JISC DEVELOPMENT PROGRAMMES

Project Document Cover Sheet

SOURCE PROJECT PLAN

Project

Project Acronym	SOURCE	**Project ID**	
Project Title	Sharing Objects Under Repository Control with Everyone		
Start Date	1 Nov 2006	**End Date**	30 September 2008
Lead Institution	Birkbeck College, University of London		
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Partner Institutions	Institute of Education, London School of Hygiene and Tropical Medicine, School of Oriental and African Studies, School of Pharmacy and The Royal Veterinarian College		
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Programme Name (and number)	*Sharing Objects Under Repository Control with Everyone*		
Programme Manager	Phil Vaughn		

Document

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Document History

Version	Date	Comments
1.0	2007-01-29	Project plan submission document
1.1.	2007-03-26	Glossary added

Glossary*

API: Application Profile Interface is a series of codes that enables machine to machine communication.

Blended/Hybrid Learning: A mix-mode learning approach where digital teaching/learning content is delivered in a traditional face-to-face classroom.

Bulk-migration: refers to the movement of file and metadata on a mass scale to different platforms, via iteration or vector processing.

Complex / Compound Object: Any set of files (MIME types) contained within a single file, i.e. IMS-CP, SCORM, ZIP, etc.

Container: Refers to the database architecture that organizes the content, this is in context to a platform which is the overall system that the container sits within, e.g. Blackboard is a platform where their LCMS is their container.

Content Package: Is a means of containing all files within a single file so that machines (and humans) can interpret their contents in a pedagogical context, e.g. like a book binding for a book

Digital Content Asset: Is any individual file that is not easily divided without loss of meaning and/or context.

LCMS: Learning Content Management Systems are Content Management Systems that are imbedded within VLEs or LMSs, e.g. Blackboard and WebCT have LCMS

Learning Object: Is any digital object intended for teaching/learning

Metadata: is data about data; in context to multimedia it is usually the only meaningful text made available to search engines that crawl text, i.e. Google, Yahoo, Microsoft, etc.

Multimedia: in general is in reference to any digital object that uses multiple signifiers to demonstrate its meaning, e.g. text, image, audio, video, animation, etc.

OKI: Open Knowledge Initiative, is standards organization that recommends and publishes best practice for creating interoperable APIs in a standardized form known as OSIDs.

OSID: Open Service Interface Definition is a kind of API that is in a standardized form that assures interoperability beyond multiple platforms, not just individual machine to machine communication as is the case with most APIs.

Published Files / **Output Files**: Files that are compressed versions of the source files to allow for transfer over the allowed bandwidth; these files are not repurposeable

Primary Repository: The primary repository to be implemented in this project will be a full implementation of the repository software selected, including server and

Repository: Is the architecture for storing, accessing and managing digital objects and their metadata records. As an analogy to the physical library it is the digital shelving, card/computer catalogue, classification system (Dewey Decimal System) and desk clerk / library shelver.

ROI: Return on Investment is the annual benefit divided by the investment amount.

Secondary Repository: The secondary repository to be implemented in this project will be a repository that provides access to the code base to allow for the creation of an API/OSID. This repository will not be implemented 'on-site' but will be accessed from another institution's installation for development and testing purposes.

Shareable Learning Object: Is a learning object that contains all of its content including source files and has metadata ascribed to the individual multimedia content assets

Source Files: Files that are not seen by the user, but are the files that contain the content (digital content assets) for creation.

Teaching/learning platform: is a general reference to any system (VLE, LMS, LCMS, Repository, etc) that contains teaching/learning content.

Tools: generally refer to APIs and/or OSIDs in context to a specific container and/or platform.

VLE: Virtual Learning Environment is an interface for students and teachers to access tools and content for their course; in relation to a repository it acts as the digital classroom, where the repository acts as the digital library.

*Please note: any terms not specified in the above glossary can be defined using the Google "define:" command.

SOURCE Project Plan
(Sharing Objects Under Repository Control with Everyone)

Overview of Project

1. Background

Significant advancements by Institutional Repositories to collect research material in the past few years has yielded several new publishing models which have been successful in making research material more accessible. In contrast, collections of teaching/learning content in the form of learning objects have not yet delivered on their expected return on investment (ROI).

Attempting simply to re-apply the publishing models adopted for research repositories to repositories of teaching/learning materials is, however, unlikely to succeed owing to the sharp differences in form (syntactic) and content (semantic) between research and teaching/learning materials. The most significant difference is in the complexity of the digital media comprising learning objects (especially multimedia learning objects) in comparison to research e-prints. Moreover, it is often the case that only *parts* of learning objects are required for use by teacher/learner, and this demands a flexible publishing model and workflow that will facilitate the repurposing of data. Thus, there is a clear need to design new publication models/workflows that account for these complex features and to develop interoperable tools to support these models.

The main goal behind such innovations will be to create workflows tailored specifically for teaching/learning media that will enable teachers to download media assets to their desktops, repurpose these in generating their own learning objects, and then to upload this material into their preferred learning platform (i.e. VLE/LCMS or Repository) for access/use by their students and/or other teachers[1]. To this end, a critical first requirement is to create bulk deposit tools that will facilitate the migration of resources to a variety of HE learning platforms (VLE/LCMSs and Repositories). Such tools must take full account of the size and complexity of multimedia learning objects and must allow for disaggregation of the digital media assets that comprise them from the start of their creation[2].

The macro implication for such a bulk-migration tool is the overall e-infrastructure and its political legalities. By enabling a more competitive environment where learning objects can be moved from content platform to content platform seamlessly, insures that HE/FE institutions will be able to control their content and place it in the repository that is most functionally suitable for their users. In addition, this will enable vendor and open source communities to specialize per sector for a richer and more customizable repository environment. These demands require that the first step -in any pedagogical workflow that will enable ease in repurposing content- to be a bulk-migration tool in the form of a standardized Application Profile Interface (API).

Of course the next logical questions are *where do objects reside* and *how should they be migrated to the appropriate repository for disaggregation*? Birkbeck has been considering this issue for the past year and has closely followed movements in the HE/FE sector for best practice. *While further scoping towards significant HE/FE platforms that contain LOs will be part of this project*, Birkbeck has already begun dialogue with several vendors who are widely used for managing UK HE teaching/learning content[3]. These containers along with other widely used platforms for multimedia teaching/learning content will be evaluated in the context of creating bulk-migration and deposit tools.

The open and flexible ease of moving learning objects through significant HE platforms will greatly benefit the higher education sector (including Birkbeck and the Bloomsbury Learning Consortium). It is specifically the creation of these APIs as open standardized code (OSIDs) that will establish a non-proprietary and interoperable method for assuring that teaching/learning content is truly migrateable now and in the future. These set of APIs/OSIDs will assure the continued development of open source code for the continued ease of migrating digital content across platforms as the information environment architecture continues to evolve[4].

