

# Repositories and Preservation Programme

Supplement to September 2006 Calls for Projects

## *Digital Repositories: a network for learning and research*

### **Introduction**

This briefing paper sets out additional information that should be taken into account when submitting proposals to the Repositories and Preservation Programme call September 2006. It contains some supplementary information that is referred to in the call for proposals, as well as additional information on standards, related reports and the programme.

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Details of the September 2006 Circular, the Calls for Projects, and the Town Meeting are available from <http://www.jisc.ac.uk/capital.html>

## **1. About the Programme**

The Repositories and Preservation Programme<sup>1</sup> builds upon extensive development and implementation in the areas of digital repositories, preservation and the JISC Information Environment<sup>2</sup> more broadly.

### **Vision**

This programme aims to establish a network of digital repositories and services, in order to significantly improve content use and curation.

### **Outcomes**

- Institutional and repository services will be further developed and populated. A richer search infrastructure for UK digital repositories.
- Further refinement of the application of standards and specifications for digital repositories and preservation.
- New software and tools for both digital repository use and digital preservation.
- Increased understanding of how repositories can be used and embedded to support education and research.
- Pilot implementations and models for resource discovery and preservation shared infrastructure.
- Clarification of roles and responsibilities across digital preservation services.

### **Benefits**

It is anticipated that the programme will result in a range of benefits for universities and colleges, including better access to and management of their intellectual outputs, increased capability within the sector to manage these assets for education and research, and an infrastructure that will support the sector into the future.

### **Structure**

The Repositories and Preservation Programme will make a major contribution to the creation of a UK wide network of digital repositories within the higher education sector. The Programme will be taken forward via a number of JISC calls for proposals. The different calls and programme areas relate to each other and will all contribute to the necessary cultural and technical change required to ensure that digital content can be used effectively to underpin education and research. Bidders should familiarise themselves with the related roadmap of calls for proposals<sup>3</sup>. The following diagram and table showing planned programme areas in the Repositories and Preservation Programme to help to give bidders an overview of how the projects are intended to work together and the planned work in these areas.

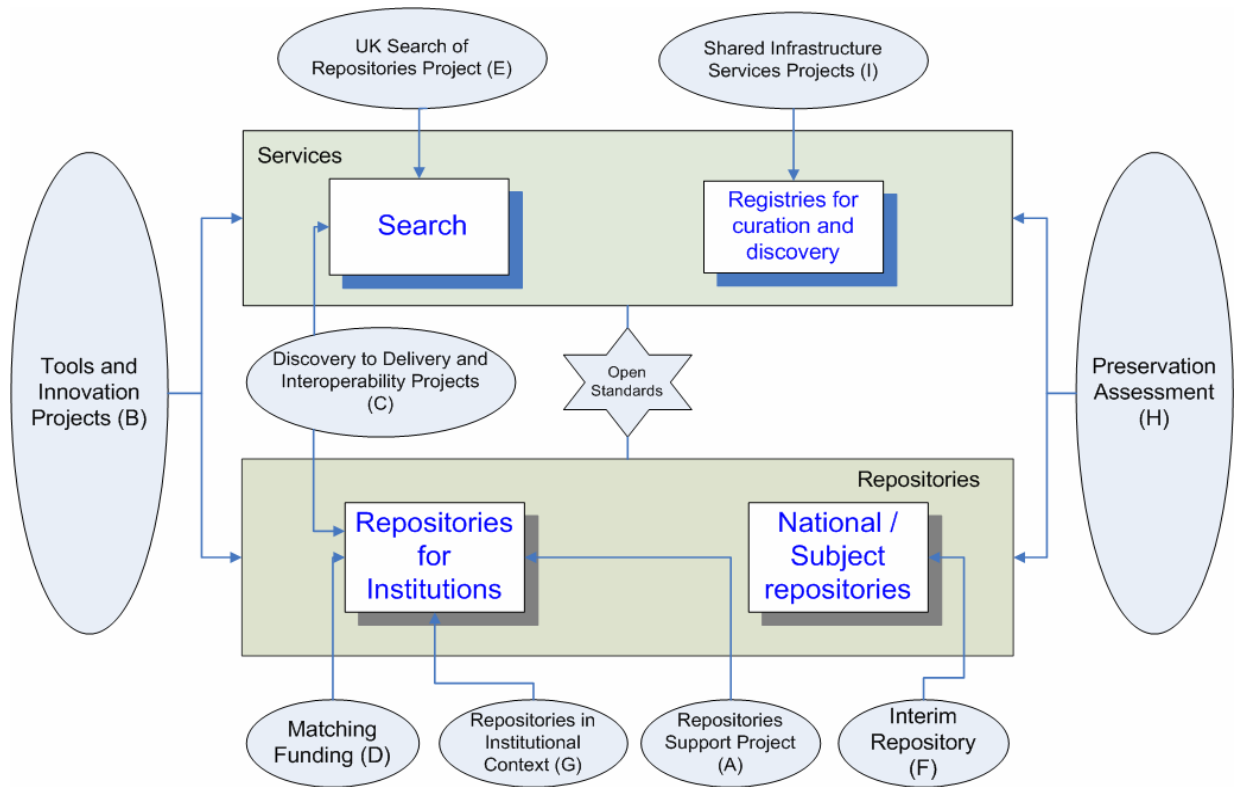
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<sup>1</sup> The Repositories and Preservation Programme [http://www.jisc.ac.uk/capital\\_rep.html](http://www.jisc.ac.uk/capital_rep.html)

<sup>2</sup> JISC Information Environment <http://jisc.ac.uk/ie>

<sup>3</sup> Circular Roadmap of Calls for Proposals [http://www.jisc.ac.uk/capital\\_roadmap.html](http://www.jisc.ac.uk/capital_roadmap.html)

# JISC Repositories and Preservation Programme Briefing - September 2006



The plans shown in the diagram above and the table below will evolve further but they are a good indication of the scope and activities of the Programme.

JISC Repositories and Preservation Programme Briefing - September 2006

Repositories and Preservation Programme Area	Work Already being funded via the April 2006 Call	Other related work that has been/is being commissioned as part of the Programme Area	Work areas via the Sept 2006 Call	April 2007 and Future work	Relationships between Programme Areas
<b>A)</b> Repositories Support Project	Repositories Support Project led by SHERPA, University of Nottingham	N/A	N/A	N/A	This project will work across the whole programme and in particular <b>B, C, D, H</b>
<b>B)</b> Tools and Innovation	<ol style="list-style-type: none"> <li>1. Complex Archive Ingest for Repository Objects - University of Oxford</li> <li>2. Contextualised Learning Activity Repository Tools (CLARET) – University of Southampton</li> <li>3. Data Exchange Tools and Conversion Utilities (DEXT) – University of Essex</li> <li>4. LIFE 2 – University College London</li> <li>5. Investigating the Significant Properties of Electronic Content Over Time – AHDS</li> <li>6. Sharing Objects Under Repository Control with Everyone (SOURCE) - Birkbeck - University of London</li> <li>7. Repository Interface for Overlay Journal Archives (RIOJA) – University College London</li> </ol>	N/A	Projects are invited as per the September 2006 Repository and Preservation call see <a href="http://www.jisc.ac.uk/capital_rep.html">http://www.jisc.ac.uk/capital_rep.html</a>	N/A	Projects in this area will be expected to feed into all other programme areas as appropriate but this is likely to vary on a case by case basis.
<b>C)</b> Discovery to Delivery	<ol style="list-style-type: none"> <li>1. e-Bank Phase 3 – UKOLN, University of Bath</li> <li>2. Defining Image Access – University of</li> </ol>	<ol style="list-style-type: none"> <li>1. Application Profile for e-Prints – Julie Allinson, UKOLN and</li> </ol>	Project are invited as per the September 2006 Repository and	It is anticipated that there	<b>A, E.</b> (in some cases <b>B)</b> Projects

