


Cover Sheet for Proposals			
Name of Capital Programme: Repositories and Preservation Programme			
Bid for Calls : (Please tick ONE BOX ONLY, as appropriate)			
Discovery to Delivery and Interoperability Demonstrators (Strand C)			
Repository Start-Up and Enhancement (Strand D)			
	Call II – Repository Start-Up and Enhancement Projects	<input type="checkbox"/> a) Repository start-up projects <input type="checkbox"/> b) Repository enhancement projects <input checked="" type="checkbox"/> c) Rapid innovation projects: enhancing repository content	
As advised by Rachael Bruce (JISC Programme Manager), this project would be willing to switch funding strands if necessary. The project team remains open to further negotiations.			
Name of Lead Institution:		Birkbeck, University of London	
Name of Proposed Project:		Fedorazon	
Name(s) of Project Partner(s): The Bloomsbury Colleges consortium			
Full Contact Details for Primary Contact: Name: David F. Flanders Position: Project Manager, SOURCE Project Email: d.flanders@bbk.ac.uk Address: Birkbeck, Malet Street, Bloomsbury, WC1 7HX Tel No: 02071936934			
Length of Project:		6 months	
Project Start Date:		October 2007	Project End Date: March 2008
Total Funding Requested from JISC:		£ 20,000.00	
Funding Broken Down over Financial Years (Mar – Apr): n/a			
Sep07 - Mar08		Apr08 – Mar09	
£27,347.00		n/a	
Total Institutional Contributions:		£ 7347.00	
Outline Project Description: Project Fedorazon will use Amazon Web Services S3 and EC2 (Storage and Computing) to enhance the scalability and robustness of content repositories. Specifically, the project will use Fedora with these services to enable new component based repository architectures that will support the entire JISC community and e-Framework as content scales in size and complexity.			
I have looked at the example FOI form at Appendix A and included an FOI form in the attached bid (Tick Box)	YES	NO X	
I have read the Circular and associated Terms and Conditions of Grant at Appendix B (Tick Box)	YES X	NO	

Glossary of Terms:

AWS: Amazon Web Services

Component service swapping: the ability to switch out well defined services for other services with minimal reconfiguration of the web services.

EC2: Elastic Computing Cloud

ESB: Enterprise Service Bus

OKI: Open Knowledge Initiative

OSID: Open Service Interface Definition

Redundant cluster: a set of servers that have duplicate mirrors so content can be served in multiplicity.

RESTful: Representation State Transfer, specifically using CRUD methodology

ROA: Resource Oriented Architecture (as defined in O'Reilly *RESTful Web Services*); ROA specifically is in contrast to SOA (which is implied to be WS* architectures).

S3: Simple Storage Service

Service stack: the services that make up a functioning repository architecture; as opposed to a hardware stack which is the physical stack of servers that deliver a service.

Storage bucket: as defined by AWS this is a folder that content can be placed within and has a unique token for access to that folder.

Switchboard: a repository that does not contain content datstreams, but only contains the metadata which points to the full content datastream. By using "switchboard repository" (as opposed to "metadata repository" we are implying that the content is owned by the institution though not hosted at the institution).

The Cloud: Also referred to as a network cloud. In telecommunications, a cloud refers to a public or semi-public space on transmission lines (such as T1 or T3) that exists between the end points of a transmission. Data that is transmitted across a WAN enters the network from one end point using a standard protocol suite such as Frame Relay and then enters the network cloud where it shares space with other data transmissions.