Perhaps the most significant consideration of this project is the inevitable need to manage the pedagogical and business models in the migration of learning objects across the UK HE e-infrastructure. In addition to creating bulk-migration tools for significant UK HE teaching/learning platforms, this project will also demonstrate innovation in its recommended pedagogical workflow by creating a series of recommended application profiles for metadata and packaging[5]. Therefore, this project will both create bulk-migration tools and recommend best-practice in using them. This project will emphasize the significant work already done by JISC projects in this area (see below) as well as contribute to the larger 'information environment architecture' as JISC continues to 'accelerate the pace of change' in e-learning.

2. Aims and Objectives

Aim:
To enable the greater reuse of digital content across HE/FE by enabling bulk-migration of content between significant UK HE platforms.

Objectives:
1.) identify significant platforms that contain teaching/learning content
2.) identify stakeholders and user case scenarios for using a bulk-migration service
3.) evaluate structure of complex objects for recommendation towards bulk-migration best practice
4.) create set of bulk-migration tools that will enable greater interoperability between content platforms
5.) publish and disseminate bulk-migration tools openly to the HE community

3. Overall Approach

Overall, this project is directed at the 'provision' level of the JISC Information Environment Architecture. Specifically, it is the containers that 'providers' are using to manage digital objects that this project hopes to provide further interoperable tools and innovations. For that reason, *the core aim of this project is to enable bulk-migration and deposit of objects in significant UK HE platforms across the JISC provider IE architecture.* However, it must be stated from the start that the projected tools to be created for exchange of content between these containers is towards a larger pedagogical model aimed at reuse of digital content in HE. This pedagogical model directly relates to the creation of these tools as well as their projected use.
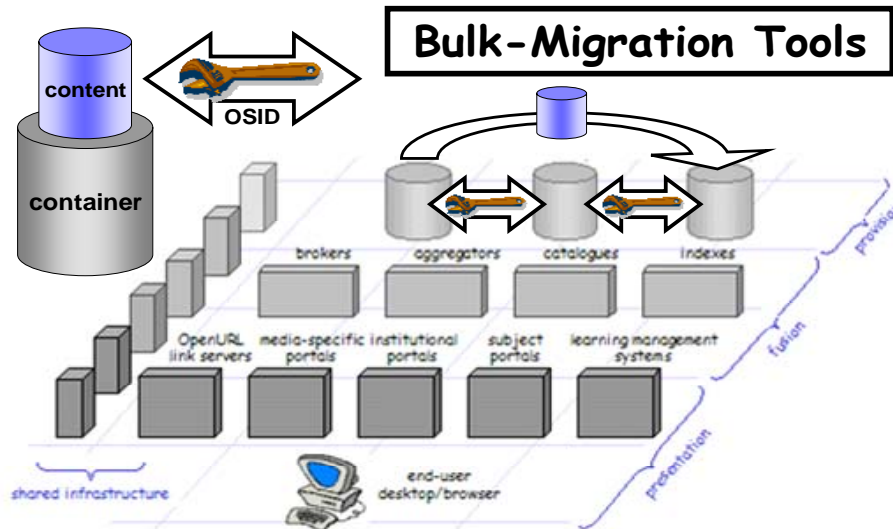
Graph 1: JISC e-Infrastructure

The creation of bulk-migration tools will further enable a competitive vendor environment where digital objects will be able to be moved between containers in an open and standardized form; thereby empowering the HE institution to select and try out vendor architectures without having to worry about their digital content being 'locked-in" to a proprietary system.

Beyond the basic technological deliverable of this project (bulk-migration tools) are the overall pedagogical innovations of this project; which reach beyond a set of interoperable tools and towards overall developments in reuse of teaching/learning content.

Technical Project Overview Towards Overall Pedagogical Reuse Goal
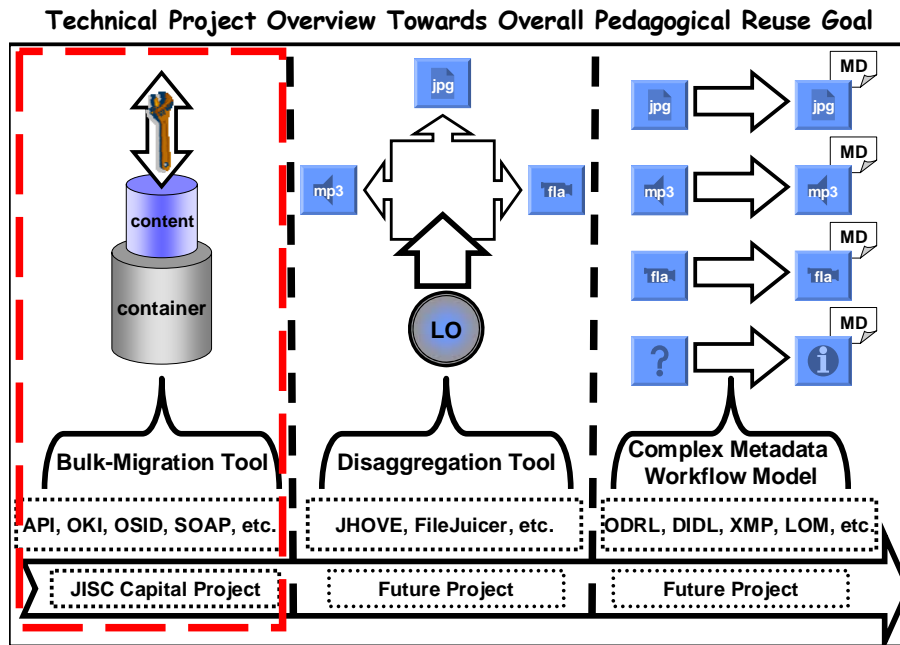
Graph 2: Bulk-migration tools as part of macro content reuse workflow

This project –as part of the capital programme- would be the first in a set of projects that will see an evolution in the workflow for reusing digital teaching/learning content and creating new learning objects. As a start the bulk-migration tools created will be aimed towards a larger pedagogical workflow for repurposing content (Graph 2). This project will NOT take on the disaggregation of learning objects NOR will it implement a complex metadata workflow; however *it will create the bulk-migration tools in context to this future model for reusing teaching/learning content*. In other words, it is essential that this project does not merely create bulk-migrations tools, but rather takes the creation of these tools in context to a complete pedagogical model for reuse of digital objects. By designing these tools from the start towards this future, this project supports the larger overall goal of reuse for teaching/learning content in HE/FE.

3.1. Methodology/Strategy

The strategy/methodology for creating these bulk migration tools can be delineated according to the project's objectives and key questions (***issues***) that need to be asked of this project throughout its progress.

