# *PROJECT PLAN*

## Project

| | | | |
|---|---|---|---|
| **Project Acronym** | CREW | **Project ID** | |
| **Project Title** | Collaborative Research Events on the Web | | |
| **Start Date** | 1 March 2007 | **End Date** | 28 February 2009 |
| **Lead Institution** | University of Manchester | | |
| **Co-Investigators** | Michael Daw, Nikki Rogers, Rob Procter, Caroline Williams, Andy Hall | | |
| **Project Manager & contact details** | Michael Daw<br>e-mail: michael.daw@manchester.ac.uk<br>0161 275 7026 | | |
| **Partner Institutions** | University of Bristol | | |
| **Project Web URL** | http://www.crew-vre.net | | |
| **Programme Name (and number)** | Virtual Research Environments Programme | | |
| **Programme Manager** | Frederique Van Till | | |

## Document

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| **Author(s) & project role** | Michael Daw (Project Manager), Nikki Rogers (Technical Manager), Mike Jones, Andrew Rowley, Anja Le Blanc, Tobias Schiebeck (Developers), Meik Poschen (Evaluation Expert) | | |
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## Document History

| Version | Date | Comments |
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| 1.0 | 6 June 2007 | Initial version |
| | | |
| | | |

# *Overview of Project*

## 1. Background

The Collaborative Research Events on the Web (CREW) project builds on two Phase 1 VRE projects, Iugo and Memetic, by developing and integrating these technologies and embedding them in a range of authentic research settings. Project user partners are: Intute, a national JISC service to provide access to web resources for research to UK universities; the Institute of Health Sciences, which promotes health sciences research in Manchester; high-profile international research groups in visualization; existing Memetic users; and research groups at the University of Bristol.

Integration of Iugo and Memetic technologies will enable the capture of the scholarly collaboration that occurs at research events to create a lasting and rich research resource that is also valuable for training and awareness-raising in a variety of domains. Events such as conferences, workshops, seminars and meetings are a characteristic part of the research process in facilitating the formal and informal scholarly collaboration that is vital among vibrant research communities. These events are critical to enable the fruits of research to be shared and to provide opportunities for the seeding of new ideas; they entail the spending of significant funds of money but their content is often ephemeral and is rarely made available in a linked, easily searchable online environment – informal blogs or more formal event documents such as research papers are rarely cross-linked in context in the way that Iugo makes possible. Similarly, Access Grid or other audio-visual content is rarely open to interrogation by advanced semantic search tools as enabled by Memetic. Our developments promise to make the entire range of event content persistent, accessible and searchable by researchers. We expect this to result in a greater return from the high level of investment in research events, and also to promote greater opportunities for distributed researchers to collaborate using these new research resources in a social software context.

Iugo is a Semantic Web application that organises and allows access to the disparate content and information related to conferences and workshops. Memetic is a tool that records and annotates Access Grid sessions allowing flexible and navigable playback. Their integration, development and deployment in a VRE (through a portal or on-line service) will enable presentations, such as lectures, conferences or seminars taking place over single or multiple sites, easily to be recorded and automatically annotated to become discoverable in context. This will enable powerful, single-point multimedia searches across distributed conference and related research data. Searches will yield results within written documents such as abstracts and papers and also in rich audio-visual content, such as clips from presentations and workshop discussions.

CREW will also integrate complementary portlet applications within institutional portals at the Universities of Bristol and Manchester to provide access to Manchester's Campus Grid initative and portlets developed by the Subject Portals Project (http://www.portal.ac.uk/spp/) in order to embed generic research support in both an institutional research portal context as well as in a national, subject-oriented service.

The consideration of important issues such as confidentiality, privacy and data protection will be achieved with involvement from the Oxford e-Social Science node (OeSS).

## 2. Aims and Objectives

The aim of this project is to develop and deploy user-centred software to support research resources (including audio-visual recordings) that arise from collaborative research events such as conferences, workshops and seminars to be discoverable in context.

The specific objectives we intend to achieve are:

- Create software to enable the recording and annotation of presentations at research events
- Create software to enable the submission of such research resources to allow them to be discoverable in context

- Create software to enable the discovery by researchers of annotated audio-visual recordings of presentations alongside other resources arising from events through a search-and-browse user interface
- Enable functionality that takes into account ethical, legal and social issues
- Deploy our software in a portal environment alongside other tools such as Wikis, blogs and a CampusGrid interface.

## 3. Overall Approach

### Strategy/Methodology

The methodology of CREW utilises the VRE Development Methodology combined with the concept of co-realisation in order to place the user and pilot technology at the heart of the project. With this approach, users take the lead in the development process, rather than operate responsively.

