


**Proposal Cover Sheet: U&I Next Generation Technologies and Practice Phase 2 Call**

<b>Cover Sheet for Proposals</b> <i>(All sections must be completed)</i>			
<b>Name of Capital Programme:</b> Users and Innovation			
<b>Next Generation Technologies and Practice Phase 2</b> Please tick ONE BOX ONLY, as appropriate			
<input checked="" type="checkbox"/> a) Small-scale pilots <input type="checkbox"/> b) Large-scale institutional demonstrators			
<b>Name of Lead Institution:</b> ILRT University of Bristol			
<b>Name of Proposed Project:</b> Content Integration Project Phase 2			
<b>Name(s) of Project Partner(s):</b>			
<b>Full Contact Details for Primary Contact:</b>			
<b>Name:</b> Nicola Rogers <b>Position:</b> Senior Technical Researcher/Coordinator Web Futures <b>Email:</b> <a href="mailto:nikki.rogers@bristol.ac.uk">nikki.rogers@bristol.ac.uk</a> <b>Address:</b> Institute for Learning and Research Technology 8-10 Berkeley Square, Bristol, BS8 1HH <b>Tel:</b> +44(0)117 9287113 (Direct) +44(0)117 9287193 (Office) <b>Fax:</b> +44(0)117 928 7112			
<b>Length of Project:</b> 8 Months			
<b>Project Start Date:</b> 01/03/08		<b>Project End Date:</b> 01/10/08	
<b>Total Funding Requested from JISC:</b> £50,000			
<b>Funding Broken Down over Financial Years (Apr–Mar):</b>			
<b>Apr07 – Mar08</b>		<b>Apr08 – Mar09</b>	
£7,400.18		£42,599.82	
<b>Total Institutional Contributions:</b> £17,359			
<b>Outline Project Description</b>			
<p>1. The CIP project Phase 2 proposes to evolve the prototype produced via our six-month, 2007 Content Integration Project (CIP) to a pilot for continued user-focussed development and testing at the University of Bristol. The original CIP project (which completes in December 2007) is a small, exploratory project, tightly scoped to three University departments and focusing on a small set of content integration scenarios designed to inform longer-term processes and systems developments to meet the aspirations of the University's revised IT and Research Strategies. A known problem at the University of Bristol is that while there is a wealth of web, systems and departmental data that is interrelated (for example in terms of subject specific data, or data about particular research projects), it is not trivial to produce applications which provide a seamless search or browse across the full range of such information. Bristol maintains central University systems storing research-related resources such as research publications data, financial data and staff and teaching details. Departments then frequently harvest central data and extend it locally with their own research-related data</p>			

(such as descriptions of their funded projects and related resources - organisations, people, professional activities, events and so on). Furthermore, many departments use wikis and other social software tools as part of their research activity. Integrated 'views' across this distributed but related information are not normally possible without considerable human effort and yet would be extremely beneficial both to University departments and faculties and also to central or interdisciplinary University bodies (such as Research and Enterprise Development (RED<sup>1</sup>) and the Institute for Advanced Studies (IAS<sup>2</sup>)).

2. The prototype from the CIP project tests how the use of Semantic Web technology can provide user-friendly data join-up across distributed, independent repositories and other heterogenous sources of data (including 'Web 2.0' data). It is based on open source semantic portal software from HPLabs<sup>3</sup>, open standards and open frameworks, namely J2EE. The prototype seeks to provide instant answers to such questions as "Who are all the researchers with an interest in subject X?", "Which research across the University has been funded by sponsor Y?" or "The Vice Chancellor is visiting University Z next week, what are all the projects that the University of Bristol collaborates on with University Z?" Such questions have been encapsulated as use cases and associated with scenarios arising from user and stakeholder liaison through the course of the current CIP project. RED<sup>1</sup> endorses the project and has a particular interest in its outcomes.

