

Repositories and Preservation Proposal Cover Sheet

Cover Sheet for Proposals (All sections must be completed)		<i>JISC Capital Programme</i>
Name of Capital Programme: Repositories and Preservation Programme		
Bid for Call Area : (Please tick ONE BOX ONLY, as appropriate)		
Tools and Innovation (Strand B)		
X	Call Area I – Tools and Innovation Projects	Please specify area of proposed project eg <i>'metadata generation and validation'</i> Linking, integration and re-use; use of RSS and Atom; common repository interfaces
Discovery to Delivery (Strand C)		
	Call Area II – Discovery to Delivery Projects	<input type="checkbox"/> a) Version identification framework <input type="checkbox"/> b) Persistent identifier interoperability demonstrator <input type="checkbox"/> c) Federated access management and repositories <input type="checkbox"/> d) Semantic interoperability demonstrator
Repository Start-Up and Enhancement (Strand D)		
	Call Area III – Repository Start-Up and Enhancement Projects	<input type="checkbox"/> a) Repository start-up projects <input type="checkbox"/> b) Repository enhancement projects
Digital Preservation and Records Management (Strand H)		
	Call Area IV – Digital Preservation and Records Management Projects	<input type="checkbox"/> a) Digital preservation across the lifecycle <input type="checkbox"/> b) Models and implementation of preservation services <input type="checkbox"/> c) Preservation tools development
Shared Infrastructure Services (Strand I)		
	Call Area V – Shared Infrastructure Services Projects	<input type="checkbox"/> a) Pilot implementation of licence registry <input type="checkbox"/> b) Pilot national name and factual authority service <input type="checkbox"/> c) Scoping an architecture to support digital policy management <input type="checkbox"/> d) Scoping a terminology registry
Name of Lead Institution: University of Bolton		
Name of Proposed Project: FeedForward		
Name(s) of Project Partner(s): N/A		

Full Contact Details for Primary Contact:

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Position: Director of CETIS

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Length of Project: 14 Months

Project Start Date: June 2007 Project End Date: September 2008

Total Funding Requested from JISC: £50,000

Funding Broken Down over Financial Years (April – March):

Apr06 – Mar07	Apr07 – Mar08	Apr08 – Mar09
	£50,000	

Total Institutional Contributions: £27,500

Percentage Contributions over the Life of the Project:	JISC	PARTNERS
	64%	36%

Outline Project Description

We will develop a highly-usable desktop tool that aims to support a synthesis of user-created and curated content within a simple workflow consistent with general information management practices emerging as a result of the popularity of the RSS and Atom metadata aggregation formats.

The tool will have many of the features of an RSS aggregator and blog post editor but combined also with the capability to make extensive use of the information environment, including using the Information Environment Service Registry (IESR) for discovering and adding new sources, ePrints servers and institutional repositories via OAI-PMH, and access to learning object repositories such as JORUM via SRU search.

I have looked at the example FOI form at Appendix A and included an FOI form in the attached bid (Tick Box)	YES	NO
	√	

I have read the Circular and associated Terms and Conditions of Grant at Appendix B (Tick Box)	YES	NO
	√	

FeedForward: A composite application to collect, create, re-use and share resources

1. Introduction

One of the key issues facing the information environment, and in particular the public-funded repositories, is connecting resources into daily practices of teaching, learning and research. While a great wealth of resources exist available for discovery, and portals have been developed around specific topics, actual use remains sporadic, and in many cases the only access to these resources is via Google. Simultaneously, however, there has been a massive increase in the use and demand for internet resources, such as Flickr and YouTube, and a massive increase in user-created content.

In this project we intend to provide a highly-usable desktop tool that aims to support a synthesis of user-created and curated content within a simple workflow consistent with general information management practices emerging as a result of the popularity of the RSS and Atom metadata aggregation formats.