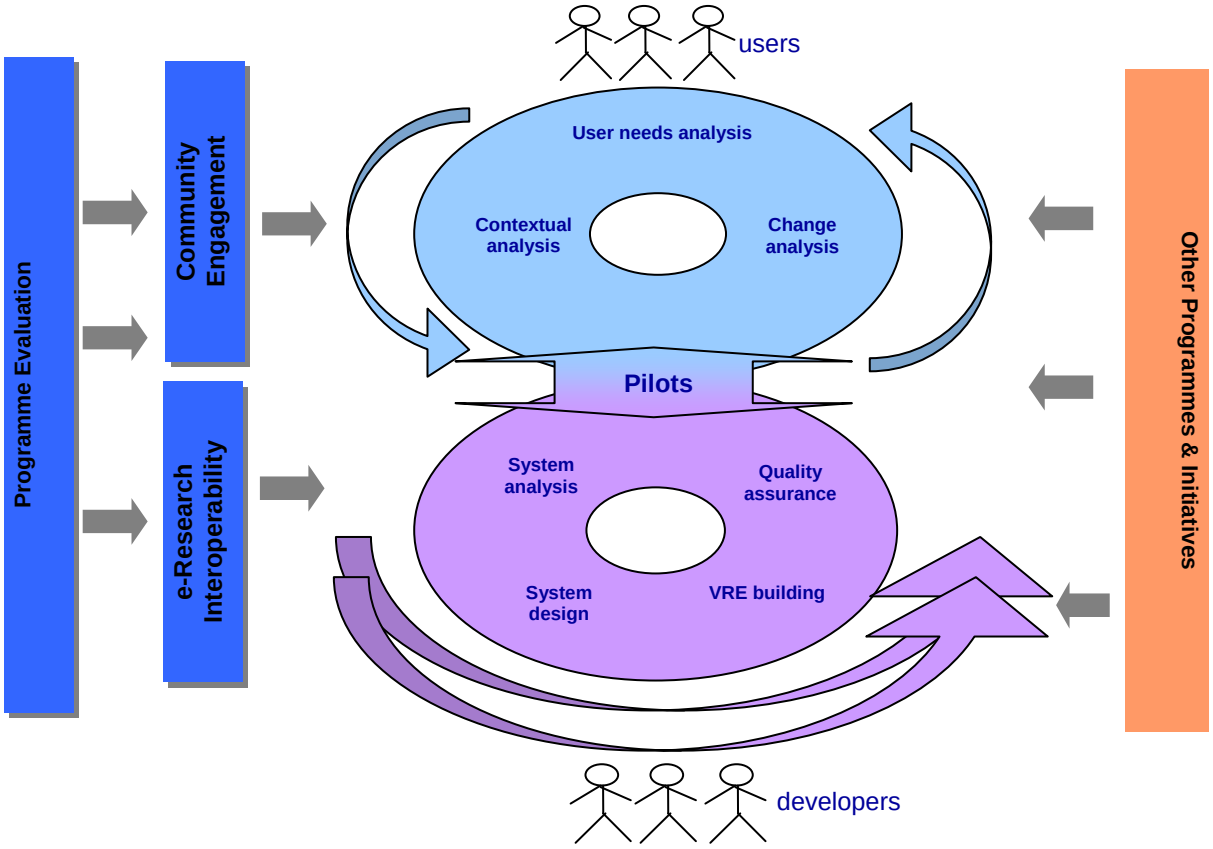


**Figure 1 - 'Figure-of-eight' development methodology including main project activities**

In line with the VRE "figure-of-eight" model, our project activities form two cycles – the Stakeholder Analysis & Impact Cycle and the VRE Construction Cycle. These cycles are bridged by the implementation, use and evaluation of pilots in authentic research settings, which form the core of the project. There are three full iterations of activities throughout this project, including three major software releases.

The concept of *co-realisation* stresses work-affording technologies. Co-realisation aims to enable users to *grow into* technology: it is minimally invasive, preserving the advantages of technology for work life while refraining from engaging in gratuitous technological interventions or dubiously-predicated work redesign efforts. Through creating shared practice, co-realisation seeks to capitalise on user-led processes of ‘design-in-use’ and emphasises tightly coupled, ‘lightweight’ design, development and evaluation techniques that can be easily and rapidly customised to create new

systems and artefacts for evaluation in use. It has synergies with agile software development and is particularly appropriate for the VRE development model adopted for this project.

Ethnographic observation is used to explicate practical work undertaken within the VRE. The aim is to assess how far the project technology affords work in authentic research settings as well as how this changes over the lifetime of various iterations of the Stakeholder Engagement and VRE Construction cycles. Evaluation will proceed from an analysis of stakeholder needs and requirements and will assess the ways in which developments meet these in research settings throughout the lifetime of the project. It will explicate how the technologies are used in and across research contexts as well as providing an opportunity for sharing best practice between both end-users and developers.

### Important Issues

The following are the important issues for this project:

- *Open, non-proprietary standards-based*. All software produced by CREW is freely distributed in binary and source code form and is, as far as possible, based on non-proprietary standards.

- *Re-usable tools*. The software tools developed by the project will be designed to have maximum reusability. In particular, many of the modules will conform to the JSR168 standard enabling them to be deployed within common portal frameworks such as uPortal and GridSphere; others will more appropriately be deployed as Rich Internet Applications.

- *Usability*. In order to create software that will be used in real-life scenarios, user interfaces must be highly usable. Our methodology is based on placing the user at the heart of the development process and our user communities are also represented in the management structures of the project. This should result in a high level of usability for applications we develop.

### Scope of Work

CREW will deliver software to enable material surrounding research events to become discoverable in context and enable research outputs (e.g. papers, presentations) to become research inputs.

Exact functionality to be implemented will be determined by user requirements. CREW will also seek to broaden understanding of our collaboration technologies and disseminate findings from the analysis and evaluation elements of the project.

Anything else is outside of the scope of the project.

### Critical Success Factors

- **Usability** – are the software outputs easy, straightforward and intuitive to use?

- **User satisfaction** – do the software outputs meet user needs?

- **Impact** – has the project achieved an impact in terms of visibility throughout the programme and wider?

## 4. Project Outputs

### Software & Support Materials

1. Research Events Application (REA) that enables the discovery of research event outputs, including audio-visual recordings of presentations

2. Events Recording Application (ERA) that enables the recording and annotation of research events

3. Portal environment for users, including portlet applications and tools in addition to REA and ERA such as the CampusGrid user interface, Wikis, blogs and modular portlets produced by the Subject Portals Project

4. Appropriate levels of materials (documentation, presentations, screencasts) to support the software outputs

**Reports**

5. Use cases for CREW software

6. Report on ethical, legal and social issues arising from use of CREW software

7. Technical Architecture Report to document an exemplar architecture for the distributed, modular events retrieval and recording components

8. Institutional/Service Embedding Report to document the project's findings from trials embedding the technology in authentic settings

9. Final evaluation report summarising major findings, lessons learnt and impact of this project's approach to facilitating effective researcher collaboration in a range of authentic research settings

## 5. Project Outcomes

Software developed by CREW will enable increased utilisation of Access Grid-equipped installations around the UK (of which there are over 100) to record seminars, workshops and training events and make these available as research resources on the web.