3. Having already engaged real users in the University and several University departments as enthusiastic collaborators and stakeholders (including departments within the Faculty of Engineering, RED and the ILRT itself), our progress represents a first iteration through Stages 1 and 2 of the User Innovation and Development model as defined by the JISC documentation supporting this call. The project has been funded through collaboration with HPLabs, Bristol, with whose Semantic Web development team ILRT has been working for several years. HPLabs also conduct work assessing the technical and organisational issues around knowledge integration in large institutions and have been able to provide feedback and contextual advice on the generic aspects of the project, particularly in relation to Semantic Web applicability<sup>4</sup>. With the opportunity to advance the prototype development and user engagement already undertaken, in this phase 2 project we propose to revisit Stage 1 with activities such as questionnaires and Stage 2 with focussed user testing to inform technical development undertaken for Stage 3.

4. The focus of this project proposal, then, is on piloting deployable solutions for managing data integration between institutionally-focussed systems, departmental-specific data storage solutions at the University of Bristol and data arising from the increasing use of social softwares for and in support of University research. The pilot itself is to be a type of social software in that it will be designed to accept user 'annotations' – for example so that a researcher may link their research publications to online resources (blogs, other publications and so on) that make a citation of their work.

5. The proposed pilot will improve our prototype implementation of a component-based architecture (a J2EE framework approach) allowing integration with (Soap or Rest-based) interfaces to the datasources used by the departments trialled on in the CIP Project phase 1. Such datasources include the University's Datahub, the Content Management System (CMS) used at the University of Bristol, Microsoft Access databases variously used by the departments, departmental wikis, researcher blogs and other Web 2.0 data sources. The latter will include news items from the innovative News Patterns project running in parallel with the CIP project at the University of Bristol in a collaboration between ILRT and Computer Science. We will review the use of Ajax technology for the user interface layer and continue to evaluate the CIP project question: "Can Semantic Web technology help 'bridge the gap' between legacy/next generation content and thus support improved interface integration?". This is

<sup>1</sup> Research and Enterprise Development, University of Bristol, <http://www.bris.ac.uk/research/>

<sup>2</sup> Institute for Advance Studies, University of Bristol <http://www.bristol.ac.uk/ias/>

<sup>3</sup> SWED software ([http://www.swed.org.uk/swed/about/swed\\_approach.htm](http://www.swed.org.uk/swed/about/swed_approach.htm)), which is also being developed in the complementary JISC-funded CREW - <http://www.crew-vre.net/> - project.

<sup>4</sup> HP Labs Semantic Web research is described at this Url: <http://www.hpl.hp.com/semweb/>

supportive of the e-framework initiative's interest in emerging user environment layers which allow for flexible plug-in software frameworks, able to cope with a range of next generation tools and software applications. In our approach we are already committed (via the first phase CIP project) to using open standards and a service oriented architecture wherever possible.

6. In the last year, the University has undertaken significant consultation with a wide range of staff and students in order to develop a new IT Strategy (combining previous ICT and Information, Processes and Systems Strategies) and a revised Research Strategy. CIP and other parallel prototype projects are providing exploratory pathways towards the strategies' aspirations. This project will have a useful focus on internal requirements that we know to vary from 'central' concerns (such as competitor analysis based on easy-to-view statistical data) to departmental needs (where the ease of data integration affects research practice and dissemination, plus potentially also teaching and learning). The opportunity to pilot the content integration tool with a wider range of real users will be welcomed. Options for sustaining the proposed effort to move the CIP prototype to a pilot and to assess its potential contribution to the research and research support communities will be possible within the frameworks being put in place by our revised IT and Research Strategies at the University.

7. Project outputs of benefit to the JISC will include:

- An open source software pilot based on open standards and the prototype from the CIP project phase 1.
- Contributions to the e-Framework Semantic Wiki (including a Service Usage Model) derived from our pilot.
- User engagement findings of generic interest in terms of the integration of content derived from traditional and next generation software in a large-scale academic institution.
- Technical analysis of the further potential of the pilot as a suitable generic approach to providing a view layer customisable for departmental use and deployable in a component based architecture.
- Analysis of the project's related themes - such as data privacy, fine-grained access to data (such as held in central financial databases), intellectual property rights and the potential impact of the proposed new tool on insitutional practice.
- Evaluation of the potential extensibility of the approach taken to other next generation technologies such as mobile technology.