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Repositories and Preservation Programme Area	Work Already being funded via the April 2006 Call	Other related work that has been/is being commissioned as part of the Programme Area	Work areas via the Sept 2006 Call	April 2007 and Future work	Relationships between Programme Areas
	<p>Oxford</p> <p>3. Rich Tags, Supporting Better Exploration of Digital Repositories with Semantic Social Tagging – University of Southampton</p>	<p>Andy Powell, Eduserv Foundation See: <a href="http://www.ukoln.ac.uk/repositories/digirep/index/Eprints_Application_Profile">http://www.ukoln.ac.uk/repositories/digirep/index/Eprints_Application_Profile</a></p> <p>2. Application Profile for Images – TASI</p> <p>3. Application profile for Moving Pictures and Sound (MPS) - BUFVC</p> <p>4. Application profile for Geospatial data – EDINA</p> <p>5. Scoping study for Learning Materials Requirements within a distributed network of Repositories</p> <p>6. Scoping Study for the requirements for Scientific Data within distributed network of Repositories</p>	<p>Preservation call see <a href="http://www.jisc.ac.uk/capital_rep.html">http://www.jisc.ac.uk/capital_rep.html</a></p>	<p>will be no further funding in this area.</p>	<p>in this area will help to ensure guidance is available on the standards and specifications required for the Search Infrastructure to work effectively. They will also form guidance for the Repositories Support Project to use.</p>
<p><b>D)</b> Matching funding for digital repository development: Start-Up and</p>	<p>No projects were commissioned via this Call.</p>	<p>N/A</p>	<p>Projects are invited as per the September 2006 Repository and Preservation call see <a href="http://www.jisc.ac.uk/capital_rep.html">http://www.jisc.ac.uk/capital_rep.html</a></p>	<p>Further Projects will be sought in April 2007</p>	<p><b>A, B, C, E.</b> Projects in this area will be expected to adhere to guidelines</p>

JISC Repositories and Preservation Programme Briefing - September 2006

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Enhancement Repository Projects			l_rep.html		that are produced via the other programme areas. In many cases projects will help to examine issues in more detail adding to findings and exploring cultural issues and institutional implementation.
<b>E)</b> Search Infrastructure	N/A	This work is being directly undertaken by the MIMAS Intute Service. The Scoping Phase has completed and the demonstrator phase is now being considered. See: <a href="http://www.intute.ac.uk/projects.html">http://www.intute.ac.uk/projects.html</a> and <a href="http://irs.ukoln.ac.uk/">http://irs.ukoln.ac.uk/</a> ( interim URL )	N/A	TBC	<b>A, C, D, F</b> ( in some cases <b>B</b> ). Areas A and C are the primary relationships with E, however the repository work under

JISC Repositories and Preservation Programme Briefing - September 2006

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					D will be expected to conform to the requirements of the search infrastructure.
<b>F)</b> Interim Repository	N/A	This work is being directly undertaken by EDINA and Sherpa, University of Nottingham. The Scoping Phase has completed and the next phase to build the interim repository is now being considered. See: <a href="http://www.sherpa.ac.uk/projects/prospero.html">http://www.sherpa.ac.uk/projects/prospero.html</a>	N/A	N/A	Should a repository be pursued beyond the current scoping phase it will have a relationship with all other areas. It will have close links to A and E
<b>G)</b> Repositories in an Institutional context	No projects were commissioned via this Call.	A small piece work may be commissioned in this area via an invitation to tender. The exact scope of this is yet to be confirmed.	N/A	This area is to be defined, it is anticipated that a small number of	Projects in this strand will have links to other packages and will be expected to

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				projects will be funded under the <b>April 2007</b> call and that systems integration will be the driver.	use and feed into A, B, C and E in particular.
<b>H)</b> Digital Preservation and Records Management	<p>No projects were commissioned via this Call. However please note that a number of projects related to preservation were funded under the tools and innovation area in April 2006 as listed above.</p> <p>Please note that are on going JISC projects in this area:  <a href="http://www.jisc.ac.uk/index.cfm?name=programme_404">http://www.jisc.ac.uk/index.cfm?name=programme_404</a></p>	N/A	Projects are invited as per the September 2006 Repository and Preservation call see: <a href="http://www.jisc.ac.uk/capital_rep.html">http://www.jisc.ac.uk/capital_rep.html</a>	TBC	<b>A, D.</b> ( in some cases <b>B</b> and <b>I</b> ) There are preservation aspects throughout the programme strands, this strand however will look specifically at roles and responsibilities in technical and organisation

JISC Repositories and Preservation Programme Briefing - September 2006

Repositories and Preservation Programme Area	Work Already being funded via the April 2006 Call	Other related work that has been/is being commissioned as part of the Programme Area	Work areas via the Sept 2006 Call	April 2007 and Future work	Relationships between Programme Areas
					al terms for different repositories and stakeholders . It will have close links with A and D.
I) Shared Infrastructure services	No projects were commissioned via this Call. Please note there are ongoing JISC projects in this area: <a href="http://www.jisc.ac.uk/index.cfm?name=programme_shared_services">http://www.jisc.ac.uk/index.cfm?name=programme_shared_services</a>	A Shared Infrastructure Services Synthesis Study was commissioned: <a href="http://www.jisc.ac.uk/circular04_06_Shared_Infrastructure_Services_Review">http://www.jisc.ac.uk/circular04_06_Shared_Infrastructure_Services_Review</a>	Projects are invited as per the September 2006 Repository and Preservation call see: <a href="http://www.jisc.ac.uk/capital_rep.html">http://www.jisc.ac.uk/capital_rep.html</a>	At this point it is anticipated that a number of projects will be funded in 07/08 but the scope and the mechanism are TBC	It is anticipated that a number of project will be sought – Some via Calls, others via Invitations to Tender and some directly commissioned
J) <i>Join-up scholarly communications</i>	No projects were commissioned via this Call.	The scope of this area is being defined.	The scope of this area is being defined.	TBC	TBC

## Repositories Research Team:

As part of the Digital Repositories Programme<sup>4</sup> a project team at UKOLN<sup>5</sup> and CETIS<sup>6</sup> was funded. This team was called Digital Repositories Support. For the new Repositories and Preservation Programme the JISC will fund this team to continue work however the name for the team has changed to Repositories Research Team<sup>7</sup> (RRT). The RRT aims to help projects find and exploit synergies across the programme and beyond e.g. gathering scenarios, use cases and workflows from projects, liaising with other national and international repositories activities, including liaison with the e-Framework, synthesizing project and programme outcomes, and engaging with interoperability standards activity and repository architectures.