Which: (*objective 1: identify significant HE learning platforms that contain teaching/learning content*): ***Which institutions would be interested in these tools?***
The first question that must be asked in creating a tool that will migrate content from one place to another is, 'which places do we want to move content to and from?'. Birkbeck has already undergone a preliminary field-survey as part of the Bloomsbury Consortium where there are a minimum of three significant teaching/learning platforms that are being used (Moodle, WebCT and Blackboard) across the consortium. In addition to this is the growing need for a place to maintain the vast amount of digitally-born content that is being generated across the Bloomsbury campuses. This content has begun to be managed in the SherpaLEAP project where Birkbeck has participated in creating and populating an ePrints repository with research content. Birkbeck and the Bloomsbury Consortium wish to now take the next step in managing their growing collection of digital teaching/learning content. This is especially important for the Birkbeck ethos as it is ranked no.1 for teaching in the national student survey (2005).

We believe this basic scenario of multiple content platforms to be repeated throughout UK HE and FE. To demonstrate this, the first workpackage of this project will be a preliminary scoping study that will look to discover which UK HE platforms are being broadly used to disseminate teaching/learning content, especially multimedia learning content. The strategy for this study will be to contact heads of learning technology departments from a broad spectrum of UK HEs. We will look to implement a short survey via email so the data can be easily transmitted/returned as well as commented upon. The primary objective of this study will be to discover which container within the

University contains –or is likely to - the most multimedia learning content in a packaged or unpackaged form. In addition, the platforms that are identified as significant from this survey will be followed up with the platform providers/community to verify a quantitative number across UK HE. This project will rely heavily upon its scoping study to ascertain the future of where content is most likely to reside for the average higher education institution. From this data we can then proceed to select the platforms that are most likely to play a significant role in the containment of data for HE institutions in the future. By identifying and then working with these container providers we can provide a more interoperable future where containers cannot 'lock-in' content, but whose systems are open for bulk-migration at any time. Therefore, to answer the question 'which institutions will be interested in these tools immediately', the answer is 'the largest segment in UK HE that this project can create APIs for bulk-migration'. This question will be iteratively reviewed and re-answered as the SOURCE project develops.

Who: (*objective 2: identify stakeholders and user case scenarios for using bulk-migration tools*)
Who will use these tools?
The second part of the scoping study will be the identification of user-case studies for the scenarios of bulk-migration. Again, this research will follow on from the preliminary work already done by the JISC API working group. Additional user cases will be considered in direct relationship to the pedagogical implications that bulk-migrations tools will have on teacher/learner. The generation of this data will be done through qualitative interviews as well as further research and development with other JISC and HE/FE projects who have been considering these issues (JORUM, CDLOR, TrustDR, DAPI, OAI-OAR, etc.). These user cases will also play a key role in developing the overall pedagogical context (and therefore dissemination payload) in which the bulk-migration tools will be implemented.

Of course, in the case of bulk-migration tools it is not necessarily the user who will be using them, but rather the administrator (the learning technologists and librarians) who will decide which system they are going to implement or purchase on behalf of their user. The user case studies will help identify and advise the community that is most likely to work with this tool: as with any open source project, it is awareness and buy-in from the community that will decide its success or failure. Since this tool will be created as an Open Source service, it requires a community of developers to see its continued use and development beyond the life of the project. This also goes towards the fifth objective (*publish and disseminate bulk-migration tools openly to the HE community)*, where awareness and successful use of the tool will see its further development towards the myriad of user case scenarios for bulk-migration. Henceforth, the initial answer to the question of "who will use these tools", is "administrators who decide which platforms are of significant value to their institution".

Why: (*objective 3: evaluate structure of complex objects for recommendation towards bulk-migration best practice*)
Why should institutions be using these tools?
Institutions have varying degrees and kinds of data, and the multiplicity of file formats is not soon to cease. This is made more complex by the growing number of content platforms available to HE/FE. This requires a normalization of educational data so that objects can be made truly platform interoperable. There are two forms of data normalization that needs to occur: syntactic and semantic. Syntactic data represents the actual form of the data (the MIME types) and semantic represents the contextual definition of the data (metadata). These two dimensions of data require normalization if objects are going to be interoperable with varying platforms, and a bulk-migration tool has the potential to not only migrate but also "massage" (transform) the data into an interoperable hybrid object. There are several scenarios that can be envisioned for such a tool, such as bulk-migration of objects into a common content package or separate outputs of different objects (one for a VLE and another for preservation archiving). SOURCE will work closely with JISC, CETIS, UKOLN, IMS, OAI, OKI and other standards bodies to recognize the standards that have the most potential for interoperability and reuse of content.

The advantages of institutions using these tools are two fold. In the first case they represent an opportunity to normalize their data for interoperable use. This in combination with the bulk-migration tool assures a more competitive environment where repository (vendor or open source) are able to compete for their market niche (without trying to be everything to everyone). This will help create a more robust repository environment where institutions can select from platforms based upon the needs of their users, and not upon the "locking-in" of their data to a single platform. Institution should be using these tools to assure that no one platform has a monopoly on the educational world. The vision for the provider platform must be a spectrum of repositories that are all interoperable and provide services according to the need of the institution.

How: (*objective 4: create a set of bulk-migration tools that will enable greater interoperability between content platforms*)

How do we create these tools?

The creation of the API/OSIDs will follow an iterative/agile code development process; where each platform to platform API will be viewed as a package independent of the other APIs. It is inevitable that each platform API will build from the precedent of the previous work-package, however the creation and testing of the API between each platform will be treated as an independent process.

Since this project is heavily reliant upon the adoption of standards (esp. OSIDs) to make data interoperable between platforms, the project will immediately attempt to do a demonstrator between two significant platforms to gain buy-in by other content platforms. It is the ubiquitous adoption of OSIDs as a deposit standard that will enable this tool to create a truly competitive platform environment. The current state of API development does not support a ubiquitous standard format for creating bulk-migration tools. Variation in programming language (i.e. Java, PHP, Objective C, C#, etc.) as well as web standards (e.g. SOAP, WSDL, JSON, ATOM, AJAX, etc) does not consider the pedagogical implications for educational resources. OSIDs present an opportunity to support an API created for teaching/learning whereby a standard contract between educational platforms -despite their use of programming language or web standards- can be created and published to the global education community. The emphasis for creating these bulk-migration tools must be upon SOA push of content to teacher/learner, not technologically pulled by a single programming language or standard. The Open Knowledge Initiative (OKI) will support interoperability as well as standardization for varying programming languages and protocols. This will enable the bulk-migration to act as an independent service that can "plug-into" any OSID API, thereby making the bulk-migration tool interoperable between any content platform that implements the OSID API. The features and functions of the bulk-migration tool itself will be built based upon the survey and user case studies generated along with qualitative input from the three evaluation committees supporting the project. The tool will be developed in three iterative cycles (strawman, beta and zenith) based upon a rapid prototyping method, to assure for optimal testing of the tool prior to version 1.0 release. These tools will be created with the final goal being adoption by the JISC community and beyond, only then will this tool be a success.