<b>I have looked at the example FOI form at Appendix A and included an FOI form in the attached bid (Tick Box)</b>	✓ YES	NO
<b>I have read the Circular &amp; associated Terms &amp; Conditions of Grant at Appendix B (Tick Box)</b>	✓ YES	NO

## **Appropriateness and Fit to Programme Objectives and Overall Value to the JISC Community**

8. In the outline project description for this proposal (above) we have described the focus of the internally funded CIP project<sup>5</sup> at the University of Bristol as having been centred on the question of "Can Semantic Web technology help 'bridge the gap' between legacy/next generation content and thus support improved interface integration?". Tackling the problem of providing a flexible and sustainable enough user interface layer over distributed, disparate, but related datasources, connected to University research, the proposed pilot is located in the problem space of integrating content via APIs (Application Programming Interfaces) to third

<sup>5</sup> The CIP Project has been funded during 2007, completing in December, via an HPLabs-supported role based in the ILRT Web Futures group at the University of Bristol.

party services and software systems, in a configurable, service-oriented technical architecture.

9. Web 2.0 aspects to the proposed phase two CIP Project involve the development of the “mash-up” features prototyped during the first phase, with extensions to include access to researcher wiki and blog content and to add social software features such as to allow end-user researchers to annotate publication resources with online links to citations of their work. By allowing researchers to annotate resources in the system in this way we aim to maximise the quality of data that the CIP tool searches, by maximising the domain knowledge of the users. For example, it is the researchers rather than the system who will be most aware of the significance of certain citations (arising from particular bloggers or academic journals, say) over others in their research area.

10. The CIP project to date has been a small, focused effort that arose out of discussions within the University during 2006 about the research content integration problem within the organisation (and its relationship to systems integration strategy at Bristol), as part of wider consultation and discussion which led to revisions to our IT and Research Strategies. With the increased use of social software tools and production of online content by researchers, it became apparent that research-relevant data extends well beyond that held in central University systems (such as the publications database) and that to have search/browse facilities across the wide range of this range of formal and less formal information content would be valuable. The value is perceived in terms of benefit both to individual departments/faculties and also to central reporting for the University, with somewhat differing concerns for each potential user group.

11. Prior to and during the CIP project we undertook focused user consultation in line with Stage 1 of the U&I Development model. During 2007 we hand-picked two University departments (the ILRT and Department of Electrical Engineering) from which to gather user requirements and to gain datasources for our prototype development. Researchers in both the ILRT (Information Services division) and the Department of Electrical Engineering (Engineering Faculty) use wikis to support their research, and both departments supplement personnel and research data from the University’s central Datahub<sup>6</sup> and IRIS<sup>7</sup> database with their own databases of research data. In addition to considering the ‘local’, departmental perspective on research content integration, we have engaged the Research and Enterprise Development (RED<sup>8</sup>) team at the University in consultation about their information issues and content integration needs from a central reporting and research strategy perspective.

12. Having identified these initial collaborators and stakeholders in the CIP project we are able to identify a real community of users and have conducted a first iteration of user needs analysis, stakeholder analysis, and prototype work. This process is described in the Community Engagement section below.

13. The issues arising from our Stage 1 User engagement<sup>9</sup> to date include (but are not limited to) the following:

- A common complaint for RAE is that publications have to be manually entered (as opposed to being generated automatically from the publications database IRIS).
- It is not easily possible to view research links with industry from a University-wide perspective.

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<sup>6</sup> The DataHub is a centrally managed Oracle database which provides an easy means of extracting, consolidating and reporting management information from the University's main administrative systems (<http://www.bris.ac.uk/is/computing/applications/infosystems/datahub/overview.html>).