## 1. Background

### *The Information Environment*

The Information Environment is part of the broader context to the Repositories and Preservation programme. The Information Environment will help to realise the potential of digital resources and networked services for learning and research. It will do this by helping to improve access and integration of these resources and services so the range of research and learning activities that users wish to undertake are more effectively supported. The JISC Information Environment<sup>8</sup> (IE) has been in development now for five or so years.

The Information Environment has a number of activities that underpin it and continue to develop and implement this vision. These are:

- A technical architecture<sup>9</sup> that supports resource discovery and curation of digital resources.
- A set of technical standards<sup>10</sup> that support the interoperability of resources and the integration of networked services.
- A set of development programmes<sup>11</sup> in the areas of portals, resource discovery, digital preservation, repositories, shared infrastructure services and so on.
- A number of national services in use e.g. Zetoc<sup>12</sup>, JORUM<sup>13</sup> and services in development e.g. Ethos<sup>14</sup> and the Information Environment Service Registry (IESR)<sup>15</sup>.

The intention is that the Information Environment (IE) will allow:

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<sup>4</sup> [http://www.jisc.ac.uk/index.cfm?name=programme\\_digital\\_repositories](http://www.jisc.ac.uk/index.cfm?name=programme_digital_repositories)

<sup>5</sup> <http://www.ukoln.ac.uk>

<sup>6</sup> <http://www.cetis.ac.uk/>

<sup>7</sup> <http://www.ukoln.ac.uk/repositories/digirep/index/About>

<sup>8</sup> [http://www.jisc.ac.uk/index.cfm?name=ie\\_home](http://www.jisc.ac.uk/index.cfm?name=ie_home)

<sup>9</sup> <http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/>

<sup>10</sup> <http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/standards/>

<sup>11</sup> Relevant URLs are set out in the body of this briefing paper.

<sup>12</sup> <http://zetoc.mimas.ac.uk/> - Zetoc provides access to the British Library's Electronic Table of Contents

<sup>13</sup> <http://www.jorum.ac.uk/> - Jorum is a free online repository service for teaching and support staff in UK Further and Higher Education Institutions

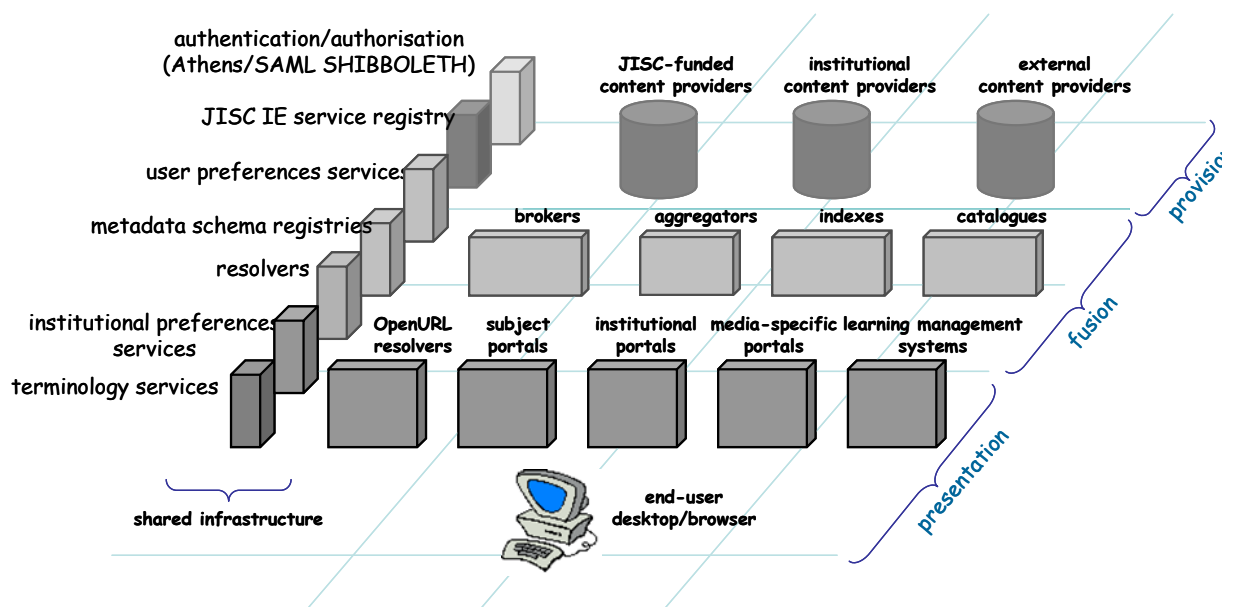
<sup>14</sup> <http://www.ethos.ac.uk/> - EThOS (Electronic Theses Online Service) is a project that aims to deliver a fully operational, easily scaleable and financially viable electronic theses service, and supporting infrastructure.

<sup>15</sup> <http://iesr.ac.uk/>

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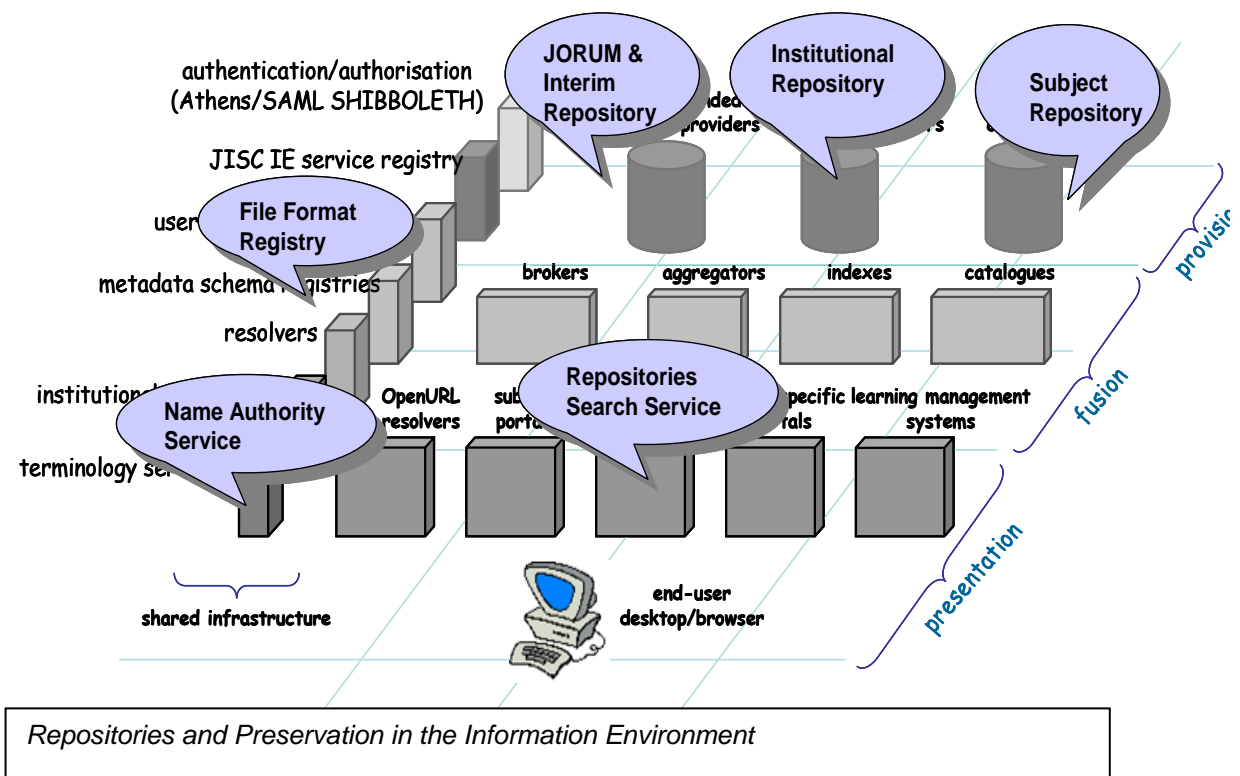
- easy access and delivery of heterogeneous and distributed resources in flexible ways;
- connections between, and use of different types of resources whether raw research data, catalogues, publications or learning materials;
- the development of good practice in the curation of digital resources including creation, dissemination and preservation;
- an approach that supports the presentation and use of resources within universities and colleges and in a distributed manner; so whether the end user is in a library, working from home using a virtual learning environment, using a virtual research environment or using a handheld device they can use resources easily.