The software will also allow data relating to research events to be more persistently available to researchers.

CREW will enable an increased understanding of the legal, social and ethical issues surrounding the use and deployment of such technologies and enable this knowledge to inform future development.

## 6. Stakeholder Analysis

| Stakeholder | Interest / stake | Importance |
|---|---|---|
| JISC | Funders and programme managers | High |
| Intute | Users within project | High |
| Institute of Health Science | Users within project | High |
| Visualization groups | Users within project | High |
| Access Grid users | Potential users of software | High |
| Access Grid Support Centre | Potential future service hosts | Medium |
| Research Councils UK | Potential users of software | Medium |
| e-Research Tools & Resources Interoperability Project (eReSS) | Standards reviewers | Medium |

## 7. Risk Analysis

| Risk | Probability (1-5) | Severity (1-5) | Score (P x S) | Action to Prevent/Manage Risk |
|---|---|---|---|---|
| Staffing | 2 | 4 | 8 | Staff are employed by groups with wide interest and expertise who have access to people with related skillsets |
| Organisational | 3 | 2 | 6 | There are inherent difficulties involved in collaborating between institutions, however the project management are used to working on multi-institutional projects and are conversant with strategies to mitigate these risks |
| Technical | 3 | 3 | 9 | The technologies involved are challenging. However, the sites involved are experts and well known to appropriate user groups if external assistance is required |
| External suppliers | 1 | 1 | 1 | No external suppliers involved |
| Legal | 4 | 2 | 8 | The technologies involve making available recordings of potentially sensitive research material and have wide potential legal implications. This is being addressed in particular project activities |

## 8. Standards

CREW will work with eReSS to review standards employed in the project and also to explore the potential for possible contributions to standards formation, e.g. in the area of publishing metadata (e.g. to search engines) and exchanging metadata with other technologies in which CREW's work is highly innovative.

**Portlet Standards**

Portlets are Web-based components managed by portals that supply dynamic content. Portlet standards aim to enable interoperability between portlets and portals by defining the APIs for portlets and by standardising the rules for preferences, user data, portlet requests and responses, deployment, packaging, and security. The following three standards are currently available and applicable to this project:

- JSR168 Portlet Specification 1.0 – widely adopted standard; portlets are local to the portal.
- WSRP Web Services for Remote Portlets – portlets are hosted on a remote server.
- JSR286 Portlet Specification 2.0 – still only a draft version. It aims to integrate JSR168 and WSRP; also provides additional functionality to fill gaps in JSR168.

**RTSP/RTP**

The recording components aim to conform to the Real Time Streaming Protocol (RTSP), which provides "VCR-style" control functionality such as pause, fast forward and rewind for Real Time Transport Protocol (RTP) data packets. RTP is a packet format for multimedia data streams and is

used by many standard protocols, such as the video and audio tools used in the Access Grid as well as H.323 and SIP for IP telephony applications. RTSP is a client-server multimedia presentation control protocol, designed to address the needs for efficient delivery of streamed multimedia over IP networks. In April 1998, it was published as a Proposed Standard by the IETF.

More information on the RTSP standard may be found at:

- http://www.rtsp.org/
- ftp://ftp.isi.edu/in-notes/rfc2326.txt

**W3C**

The standards from the World Wide Web consortium cover a range of layered specifications to build the data-rich environment of the Semantic Web in which data exchange, common understanding and generic tools are key features. Both Iugo and Memetic (CREW's 'parent' projects) made heavy use of W3C standards for data interoperability between tools. In particular, they use XML for low-level data formats, Resource Description Framework (RDF) to describe relationships between resources, and extensive use of the Web Ontology Language (OWL) for ontologies to formalise relationships and Simple Knowledge Organisations (SKOS) for taxonomies.

These technologies/standards will continue to be used within CREW. In addition, there are other communication technologies such as web services and common information standards such as schemas published by the OASIS group that will be used as appropriate.

Event metadata will be shared between software components using a metadata scheme based on the above standards, as appropriate.

**Multimedia Formats**

Video and audio in recordings can be stored in a variety of formats. In order for video and audio to be displayed within a web page, a web browser plug-in must be used. To avoid the user having to install a plug-in when using the application, a multimedia file format can be chosen that is likely to be compatible with either a variety of plug-ins (such as avi, mpeg, or wmv), one of which is commonly installed in most systems, or a particular plug-in that is commonly installed on most systems (such as Adobe Flash). It would also be useful if this format could be played within a stand-alone multimedia player on various platforms so that the recorded media can be written to a CD or DVD for playback where an internet connection is not available.

The pros and cons of various media formats will be evaluated to determine the most suitable for users' needs.

**Design Patterns**

Appropriate design patterns will be adopted where appropriate. Design patterns are not a standard but they do provide descriptions and templates to solve common problems that appear in object-oriented software design. 23 patterns are documented in *Design patterns : elements of reusable object-oriented* software by Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides (ISBN: 0201633612).

**The Spring Framework**

Spring is a popular open source Java/J2EE application framework that applies Inversion-of-Control principles and promotes good practice such as programming to interfaces. It also provides a Model View Controller (MVC) framework for web applications with good portlet (JSR168) support.

**AJAX**

Asynchronous JavaScript and XML (AJAX) allows parts of a web page to be updated without the need to reload the entire page. This is well-suited to portlet applications where one may want to update the user interface of one portlet without affecting the others. Although the JSR-168 standard does not disallow the use of AJAX, it does not give any information on how it might be used. Many workarounds have been devised to aid the use of AJAX from within portlets; considering the

advantages AJAX provides for portlets, it is worth pursuing these workarounds in the development of portlets for the CREW project.