We intend to broaden the reach of resources by providing a tool (FeedForward) that has many of the features of an RSS aggregator and blog post editor but combined also with the capability to make extensive use of the information environment, including using the Information Environment Service Registry (IESR) for discovering and adding new sources, ePrints servers and institutional repositories via OAI-PMH, and access to learning object repositories such as JORUM via SRU search.

On the user-creation side of things, we intend to support a model of basic connecting and linking that treats references to resources in the IE and wider web in the same manner, either as links within weblog posts (which can be directly published from the tool via the Atom Publication Protocol to popular blog services such as Blogger.) but also within learning object packages that can be deposited in JORUM, or simply exported in bibliographic formats.

This feed-forward workflow we believe is key to recognising and releasing value in a diverse range of electronic resources, regardless of source, and to connect in a practical fashion the resource held in publicly-funded repositories with the wider internet and with user-created resources. It can also stimulate greater resource creation through active, simple re-use.

The project will build upon two previous project outputs: RELOAD and PLEX. This will enable a prototype to be developed rapidly, as many of the core capabilities and standards support can be taken from previous work. Overall time from start to finish is one year, starting in March 2007 and completing in March 2008.

In addition to its primary benefits, the tool has potential side benefits by providing a simple way of conducting interoperability testing for other projects, including new repositories (and repository enhancements), the development of deposit APIs, and other interworking activities.

CETIS¹

CETIS is a Research Centre at the University of Bolton, conducting research into the development and use of eLearning technologies and interoperability standards and specifications. A large part of its work is devoted to managing the national JISC-CETIS service², advising the JISC development group on eLearning technologies and interoperability standards and specifications, representing the community on international standardisation initiatives, disseminating progress and building community capacity to exploit developments, primarily through the provision of special interest groups. This work is highly regarded internationally, and has resulted in high profile international partnerships and activities, such as membership of the EC Framework 6 integrated project “TenCompetence”³. JISC-CETIS also provides support to JISC development programmes throughout their lifecycle, from helping with tender documents and bid marking to providing advice and support for funded projects.

RELOAD⁴

Between 2002 and 2005 CETIS was funded by the JISC X4L programme to produce a software system to support the development of standards-based learning materials and activities. CETIS developed a desktop application that allows materials to be tagged with IEEE LOM metadata and packaged using the IMS Content Packaging specification. It was made available as an open source system, and this combined with the quality of its implementation resulted in it becoming the leading software system in its category. Through a collaboration with ADL⁵ it has been extended to become the reference implementation of SCORM 2004 with both a content editor and player. Further extensions resulted in RELOAD becoming one of the first IMS Learning Design editors and players, and this has been adopted as a core technology within the EC Framework 6 integrated project TenCompetence project. Further extensions developed RELOAD into a general purpose editor of XML schema based specifications.

RELOAD continues to be developed as a component technology in a number of development projects.

¹ <http://www.cetis.ac.uk>

² <http://jisc.cetis.ac.uk>

³ <http://www.tencompetence.org>

⁴ <http://www.reload.ac.uk>

⁵ <http://www.adlnet.gov>

PLEX⁶

In 2005 CETIS was funded by JISC to develop a reference model for Personal Learning Environments⁷. This project has explored the definition of the term and how it can be distinguished from other eLearning concepts (e.g. VLEs). It elaborated how a personal technological system can interoperate with other services to create a personalised learning experience, under the control of the learner while interacting with external systems such as repositories, using open APIs and standards. As part of the project an extensible prototype was developed known as PLEX. Based on IBM's Eclipse Rich Client Platform⁸, PLEX provided a plug-in architecture that allows plug-ins to be developed that can interact with external services. As a prototype only a limited number of plug-in were developed to illustrate the concept. Of particular note was the implementation of the XCRI API, allowing PLEX to search and find courses available on any XCRI enabled system.

2. Project Description

FeedForward is a project that aims to produce a simple, personal desktop application that leverages the wide range of services in the JISC Information Environment and the wider Internet, enabling the use of simple workflow for using repository content and adding content to repositories in a way that is natural and simple to use for students, teachers and researchers alike.