<sup>7</sup> IRIS is Bristol University’s on-line database of research outputs (<https://www.bris.ac.uk/iris/publications/>).

<sup>8</sup> RED - <http://www.bristol.ac.uk/research/>.

<sup>9</sup> Please note that the issues presented here are not distinguished according to stakeholder group (department versus central), however work characterising specific use cases has been undertaken in CIP Phase 1.

- When the Vice Chancellor or another academic visits another University it is not currently possible to quickly identify all project connections with that University or alumni at the University for example.
- When a new researcher joins a departmental project it is not immediately easy to orientate them with an automatically joined-up view of all the relevant information - people, tools (for example wikis), project plans, websites, organisations and current outputs to do with that project.
- Bibliometric information would usefully be derived from a CIP system to support academics and departments in assessing the international impact of their research. Feedback on the economic and social impact of research is also increasingly relevant when reporting to research council funders in many cases.
- Data sensitivity is important and it might be important for example to protect one department's data from being viewable by another, to protect personal and financial data from misuse and so on.
- Competitor analysis support would be useful, including for example the ability to see which submitted bids were not successful in attracting funding as well as those that were.

14. To have an intuitively usable system capable of 'answering questions' relating to the above issues 'instantly' and using 'live data' is perceived to be of use to the organisation in terms of saving time costs, potentially informing research strategy, and also providing serendipitous value. Serendipitous value could be obtained by, for example, researchers being able to forge new interdisciplinary collaborations simply from being able to visualise previously unrealised subject-based research connections across university departments or projects.

15. The pilot project proposed here is intended further to inform policy at the University of Bristol by making a significant contribution to the evaluation of different approaches and engagement with the research and research support communities within the frameworks being put in place by our revised IT and Research Strategies.

### **Innovation**

16. The CIP pilot project proposes a service-oriented approach by building on the prototype APIs we have developed in the phase one project and by using open standards for web services and content integration. With an e-framework perspective in mind, the component based architecture for this project will allow for reuse of the developments in other contexts where the generic value of this pilot may be repurposed.

17. Particularly innovative in our proposed project is the use of Semantic Web technology to facilitate content integration for the user interface layer, where that content has been acquired from a variety of social softwares as well as legacy datasources. Furthermore we propose to extend the system to support user annotation as detailed in earlier sections.

### **Value to the JISC Community**

18. We will publicise our generalised findings, in terms of the use of Semantic Web technology combined with J2EE technology, towards a solution for content integration problems in large organisations. Our outputs will include the open source pilot software and also reusable data models based on open standards. We will also report on our user engagement findings and project themes such as data protection, IPR and potential organisational impact. Thus experience and lessons learned from the project's efforts to pilot the CIP prototype in an institutional context with 'real' users will also be reported on for the benefit of the JISC community.

## Project Workplan

19. Please see the workplan in the Appendix for the project timetable. It is related to the following deliverables:

20. **Deliverable 1** Questionnaire: design and distribute to users following an evaluation of the User Engagement and the Stakeholder community findings from CIP Phase 1. To include a review of scenarios and use cases from CIP Phase 1 and a re-evaluation of the legal issues surrounding content and licensing at the University of Bristol and beyond.

21. **Deliverable 2** Public email list and project wiki site tailored to the stakeholder, user and developer communities identified.

22. **Deliverable 3**. Detailed technical workplan. This will likely specify several aspects as listed in the workplan 'Pilot' section in the appendix.

23. **Deliverable 4** Pilot CIP system supporting functionality as determined by processes undertaken from D1 through D3.

24. **Deliverable 5**. Beta testing report, following user testing. To include an assessment of the pilot's usability and relevance to organisational needs, with the support of consultancy factored into the project, to be provided by Geraint Jones, Research Manager, Faculty of Engineering and also in consultation with the directors of RED and ILRT.

25. **Deliverable 6**. Final project report as required by the JISC.

26. **Deliverable 7**. Any other reports as required by users and stakeholders.