The Repositories and Preservation programme is one of the activities that JISC is funding that will contribute to the development and implementation of the Information Environment. For example the architecture set out below has a provision layer – repositories form part of this provision layer. There are also projects that look to provide shared infrastructure services (also shown as a layer in the architecture below ) that will be funded via the Repositories and Preservation programme, for example the current September 2006 call seeks a pilot licence registry, such a registry is a potential shared infrastructure service. The repositories search project that is being funded through this programme will form part of the fusion and presentation layers of the architecture. It is also possible to see that the architecture could be extended to provide preservation services such as a file format registry which could be a shared infrastructure service. There are also a lot of organisational, policy and practice issues that surround the curation, provision and use of resources. These activities are not part of the architecture but they support the implementation of the architecture and also the ultimate goal of easy and flexible use for learning and research. Despite this general point with regard to organisational and policy issues in the architecture some services in the architecture will help, for instance the licence registry referred to above will help with the implementation of licence policies. In addition the aim of the architecture in achieving flexible interoperability should mean easier embedding into workflow and practice.



Andy Powell, UKOLN, University of Bath, 2003

Note SAML technologies and Shibboleth services will be implemented at different levels within the architecture and not as a single shared infrastructure service in same way ATHENS is.



## 2. JISC Programme Context

As well as digital repositories the JISC has been active in the development of digital preservation. For a number of years distinct programmes of activity in digital preservation have been undertaken. However, as far as possible digital preservation should be integrated into other activities that form part of the digital environment for learning, teaching and research. As part of this new programme, Repositories and Preservation, digital preservation will be as integrated as far as possible within the management and use aspects of digital repositories. It is important however to understand that the JISC is not only interested in digital repositories and how they support digital preservation, the JISC's vision is much wider than this and this programme intends to support other aspects of digital preservation that may fall outside of digital repositories. The name of the programme reflects the importance of digital preservation as a key element in the management and use of digital assets.

There have been a number of programmes in the areas of digital repositories and preservation that JISC has previously supported some of which are still on-going. These include:-

- Digital Repositories Programme (Circular 03/05)<sup>16</sup>
- Supporting Digital Preservation and Asset Management in Institutions (Circular 04/04)<sup>17</sup>
- Distributed e-Learning Regional Pilots<sup>18</sup>
- Digital Preservation and Records Management Programme<sup>19</sup>

<sup>16</sup> Digital Repositories Programme (Circular 03/05)

[http://www.jisc.ac.uk/index.cfm?name=programme\\_digital\\_repositories](http://www.jisc.ac.uk/index.cfm?name=programme_digital_repositories)

<sup>17</sup> Supporting Digital Preservation and Asset Management in Institutions (Circular 04/04)

[http://www.jisc.ac.uk/index.cfm?name=programme\\_404](http://www.jisc.ac.uk/index.cfm?name=programme_404)

<sup>18</sup> Distributed e-Learning Regional Pilots <http://www.jisc.ac.uk/pilotsdetail.html>

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- FAIR (Focus on Access to Institutional Resources)<sup>20</sup>
- X4L Phase One and Two<sup>21</sup>
- Semantic Grid and Autonomic Computing<sup>22</sup>
- Digital Libraries in the Classroom<sup>23</sup>
- LOCKSS Pilot Programme<sup>24</sup>

Closely related JISC initiatives include;

- JISC –SURF Partnering on Copyright<sup>25</sup>
- JISC Scholarly Communications Group<sup>26</sup>
- The Digital Curation Centre<sup>27</sup>

Other relevant JISC programmes are:

- Shared Services Programme<sup>28</sup> [note that this activity will be referred to as Shared Infrastructure Services and that it is a major area in the Repositories and Preservation Programme]
- PALS Metadata Interoperability Projects Phase 2<sup>29</sup>
- Portals Programme<sup>30</sup>
- Presentation Programme<sup>31</sup>
- Core Middleware Infrastructure Programme<sup>32</sup>
- Core Middleware Technology Development Programme<sup>33</sup>
- Digitisation Programme<sup>34</sup>

Particularly Relevant JISC Projects and Services:

- Digital Repositories Programme<sup>35</sup>, especially perhaps PerX, MIDESS, IRI Scotland, Grade, openDOAR, Community-Based Images Study
- FAIR Programme<sup>36</sup>, especially perhaps Eprints UK, HaIRST, Daedalus, and FAIR Portal
- EThOS Project<sup>37</sup>
- SHERPA/RoMEO<sup>38</sup> Publisher copyright policies and self-Archiving

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<sup>19</sup> Digital Preservation and Records Management Programme

[http://www.jisc.ac.uk/index.cfm?name=programme\\_preservation](http://www.jisc.ac.uk/index.cfm?name=programme_preservation)

<sup>20</sup> FAIR (Focus on Access to Institutional Resources) [http://www.jisc.ac.uk/index.cfm?name=programme\\_fair](http://www.jisc.ac.uk/index.cfm?name=programme_fair)

<sup>21</sup> X4L Phase One and Two [http://www.jisc.ac.uk/index.cfm?name=programme\\_x4l](http://www.jisc.ac.uk/index.cfm?name=programme_x4l)

<sup>22</sup> Semantic Grid and Autonomic Computing [http://www.jisc.ac.uk/index.cfm?name=programme\\_semantic\\_grid](http://www.jisc.ac.uk/index.cfm?name=programme_semantic_grid)

<sup>23</sup> Digital Libraries in the Classroom [http://www.jisc.ac.uk/index.cfm?name=programme\\_dlitc](http://www.jisc.ac.uk/index.cfm?name=programme_dlitc)