What (*objective 5: publish and disseminate bulk-migration tools openly to the HE community*):

What can these tools be used for?

The publishing and dissemination of these bulk-migration tools will once again return to the original scoping study of the project and look to implement several test cases in other institution beyond the Bloomsbury Consortium. Key stakeholders/champions (in learning technology departments) throughout the UK will be selected to participate in a workshop to use and implement these tools for their own institution. In addition, this project will look to team with an international partner to show an international demonstrator of the tools. In the latter case, it is of significant importance that this project recognizes the global teaching/learning community and the potential for sharing in the future if ubiquitous worldwide interoperability is to be achieved.

This also will encourage greater interest in the potential of this bulk-migration tool for other user case migration scenarios and transformation opportunities. Most importantly this project will publish the created tool as an interoperable tool of the Open Knowledge Initiative organization (founded by MIT). This standard will not only act as an international dissemination method, but will also assure interoperable use of the API across other platforms both now and in the future. Therefore, the opportunity of this bulk-migration tool to be used in project beyond this initial SOURCE project is left open thereby proliferating the possible uses of this tool.

4. Project Outputs

Tangible Outputs:

File ID	Work-Package / Task	Report / Deliverable Description	Due
Research Strand*			
R-WP1-T7	WP-1/T7	Report on significant content platforms and stakeholders	03/07
R-WP2-T15	WP-2/T14	Report on (strawman) proof-of-concept demonstrator	04/07
R-WP3-T17	WP-3/T17	Report on user case studies for bulk-migration	04/07
R-WP4-T20	WP-4/T20	Report on Developer Roundtable meeting and Training	05/07

R-WP6-T28	WP-6/T28	Report on testing of tool (beta build) with Platform A	08/07
R-WP7-T32	WP-7/T32	Report on testing of tool (beta build) with Platform B	10/07
R-WP8-T36	WP-8/T36	Report on testing of tool (beta build) with Platform C[OS]	11/07
R-WP10-T43	WP-10/T43	Report on testing of tool (zenith build) with Platform A	04/08
R-WP11-T47	WP-11/T47	Report on testing of tool (zenith build) with Platform B	05/08
R-WP12-T51	WP-12/T51	Report on testing of tool (zenith build) with Platform C[OS]	06/08
R-WP13-T53	WP-13/T53	Publish user guides and manuals for tool implementation	07/08
R-WP14-T57	WP-14/T57	Publish workshop guides and documentation	08/08
R-WP15-59	WP-15/T59	Publish completion report and project sign-off	09/08
Technical Strand*			
D-WP2-T10	WP-2/T10	OSID build for Platform 1	04/07
D-WP2-T11	WP-2/T11	OSID build for Platform 2	04/07
D-WP2-T12	WP-2/T12	Data migration tool (strawman build)	04/07
D-WP2-T14	WP-2/T14	Report on demonstrator proof-of-concept build	05/07
D-WP5-T24	WP-5/T24	Beta build of bulk-migration tool	08/07
D-WP9-T39	WP-9/T39	Zenith build of bulk-migration tool	02/08
D-WP19-52	WP-19/T52	Agreement / encoding on OS license for tool	06/08
D-WP13-T54	WP-13/T54	Publish bulk-migration tool (ver.1.0)	08/08
D-WP15-60	WP-15/T60	Assure tool accessibility and long term archive	09/08

*For intangible outputs see detailed timeline:
(http://spreadsheets.google.com/pub?key=peLjpLkLWKet0rUl4S4WrZQ)

5. Project Outcomes

SOURCE will deliver significant benefit to four principle communities: 1.) Birkbeck students and staff; 2.) Bloomsbury Colleges Consortium students and staff; 3.) JISC HE/FE Community:

Outcomes for Birkbeck College, University of London:
- Evaluation and establishment of a digital repository specific to the needs of Birkbeck
- Establishment of a repository focused towards sharing resources in a consortium environment
- Ability to migrate content to and from other consortium platforms
- Metadata Application Profile for Birkbeck schools and departments
- Closer ties with the Bloomsbury Consortium

Outcomes for Bloomsbury Colleges Consortium:
- Scoping study of Bloomsbury digital landscape
- Initial work towards metadata application profile for Bloomsbury institutions
- Best-practice recommendations for object creation and reuse cross-disciplinary
- Evaluation and Establishment of a consortium based digital repository
- Tools for independent platform negotiations
- First established working group in Bloomsbury towards sharing digital teaching/learning resources in a distributed network environment
- Participation in JISC project

Outcomes for UK HE/FE:
- Established real-world standards (OSIDs) for enhanced interoperability between repositories
- Best-practice recommendations for use and implementation of bulk-migration tools
- Evaluative report of benefits/disadvantages in using bulk-migration tools between repositories (contribution to overall evaluation of repository procurement)
- Forecasting and recommendations for bulk-migration tools in context of an overall pedagogical model for teaching/learning content
- Enhanced knowledge of repository tools and object handling best-practice

Outcomes for JISC community:
- Tools for bulk-migration of content between platforms
- Competitive repository environment where digital objects are *not* 'locked" into a single platform
- Further development of partnerships between HEIs towards teaching/learning networks
- Greater awareness by HE/FE for need of interoperable standardization of platforms.
- Further evolution and connectivity between middleware within the JISC Information Environment architecture

6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
Institutional Department Partners	Repository hardware and software establishment	High
Bloomsbury Consortium Partners	Repository hardware and software establishment	Med
Teaching/Learning Platform Partners	Ubiquitous integration and deployment of APIs (OSIDs)	Med
Learning Object Repository Partners	Ubiquitous integration and deployment of APIs (OSIDs)	High
Learning Content Management System Partners	Ubiquitous integration and deployment of APIs (OSIDs)	Low
Open Source Platform Partnerships	Ubiquitous integration and deployment of APIs (OSIDs)	High
JISC and HE/FE Project Partners	Tools and research outputs	High
International Project Partners	Tools and research outputs	Med

7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Staffing				
Loss of project manager	1	3	3	Require thorough documentation of project as it develops so new project manager can take-over
Disagreement by vendor / consultant in project ethos	2	2	4	Look for other consultant / vendor to participate in the project, while maintaining relationships for future
Organisational				
Disagreement by consortium partners in project decisions	1	4	4	Pull back project to smaller consortium project or as an individual institutional project
Lack of support in providing test objects for bulk-migration	2	3	6	Request objects from HE/FE institutions in UK and abroad
Technical				
Not enough budget for test platform servers	2	3	6	The project can be scaled back to work with less platforms; or additional funding can be sought from vendors or HE funding bodies
Implementation of platform is more problematic than thought	1	4	4	Support from BBK Central computing or out-sourced help can be hired.
New standard is adopted replacing selected API (OSID)	1	5	5	OSID work could be adapted to work with new standards
Remote access of repository SDK is not configurable	2	3	6	Approach platform vendor to request alternative access method
User case studies are too many to select from				Approach JISC community project for decision
External suppliers				
Lack of integration of APIs into platform source code	1	3	3	Alternative communities/vendors can be selected for the project with hope that buy-in will occur later
New repository vendor/community emerges which is quickly adopted	1	4	4	Vendor / community will be approached to work with project.
Legal				
Disagreement by vendor with license for integrated OS code base	1	4	4	Consultation with JISC legal and BBK law dept to see if license can be adapted to suit vendor needs