27. The above deliverables and workplan included in the appendix detail Stage 3 work on the CIP project with stages 1 & 2 revisited to ensure the appropriate level of user engagement and the pilot's relevance in terms of the proposed system's 'fitness for purpose'. We will engage with the JISC U&I support projects where possible to enlist support in our implemented stages of the U&I development model. Short releases with frequent bug fixes will be facilitated by the ILRT's regular use of the Trac<sup>10</sup> (or similar) software development support tool. We will make available the outputs from this project for a 12 month minimum period beyond the project's end.

### Project Management Arrangements

28. The project will be managed and administered by Nikki Rogers based at the ILRT, University of Bristol. This role will have responsibility for coordinating the community and user engagement aspects of the project together with the technical effort on the project – which will be undertaken by Damian Steer who is also based at the ILRT. The project management role will in general provide strategic direction to the project, monitor project activities, produce JISC progress and final reports and undertake any remedial action required in the event of project slippage or the occurrence of other risks.

### 29. Risks

Risk	Probability (1-5)	Severity (1-5)	Score (PxS)	Action to Prevent/Manage Risk
Staffing	2	4	8	Technical expertise is being provided by an experienced

<sup>10</sup> Trac: <http://trac.edgewall.org/>

				developer in our department. Project management by an experienced project manager. Both are part of an extensive development community within the University with collaborative experience with other HEIs and industry. ILRT and Bristol University at large offers a pool of staff with suitably equivalent skills in the event of any staff departures occurring on the project.
Organisational	4	1	4	Organising user engagement through the course of revisiting Stages 1 and 2 and testing as part of Stage 3 of the U&I development model is challenging given the short timescales of this small pilot project. The need to tightly manage this project justifies the proportion of project management allocated plus is helped by the fact that the technical team consists of an experienced developer who will be fully focused on this project for its duration.
Technical	3	3	9	The range of structured and non-structured data sources to be integrated is potentially challenging, however we have previous and parallel project experience to build on (for example from the IUGO project and the JISC-funded VRE2 CREW project). Other risks include: the Newspatterns project fails to deliver during the time-frame. Wiki and other blog content moves and is not maintained for lifetime of project. CMS system adoption during the lifetime of project and/or changes to other systems in use affects access to local departmental content. To mitigate these risks we have carefully chosen the departments being targeted for piloting and have built strong relationships to back agreements which should keep fully us informed of any system change timetables that could affect this project reaching full potential.
Legal	3	3	9	Legal and data protection issues will apply in terms of the copyrighted departmental or central systems data (especially financial) that could become searchable via the pilot to be produced for the project. We have obtained departmental consent for use of data for this piloting stage project. The CIP phase 1 findings on data sensitivity will be available by this project's planned start date and if necessary for example we can restrict CIP to handling only the financial funding awards data published by public bodies such as HEFCE. The security policy to be developed as part of the deliverables should cover these issues in more detail.
User stakeholders	2	3	6	The budget includes some provision for user engagement and we have already engaged with the users and stakeholders listed during the 2007 CIP project phase 1. The project management element is also justifiable in terms of the need to align stake holder interests with the direction of the project. User and stakeholder expectations will need to be managed in terms of both the potential legal and technical risks to the project.

### IPR Position

30. All software and tools developed as part of this project will be made available on an open source basis to the UK HE and FE community, with a license permitting their free non-commercial use and development.

### 31. Evaluation

The success of the project will be measured by evaluating the outputs against our workplan and via user testing and consultancy with our stakeholder departments. Evaluation in terms of community engagement is discussed more in section below.

