlet when building the search tool originally. This is particularly the case where the original application is not Java-based. JSR 168 is a Java-based standard and it is thus simpler for Java-based applications to be adapted for use with it. The project found that the simplest route to using WSRP was to develop a JSR 168 portlet first and then transform this for presentation as a Web service and provide a WSRP portlet. A step-by-step guide described by Matthew Dovey at the University of Oxford enabled

this transformation[10]. Beyond the initial development of the portlets, technical partners have provided additional functionality through the Help and Edit modes of a portlet, made use of XSLT to enhance the look and feel of the portlets, described a mechanism for enabling inter-portlet communication between JSR 168 portlets, and proposed alternative methods for the display of results using additional portlet windows.

User requirements strand

The three-prong approach of the user requirements strand (survey, focus groups, user testing) resulted in a validated set of user requirements for the presentation of search tools within portal and non-portal contexts. The survey and focus groups found that Google is the most popular approach to searching. However, library resources are used and recognised for what they are. The user is looking for a quick return on a search and is working with limited time. Quick access can be followed by more detailed use if a user perceives they have found results of value from a search tool. The user testing sessions reinforced this finding and also found users welcome the idea of using search tools within different institutional environments. The presentation of subject-based search tools within an online learning environment/VLE gathered the most enthusiastic response, associating searching with learning activities. The use of search tools in different environments was particularly welcomed in the case of search tools that the users were not previously familiar with: bringing the search tool to the user made them aware of it and provided them with a convenient local access point.

Conclusions and Recommendations

- Users want to be able to access search tools more easily and directly. This mimics the style of Google (from where the idea mainly comes)
- Users will investigate the further potential of a search tool if they have had initial success when using it.
- Users are open to the idea of search services being delivered within different environments, and indeed welcome this. Careful selection of which tools are presented can help guide the user in their searching, with subject-based tools favoured by users.
- Portlets within an institutional portal offer potential, but require further work to fully develop services that users feel comfortable using.
- Access to communication tools through a portal was also welcomed, though there needs to be a clearly defined reason for accessing them via this route as opposed to direct access. The portlet standards are better able to support asynchronous communication.
- There is recognition that it is possible to adapt search tools for use within portlets, but there are reservations about the efficiency of this that would have to borne in mind in each individual case. The support of search services delivered via this route is equivalent to supporting the original search service via the native website.
- For search services WSRP appears to be the best standard to follow because of its ability to present remote services within the portal framework.
- User feedback is valuable to feed into development and essential as part of the development cycle. The use of a range of methodologies helps to validate findings and provide explanations for views held.

It is recommended that the HE/FE community consider alternative ways of delivering search services in different institutional environments to suit the needs of users. This recommendation is made in the light of the positive response gathered through CREE to such possibilities.

[10] http://www.oucs.ox.ac.uk/portal/developers/environment.xml

Appendix A: JSR 168 and WSRP

The reason for the existence of the two portlet standards can be seen in their respective purposes.

The origin of JSR 168 lies in the Java Community Process, a process through which Java community needs are identified and developed into specifications. JSR 168 describes a standard way for a portal framework to communicate with the individual portlets it is presenting. Each portal framework (e.g., uPortal, Oracle, IBM, Sun, etc.) has its own method for doing this, and JSR 168 is the result of an attempt to find a common way in which all portal frameworks can carry out this communication, facilitating the development of portlets by third parties. The standard is, to a certain extent, a lowest common denominator, and there is functionality it does not currently support. However, there has been wide adoption JSR 168 and it appears to be a standard that will remain current for some time. Experience from CREE suggests that use of the standard is not difficult.

WSRP (Web Services for Remote Portlets) has its origins in the Web Services domain. Whereas JSR 168 focuses on the *local* communication between portal and portlet, WSRP is designed to enable the presentation of applications and services within a portal from *remote* locations. The ability of a portal to act as a true aggregator of services from wherever they are served from requires a standard such as WSRP. The use of Web Services means that the portlet standard can be used across different platforms, and the use of WSRP is not limited to Java portals (as JSR 168 is). Use of WSRP directly is a complex development path. Hence, CREE partners opted for the use of JSR 168 and then migrated this to WSRP as described below.

The development of portlets can follow two paths depending on which portlet standard is adopted. The WSRP4J toolkit[11] permits a bridge to be built between these two paths, allowing both standards to be used (see Fig. 1) where required.

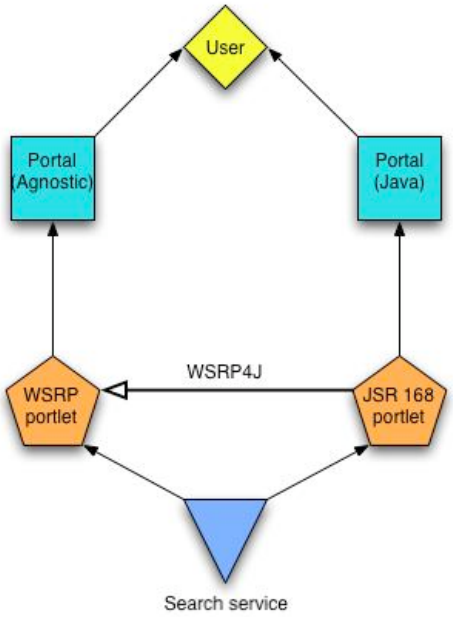

Fig 1. Portlet development paths

[11] http://ws.apache.org/wsrp4j/