The application will work with a very wide range of repository types, including not only bibliographic collections, learning object repositories, ePrints and other 'formal' sources, but also popular online services such as blogs, Flickr and YouTube using services based on RSS and IETF Atom. Users can then easily link and share this diverse range of resources using a range of deposit services, again both formal and informal. An overview of the planned system is shown in Figure 1.

To assist in discovery of sources and collections, the application will support both outline import in OPML format (commonly used for sharing sets of RSS feed locations), and also access to the IESR (Information Environment Service Registry) to discover available collections that can be accessed using an available input protocol.

⁶ <http://www.reload.ac.uk/plex/>

⁷ <http://wiki.cetis.ac.uk/ple>

⁸ <http://www.eclipse.org/>

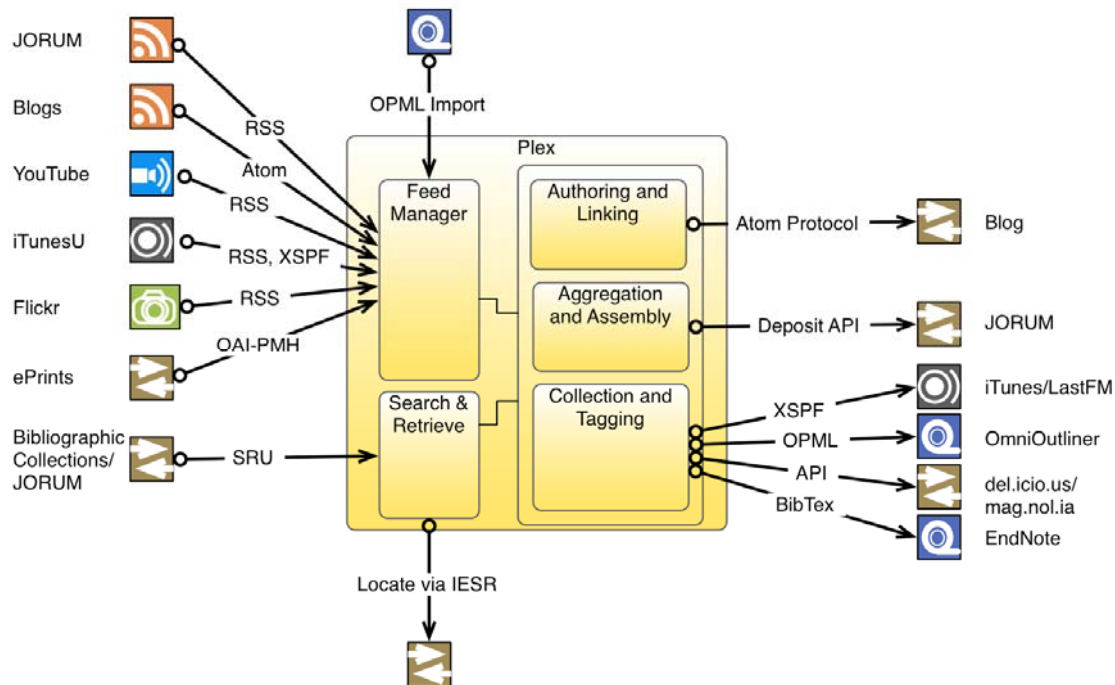


Figure 1 Overview of FeedForward

2.1 What is FeedForward?

FeedForward will be a simple-to-use desktop application that simplifies access to a wide range of services in the information environment. FeedForward enables the aggregation of newsfeeds, photostreams and playlists from general Internet sources useful for informal learning, and also the collection of metadata from formal resource collections such as bibliographic collections, ePrints, and learning object repositories.

The assembled metadata can then be used in the process of authoring (e.g. writing and publishing weblog posts), in the assembly of composite objects and their deposit into repositories, or in the process of creating reusable lists and collections that can be exported as playlists, social bookmarks, and bibliographies.