# 9. Technical Development

### Developer Collaboration and Co-ordination

Close co-operation and a common approach between developers is vital to the success of this project.

The fact that the development team is spread across two institutions represents a particular challenge when ensuring the compatibility of the different technologies that comprise CREW software. To address this, there must be a close working relationship between the teams based at the Universities of Manchester and Bristol and common development processes used throughout the development stages of this project.

The teams will be in regular and close contact using the Access Grid for project and development meetings, BSCW for sharing documents, a Wiki for collaborative document creation, version control and bug tracking tools, as well as the use of more common forms of communication such as e-mail and telephone. The use of peer reviews, code-walkthroughs and common standards across institutions will also help to integrate the technologies developed through implicitly sharing knowledge about technical details.

### Ensuring Quality Code

CREW will follow best practice in future development of code by ensuring that all code follows the relevant programming guideline via *Section 17 – Quality Assurance Plan*, e.g.:

- * C++ Coding Standard http://www.chris-lott.org/resources/cstyle/CppCodingStandard.html
- Java Code Conventions http://java.sun.com/docs/codeconv/
- * Style Guide for Python Code http://www.python.org/peps/pep-0008.html
- HTML Style Guide http://www.ology.org/tilt/cgh/index.html
- SQL Style Guide http://www.probusiness.de/projekte/phpgroupware/sql_style_guide.html
- Perl Style Guide http://www.perl.com/doc/manual/html/pod/perlstyle.html

The guidelines marked with an asterisk (*) contain general coding standards that are applicable to most programming languages. These guidelines should be used as generic guides where the particular language style guide is limited in scope (e.g. the Perl Style Guide).

The CREW development team will adopt suitable Integrated Development Environment (IDE) Tools, such as Eclipse (http://www.eclipse.org/) and IntelliJ (http://www.jetbrains.com/idea/) to support quality, shared software development. This use of IDEs should enable code to be more easily produced during the project and make it more readable, easier to maintain, more reusable and easier to unit test.

### Application Development

Application development will involve close consultation with users to meet the needs of the co-realisation methodology and ensure a thorough understanding of the user environment by developers. Lines of communication between users and development teams will be as open and fluid as possible with the aim of producing software tools that are highly usable and relevant to user needs. This process will be assisted by utilisation of social scientists from the National Centre of e-Social Science (NCeSS) who are experts in the latest thinking in software development methodology. Traditional stages of requirements capture, design, development, deployment and evaluation will be encompassed within a non-linear and iterative approach.

## 10. Intellectual Property Rights

All project outputs will be available free of charge to the UK HE/FE community.

The text of our software license agreed between collaborators will be as follows:



# *Project Resources*

## 11. Project Partners

| Partner | Main Role | Primary Contact |
|---|---|---|
| University of Manchester | Project management, development, evaluation and user engagement | Michael Daw – michael.daw@manchester.ac.uk |
| University of Bristol | Technical leadership and development | Nikki Rogers – nikki.rogers@bristol.ac.uk |

We aim for a consortium agreement to be signed before 31 May 2007.

## 12. Project Management

**Project Team**

| Team Member | Roles | Contact Details |
|---|---|---|
| Michael Daw | Project Manager, Line Manager, Co-Investigator | michael.daw@manchester.ac.uk |
| Nikki Rogers | Technical Manager, Line Manager, Developer, Co-Investigator | nikki.rogers@bristol.ac.uk |
| Andrew Rowley | Developer | andrew.rowley@manchester.ac.uk |
| Anja Le Blanc | Developer | anja.leblanc@manchester.ac.uk |
| Tobias Schiebeck | Developer | tobias.schiebeck@manchester.ac.uk |
| Mike Jones | Developer | mike.a.jones@bristol.ac.uk |
| Roger Slack | User Engagement | r.slack@bangor.ac.uk |
| Meik Poschen | User Engagement | meik.poschen@manchester.ac.uk |
| Rob Procter | Co-Investigator | rob.procter@manchester.ac.uk |
| Caroline Williams | User Stakeholder, Co-Investigator | caroline.williams@manchester.ac.uk |
| Andy Hall | User Stakeholder, Co-Investigator | andrew.g.hall@manchester.ac.uk |
| Martin Turner | User Stakeholder | martin.turner@manchester.ac.uk |

## 13. Programme Support

None currently identified.

## 14. Budget

See Appendix A.

# *Detailed Project Planning*

## 15. Project Activities

See Appendix B.

## 16. Evaluation Plan

| Timing | Factor to Evaluate | Questions to Address | Method(s) | Measure of Success |
|---|---|---|---|---|
| End of project | Software robustness | How robust is CREW software? | User evaluation | Users report satisfaction with software robustness |

| | | | | |
|---|---|---|---|---|
| Deployment | Usage levels | Is CREW being used as normal work practice? | User evaluation | Users are using CREW technologies outside of that required for the project |
| Deployment | Usability | What uses are made of CREW software?<br>Is CREW software highly usable? | User evaluation | Analysis of usage by new users shows little help required to get started and that users are able to discover features new to them; users submit few bug reports related to usability |
| Deployment | Mode of usage | How is CREW software used? | User evaluation and analysis of types of recordings made | Most major features of CREW software fully employed by users |
| Throughout project lifetime | Knowledge contribution | How has CREW helped to increase understanding of VREs and improve access to research resources from this stage of the research lifecycle? | Papers submitted to journals and conferences | Papers accepted for publication/presentation |

# 17. Quality Assurance Plan

## Quality Procedure

### Project Outputs, as listed in section 4

1. Team worker submits project output to reviewer (in the case of a manual code review, this may take the form a code walk-through between submitter and reviewer)