8. Standards

Name of standard or specification	Version	Notes
OSID Repository	2.0, 3.0	The OSID will act as a binding to other standards/languages (WSDL, SOAP, JSR 170, JSR 283, Java, PHP, C#, etc)
SQI	1.0 beta	Search standards watching brief will occur throughout the project, especially in relation to these standards being used as common interface for the bulk-migration tool.
SRW/U	1.2+	
OAI-PMH	2.0	
XML over HTTP	n/a	Watching brief on various ReST procedures (JSON, AJAX, ATOM, etc)
BPMN/BPEL		SOURCE will rely upon BPMN/BPEL to provide high-level abstraction of the tool and its uses for future sustainability of the tools and code it creates.

9. Technical Development

SOURCE will primarily rely upon subcontracts to get code –iteratively- developed quickly and efficiently. Subcontracts will be procured by independent consultants and vendor platform developers (as already prearranged); this will assure buy-in and awareness of the OSID standard from the start so that it can be adopted and maintained within the source code of the platform. Development and integration gaps will be filled by the SOURCE team and the skills of its partners within the Bloomsbury Colleges Consortium.

The workpackages allow for three development cycles (strawman, beta and zenith). This will allow for development of the tool in relation to the selected platforms to assure interoperability as well as develop the tool to its "height of functionality" prior to being released (zenith). Testing will occur throughout the workpackages to assure bug and error tracking. All technical documentation will be released via the SOURCE website, OKI website and SourceForge.

10. Intellectual Property Rights

There are two sets of code that will require Open Source licenses. The first set is the bulk-migration tool which will be released under a GPL license[6]. The second set of code is the OSIDs to be integrated into the source code of each platform with which the project will partner. In the case of Open Source software the project development team will be contacted for integration and choice of license. With vendor software a BSD license[7] will be ascribed to the code so that it can be used, altered and sold by the vendor without any restrictions, while still being licensed as OS software for use by anyone. This will not affect the proprietary rights of the vendor or other licenses.

Project Resources

11. Project Partners

Primary contractor:
Birkbeck, University of London, Library Systems Team
Project Manager: David F. Flanders
Role: Project Management, Research and Education Officer

Consortium agreement:
Bloomsbury Colleges Consortium (*consortium agreement for project to be signed by mid-February*):
Birkbeck College, Institute of Education, London School of Hygiene and Tropical Medicine, School of Pharmacy, School of Oriental and African Studies and The Royal Veterinarian College.

Subcontractors*:

SC1: Verbena Consulting
Contact: Jeff Kahn verbenaconsulting@comcast.net

Address: 780 Owens Lake Road, Alpharetta, Georgia, 30004(USA)
Role: Bulk-migration tool developer and OSID trainer/overseer

SC2*: Harvest Road Hive
Damian Hass dhaas@harvestroad.com
Address: Level 6, 10 William St, Perth WA 6000 (Australia)
Role: OSID development and integration

SC3*: Intralect Intralibrary
Martin Morrey M.Morrey@intrallect.com
Address: Intrallect Ltd, Regent House, Blackness Road, Linlithgow, EH49 7HU, Scotland, UK
Role: OSID development and integration

SC4*: The Learning Edge International Pty Ltd., Equella
Chris Jones chris.jones@thelearningedge.com.au
Address: Level 2, 25 Argyle Street, GPO Box 642, Hobart TAS 7000 (Australia)
Role: OSID development and integration

SC5*: Open Source Platform Consultants (Fedora, DSpace and/or EPrints)
TBA

SC6*: Other Content Platforms Providers: To be selected based upon significant platform survey.

**Additional subcontracts have been agreed upon with platform vendors / community programmers, confirmation of the contracts will occur once the project survey identifies the repository as significant.*
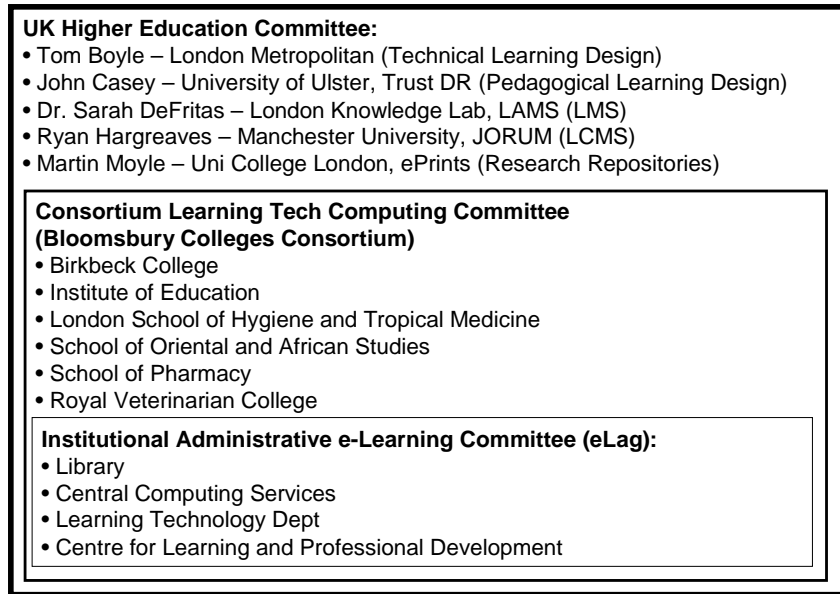
12. Project Management

The project management approach for the SOURCE project will follow a 'rapid prototyping model' of "***right – rapid – rough***" as used by IDEO design company (see book: *The Art of Innovation* by Tom Kelley). Its three iterations (strawman -> beta -> zenith ->) will prototype there way to a final release (version 1.0). The emphasis in this model is upon first creating a prototype tool that will work in the real world the ***right*** way (strawman); and then to test this tool as thoroughly as if it were the final product but with minimal drain on resources ***rapid***ly. By understanding this tool in its pragmatic usage a second iteration and development process can occur (beta), where the tool can be scaled up to achieve better functionality and usability but without its finished sheen – ***rough*** . This second prototype follows the motto: "Fail early in order to succeed sooner". The final prototype (zenith) will once again go through testing but this time with a fine-toothed comb to assure its release as a usable and functionally 'plug and playable' tool.