<sup>24</sup> LOCKSS Pilot Programme. [http://www.jisc.ac.uk/index.cfm?name=programme\\_lockss](http://www.jisc.ac.uk/index.cfm?name=programme_lockss)

<sup>25</sup> JISC –SURF Partnering on Copyright [http://www.jisc.ac.uk/index.cfm?name=programme\\_jiscsurfpr](http://www.jisc.ac.uk/index.cfm?name=programme_jiscsurfpr)

<sup>26</sup> JISC Scholarly Communications Group [http://www.jisc.ac.uk/index.cfm?name=jcie\\_scg](http://www.jisc.ac.uk/index.cfm?name=jcie_scg)

<sup>27</sup> The Digital Curation Centre <http://www.dcc.ac.uk/>

<sup>28</sup> Shared Services Programme [http://www.jisc.ac.uk/index.cfm?name=programme\\_shared\\_services](http://www.jisc.ac.uk/index.cfm?name=programme_shared_services)

<sup>29</sup> PALS Metadata Interoperability Projects Phase 2 [http://www.jisc.ac.uk/index.cfm?name=programme\\_pals2](http://www.jisc.ac.uk/index.cfm?name=programme_pals2)

<sup>30</sup> Portals Programme [http://www.jisc.ac.uk/index.cfm?name=programme\\_portals](http://www.jisc.ac.uk/index.cfm?name=programme_portals)

<sup>31</sup> Presentation Programme [http://www.jisc.ac.uk/index.cfm?name=programme\\_presentation](http://www.jisc.ac.uk/index.cfm?name=programme_presentation)

<sup>32</sup> Core Middleware Infrastructure Programme [http://www.jisc.ac.uk/index.cfm?name=programme\\_cminfrastructure](http://www.jisc.ac.uk/index.cfm?name=programme_cminfrastructure)

<sup>33</sup> Core Middleware Technology Development Programme

[http://www.jisc.ac.uk/index.cfm?name=programme\\_middleware](http://www.jisc.ac.uk/index.cfm?name=programme_middleware)

<sup>34</sup> Digitisation Programme [http://www.jisc.ac.uk/index.cfm?name=programme\\_digitisation](http://www.jisc.ac.uk/index.cfm?name=programme_digitisation)

<sup>35</sup> JISC Digital Repositories Programme: [http://www.jisc.ac.uk/index.cfm?name=programme\\_digital\\_repositories](http://www.jisc.ac.uk/index.cfm?name=programme_digital_repositories)

<sup>36</sup> FAIR Programme: [http://www.jisc.ac.uk/fair\\_synthesisintro.html](http://www.jisc.ac.uk/fair_synthesisintro.html)

<sup>37</sup> Ethos <http://www.ethos.ac.uk/>

- Portals Programme<sup>39</sup>
- Shared Services Programme<sup>40</sup>, especially IESR, IEMSR, HILT, geoXwalk
- Core Middleware Programme<sup>41</sup>.
- Briefing papers on JISC's developments in the Federated Access Management Infrastructure<sup>42</sup>
- Linking UK Repositories: Scoping Study Report<sup>44</sup>
- The JORUM<sup>45</sup>
- ePrints Dublin Core Application Profile (UKOLN)<sup>46</sup>
- Planned studies to be funded outside this call for proposals in the area of images, moving pictures and Sound (MPS) and geospatial data application profiles
- Planned studies to be funded outside this call for proposals into what is required for scientific data and Learning materials application profiles.

### **Key Reports**

#### **Digital Repositories Roadmap: Looking Forward**

JISC has funded a Digital Repositories Roadmap<sup>47</sup> document to present a vision for 2010. This has been undertaken by Rachel Heery from UKOLN and Andy Powell from the Eduseriv Foundation. This is a discussion document that provides context for project and programme work and it will serve to show progress as the programme develops.

The vision is one where there is a rich scholarly communications and learning environment that is supported by an extensive network of repositories, where content is widely available and re-used. The repositories will allow sharing, collaboration, a record of activity and so on and will be enhanced by value added services that support manipulation, interlinking and personalisation among other things. The Digital Repositories Roadmap concludes that it is cultural and policy issues that lie at the heart of achieving success for a digital repository network for learning and research. It will therefore be important for rights issues, policy, training and advocacy to form part of the programme.

The Roadmap uses a broader definition of a repository than that outlined in the call. This broader definition is helpful in thinking about the purpose of a repository and it comes from Cliff Lynch, Director of the Coalition of Networked Information.

"...a university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organisational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organisation and access or distribution. ...an institutional

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<sup>38</sup> SHERPA/RoMEO <http://www.sherpa.ac.uk/projects/sherparomeo.html>

<sup>39</sup> Portals Programme: [http://www.jisc.ac.uk/index.cfm?name=programme\\_portals](http://www.jisc.ac.uk/index.cfm?name=programme_portals)

<sup>40</sup> Shared Services Programme: [http://www.jisc.ac.uk/index.cfm?name=programme\\_shared\\_services](http://www.jisc.ac.uk/index.cfm?name=programme_shared_services)

<sup>41</sup> Core Middleware Programme: [http://www.jisc.ac.uk/index.cfm?name=programme\\_cminfrastructure](http://www.jisc.ac.uk/index.cfm?name=programme_cminfrastructure)

<sup>42</sup> Federated Access Management Infrastructure: <http://www.jisc.ac.uk/federation.html>

<sup>43</sup> Federated Access Management Infrastructure <http://www.jisc.ac.uk/federation.html>

<sup>44</sup> Linking UK Repositories: Scoping Study Report:

[http://www.jisc.ac.uk/uploaded\\_documents/Linking\\_UK\\_repositories\\_report.pdf](http://www.jisc.ac.uk/uploaded_documents/Linking_UK_repositories_report.pdf)

<sup>45</sup> Jorum <http://www.jorum.ac.uk>

<sup>46</sup> ePrints Dublin Core Application Profile [http://www.ukoln.ac.uk/repositories/digirep/index/Eprints\\_Application\\_Profile](http://www.ukoln.ac.uk/repositories/digirep/index/Eprints_Application_Profile)

<sup>47</sup> Digital Repositories Roadmap [http://www.jisc.ac.uk/uploaded\\_documents/rep-roadmap-v15.doc](http://www.jisc.ac.uk/uploaded_documents/rep-roadmap-v15.doc)

repository is not simply a fixed set of software and hardware.” Lynch,C.,ARL Bimonthly report 226<sup>48</sup>.

Prior to the Digital Repositories programme that JISC funded in 2005 JISC funded a short study to set out the issues relating to digital repositories. This was an overview of the terrain at that point in time and it set out issues and challenges and parameters. This study is still relevant and is at: [http://www.jisc.ac.uk/uploaded\\_documents/digital-repositories-review-2005.pdf](http://www.jisc.ac.uk/uploaded_documents/digital-repositories-review-2005.pdf)

### Linking UK Repositories

JISC commissioned Chris Awre, University of Hull and Alma Swan, Key Perspectives Ltd to undertake a five-month scoping study<sup>49</sup> to identify sustainable technical and organisational models to support user-oriented services across digital repositories. The study investigated four aspects:

- User requirements
- Roles and responsibilities
- Technical architecture
- Business models

A key output from the study was a description of the range of services and functionality that would be required around repositories to facilitate their linkage and support user-oriented services.