Virtual Servers: We are specifically using this term to mean both: 1.) "virtual" implies that several such sets of programs may reside on a single machine, allowing them to serve different web sites independently, by sharing the machine resources; and, 2.) "virtual" servers that are not held at an institution but are accessed in the cloud

WS*: Web Service Standards as defined by OASIS (WSDL and SOAP based)

Project Fedorazon

Value to JISC community:

The specific aim of this rapid innovation project is to lower the immediate and future technical barriers in adopting repositories. One of the primary barriers that have been encountered across the UK HE and FE community is the lack of technical knowledge in the departments that are most apt to take on repositories. A specific user case -that is often cited- is the willingness by libraries to take on the fundamental role of digital content management, but do not have the hardware nor expertise of how that hardware can scale and maintain its robustness. In addition, where some libraries might have the technical know-how, they do not necessarily have the facilities to host multiple physical servers nor the budget to do so (The Bloomsbury College Libraries are particularly aware of this problem given the cost of hosting local servers in WC1 space). This fundamental hardware computing requirement must be addressed if the 14 million pounds that JISC has invested is not to be drained by the ever increasing need for more servers as more content is collected. In other words, the complexity of physical hardware set-up and maintenance must be hidden away from the institution so true focus can be placed upon enhancing repository content.

While the solution to this problem for proprietary systems might be to outsource this scalability problem to the company's server farm¹, open source software (including Fedora, ePrints and DSpace) do not have this kind of centralized community hardware stack to support the growing needs of repositories. Accordingly, while projects should be focusing on populating repositories -without a scalable and robust growth plan- many of the repositories will be required to redirect their focus on the hardware issues rather than on content collection and enhancement efforts.

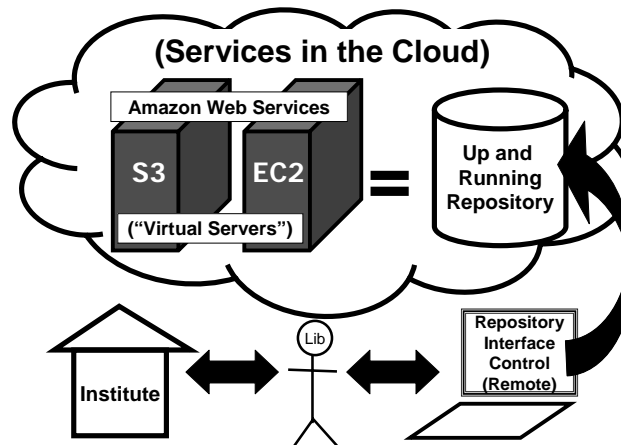
Our solution to this problem is to use "virtual servers" in the web cloud², or more specifically to use the Elastic Computing Cloud (EC2) and Simple Storage Service (S3) as provided by Amazon Web Services³. These two web services by Amazon offer a unique opportunity to the JISC repository community to grow and scale as quickly (or as slowly) as they wish and without the hassle of projecting hardware sustainability costs or computing expertise support⁴. Therefore this project directly supports the 1.2 million pounds that JISC is investing in Repository Start-up and Enhancement, and it is doing it by assuring that projects who receive capital will spend it on content enhancement and not on hardware issues.

What are Amazon Web Services?

Amazon Web Services⁵ are a direct response to the Service Oriented Architecture that is spreading across all sectors. However, Amazon is looking to provide "common services" not just to a single sector but to all sectors (business, government, education, et al). Their response to this has been to release twelve services (since March 2006) that are intended for use by all sectors. Two of the most talked about services (and certainly the most common) are the Simple Storage Service⁶ (S3) and the Elastic Computing Cloud⁷ (EC2).

S3 is essentially expandable digital shelving that can grow dynamically ad infinitum. The advantage of using this storage service is that it is as easy to use (REST CRUD) and yet can be as secure as a cash point (WSDL SOAP). Furthermore this service will automatically scale as it is required to do so. With up to 5Gb object uploads, no limit on number of objects and no restrictions in bandwidth capabilities (therefore taking full advantage of SuperJanet), S3 is fit for purpose in supporting the success of repositories as they grow.