The “Feed forward” model of operation is intended to support the dynamic use and re-use of resources (and particularly resource metadata) by teachers, learners, and researchers. FeedForward supports the general Internet paradigm of connecting and linking rather than of replication and delivery, avoiding many of the copyright issues found in discovery-to-delivery processes. A FeedForward user collects and scans metadata for a range of resources, views them using a standard embedded browser, and can then create a new blog post referencing the resources, add them to a playlist or other collections that can then be shared with others, or can even assemble composite objects for submission to JORUM or other Learning Object Repositories using any of the IMS Content Packaging formats supported by RELOAD.

This diverse range of functionality is made possible by the wide range of standards-based web services that the project can draw upon, some of which have already been implemented by the RELOAD and PLEX teams. The existing RELOAD and PLEX codebase and functionality, combined with the use of established development frameworks, is also key to the rapid development and deployment envisioned in the project.

The application should also be useful for developing and testing new deposit APIs, for example with JORUM.

2.2 Relationship to the e-Framework and Information Environment

FeedForward is a composite application making use of a range of framework services, including Syndication, Harvesting, Search, and Service Registry on the input side, and Deposit/Post, and Resource List on the output side. Additional services, such as identifier resolution, may be added as they become available. FeedForward surfaces a wide range of web services in an accessible manner, making the benefits of a service-oriented approach easier to comprehend to a wider audience.

Within the wider programme, FeedForward could provide a very useful means of demonstrating the use of the outputs of other projects (e.g. new and enhanced repositories) and help to identify use-cases for the application of new shared services. In particular the project intends to exploit the potential of the IESR to link up a wide range of repositories in a dynamic fashion.

Within the Information Environment, FeedForward is best considered as a type of end-user service within the three-component model⁹, with some aggregator characteristics, as is common within the Web 2.0 approach to web services.

2.3 Development strategy

The project will use an iterative development process based upon the successful approach taken with both RELOAD and PLEX. Wherever possible existing open-source libraries and frameworks will be reused. In particular, the project will use the Eclipse Rich Client Platform (RCP) developed by IBM as the basis of the application framework. RCP is a mature, capable Java framework for developing and deploying desktop applications on a wide range of platforms.

For access to services, the project will re-use the Atom, RSS, del.icio.us, and OPML components from PLEX, and the Content Packaging components from RELOAD. The SRU, OAI-PMH, XSPF, and BibTex functionality will be sourced from e-Framework toolkits such as D-Plus and other toolkits available from organisations such as OCLC.

On the less technical side, the project will develop a set of business-level use cases and scenarios to identify critical areas where benefits can be realized.

⁹ Swan and Awre, "Linking UK Repositories" downloaded from http://www.jisc.ac.uk/uploaded_documents/Linking_UK_repositories_report.pdf

2.4 Validation strategy

FeedForward will be validated using three approaches:

- The software will be tested with a focussed user group, consisting of researchers and teachers at the University of Bolton. Additional testers will be identified during the project. A Bugzilla issue tracking system will be used to support the QA process.
- The software will be made available as early as possible to other projects within the capital programme and used to cross-validate outputs. Specific resource is allocated within the project to facilitate interworking with other projects to identify possible validation opportunities.
- A steering group with a broad range of expertise spanning e-learning, research and the information environment will provide input on the overall direction of the development activity.

The business cases and benefits-realisation scenarios will also be continually checked at each development milestone with the test group.

2.5 Sustainability strategy

CETIS is already engaged in open-source software sustainability through RELOAD, which was originally funded as part of the JISC X4L project. RELOAD continues to thrive through continued support from users, vendors re-packaging the software (e.g. Harvest Road), organisations such as the US ADL programme, and a wider development and localization community who have released versions in 10 other languages. We intend to use the lessons and experience of RELOAD for the benefit of FeedForward, and adopt the same liberal open-source license and sustainability practices.