The committee structure for this model is represented by the three users-groups of this tool:

- Institutional e-Learning Administrative Committee
- Consortium Learning Technologist Computing Committee
- UK HE Evaluation Committee

The first two groups represent the administrative and technical staff that would use and implement the tool for their institution or consortium. Emphasis for usability will be upon two factors: 1.) Ease in understanding the functionality, reliability and use of the tool (Institutional e-Learning Administrative Committee, and; 2.) Ease in setting-up and executing the tool (Learning Technologists, Computing Committee). The UK HE evaluation Committee is in place to advise overall on both these groups, as well as advise on overall functionality of the tool for all UK HE/FE.

> **UK Higher Education Committee:**
> • Tom Boyle – London Metropolitan (Technical Learning Design)
> • John Casey – University of Ulster, Trust DR (Pedagogical Learning Design)
> • Dr. Sarah DeFritas – London Knowledge Lab, LAMS (LMS)
> • Ryan Hargreaves – Manchester University, JORUM (LCMS)
> • Martin Moyle – Uni College London, ePrints (Research Repositories)
>
> > **Consortium Learning Tech Computing Committee (Bloomsbury Colleges Consortium)**
> > • Birkbeck College
> > • Institute of Education
> > • London School of Hygiene and Tropical Medicine
> > • School of Oriental and African Studies
> > • School of Pharmacy
> > • Royal Veterinarian College
> >
> > > **Institutional Administrative e-Learning Committee (eLag):**
> > > • Library
> > > • Central Computing Services
> > > • Learning Technology Dept
> > > • Centre for Learning and Professional Development

Structure of Evaluation Committees (Stakeholder Groups)

13. Programme Support

It would be nice to participate in:

- UML workshop: to bounce ideas off of other projects in how they are creating their UML models so other can use/understand them beyond the life of the project.
- E-Framework discussion group with other real-world projects implementing web services, regarding "pragmatics" (not theoretical mapping) of service oriented architectures/approaches.
- General opportunities to network with other JISC project (old and new).
- Further opportunities to meet global projects (i.e. JISC hosts an international educational project innovators conference?)

14. Budget (see *Appendix A*)

The only alteration in the project proposal budget has been the dispersion of the Open Source Platform Programmer's salary to a set of consultancy contracts for Open Source platform development. Due to the percentage of salary that would be lost to salary on-cost, it was decided that more work could be achieved by out-sourcing the work to a consultant(s). Several OS Platform consultants have emerged through the API Working Group, and enhanced opportunities to work with the Fedora User Group have been made available as well.

Detailed Project Planning

15. Workpackages (see *Appendix B*)

16. Evaluation Plan

Timing	Factor to Evaluate	Questions to Address	Method(s)	Measure of Success
<05/07	Survey	Does the survey represent scope of potential users?	Quantitative Survey / Data Analysis	Size of sample results
<06/07	Proof-of-concept demonstrator (strawman)	Does the tool meet identified needs?	Evaluation Committees	Approval and recommendations by committees

<09/07	Case-studies	Are the case studies exhaustive representations of HE/FE?	Evaluation Committees	Approval and recommendations by committees
<12/07	Tool development (1st iteration: beta)	Does the tool meet prototyping functionality / is it robust?	Testing between platforms	Percentage of error (human correctable) between each platform
<07/08	Tool development (2nd iteration: zenith)	Does the tool meet prototyping functionality / is it robust?	Testing between platforms	Percentage of error (human correctable) between each platform
<08/08	Adoption of Standards	Are vendors / communities supporting the OSID standard	Qualitative Interview with Vendors / Communities	Integration of APIs into source code of platform
<09/08	Take-up of Tool	Is their evidence of the tool being used outside the project boundaries?	Qualitative Interviews	Success by institutional use of tool without help by project

17. Quality Plan

Output	Workpackage 2: Proof-of-concept demonstrator (OSIDs + BulkMigration Tool)			
Deliverable ID	**Quality criteria**	**QA method(s)**	**Evidence of compliance**	**Quality responsibilities**
R-WP2-T15	Vote	Evaluation Committee	Feed (RSS) announcement	DFF
D-WP2-T10	DMADV	Testing / Approval	Feed (RSS) announcement	JK, DP
D-WP2-T11	DMADV	Testing / Approval	Feed (RSS) announcement	JK, DP
D-WP2-T12	DMADV	Testing	Feed (RSS) announcement	JK, DFF
D-WP2-T14	Comments	Peer Review	Feed (RSS) announcement	JK, DFF

Output	Workpackage 3: Scope Functionality of Bulk-Migration Tool (User Cases)			
Deliverable ID	**Quality criteria**	**QA method(s)**	**Evidence of compliance**	**Quality responsibilities**
R-WP3-T16	Survey	Evaluation Committee	Feed (RSS) announcement	DFF
R-WP3-T17	Comments	Peer Review	Feed (RSS) announcement	DFF

Output	Workpackage 4: Developer Roundtable Meeting and OSID training (buy-in)			
Deliverable ID	**Quality criteria**	**QA method(s)**	**Evidence of compliance**	**Quality responsibilities**
R-WP4-T20	Comments	Peer Review	Report	DFF
R-WP4-T21	Interviews	Eval Committees	Feed (RSS) announcement	DFF

Output	Workpackage 5-8: Testing of Bulk-Migration Tool (beta)			
Deliverable ID	**Quality criteria**	**QA method(s)**	**Evidence of compliance**	**Quality responsibilities**
D-WP5-T24	DMADV	Testing / Approval	Feed (RSS) announcement	JK, DFF
R-WP6-T28	Comments	Peer Approval	Feed (RSS) announcement	DFF, PD
R-WP7-T31	Comments	Peer Approval	Feed (RSS) announcement	DFF, PD
R-WP8-T36	Comments	Peer Approval	Feed (RSS) announcement	DFF, PD

Output	Workpackages 9-12: Testing of Bulk-Migration Tool (zenith)			
Deliverable ID	**Quality criteria**	**QA method(s)**	**Evidence of compliance**	**Quality responsibilities**
D-WP9-T39	DMADV	Testing / Approval	Feed (RSS) announcement	JK, DFF
R-WP10-T43	Comments	Peer Approval	Feed (RSS) announcement	DFF, PD
R-WP11-T47	Comments	Peer Approval	Feed (RSS) announcement	DFF, PD

R-WP12-T51	Comments	Peer Approval	Feed (RSS) announcement	DFF, PD

Output	Workpackages 13: Publish Tool and Open Source Documentation			
Deliverable ID	**Quality criteria**	**QA method(s)**	**Evidence of compliance**	**Quality responsibilities**
D-WP13-48	Contract	Eval Committees	Integration into source code	DFF, PD