### Information Environment Shared Infrastructure Requirements Synthesis

JISC commissioned UKOLN to undertake a Shared Infrastructure Services requirements synthesis<sup>50</sup> to support taking forward machine-to-machine (M2M) shared infrastructure within the IE. The objectives of the report were:

- to inform development of M2M shared infrastructure for resource discovery, repositories and preservation;
- to synthesise the outcomes of effort so far, from JISC activities and the wider context and to include the international and commercial context
- to help stakeholders understand the need for this M2M shared infrastructure
- to help JISC identify and mitigate risks to development in this area
- to inform planning and commissioning for capital funding, most significantly the September Call for Shared Infrastructure Services
- to provide a report that transforms the study findings into a series of direction-setting recommendations.

### State-of-the-art Review of Terminology Services and Technology

JISC commissioned UKOLN and the University of Glamorgan undertake work on a State-of-the-art Review of Terminology Services and Technology<sup>51</sup>. The review is intended to inform the JISC on how to move forward with terminology services, building on progress in the HILT

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<sup>48</sup> Lynch,C.,ARL Bimonthly report 226 : <http://www.arl.org/newsltr/226/ir.html>

<sup>49</sup> Linking UK Repositories [http://www.jisc.ac.uk/uploaded\\_documents/Linking\\_UK\\_repositories\\_report.pdf](http://www.jisc.ac.uk/uploaded_documents/Linking_UK_repositories_report.pdf)

<sup>50</sup> Shared Infrastructure Services requirements synthesis

[http://www.jisc.ac.uk/circular04\\_06\\_Shared\\_Infrastructure\\_Services\\_Review](http://www.jisc.ac.uk/circular04_06_Shared_Infrastructure_Services_Review)

<sup>51</sup> State-of-the-art Review of Terminology Services and Technology

[http://www.jisc.ac.uk/circular04\\_06\\_Terminology\\_Services\\_and\\_Technology](http://www.jisc.ac.uk/circular04_06_Terminology_Services_and_Technology)

project and geoXwalk project<sup>52</sup>, and the outcome of the JISC Terminology Services Workshop of February 2004<sup>53</sup>

The review's aims were to: identify problem areas where terminology support could be useful; set out a typology of vocabularies and review existing vocabularies, identifying gaps in vocabulary provision and pointing to best practice in vocabulary construction; consider applications of name authority and disambiguation services, and folksonomies and social tagging.

### **3. International Context**

Research and education are increasingly global, so that repositories need to interoperate at a global level. Projects will need to show that they have taken into account this need and, where relevant, should seek to work with or learn from initiatives such as DAREnet<sup>54</sup> and LOREnet in the Netherlands and ARROW<sup>55</sup> in Australia. The JISC has formal strategic partnerships with SURF<sup>56</sup> in the Netherlands and DEST<sup>57</sup> in Australia and is therefore particularly interested in sharing and cooperating with SURF and DEST initiatives.

An example of the major international initiative in digital preservation is the National Digital Information Infrastructure and Preservation Program (NDIIPP) programme<sup>58</sup>, a collaborative effort led by the US Library of Congress, and its associated Digital Archiving and Long-Term Preservation (DIGARCH) research program, funded by NDIIPP and the US National Science Foundation to stimulate research and build capabilities for long-term management and preservation of digital materials. Projects may build on outputs from this activity.

### **4. Technical Guidelines**

The JISC Repositories and Preservation Programme projects are encouraged to adopt relevant standards in order to improve interoperability between repositories, content and services.

Bidders under the Repositories and Preservation Programme should familiarise themselves with the technical standards for the JISC Information Environment<sup>59</sup> and the service oriented approach of the JISC e-Framework for Education and Research<sup>60</sup>.

Background on the Information on the Information Environment is set out earlier in this briefing paper. There are briefing papers to support further understanding of the e-Framework. An introduction follows here. The e-Framework for Education and Research is an international initiative, led by JISC, to explore the potential benefits of applying a service oriented approach to the provision of ICT infrastructure for education and research, and where successful to support its broader adoption by institutions and their suppliers. Where projects carry out technical development, this should as far as possible be done within the service-oriented approach of the e-Framework, and, where possible, should expose and consume functionality via web services. However other technical approaches are permissible, where appropriate, e.g. where existing standards are already in use (such as Z39.50), where

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<sup>52</sup> GeoXwalk [http://www.jisc.ac.uk/index.cfm?name=project\\_xwalk3](http://www.jisc.ac.uk/index.cfm?name=project_xwalk3)

<sup>53</sup> JISC Terminology Services Workshop of February 2004 <http://www.ukoln.ac.uk/events/jisc-terminology/demonstration-summaries.html>

<sup>54</sup> DAREnet: <http://www.darenet.nl/en/page/language.view/home>

<sup>55</sup> ARROW: <http://arrow.edu.au/>

<sup>56</sup> SURF: <http://www.surf.nl/home/>

<sup>57</sup> DEST: <http://www.dest.gov.au/>

<sup>58</sup> NDIIP: <http://www.digitalpreservation.gov/>

<sup>59</sup> JISC Information Environment <http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/standards/>

<sup>60</sup> JISC e-Framework for Education and Research <http://www.e-framework.org/>

Web services (SOAP or REST) do not yet meet performance or functional needs (such as for secure transactions). Other projects that will not be providing services themselves are encouraged to use web service-enabled tools and applications within their own environment. All projects should be able to contribute to the knowledge base which the e-Framework is developing. This can include domain, practice and process models, scenarios and use cases, and good practice guidelines on the internal and cross-institutional implementation of the technology, as well as information about the service definitions they have used or developed.

The Information Environment approach fits within that of the e-Framework. In effect the Information Environment architecture includes a sub set of the e-Framework services and is a proposed implementation of services that support discovery to delivery and curation. A useful way to see how this works is Andy Powell's draft discovery to delivery reference model<sup>61</sup>

Repository service developers must adopt the Information Environment standards. Particularly relevant standards and specifications are:

- Dublin Core for metadata,
- OAI-PMH for harvesting
- UK LOM Core for learning resource metadata
- E-Prints applications profile

Projects should also be aware of further emerging standards and frameworks such as:

- OAIS framework<sup>62</sup>
- Trusted Repositories model<sup>63</sup>

This list is provided as a rough guide, and successful bidders will be supported in further exploration of appropriate standards. For example METS<sup>64</sup> and MPEG 21 DIDL are relevant for complex objects and will be relevant to projects. JISC-funded projects are part of a development community, and should engage with standards issues where possible, exploring specifications for innovative developments. Projects will be expected to work with the JISC Development services, UKOLN and CETIS, in the area of interoperability and standards and specifications.