2. Reviewer assesses project output with respect to appropriate Quality Criteria and produces review on review form (see Appendix C)

3. Reviewer discusses review with team worker to agree comments

4. If comments are of categories Extensive, Significant or Minor, team worker iterates version of project output, enacts changes and resubmits output to reviewer (step 1)

### Internal Project Documents

1. Team worker submits internal project document to line manager

2. Line manager assesses document with respect to the criteria for internal project documents

3. Line manager discusses review with team worker to agree required changes

4. Team worker enacts changes, if any, and resubmits document (step 1)

## Quality Criteria Descriptions

### Code Review

Manual code reviews are valuable to ensure quality code that is robust as well as helping to disseminate knowledge about the workings of software amongst the team. For these reasons, they

will comprise part of our Quality Assurance procedure. However, full code reviews take up a great deal of time, so we aim to perform partial manual code reviews of all new code written for this project and to make use of tools to help code reviews, e.g. FindBugs and plug-ins to Eclipse. The manual code review will comprise either an inspection of a subset of the new application code or a code walk-through between developer and reviewer to ensure that it conforms to good coding practice. The review will reference the appropriate coding guidelines document(s) detailed in *Section 9 – Technical Development*.

**Functional/Regression Test**

Each software application produced by the project will have a corresponding Functional Test Document (based on the structure outlined in Appendix D). The document will contain a test for every element of functionality possible within the application in order to test all parts of the software. When a new version of the software application is released, this document will be updated to reflect the changes in the application. The entire functional test will then be performed again. In this way, regression testing will be automatic as all features will be retested to ensure that the new functionality has not broken the old.

**Unit Tests**

New code written for the project will have appropriate unit tests. A unit test validates individual parts of code, such as a method within a class, to ensure that they are working correctly. The project will utilise a framework such as JUnit (http://junit.sourceforge.net), which provides an open source framework for creating and executing unit tests.

**Load Test**

Software must be able to perform under likely load conditions. The software produced within the project will undergo "black box" load testing and "white box" load testing. Black box load testing will be performed implicitly by users during the deployment phase of the project; problems found here will be reported using the bug reporting tool. White box load testing will be co-ordinated by the developer of the application prior to deployment. As far as possible, the project will use automated load testing utilities such as JMeter (http://jakarta.apache.org/jmeter/) to simulate requests by multiple users.

Each application produced by the project will have a corresponding Load Test Document (based on the structure outlined in Appendix D). This document will specify appropriate tests for the application to ensure that it can work outside of the development environment, or at least to catch possible problems that arise when multiple users attempt to use the application simultaneously, as in a real-world deployment.

**Document Review**

Documents will be reviewed against the following criteria:

- Be fit for purpose (i.e. address appropriate issues for the intended audience)
- Be readable and clear (for target audience)
- Have no spelling mistakes
- Be grammatically correct
- Include appropriate acknowledgements
- Include contact details for the author and project
- Include version number for the document

**Guide Document Review**

As well as meeting all the criteria for a normal document review, guide documents must also undergo testing to ensure that the information contained within them is correct. All step-by-step instructions must be fully tested with the software to which they refer to ensure accuracy and clarity. Unlike many

of the other review categories, it is important that the guide document review be carried out by a user, who is more likely to reveal errors, inconsistencies and a lack of clarity, rather than a project member whose level of knowledge may obscure such problems.

**Internal Project Documents**

Internal project documents are subject to a less formal review than are project outputs. The review is conducted by the team worker's line manager (or other appropriate project member) in any form that is most convenient (e.g. handwritten comments on hard copy document). These reviews are not audited and although certain criteria that would be demanded of formal project outputs may be relaxed (e.g. grammar, spelling, acknowledgements, etc.) other criteria should not be relaxed and these reviews should still demand the highest quality from team workers.

Internal project documents will be reviewed against the following criteria:

- Be fit for purpose (i.e. address appropriate issues for the intended audience)
- Be readable and clear
- Include contact details for the author

Once reviewed, internal project documents will be posted to the project Wiki or BSCW and an e-mail sent to project team members for further review and discussion.

**Other Items**

All other items to be distributed outside of the project (e.g. agendas for user meetings and other non-deliverables) should be circulated to the project team for comments *and* approved by a line manager before distribution. This will serve to reduce the number of errors and improve the overall quality of these materials.

## 18. Dissemination Plan

Some of our planned dissemination is detailed below. Further dissemination activities will be added throughout the project in collaboration with our user partners and as opportunities are presented, e.g. following CREW-supported events.

| Timing | Dissemination Activity | Audience | Purpose | Key Message |
|---|---|---|---|---|
| Apr 2008 | Paper at Access Grid Retreat | Access Grid community | Increase awareness of CREW | CREW has arrived |
| Sep 2007 | Paper at e-Science All Hands Meeting | e-Research community | Increase awareness of CREW | CREW has arrived |
| Jun 2008 | Paper at International Conference on e-Social Science | Social Science community | Recruit users | CREW can extend life of research event outputs |
| Jan 2008 | Workshop for Access Grid Support Centre | UK Access Grid community | Recruit users | CREW can help utilisation of Access Grid |

## 19. Exit/Sustainability Plan

This section presents some early thoughts concerning our Sustainability Plan. We take sustainability very seriously and we intend to form a Steering Committee, whose primary role will be to examine this issue and offer solutions to lead to long-term sustainability for CREW technology.