18. Dissemination Plan

Timing	Dissemination Activity	Audience	Purpose	Key Message
Nov 2006	Project Web Site, including RSS feed.	Global HE/FE Community	Awareness Inform Engage Promote	Information about the SOURCE project
Throughout	JISC-UKOLN Repository Wiki and/or BBK e-Learning wiki	Global HE/FE Community	Inform Engage Promote	
As appropriate	Papers and presentations at conference/meetings in the areas of: learning objects, content packaging, metadata, platform/repository development, Web Services, etc.	UK HE/FE Community, Stakeholders	Engage Promote	Information about the SOURCE project
As appropriate	Feedback and Participation in Programme and Special Interest Group Meetings	UK HE/FE Community	Engage Promote	Share Knowledge and Experience
As appropriate	Articles in appropriate journals, e.g. D-Lib Magazine	Global HE/FE Community	Inform	Information about the SOURCE project
03/07-06/07	Developer Roundtable meeting	Platform Developers	Awareness Train Engage Promote	Adopt OSID as standard to enable bulk-migration tool
06/08-09/08	Training "plug-fest" of tool	UK HE/FE Community	Awareness Inform Engage Promote Train	Training on the use and 'play & plugability' of the bulk-migration tool and OSIDs

19. Exit and Sustainability Plans

This project sits within the long-term strategy of the Bloomsbury Colleges Consortium to establish a repository for the full spectrum of content that is being created amongst its six colleges.

Project Outputs	Action for Take-up & Embedding	Action for Exit
Survey data	Dissemination across UK HE/FE	Notify (RSS) and Publish (Website)
API OSIDs	Assure integration into source code of platforms	Agreement with vendors / buy-in from OS community leaders
OSID training	Assure all training material posted for use by other projects	Notify (RSS) and Publish (Website)
Bulk-Migration Tool (version: strawman)	Disseminate to HE/FE	Ensure final version on SorceForge and Open Knowledge Initiative site.
Bulk-Migration Tool (version: beta)	Disseminate to HE/FE	Ensure final version on SorceForge and Open Knowledge Initiative site.
Bulk-Migration Tool (version: zenith)	Disseminate to HE/FE	Ensure final version on SorceForge and Open Knowledge Initiative site.

Testing documentation	Disseminate to HE/FE	Notify (RSS) and Publish (Website)

Project Outputs	Why Sustainable	Scenarios for Taking Forward	Issues to Address
Bulk-migration tool, including training material and UML models	Need for interoperable transfer of content between platforms, so content cannot be 'lock-in", also a more competitive repository environment	• Project documentation on project web site • Software on SorceForge • Community development within OKI project CMS	Assurance of accessibility to versions of tool for redevelopment as further bulk-migration needs arise.
OSID APIs	Need for "bridges" of interoperability between platforms to assure a SOA environment.	• Spread awareness of OSIDs to other HE/FE partners to assure vendor/community use of APIs	Vendor/community awareness of need for common interoperable standards

Appendix A. Project Budget

	JISC Contribution		Institution Contribution		Total
	YR1	**YR2**	**YR1**	**YR2**	
Staff					
Project Manager / Education Officer .8 FTE	29901	32116	0	0	62017
Tool Development Consultant	4661	4661	0	0	9322
API (OSID) Development Consultant	4661	4661	0	0	9322
API (OSID) Training Consultant	5137	5317	0	0	10454
Travel & Subsistence					0
Travel & Accommodation	1000	1000	0	0	2000
Education and Outreach	231	239	0	0	470
Equipment					0
Repository Software (A)	0	0	25829	0	25829
Repository Software (B)	6011	0	0	0	6011
Repository Software OS (C)	0	0	0	0	0
Server(s)	0	0	9727	0	9727
Dissemination					0
London Training Rooms and Lunch	0	0	0	0	0
Web Site / RSS / Wiki	0	0	0	0	0
Evaluation					0
Web Survey	0	0	0	0	0
Other *(please specify)*					0
Computer	303	0	0	0	303
Staff Recruitment	101	0	0	0	101
Estates Office Cost	0	0	4182	4311	8493
Indirect Costs	0	0	39463	40678	80141
Total	52006	47994	79201	44989	**224190**
Total Institutional Contribution					**124190**
Total requested from JISC					**100000**

Appendix B. Workpackages

Month	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
WORKPACKAGES																							
1: Scope Significant HE Platforms		->	->	->	->																		
2: API (OSID) Proof-of-Concept Demonstrator			->	->	->	->	->																
3: Scope functionality of bulk-migration tool				->	->	->	->																
4: Developer Roundtable Meeting and OSID Training				->	->	->	->	->															
5: Create bulk-migration tool (version: beta)					->	->	->	->	->	->	->												
6: Integrate and Test Tool with Platform A (beta)								->	->	->	->	->											
7: Integrate and Test Tool with Platform B (beta)									->	->	->	->	->										
8: Integrate and Test Tool with Platform C[OS] (beta)										->	->	->	->	->									
9: Create bulk-migration tool (version: zenith)														->	->	->	->						
10: Integrate and Test Tool with Platform A (zenith)															->	->	->	->	->				
11: Integrate and Test Tool with Platform B (zenith)																->	->	->	->	->			
12: Integrate and Test Tool with Platform C[OS] (zenith)																	->	->	->	->	->		
13: Publish Tool and Open Source Documentation																				->	->	->	->
14: Plug-fest and Dissemination Training																				->	->	->	->
15: Final JISC report and sustainability report																						->	->

Project start date: *2006-11-01*

Workpackage and activity	Earliest start date / Latest completion date	Outputs	Miles tone	Responsibil ity
YEAR 1				
WORKPACKAGE 1: Scope Significant HE Platforms *Objective: identify key stakeholders and significant platforms*	**December 2006 / May 2007**			
1. Research of potential teaching/learning content platforms				DFF
2. Emails to HE platforms for statistical usage in UK and abroad				DFF
3. Survey creation and pilot				DFF
4. Implement survey (email quantitative)				DFF
5. Evaluate survey results				DFF
6. Follow up with phone call interviews (qualitative survey)				DFF
7. Report of findings and dissemination to UK HE		**Report**		DFF
WORKPACKAGE 2: API (OSID) Proof-of-Concept Demonstrator *Objective: identify stakeholders for bulk-migration tool adoption*	**January 2007 / May 2007**			
8. Negotiate demonstrator with vendors and community members				DFF / JK
9. Specification gathering of demonstrator content platforms				JK
10. Build OSIDs for Platform 1		**Deliverable**		JK
11. Build OSIDs for platform 2		**Deliverable**		JK
12. Build strawman data migration tool (beta version)		**Deliverable**		JK
13. Test tool (*version: strawman*)				JK / DFF
14. Write and disseminate report on findings and further developments		**Report**	🧭	DFF /JK
WORKPACKAGE 3: Scope functionality of bulk-migration tool *Objective: identify user cases for bulk-migration scenarios*	**February 2007 / May 2007**			
15. Research user case scenarios from previous projects (Jisc, etc)				DFF