EC2 offers the second hardware service or "virtual server(s)" that is required to launch a repository, which is the computing (or software logic) that makes calls to S3 to get and deliver data from store to the user⁸. EC2 can be used to install and run any repository software including ePrints, DSpace and Fedora. The "elastic" part of EC2 is the ability to scale at a moments notice, which means that if all a universities students decided to use the repository simultaneously EC2 would allocate as many servers required to compensate for this need. Previously, to do this with local servers an institution would have to have numerous servers in place (redundant cluster) and have the forethought to turn these server on and off as they are needed. This elastic computing service in combination with the storage service provides an ideal scalable SOA architecture for JISC repositories.



Graph 1: Content Repository Enhancement Architecture

With these two “virtual servers” (S3 & EC2) institutions no longer have to worry about hardware, scalability, robustness or specialty technical expertise. Quite simply the heavy technical lifting of a repository can be taken care of by one of the most reliable companies in the web. This leaves the institution (and especially JISC projects) to do what they are intended to do: focus on content collection and enhancement. For the JISC community, as repositories continue to grow across UK HE and FE, the barrier to repository implementation will not be a technical discussion but a cultural one. *Potentially the most exciting aspect of this project is that an institution could make the cultural decision of initiating a repository and still have time to technically install that repository and have it up and running in the same day!*

Why AWS (Amazon Web Services)?

It is important that project Fedorazon addresses to the JISC community the reason for using a global commercial company to support an Open Source movement. Primarily, it is because there is no such thing as Free and Open Source Hardware (i.e. server boxes still must be purchased not open sourced). Amazon also supports the architecture of JISC’s SOA by using a component based architecture that allows for the swapping out of services for other services without any delay or repercussions to the client. This loose-coupling provides JISC with the opportunity to encourage enhanced services that could replace either EC2 or S3. For example Grid technology for automated robots could replace EC2, as has already been accomplished at Southern Florida University⁹; or a future Janet service could provide a cheaper storage service to education as our Robot Scientists¹⁰ continue to collect data? The possibilities are endless when true open standard SOA is adhered to and therefore AWS naturally encourages further advancements in the e-infrastructure regardless of proprietary position. Both UKOLN and the AHDS see the potential for this development and therefore fully support project Fedorazon even with their commitments to the Open Source movement (see appendix no. 2 & no.3).

From an institutional perspective, the benefit of having one of the largest web providers in the world tender these services (S3 & EC2) are three-fold¹¹:

1. *Economies of scale*: Amazon via its commercial services are already required to have a massive data network (larger than all UK HE and FE institutions combined). This includes a level of robustness that no HE/FE institution –nor educational company- could ever provide individually (99.99% up time). Currently S3 is storing 5 billion objects and zero latency has been noticed. This kind of scaling business model combined with Moore’s law on digital storage suggests that the cost will actually decrease as time goes along¹².
2. *Open Standards and Trustworthy*: As a true web services approach, the services of Amazon are truly “loosely-coupled” so that the boundaries of the service are clearly defined. This is manifest in the clean use of open web service standards, both SOAP and ROA (RESTful CRUD) are supported. Furthermore, the advantage of using Amazon is that it is Amazon, the same company that is one of the most successful web retailers in the world. Let alone a trusted book service regularly used by university libraries.
3. *Available, fast and durable*: or simply put the repository manager doesn’t need to know it exists because it just does its job all the time, well 99.99% of the time.

From a Birkbeck point-of-view AWS makes sense because it supports the growing community of practice evident in the Bloomsbury Colleges consortium. This is the primary reason why Birkbeck

needs a flexible architecture that will change and grow with the consortium without any restriction. By adopting AWS services Bloomsbury does not have to decide which college is going to bare the burden of server maintenance and therefore can focus on community issues of support for our researchers and students. This places the efforts of the consortium upon content development which the Bloomsbury College consortium is actively pursuing with other projects such as the SOURCE project¹³, EMERGE project¹⁴, International Development Centre¹⁵, as well as its general courses and research programmes.

Project Plan:

Aim: Develop and establish the interoperability of component repository content services that can be seamlessly incorporated into the e-Framework for immediate and robust use by the education sector.