2.6 Dissemination strategy

Dissemination will be provided primarily through a website, accessed from the main RELOAD site. The project will also engage with the CETIS Special Interest Groups (particularly the metadata and repositories SIG, but also the content SIG, and pedagogy forum), and seek to demonstrate the work at a range of events and conferences.

2.7 Work Plan

Work Package One – Analysis [3 months]

This work package involves the initial business analysis and scenario development for the application. This will involve a series of UCD activities including scenario and persona development, and user interface design using wireframes and activity charts. These will be developed iteratively with feedback from a sample group of potential users.

Deliverables:

- Business Requirements Analysis document

Work Package Two – Development [6 months]

This work package includes all development activities, including testing. The coding will take place using a series of incremental cycles, each of which delivers a functioning

application. Each cycle adds more completed features to the core build until the complete feature set is implemented. Testing is conducted continuously throughout the development work.

Deliverables:

- FeedForward application installer and binaries for Windows, Mac OS X, and Ubuntu Linux
- All project source code
- Design documents (UML)
- Test reports

Work Package Three – Dissemination and Support [2 months]

This work package is concerned with informing the wider community of the project and supporting the use of software deliverables. The primary focus of dissemination is working with other projects and services to identify potential usage of FeedForward within other work, as this will increase the range of users from whom we can obtain feedback. See Work Package Five for more details. We will, however, also engage in general dissemination activity by participating in CETIS SIGs, JISC programme events and workshops, including the programme kick-off meeting, and relevant conferences.

Deliverables:

- Project web site
- Issue tracker
- JISCMail Mailing list
- Online help and documentation
- Presentations and papers at events
- Research publications as appropriate

Work Package Four – Outcomes and Sustainability [2 months]

This work package is concerned with the future of the project beyond the initial funding stage, including open-source sustainability, marketing and uptake, and recruiting active users.

Deliverables:

- Validation and Benefits Realization document
- Sustainability Business Plan document

Work Package Five – Programme Interworking [1 month]

This work package involves networking with other projects in the programme and identifying opportunities for interworking, such as cross-validation of interoperability. This will mainly be accomplished using collaboration facilities provided by JISC Services such as CETIS and UKOLN and facilitated by communications with the JISC programme team. The project will proactively engage with other projects as part of its overall validation strategy. One specific interworking activity we will be actively

developing is to work with UKOLN and JISC on the Information Environment Testbed activity, where we intend to contribute FeedForward as part of the testbed suite.

3. Risk Assessment

Risk	P	S	Score (PxS)	Action to Prevent/Manage Risk
Staffing	2	3	6	There is capacity within the Centre that can be re-allocated to cover gaps in resourcing.
Organisational	1	1	1	The project team all work together at present and have excellent working relationships
Technical	1	3	3	The development team has a lot of experience with Java development, and many of the features of the planned system are already understood from earlier work on which it builds
Partners	2	2	4	There is a possibility that developments such as a JORUM deposit API may face delays that will impact the project; if this arises we will implement a likely candidate specification, noting that the final implementation may differ The test bed activity is not fully specified or planned at present and so it is difficult to judge its impact. We will handle this risk through regular communications with UKOLN and JISC
Adoption	2	2	4	It is entirely possible that usage will fail to take-off. We address this by developing a sustainability plan (WP4) to identify actions we can take to sustain the activity and widen adoption. We will also use our programme interworking activity (WP5) to identify opportunities for usage of the application within other projects to help widen the user base and developer base throughout the project term.

P = Probability on a scale of 1-5, S = Severity on a scale of 1-5, where 1 is low and 5 is high.