| Project Outputs | Action for Take-up & Embedding | Action for Exit |
|---|---|---|
| Research Events Application & Events Recording Application | Deployed as service to UK community by Access Grid Support Centre; software to be retained in CVS repository by Access Grid Support Centre or the Open Middleware Infrastructure Institute | Work with AGSC to deploy as service and possibly software repository; work with AGSC or OMII to ensure software and documentation up-to-date |
| User portal environment | Integrated in Universities of Manchester & Bristol portal environment | Work with relevant institutional IT service group for support of applications |
| Support materials | Accessible via software installations | Ensure integration with main software |
| Reports | Accessible from project and JISC websites | Publish reports on both project and JISC websites |

| Project Outputs | Why Sustainable | Scenarios for Taking Forward | Issues to Address |
|---|---|---|---|
| Research Events Application & Events Recording Application | Still of use to community | AGSC & JISC will promote usage | Determine proper channels for JISC promotion |

# *Appendixes*

## Appendix A. Project Budget

| **Directly Incurred Staff** | **March 07** | **Apr 07-Mar 08** | **Apr 08-Feb 09** | **TOTAL £** |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Directly Incurred Staff (A)** | **£13,396** | **£163,642** | **£150,001** | **£327,039** |
| | | | | |
| **Non-Staff** | **March 07** | **Apr 07-Mar 08** | **Apr 08- Feb 09** | **TOTAL £** |
| Travel and expenses | £1,100 | £2,000 | £2,000 | £5,100 |
| Hardware/software | £4,000 | £0 | £0 | £4,000 |
| Dissemination | £0 | £2,000 | £4,000 | £6,000 |
| Evaluation | £0 | £500 | £500 | £1,000 |
| User consultancy | £6,000 | £4,000 | £3,000 | £13,000 |
| AG hire & general office costs | £250 | £2,800 | £2,300 | £5,350 |
| **Total Directly Incurred Non-Staff (B)** | **£11,350** | **£11,300** | **£11,800** | **£34,450** |
| | | | | |
| **Directly Incurred Total (A+B=C) (C)** | **£24,746** | **£174,942** | **£161,801** | **£361,489** |
| | | | | |
| **Directly Allocated** | **March 07** | **Apr 07-Mar 08** | **Apr 08- Feb 09** | **TOTAL £** |
| Staff | £0 | £0 | £0 | £0 |
| Estates | £3,014 | £35,421 | £31,636 | £70,071 |
| Other | £0 | £0 | £0 | £0 |
| **Directly Allocated Total (D)** | **£3,014** | **£35,421** | **£31,636** | **£70,071** |
| | | | | |
| **Indirect Costs (E)** | **£11,757** | **£135,025** | **£117,233** | **£264,015** |
| | | | | |
| **Total Project Cost (C+D+E)** | **£39,517** | **£345,388** | **£310,670** | **£695,575** |
| **Amount Requested from JISC** | **£29,638** | **£259,041** | **£233,003** | **£521,681** |
| **Institutional Contributions** | **£9,879** | **£86,347** | **£77,668** | **£173,894** |
| **Percentage Contributions** | | **JISC – 75%** | **Partners - 25%** | **Total – 100%** |

## Appendix B. Project Activities

| | | Mar-07 | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Mar-08 | Apr-08 | May-08 | Jun-08 | Jul-08 | Aug-08 | Sep-08 | Oct-08 | Nov-08 | Dec-08 | Jan-09 | Feb-09 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Stakeholder Analysis & Impact Cycle** | | | | | | | | | | | | | | | | | | | | | | | | | |
| User Needs Analysis | Develop use case scenarios, user needs & req.s | | | | | | | | | | | | | | | | | | | | | | | | |
| Contextual Analysis | Analyse VRE deployment & adoption | | | | | | | | | | | | | | | | | | | | | | | | |
| | Issues for intra & inter-institutional use | | | | | | | | | | | | | | | | | | | | | | | | |
| | Assess legal issues surrounding data capture | | | | | | | | | | | | | | | | | | | | | | | | |
| | Define requirements resulting from legal issues | | | | | | | | | | | | | | | | | | | | | | | | |
| Change Analysis | Qualitative & quantitive measures of VRE impact | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lessons learned | | | | | | | | | | | | | | | | | | | | | | | | |
| **Pilots** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pilot Preparation | Install system for use | | | | | | | | | | | | | | | | | | | | | | | | |
| | User environment-based induction sessions (Intute) | | | | | | | | | | | | | | | | | | | | | | | | |
| | User environment-based induction sessions (IHS) | | | | | | | | | | | | | | | | | | | | | | | | |
| Pilot Implementation | Use of VRE in research practice | | | | | | | | | | | | | | | | | | | | | | | | |
| Pilot Evaluation | Usability focus groups | | | | | | | | | | | | | | | | | | | | | | | | |
| | User feedback sessions | | | | | | | | | | | | | | | | | | | | | | | | |
| | Continuous feedback (bug reporting, feature requests) | | | | | | | | | | | | | | | | | | | | | | | | |
| **VRE Construction Cycle** | | | | | | | | | | | | | | | | | | | | | | | | | |
| System Analysis | Specify VRE solutions | | | | | | | | | | | | | | | | | | | | | | | | |
| System Design | Construct VRE design & architecture | | | | | | | | | | | | | | | | | | | | | | | | |
| VRE Building | Development of portal user interface | | | | | | | | | | | | | | | | | | | | | | | | |
| | Development of IUGO-Memetic common user i/f | | | | | | | | | | | | | | | | | | | | | | | | |
| | Integration of social software | | | | | | | | | | | | | | | | | | | | | | | | |
| | Development of security model | | | | | | | | | | | | | | | | | | | | | | | | |
| | Extend IUGO portlet | | | | | | | | | | | | | | | | | | | | | | | | |
| | Portalise Memetic | | | | | | | | | | | | | | | | | | | | | | | | |
| | Development of CampusGrid user i/f | | | | | | | | | | | | | | | | | | | | | | | | |
| | Integration of IUGO-Memetic data models | | | | | | | | | | | | | | | | | | | | | | | | |
| | Developments to ensure security & legality | | | | | | | | | | | | | | | | | | | | | | | | |
| | Develop relevant federated ontology for research | | | | | | | | | | | | | | | | | | | | | | | | |
| | Memetic security enhancements | | | | | | | | | | | | | | | | | | | | | | | | |
| | Development of Memetic conference user i/f | | | | | | | | | | | | | | | | | | | | | | | | |
| | User initiated developments | | | | | | | | | | | | | | | | | | | | | | | | |
| | Bug fixing & support | | | | | | | | | | | | | | | | | | | | | | | | |
| Quality Assurance | Code reviews | | | | | | | | | | | | | | | | | | | | | | | | |
| | Functional tests | | | | | | | | | | | | | | | | | | | | | | | | |
| | Regression tests | | | | | | | | | | | | | | | | | | | | | | | | |