## Engagement with the Community

32. In the CIP 1 project we covered Stage 1 and Stage 2 of the U&I development model as follows.

33. User Needs Analysis – this was undertaken in direct consultation with RED, the Faculty of Engineering and the ILRT. Through this we discovered issues in terms of research data integration for each, the problems they currently have in terms of supplying information from across their datasources and therefore what sorts of questions they might want answerable from a prototype system. Both brain storming and ‘paper piloting’ activities were undertaken: by using the IUGO<sup>11</sup> project demo we were able to illustrate the concept of faceted browse and from this discuss what sort of information we could model for stakeholders in this project. This sort of paper piloting threw up useful responses such as from RED Director Dr David Langley who viewed the paginated text views of data in the IUGO prototype and suggested the usefulness of alternative views – statistical views of data (i.e. self-configuring tabulated data pages) to support competitor analysis and in order to show research funder profiling by faculty for example. From this we undertook scenario writing and have a dedicated internal project wiki where scenarios, use cases and stakeholder meetings are documented.

34. Stakeholder analysis – during 2006 consultation with key personnel from the University’s DataHub<sup>12</sup> project was undertaken alongside consultation with experienced members of the HPLabs<sup>13</sup> group who funded the first phase CIP through a sponsored post in the Web Futures group at the ILRT. During the 2007 CIP project, issues connected with University of Bristol IT Strategy in general have been discussed alongside system integration issues relating to the increasing adoption of the Content Management System (CMS) by departments (including the ILRT and Electrical Engineering Departments). Other issues such as levels of internal departmental technical support for systems and the sustainability of a system such as proposed by the CIP project have been explored further during CIP phase 1.

35. Building – following successful paper piloting and user needs and stakeholder analysis, prototype building is being undertaken and due to be completed by December 2007. It should be noted that the prototype user interface layer is primarily a customisation of the open source SWED software (a faceted browse directory of worldwide environmental projects and organisations), using ongoing improvements arising from the current, JISC-funded CREW<sup>14</sup> project (which produces a multimedia-enriched, faceted browse directory of worldwide research events). In this sense some user and task analysis (as per Stage 1) has been undertaken and continues to be undertaken in previous and parallel projects. This is not duplication, as in the CIP project we are developing with different datasources and Web 2.0 technology with an institutional focus; therefore the related projects represent complementary development activity advantageous to the CIP pilot work proposed here. The CIP prototype differs technically from the CREW project in its architecture and functionality as it is based around the integration of formal institutional database systems with social softwares in use for research activity.

36. For this project we aim to sustain engagement with the stakeholder community at the University of Bristol by activities outlined in the workplan in the appendix and in the project plan section above. Geraint Jones, Research Manager in the Faculty of Engineering has agreed to dedicate time as a consultant to the project and Dr David Langley, Director of RED

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<sup>11</sup> The IUGO demonstration is an output from the JISC project completed by the ILRT and funded under the VRE1 programme. The prototype is linked from: <http://iugo.ilt.bris.ac.uk/iugo/demo/> .

<sup>12</sup> The DataHub is a centrally managed Oracle database which provides an easy means of extracting, consolidating and reporting management information from the University's main administrative systems (<http://www.bris.ac.uk/is/computing/applications/infosystems/datahub/overview.html> ).

<sup>13</sup> HP Labs Semantic Web research is described at this Url: <http://www.hpl.hp.com/semweb/>

<sup>14</sup> The JISC-funded CREW project is described at this Url: <http://www.crew-vre.net/> .

and Allison Allden, Director of Information Services have expressed their support for the project in the attached supporting letter.

37. Our approach to dissemination and engagement with external communities of practice will include seeking advice from the U&I programme and publishing project outputs to the e-Framework wiki. We will articulate our 'mashup' through a SUM (Service Usage Model) to the e-Framework semantic wiki, and attend U&I programme meetings as appropriate. We will seek to collaborate with related JISC projects where possible and we will also make reports and our open source pilot software freely available online.