It is anticipated that programme structures will support the sharing of lessons and the specifying and testing of technical standards and specifications. As the programme develops the JISC will require that projects test and adopt solutions to develop a national infrastructure for repository curation and discovery services. This will be based on the IE but the IE will be further refined and implemented through the programme activity and in particular with reference to services for digital repositories, preservation and shared infrastructure services. The JISC recognises that the implementation of standards is not always simple: there is often room for interpretation; standards are maturing at different rates; and developers may need to customise standards for local requirements. Standards should not be a constraint on projects: they should improve interoperability, save time and effort, and ensure that the education sector can benefit from individual projects. In the long term, widespread adoption of standards will improve the user experience.

### **e-Framework for Education and Research**

The e-Framework for Education and Research is an international initiative, led by JISC, to explore the potential benefits of applying a service oriented approach to the provision of ICT infrastructure for education and research, and where successful to support its broader adoption by institutions and their suppliers. See e-Framework Overview Briefing<sup>65</sup>.

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<sup>61</sup> Discovery to delivery reference model. <http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/dlf/>

<sup>62</sup> OAIS framework <http://public.ccsds.org/publications/archive/650x0b1.pdf>

<sup>63</sup> Trusted Repositories model <http://www.rlq.org/legacy/longterm/repositories.pdf>

<sup>64</sup> METS <http://www.loc.gov/standards/mets/>

<sup>65</sup> e-Framework and SOA Briefing [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_Overview\\_word](http://www.jisc.ac.uk/circular04_06_e-Framework_Overview_word)  
or [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_Overview\\_pdf](http://www.jisc.ac.uk/circular04_06_e-Framework_Overview_pdf)

Its main provision is an evolving knowledge base, presented as the e-Framework website<sup>66</sup>, containing information and links to further information on services and their effective use. There is thus technical information about open service standards covering pre-specification prototypes, specifications and standards under development, those being implemented and those in general use. There is also information about the usage of services, the domains and context of use, the human level, tasks and processes being supported, scenarios and case studies of how humans make use of service based applications to accomplish these and technical information about the ways in which the services were brought together. See e-Framework DP and SM Briefing<sup>67</sup>.

These two aspects interact and are expected to evolve as it becomes clear which areas benefit most from a service oriented approach, and which less. Also commonalities across tasks will refine the services that support them and the provision of services will enable more flexible implementations that allow new practices and processes to evolve.

Projects are expected to work within the e-Framework by making use of its available information and by contributing to its further development, with the emphasis on the latter in the early stages. How this happens will depend on the nature of the project.

Where projects carry out technical development, this should be done within the service-oriented approach of the e-Framework, and, where possible, should expose and consume functionality via Web Services (SOAP or REST). However other technical approaches are permissible, where appropriate, e.g. where existing standards are already in use (such as Z39.50), or where Web services do not yet meet performance or functional needs (such as for secure transactions). See Web Services and SOA Briefing<sup>68</sup>.

Other projects that will not be providing services themselves are encouraged to use web service-enabled tools and applications within their own environment. All projects should be able to contribute to the knowledge base which the e-Framework is developing. This can include domain, practice and process models, scenarios and use cases, and good practice guidelines on the internal and cross-institutional implementation of the technology, as well as information about the service definitions they have used or developed.

At the interface between users and services there is emerging a thinner, but more flexible and capable technical user environment layer. This is taking two forms: the continued development of portal technology and the so called rich client platform. Both of these provide a capable plug-in software framework that can take much of the work out of developing the user interface allowing concentration on the coordinating functionality of the tool or application. See Service Oriented Application Integration Layer Briefing<sup>69</sup>.

The goal is to both to record relevant project outputs and outcomes, in order to support those seeking to implement a service oriented approach. By sharing developments and experiences internationally, we hope to be able to do this more effectively and rapidly than if done alone, and by developing and adopting open standards, establish a wider and more open market enabling costs to be reduced.

### Software Development

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<sup>66</sup> <http://www.e-framework.org>

<sup>67</sup> *e-Framework DP and SM Briefing* [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_DP\\_and\\_SM\\_Briefing\\_word](http://www.jisc.ac.uk/circular04_06_e-Framework_DP_and_SM_Briefing_word) or [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_DP\\_and\\_SM\\_Briefing\\_pdf](http://www.jisc.ac.uk/circular04_06_e-Framework_DP_and_SM_Briefing_pdf)

<sup>68</sup> *e-Framework Web Services and SOA Briefing* [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_and\\_SOA\\_Briefing\\_word](http://www.jisc.ac.uk/circular04_06_e-Framework_and_SOA_Briefing_word)

or [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_and\\_SOA\\_Briefing\\_pdf](http://www.jisc.ac.uk/circular04_06_e-Framework_and_SOA_Briefing_pdf)

<sup>69</sup> *e-Framework Service Oriented Application Integration Layer Briefing* [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_SOA\\_Integration\\_Layer\\_Briefing\\_word](http://www.jisc.ac.uk/circular04_06_e-Framework_SOA_Integration_Layer_Briefing_word) or [http://www.jisc.ac.uk/circular04\\_06\\_e-Framework\\_SOA\\_Integration\\_Layer\\_Briefing\\_pdf](http://www.jisc.ac.uk/circular04_06_e-Framework_SOA_Integration_Layer_Briefing_pdf)

Projects developing software should also provide evidence and/or consideration of an exit strategy appropriate to the software outputs and desired outcomes of the call areas. For instance, bidders must take into account JISC's Policy on Open Source Software for JISC Projects and Services<sup>70</sup>. In particular, proposals should make clear the licence under which software outputs will be released, mechanisms that will be put in place for community contribution (users and developers) throughout the project, and the sustainability plan for the project software outputs beyond the period of direct JISC funding. Bidders are encouraged to consult with JISC's open source software advisory service, OSS Watch<sup>71</sup>. There are also examples of software and practice that projects can refer to e.g. The Open Middleware Infrastructure Institute UK (OMII-UK)<sup>72</sup>

The robustness of software or a service produced should be appropriate to the level of funding and the intended usage. To aid thinking around these issues, a three point scale over a continuum that indicates the maturity of the software development is set out below. As developments mature more robust documentation for software and associated licences will be necessary:

- i) proof or development of the technologies – as in a demonstrator - "in the lab";
- ii) piloting applicability "outside the lab" - something that external users can experiment with even if the software is not full production quality or can only cope with smaller data sets;
- iii) production service - starts looking toward the business models needed to reach full production.

Further, more detailed, advice is available under the JISC Project Management Guidelines<sup>73</sup> and there will be further discussions with the successful bidder(s) upon award.

### **Further open source software advice and sites:**

- Randy Metcalfe, OSS-Watch – [randolph.metcalfe@oucs.ox.ac.uk](mailto:randolph.metcalfe@oucs.ox.ac.uk)
- The 'standard' repository for open source software<sup>74</sup>
- An alternative for directory and security infrastructure<sup>75</sup>

## **5. Cultural Considerations for Digital Repositories**

The JISC Repositories and Preservation projects are encouraged to draw from good practice that has been either developed or identified in previous work in this area. Such practice varies between domains (learning, research), so that it is difficult to give general guidance. In general it is important to show that relevant organisation, cultural, policy and legal dimensions to a project's work have been addressed and that risks and opportunities have been identified and planned for. The following guide to sources of information about good practice should allow projects to draw from and build on previous work, and plan more effectively.