**Project start date: 01-03-2007**

**Project completion date: 28-02-2009**

**Duration: 24 months**

| Activities | Depend-encies | Earliest start date | Latest completion date | Outputs (clearly indicate deliverables & reports in bold) | Mile-stone | Respon sibility |
|---|---|---|---|---|---|---|
| **ACTIVITY CYCLE 1:**<br>*Stakeholder Analysis & Impact Cycle*<br>**Objectives:**<br>To elicit functional requirements from an understanding of user needs and the context in which users work | | | | | | |
| 1. User needs & usability focus group for Intute | | May 2007 | Oct 2007 | Face-to-face meeting | | MP/NR |
| 2. User needs & usability focus group for IHS | | May 2007 | Oct 2007 | Face-to-face meeting | | MP/NR |
| 3. User needs & usability focus group for scientific research groups | | May 2007 | Oct 2007 | Face-to-face meeting | | MP/NR |
| 4. Develop use cases from Intute | | May 2007 | Jul 2007 | Internal project document | | MP |
| 5. Develop use cases from IHS | | May 2007 | Jul 2007 | Internal project document | | MP |
| 6. Develop use cases from scientific research groups | | May 2007 | Jul 2007 | Internal project document | | MP |
| 7. Write use cases report | | Jul 2007 | Aug 2007 | **Report** | **X** | MP/RS |
| 8. Elicit requirements from Intute | | May 2007 | Oct 2007 | Internal project document | | MP |
| 9. Elicit requirements from IHS | | May 2007 | Oct 2007 | Internal project document | | MP |
| 10. Elicit requirements from scientific research groups | | May 2007 | Oct 2007 | Internal project document | | MP |

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|---|---|---|---|---|---|---|
| 11. Define requirements resulting from legal & ethical issues | | Dec 2007 | Jan 2008 | Internal project document | | NR |
| 12. Create prioritised list of functional requirements | | Mar 2007 | Jan 2008 | Internal project document | **X** | NR |
| 13. Evaluation of CREW software in use by Intute | | Sep 2007 | Dec 2008 | Internal project document | | MP |
| 14. Evaluation of CREW software in use by IHS | | Sep 2007 | Dec 2008 | Internal project document | | MP |
| 15. Evaluation of CREW software in use by scientific research groups | | Sep 2007 | Dec 2008 | Internal project document | | MP |
| 16. Write Institutional/Service Embedding report | | Dec 2008 | Jan 2009 | **Report** | **X** | MP/RS |
| 17. Create questionnaire for user needs workshops | | May 2007 | Jun 2007 | Questionnaire | | AMC |
| 18. Questionnaire completed by Intute users | | May 2007 | Oct 2007 | Questionnaire results | | MP |
| 19. Questionnaire completed by IHS users | | May 2007 | Oct 2007 | Questionnaire results | | MP |
| 20. Questionnaire completed by scientific research groups users | | May 2007 | Oct 2007 | Questionnaire results | | MP |
| 21. Interview small number of users pre- and post-recording at a user event | | May 2007 | Nov 2007 | Interview results | | AMC |
| 22. Interview same users a few weeks after user event | | Jul 2007 | Dec 2007 | Interview results | | AMC |
| 23. Write report on legal & ethical issues based on questionnaire and interview results | | Oct 2007 | Dec 2007 | **Report** | **X** | AMC |
| 24. Write final evaluation report | | Jan 2009 | Feb 2009 | **Report** | **X** | MP/RS |

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| **ACTIVITY CYCLE 2:**<br>*Pilots*<br>**Objectives:**<br>To deploy software tools for user communities | | | | | | |
| 25. Implement continuous user feedback mechanisms (support e-mail address, bug reporting/feature request tool) | | Jun 2007 | Jul 2007 | E-mail address, bug reporting/feature request tool | | MJ |
| 26. Pilot deployment 1 | | Aug 2007 | Sep 2007 | **Service** | **X** | NR |
| 27. Pilot deployment 2 | | Jan 2008 | Feb 2008 | **Service** | **X** | NR |
| 28. Pilot deployment 3 | | May 2008 | Jun 2008 | **Service** | **X** | NR |
| 29. Pilot deployment 4 | | Oct 2008 | Nov 2008 | **Service** | **X** | NR |
| 30. Intute work-based induction 1 | | Jan 2008 | Jun 2008 | Face-to-face meeting | | MP |
| 31. IHS work-based induction 1 | | Jan 2008 | Jun 2008 | Face-to-face meeting | | MP |
| 32. Scientific research groups work-based induction 1 | | Jan 2008 | Jun 2008 | Face-to-face meeting | | MP |
| 33. Intute work-based induction 2 | | Jul 2008 | Dec 2008 | Face-to-face meeting | | MP |
| 34. IHS work-based induction 2 | | Jul 2008 | Dec 2008 | Face-to-face meeting | | MP |
| 35. Scientific research groups work-based induction 2 | | Jul 2008 | Dec 2008 | Face-to-face meeting | | MP |