4. Budget

Directly Incurred Staff	March 07	June 07– March 08	April 08– March 09	TOTAL £
Non-Staff	March 07	April 07– March 08	April 08– March 09	TOTAL £
Travel and expenses	£	£1,000	£	£1,000
Hardware/software	£	£	£	£
Dissemination	£	£	£	£
Evaluation	£	£	£	£
Other	£	£500	£	£500
Total Directly Incurred Non-Staff (B)	£	£1,500	£	£1,500
Directly Incurred Total (A+B=C) (C)	£	£30,000	£9500	£39,500
Directly Allocated	March 07	June 07– March 08	April 08– March 09	TOTAL £
Staff	£	£	£	£
Estates	£	£	£	£
Other	£	£	£	£
Directly Allocated Total (D)	£	£	£	£
Indirect Costs (E)	£	£28,500	£9,500	£38,000
Total Project Cost (C+D+E)	£	£58,500	£19,000	£77,500
Amount Requested from JISC	£	£ 40,500	£9500	£50,000
Institutional Contributions	£	£18,000	£9,500	£27,500
Percentage Contributions over the life of the project		JISC 64 %	Partners 36 %	Total 100%

4. Key Personnel

Director: Professor Oleg Liber is Director of CETIS and Professor of eLearning at the University of Bolton. He was previously Director of the Centre for Learning Technology at the University of Wales Bangor. Professor Liber has been involved in pioneering work in learning technologies for over twenty years, managing a number of projects developing innovative technical systems, including distributed learning networks, multimedia databases, learning management systems, peer-to-peer collaborative learning environments (Colloquia) and tools for implementing eLearning standards (RELOAD). He co-founded the UK IMS Centre in 1998 and its successor, CETIS, which he has steered to its current position of international leadership in the development and implementation of standards-based eLearning. He has published widely on eLearning, including co-authoring the widely cited JISC report “A Framework for the Pedagogical Evaluation of Virtual Learning Environments”, and is regularly invited to speak at major eLearning events. He has provided consultancy for national government and European agencies on eLearning issues. His research interests are in organisational cybernetics and constructivist learning theory, and how these can inform the development, implementation and embedding of learning technologies.

Lead Developer: Dr Roy Cherian is the open source manager and lead developer for the RELOAD system. He was responsible for extensions to RELOAD within the EC Framework 6 TELCERT project that resulted in the Content Reuse Tool, allowing any XML Schema based specification to be edited by RELOAD. Before joining the University of Bolton, Roy worked as a programmer in the commercial sector and as a lecturer in computer science at a private college.

Technical Consultant: Phillip Beauvoir is the lead architect of the RELOAD software system. He has been a software developer for over 20 years, including implementing Colloquia, the peer-to-peer learning environment, and is currently leading the University’s contribution to software development in the Ten Competence project. He has significant expertise in object-oriented (in particular) Java development, including the rich client platform Eclipse, in implementing interoperability specifications, and in user interface design.

Technical Consultant: Scott Wilson is assistant director of CETIS. He is an experienced software developer and solution architect in both commercial and educational software development, and has been closely involved in the development of a number of interoperability specifications and research activities. He was also one of the principal instigators of the JISC e-Framework and an expert in service-oriented architecture, XML, and RDF.

Appendix A: 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.

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.

Section / Paragraph No.	Relevant exemption from disclosure under FOI	Justification
N/A	N/A	N/A

Appendix B: Supporting Letter



Our ref: OL 231106-1
Your ref:

23rd November 2006

Alice Colban,
JISC Executive,
Northavon House,
Coldharbour Lane,
Bristol,
BS16 1QD

Direct tel: 01204 903006
Email: p.marsh@bolton.ac.uk

Dear Alice,

Re: JISC Capital Programme: Repositories and Preservation Programme

We are very pleased to recommend the FeedForward project for your attention. The project fits well with the University of Bolton's strategy to develop and exploit eLearning technologies in pursuance of establishing Bolton as a modern professional university.

Therefore, on behalf of the University of Bolton, I confirm institutional support for this proposal.

Yours sincerely,

Dr Peter Marsh
Pro-vice Chancellor



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George Holmes