Objectives:

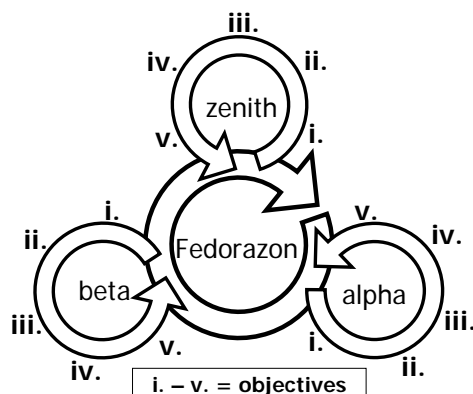
- i.) Provide OS code and documentation for using Fedora with EC2, S3 and other services*
- ii.) Encourage and disseminate the use of Fedora on AWS to JISC projects and communities*
- iii.) Provide training on how to deploy Fedora as a component of other services*
- iv.) Support any and all project wishing to deploy repository services on EC2 and S3*
- v.) Provide robust testing and validation of these services as part of the e-Framework & JISC SOA communities.*

The 'aim' of this project as stated above is intentionally agnostic to Fedora and AWS, as this project hopes to accomplish more than merely set up a successful component based content system. Rather, the aim is intended to demonstrate that services (regardless of proprietary or open source state) should be easily and effortlessly put in place as well as 'swapped-out' using open standards. By taking advantage of SOA in both the education and business sectors, JISC has greater odds of success as we create our own well defined services. This overall aim is intended to support the e-Framework goals of:

- *A service oriented approach to system and process integration*
- *Development, promotion and adoption of Open Standards*
- *Community involvement in development of the e-Framework*
- *Open collaborative development activities*
- *Flexible and incremental deployment*

Therefore the project will not only support the Fedora community in establishing a loosely-coupled approach to their own architecture, but also encourage other repositories communities to incorporate AWS services (and other services) to better enable their architecture as it grows and changes.

The means of achieving this aim are laid out with the specific objectives of this rapid innovation project which are further specified below. It is worth noting the overall project management approaches of the Fedorazon project as each of the objectives are achieved. The method for assuring rapid innovation is achieved will be through a 'rapid prototyping model' of "right – rapid – rough" as used by IDEO Design Company¹⁶. The focus of the project will be upon the delivery of a real world service that will become available in three iterative releases: 1.) alpha (installation of Fedora 2.2 on EC2 and S3), 2.) beta (installation of Fedora 3.0 on EC2 and S3), and 3.) zenith (swapping out of service components with other services). During each of these three releases the objectives of the project will be cycled through to assure our overall aim is achieved. The project plan as incorporated into this cycle is described in detail below.



Graph 2: Project Plan Release Cycle ("right-rapid-rough")

Alpha Release: Installation of Fedora 2.2 on S3 and EC2

Objective no. i.) Provide OS code and documentation for using Fedora with EC2 and S3: Because of Birkbeck's engagement with AWS the work of installing Fedora 2.2 on S3 and EC2 is already underway. However, rather than install the system and move on with the work at hand for the Bloomsbury Colleges, JISC would be funding the creation of documentation and a public facing help guide on how an institution can accomplish this work themselves. To release this documentation the Fedora wiki will be the primary source with further support via the AWS community portals and SourceForge for any and all OS code creation.

Objective no. ii.) Encourage and disseminate the use of Fedora on AWS to JISC projects and communities: Upon start of the project Fedorazon will immediately look to partner with another institution to demonstrate the ease of accomplishing this work without need for technical expertise in server configuration. We envision passing over the help documentation of our alpha release and monitoring the stress points and bottlenecks that this institution has in setting up the server configurations; this will feed back into the beta release documentation and help guides. Because of Birkbeck's ongoing work in the Fedora community (in the UK as part of the UK&I User Group, in Europe as bidding member of the FP-7 Fedora Community and as active listserv member on the US generated list) Fedorazon should have no lack of volunteers and already has several potential candidates in mind. Ideally as a qualitative measure Fedorazon would like to support a smaller HE/FE college that could not install Fedora because of a lack of server expertise. A qualitative success factor for this cycle would be the ease by which a small college is able to install Fedora 2.2 from our initial documentation.