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|---|---|---|---|---|---|---|
| 36. Usability focus group & feedback session 1 | | Jun 2007 | Apr 2008 | Face-to-face meeting | | MP |
| 37. Usability & user feedback report 1 | | Jun 2007 | Apr 2008 | Internal project report | | MP |
| 38. Usability focus group & feedback session 2 | | Apr 2008 | Oct 2008 | Face-to-face meeting | | MP |
| 39. Usability & user feedback report 2 | | Apr 2008 | Oct 2008 | Internal project report | | MP |
| | | | | | | |
| **ACTIVITY CYCLE 3:**<br>*VRE Construction*<br>**Objectives:**<br>To develop and integrate software and produce appropriate support material | | | | | | |
| 40. Initial technical architecture and interfaces between components | | Jun 2007 | Aug 2007 | Internal project document | | AR/MJ |
| 41. Final technical architecture and interfaces between components | | Oct 2008 | Nov 2008 | **Report** | **X** | AR/MJ |
| 42. Initial draft of security model | | Jun 2007 | Aug 2007 | Internal project document | | AR/MJ |
| 43. Final version of security model | | Oct 2008 | Nov 2008 | Internal project document | | AR/MJ |
| 44. Design prototype user interface for Research Event Application | | Apr 2007 | Jun 2007 | Prototype user interface | | MP |
| 45. Design prototype user interface for Event Recording Application | | Apr 2007 | Jun 2007 | Prototype user interface | | MP |

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|---|---|---|---|---|---|---|
| 46. Memetic & lugo database integration | | May 2007 | Sep 2007 | Database schema | | AR/MJ |
| 47. Recording web upload & annotation developments | | Apr 2007 | Oct 2008 | Software | | AR/MJ |
| 48. Recording playback developments | | Apr 2007 | Oct 2008 | Software | | AR |
| 49. ScreenStreamer developments | | Apr 2007 | Oct 2008 | Software | | AR |
| 50. Security developments | | Apr 2007 | Oct 2008 | Software | | AR/MJ |
| 51. Developments based on legal & ethical issues | | Apr 2007 | Oct 2008 | Software | | AR/MJ |
| 52. CampusGrid user interface | | Apr 2007 | Nov 2007 | Software | | ALB |
| 53. User interface developments | | Apr 2007 | Oct 2008 | Software | | AR/MJ |
| 54. Performance optimisation work | | Apr 2007 | Oct 2008 | Software | | AR/MJ |
| 55. Portal integration work | | Apr 2007 | Oct 2008 | Software | | AR/MJ |
| 56. Integration of social software & development of user environment | | Apr 2007 | Oct 2008 | Software | | ALB |
| 57. Create a new Data Access Object (DAO) code base for events that use SPARQL | | May 2007 | Oct 2007 | Software | | MJ |
| 58. Develop the annotations engine for events | | Nov 2007 | March 2008 | Software | | MJ |
| 59. Update Simple Knowledge Organisation (SKOS) files for events | | June 2007 | Oct 2007 | Software | | MJ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 60. Development of event data maintenance tools | | March 2008 | Dec 2008 | Software | | MJ |
| 61. Bug-fixing and support activities | | Aug 2007 | Feb 2009 | Support | | AR/MJ/ ALB/TS |
| 62. Functional test documents for Events Recording Application | | Jul 2007 | Oct 2008 | Internal project document | | AR/ALB /TS |
| 63. Functional test documents for Research Events Application | | Jul 2007 | Oct 2008 | Internal project document | | MJ |
| 64. Load test environment for Events Recording Application | | Jul 2007 | Oct 2008 | Load test environment | | AR/ALB /TS |
| 65. Load test environment for Research Events Application | | Jul 2007 | Oct 2008 | Load test environment | | MJ |
| 66. Support materials (including screencasts) for Events Recording Application | | Feb 2008 | Feb 2009 | Support materials | | NR |
| 67. Support materials (including screencasts) for Research Events Application | | Feb 2008 | Feb 2009 | Support materials | | NR |
| 68. Final software release | | Nov 2008 | Feb 2009 | **Software** | **X** | NR |

Project Team Workers:

- Nikki Rogers, University of Bristol (NR)
- Mike Jones, University of Bristol (MJ)
- Andrew Rowley, University of Manchester (AR)
- Tobias Schiebeck, University of Manchester (TS)

- Anja Le Blanc, University of Manchester (ALB)
- Meik Poschen, University of Manchester (MP)
- Roger Slack, University of Wales, Bangor (RS)
- Annamaria Carusi, University of Oxford (AMC)

# Appendix C – QA Review Form

**Reference (unique identifier of document, application, or other project output, including version number under review):**

**Standards Document Used (if applicable):**

**Date:**

**Submitter:**

**Reviewer:**

**Resubmit (any reviews with categories above minor require resubmission):**
**Yes No (delete as applicable)**

**Categories: E = Extensive; S = Significant; M = Minor; C = Comment**

| No. | Ref. | Comment | Standards Document Ref. | Category |
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# Appendix D – Functional Test Document

This appendix describes a structure for the functional and load test documents that will be produced for each software application, assuming they are not produced using Compendium.

The document should contain on the title page at least:

- The author of the test document
- The purpose of the document (i.e. whether for functional or load tests)
- The name of the application under consideration
- A version number for the document
- A placeholder to reference the version number of the software under test
- A placeholder for the name of the tester.

The main bulk of the document will consist of a table similar to the one below (the example text relates to two functional tests). The columns Number, Description and Expected Behaviour are completed by the author of the document; the remaining columns Result and Actual Behaviour are completed by the tester.

| **Number** | **Description** | **Expected Behaviour** | **Result (Pass/Fail)** | **Actual Behaviour (if Fail)/Comments** |
|---|---|---|---|---|
| 1 | Logging in with incorrect password | Error message stating that user has attempted to log in with incorrect password | | |
| 2 | Logging in with correct password | Access to system | | |
| 3 | Etc… | | | |