16. Write user case studies and submit to steering committee				DFF
17. Disseminate user case studies and findings to HE/FE		**Report**		DFF
WORKPACKAGE 4: Developer Roundtable Meeting and OSID Training	**February 2007 / June 2007**			
Objective: buy-in by communities for creation of bulk-migration tool				
18. Confirm trainer and participation of developers in meeting				DFF
19. Coordinate logistics and schedules for 3 day meeting in London				DFF
20. Publish meeting notes and training material for post-meeting access.		**Report**		DFF / JK
21. Follow-up with developers on opinions and participation			🧭	DFF / JK
WORKPACKAGE 5: Create bulk-migration tool (version: beta)	**May 2007 / September 2007**			
Objective: create bulk-migration tool				
22. Gather requirements and user case specifications for beta build of tool				DFF / JK
23. Obtain access to SDK for platforms / schedule build time				JK
24. Build and Test tool against platforms (Workpackages 6-8)		**Deliverable**	🧭	JK
WORKPACKAGE 6: Integrate and Test Tool with Platform A (beta)	**June 2007 / October 2007**			
Objective: create bulk-migration tool				
25. Acquire approval by partner institutions for testing to take place				DFF /JK
26. Contact community/vendor developer to access/develop system resources				PD / JK
27. Perform test, record activity				PD / DFF
28. Report on test findings for iterative development of tool		**Report**		DFF / PD
WORKPACKAGE 7: Integrate and Test Tool with Platform B (beta)	**July 2007 / November 2007**			
Objective: create bulk-migration tool				
29. Acquire approval by partner institutions for testing to take place				DFF /JK
30. Contact community/vendor developer to access/develop system resources				PD / JK
31. Perform test, record activity				PD / DFF

32. Report on test findings for iterative development of tool		**Report**		DFF / PD
WORKPACKAGE 8: Integrate and Test Tool with Platform C[OS] (beta)	**August 2007 / December 2007**			
Objective: create bulk-migration tool				
33. Acquire approval by partner institutions for testing to take place				DFF /JK
34. Contact community/vendor developer to access/develop system resources				PD / JK
35. Perform test, record activity				PD / DFF
36. Report on test findings for iterative development of tool		**Report**		DFF / PD
WORKPACKAGE 9: Create bulk-migration tool (version: zenith)	**December 2007 / March 2008**			
Objective: create bulk-migration tool				
37. Gather requirements and user case specifications for beta build of tool				DF /JK
38. Schedule/coordinate with technical lead consultant on build and delivery				JK
39. Build and test tool against platforms (Workpackages 10-12)		**Deliverable**		JK
WORKPACKAGE 10: Integrate and Test Tool with Platform A (zenith)	**January 2008 / May 2008**			
Objective: create bulk-migration tool				
40. Acquire approval by partner institutions for testing to take place				DFF /JK
41. Contact community/vendor developer to access/develop system resources				PD / JK
42. Perform test, record activity, integrate into source code				PD / DFF
43. Publish report on test findings for bug tracking and dissemination		**Report**		DFF / PD
WORKPACKAGE 11: Integrate and Test Tool with Platform B (zenith)	**February 2008 / June 2008**			
Objective: create bulk-migration tool				
44. Acquire approval by partner institutions for testing to take place				DFF /JK
45. Contact community/vendor developer to access/develop system resources				PD / JK
46. Perform test, record activity, integrate into source code				PD / DFF
47. Publish report on test findings for bug tracking and dissemination		**Report**		DFF / PD

WORKPACKAGE 12: Integrate and Test Tool with Platform C[OS] (zenith)				
Objective: create bulk-migration tool	**March 2008 / July 2008**			
48. Acquire approval by partner institutions for testing to take place				DFF /JK
49. Contact community/vendor developer to access/develop system resources				PD / JK
50. Perform test, record activity, integrate into source code				PD / DFF
51. Publish report on test findings for bug tracking and dissemination		**Report**		DFF / PD
WORKPACKAGE 13: Publish Tool and Open Source Documentation				
Objective: disseminate bulk-migration tool openly to UK HE/FE	**June 2008 / Sept 2008**			
52. Ascribe Open Source license to tool (community/vendor agreement)		**Deliverable**		DFF
53. Publish user guides and manuals for tool implementation		**Report**		DFF / JK
54. Publish Tool (version 1.0) on SourceForge		**Deliverable**		DFF / JK
WORKPACKAGE 14: Plug-fest and Dissemination Training				
Objective: disseminate bulk-migration tool openly to UK HE/FE	**June 2008 / September 2008**			
55. Broadcast completion of tool to HE/FE community, invite attendance				DFF
56. Coordinate logistics and dates for plug-fest training				DFF
57. Record and publish training of tool		**Report**		DFF
58. Encourage further partnerships for tool development sustainability				DFF / JK
WORKPACKAGE 15: Final JISC report and sustainability report				
Objective: Publish tool to JISC community	**August 2008 / October 2008**			
59. Collect final evaluation data for JISC completion report		**Report**		DFF
60. Assure archive state of tool for long-term accessibility		**Deliverable**		DFF
61. Sign-off on project				DFF

Members of Project Team: DFF = David F. Flanders (Project Manager) / JK = Jeff Kahn (Technical Lead - Consultant) / PD = Consultant Platform Developers (Fedora, HarvestRoad Hive, Intralect Intralibrary, The Learning Edge's Equella)

Footnotes:

[1] Note on OAI-OAR: As this is the ethos behind the OAI-OAR project, a watching brief on the standards model that is being created by this project will be closely followed.

[2] At present, it is common for archived learning objects to consist only of the *published* output of the source file content (e.g. compressed flash files of the original source files)[2]. Unless the source files are also contained within the content package along with the published export files, possibilities for reshaping and repurposing of the digital media assets will be extremely limited. In this case, with both source file and output file, difficulty arises from the size of content packages that contain their source files: these are commonly up to ten times larger than the compressed, published files.

[3] Harvest Road, Intralect, The Learning Edge, Blackboard Building Block Consultants, Fedora Community and ePrints Development team.

4 There is a dichotomy of needing vendors to create features and tools for educational purposes, contrasted with the business model for capitalistic advancement: This results in the creation of tools and features that are developed for overall financial gain and not with due consideration for overall development in the sector for the greater good: preservation or best-practice in interoperable innovation are examples of this dichotomy, see article by W Nasierowski, OpenURL: http://journals.pepublishing.com/openurl.asp?genre=article&issn=0954-4054&volume=217&issue=8&spage=1145

5 Most significantly, it is the combination of tailoring metadata to enable the pedagogical model of repurposing content that has the most implications for the tools this project will create.

[6] http://www.opensource.org/licenses/gpl-license.php

[7] http://www.opensource.org/licenses/bsd-license.php