### 38. Budget

<b>Directly Incurred Staff</b>	<b>April 07– March 08</b>	<b>April 08– Oct 08</b>	<b>TOTAL £</b>
Project Manager, RII, 3.15 hours per week, 12.5%			
Senior Technical Researcher, RII, 35 hours per week, 100%			
<b>Total Directly Incurred Staff (A)</b>	<b>£4,356.38</b>	<b>£30,494.62</b>	<b>£34,851.00</b>
<b>Non-Staff</b>	<b>April 07– March 08</b>	<b>April 08– Oct 08</b>	<b>TOTAL £</b>
Travel and expenses	£	£	£
Hardware/software	£	£	£
Dissemination	£	£	£
Evaluation	£	£	£
Consultancy (to be provided by Geraint Jones, Research Manager, Faculty of Engineering)	£1,561.88	£937.12	£2,499.00
Office Costs	£375.00	£225.00	£600.00
<b>Total Directly Incurred Non-Staff (B)</b>	<b>£1,936.88</b>	<b>£1,162.12</b>	<b>£3,099.00</b>
<b>Directly Incurred Total (A+B=C)</b>	<b>£6,293.26</b>	<b>£31,656.74</b>	<b>£37,950.00</b>
<b>Directly Allocated</b>	<b>April 07– March 08</b>	<b>April 08– Oct 08</b>	<b>TOTAL £</b>

Staff			
Estates	£574.00	£4,018.00	£4,592.00
Other			
<b>Directly Allocated Total (D)</b>	<b>£574.00</b>	<b>£4,018.00</b>	<b>£4,592.00</b>
<b>Indirect Costs (E)</b>	<b>£3,102.12</b>	<b>£21,714.88</b>	<b>£24,817.00</b>
<b>Total Project Cost (C+D+E)</b>	<b>£9,969.38</b>	<b>£57,389.62</b>	<b>£67,359.00</b>
<b>Amount Requested from JISC</b>	<b>£7,400.18</b>	<b>£42,599.82</b>	<b>£50,000.00</b>
<b>Institutional Contributions</b>	<b>£2,569.20</b>	<b>£14,789.80</b>	<b>£17,359.00</b>
<b>Percentage Contributions over the life of the project</b>	<b>JISC</b>	<b>Partners</b>	<b>Total</b>
	<b>74.23%</b>	<b>25.77%</b>	<b>100.00%</b>

## Previous Experience of the Project Team

**39. Nikki Rogers** is a Senior Technical Researcher and Coordinator of the Web Futures team at the Institute for Learning and Research Technology at the University of Bristol. She has worked at the ILRT since 2000. She holds a First Class honours degree in Mathematics with Education (University of Warwick, 1993) and an MSc in Computer Science (University of Bristol 1999). She has several years' experience in developing with Semantic Web technologies including project work for the JISC IE Metadata Schema Registry (IEMSR) project and the SWAD-E (European Semantic Web) project. She was the Project Manager on the JISC VRE1 funded Iugo project and is currently the Technical Manager for the JISC funded VRE2 CREW project and Project Manager for the first phase CIP project based at the University of Bristol.

**40. Damian Steer** is a Senior Technical Researcher in the Web Futures team at the Institute for Learning and Research Technology at the University of Bristol. He is also a technical developer on the Semantic Web software 'Jena' at HPLabs Bristol. He has been developing Semantic Web applications since 1998 and is an experienced programmer with skills which include J2EE development. Recent projects include the JISC IE Metadata Schema Registry (IEMSR) project and the SWAD-E (European Semantic Web) project. Damian currently maintains the SquirrelRDF toolkit for bridging LDAP and relational databases into RDF, as well as working on the next Jena triple store at HPLabs Bristol. He also contributes to the JRuby project.

**FOI Withheld Information Form**

We would like JISC to consider withholding the following sections or paragraphs from disclosure, should the contents of this proposal be requested under the Freedom of Information Act, or if we are successful in our bid for funding and our project proposal is made available on JISC's website.

We acknowledge that the FOI Withheld Information Form is of indicative value only and that JISC may nevertheless be obliged to disclose this information in accordance with the requirements of the Act. We acknowledge that the final decision on disclosure rests with JISC.

<b>Section / Paragraph No.</b>	<b>Relevant exemption from disclosure under FOI</b>	<b>Justification</b>