The JISC has released a number of briefing papers that are relevant to repositories and preservation, and which offer a high-level overview of the main issues. These include papers

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<sup>70</sup>JISC Open source Policy [www.jisc.ac.uk/index.cfm?name=about\\_opensourcepolicy](http://www.jisc.ac.uk/index.cfm?name=about_opensourcepolicy)

<sup>71</sup>JISC's open source software advisory service, OSS Watch [www.oss-watch.ac.uk/](http://www.oss-watch.ac.uk/)

<sup>72</sup>The Open Middleware Infrastructure Institute UK (OMII-UK) [www.omii.ac.uk/](http://www.omii.ac.uk/)

<sup>73</sup>JISC Project Management Guidelines [http://www.jisc.ac.uk/proj\\_manguide.html](http://www.jisc.ac.uk/proj_manguide.html)

<sup>74</sup> The 'standard' repository for open source software [www.sourceforge.net](http://www.sourceforge.net)

<sup>75</sup> An alternative for directory and security infrastructure <http://safehaus.org/>

on Repositories in Further and Higher Education<sup>76</sup>, Open Access<sup>77</sup>, and e-Science Data Curation<sup>78</sup>. Others have written in more detail, for example a recent book on Institutional Repositories offers guidance<sup>79</sup> in that area.

Research outputs: Previous JISC-funded development work has produced substantial knowledge in this area. For example, the FAIR Programme<sup>80</sup> resulted in a topic-based synthesis of work, covering setting up a repository, advocacy and cultural issues, legal issues and preservation. The Sherpa project<sup>81</sup> continues to offer guidance on a similar range of issues. Legal matters are a particular focus of the outputs from work arising from a JISC-SURF partnership on copyright<sup>82</sup>, focusing specifically on questions around research papers. In the field of curation, the Digital Curation Centre<sup>83</sup> is producing a Digital Curation Manual.

In the eLearning world, the SURF project (not to be confused with the SURF Foundation, mentioned above), which was funded under the JISC X4L programme<sup>84</sup>, developed a guide to good practice and problem areas in cultural, educational and organisational change<sup>85</sup>. The JORUM<sup>86</sup> has released a number of review reports, including one on preservation in an eLearning context<sup>87</sup>. The Trust DR<sup>88</sup> project has released papers on the practical implications of IPR in eLearning.

### **6. Proposal Planning – areas to consider**

Projects may want to consider the following aspects within their proposals, in particular it is relevant to the Repository Start-Up and Enhancement Projects

- Planning
  - Business process reviews and requirements analysis
  - stakeholder consultation
  - Specification of solutions
  - Identifying staff roles and responsibilities within and between organisations
  - Specification of enhancements
- Technical implementation:
  - Procurement of software or services
  - Implementation and configuration
  - Maintenance
  - Developing approaches to authorisation and authentication, such as the provision of repository content through the access management federation<sup>89</sup>

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<sup>76</sup> Repositories in Further and Higher Education briefing paper:

[http://www.jisc.ac.uk/index.cfm?name=pub\\_repositories](http://www.jisc.ac.uk/index.cfm?name=pub_repositories)

<sup>77</sup> Open Access: [http://www.jisc.ac.uk/index.cfm?name=pub\\_openaccess](http://www.jisc.ac.uk/index.cfm?name=pub_openaccess)

<sup>78</sup> e-Science Data Curation: [http://www.jisc.ac.uk/index.cfm?name=pub\\_escience](http://www.jisc.ac.uk/index.cfm?name=pub_escience)

<sup>79</sup> Jones, R., Andrew, T. and McColl, J. (2006) The Institutional Repository:

[http://www.chandospublishing.com/catalogue/record\\_detail.php?recordID=76](http://www.chandospublishing.com/catalogue/record_detail.php?recordID=76)

<sup>80</sup> FAIR Programme Synthesis: [http://www.jisc.ac.uk/index.cfm?name=pub\\_fair](http://www.jisc.ac.uk/index.cfm?name=pub_fair)

FAIR Synthesis website: [http://www.jisc.ac.uk/fair\\_synthesisintro.html](http://www.jisc.ac.uk/fair_synthesisintro.html)

<sup>81</sup> Sherpa Guidance: <http://www.sherpa.ac.uk/guidance/index.html>

<sup>82</sup> JISC-SURF partnering on copyright: <http://www.lboro.ac.uk/departments/dis/disresearch/poc/index.html>

<sup>83</sup> Digital Curation Centre: <http://www.dcc.ac.uk/>

<sup>84</sup> Exchange for Learning (X4L) programme: [http://www.jisc.ac.uk/programme\\_x4l.html](http://www.jisc.ac.uk/programme_x4l.html)

<sup>85</sup> Introducing the Reuse and Repurposing of Content as part of the embedding of eLearning:

<http://www.staffs.ac.uk/COSE/X4L/SURFX4Lmain.pdf>

<sup>86</sup> JORUM: <http://www.jorum.ac.uk/>

<sup>87</sup> JORUM Preservation Watch Report: [http://www.jorum.ac.uk/docs/pdf/Digital\\_Preservation\\_Report.pdf](http://www.jorum.ac.uk/docs/pdf/Digital_Preservation_Report.pdf)

<sup>88</sup> Trust DR: <http://www.staff.uhi.ac.uk/eo02jc/trustdr/index.php>

<sup>89</sup> UK Access Management Federation <http://www.ukfederation.org.uk/>

- Implementation and configuration of tools and enhancements, such as Using tools to enable full-text searching, Improving the exposure of metadata and content through implementing standards-based application profiles, Using tools to aid deposit and metatagging
- Improving the integration of repositories with other systems (research information systems, virtual learning/research environments, library catalogues etc)
- Policy development:
  - Developing policies and processes for deposit.
  - Developing policies for long-term access and strategy for preservation, with clearly defined roles and responsibilities, including external services where appropriate
  - Developing policies for addressing legal issues such as IPR, third party copyright, data protection etc
- Populating the repository with content:
  - Training and support
  - Promotion and advocacy
  - Collecting student e-theses for future access
  - Building repository use into workflows in learning, teaching and research

## **7. JISC Website Resources for Project Planning**

JISC projects are expected to adhere to the JISC Programme Management Framework<sup>90</sup> as set in the terms and conditions of grant once funding is approved. This includes regular reporting and attendance at programme related meetings.

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<sup>90</sup> JISC Project Management Guidelines [http://www.jisc.ac.uk/proj\\_manguide.html](http://www.jisc.ac.uk/proj_manguide.html)

## **8. *Contacts***

Further Information is available from the JISC Development Group. The following people form the team managing the Repositories Preservation Programme:

**Rachel Bruce**, Programme Director, Information Environment

**Helen Hockx-yu**, Programme Manager, Digital Preservation

**Neil Jacobs**, Programme Manager, Digital Repositories

**Balviar Notay**, Programme Manager, Resource Discovery, Portals and Presentation

**Amber Thomas**, Programme Manager, Digital Repositories

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