Objective no. iii.) Provide training on how to deploy Fedora as a component of other services: Training at the alpha release will be wiki and telecommunications based. As this is a rapid innovations project the Fedora wiki will be used to keep ongoing project updates and real-time documentation posted as it progresses. The project manager will also keep an ongoing blog on project developments, so as to help manage the team as well as provide an open working policy for all community members. From these output methods Fedorazon will create a "buzz" about the project so as further releases occur; the support community for this project will grow alongside.

Objective no. iv.) Support any and all project wishing to deploy repository services on EC2 & S3: To help encourage interest by other communities in the use of a component based content system for repositories Birkbeck will utilize its partnership via the SHERPA-LEAP consortium. The timing for this work should be ideal, as the funding for SHERPA-LEAP comes to an end summer of 2008 which means that the institutions (of which Birkbeck is one) are beginning to look around for alternative means of hosting their repositories which UCL had previously been doing. This is the first of many ways that this project will support the enhancement and sustainability of collections that UK HE/FE has invested in significantly.

Objective no. v.) Provide robust testing and validation of these services as part of the e-Framework and JISC SOA communities: From the start Fedorazon will engage with the e-Framework to assure best-practice is being established in regards to mapping out the component services into Service Descriptions and Service Usage Models (SUM). In the first instance Fedorazon will begin to map out S3 and EC2 as service expressions for the education sector's domains. In addition, an initiative will be made to assure that Fedora as a repository SUM is mapped out according to its own service definitions. It will submit this work to the e-Framework community so as to support the mapping of the service genre. Overall, it is this larger mapping exercise that will demonstrate the interoperability of EC2, S3 and Fedora with the e-Infrastructure's other services.

Beta release (installation of Fedora 3.0 on S3 and EC2):

Objective no. i.) Provide OS code and documentation for using Fedora with EC2, S3 and other services: With the release of Fedora 3.0 in September Fedorazon is ideally placed to support the Fedora community as they decide to upgrade from Fedora 2.2. to 3.0. Because of the development team that Fedorazon is using (see team CVs, appendix no. 6), immediate access to the SOURCE code for this new release of Fedora will be readily available.

The work to be accomplished should be minimal given the work that will have been accomplished with Fedora 2.2. and AWS. This work will be in the spirit of an open beta release where the community will be openly invited to participate. Also because of the alpha release documentation work that will have identified stress points in installation the second set of documentation should be worked out to accommodate the largest audience possible.

Finally, the project will actively monitor its own use of the services and their cost. This will be done for both single institution budget expenditures and consortium based budget expenditures.

Objective no. ii.) Encourage and disseminate the use of Fedora on AWS to JISC projects and communities: At this stage in the development cycle the Fedorazon team will be able to start actively writing up documentation for typical scenarios in which institutions could utilize AWS services. This will include updating the Fedora wiki and Amazon community portal, posting help articles and podcasts, and creating learning objects to support the community as they switch to Fedora 3.0. The project team has expertise in these areas having been funded for various projects from JISC and HEFCE (see appendix no. 5).

During the beta cycle Fedorazon will take advantage of its connections with the UK&I Fedora User group to get community acceptance and evaluation of the work being done. Additional community outreach will be via the regular events that Fedorazon's team will attend (both in the US and UK, appendix 5-7).

Objective no. iii.) Provide training on how to deploy Fedora as a component of other services: Training with Fedora will be scaled up alongside wiki help documentation and telecommunications by openly inviting other institutions to participate in the beta testing release. This will be done on three fronts: 1.) Fedora listserv; 2.) JISC repositories listserv, and 3.) via EU contacts and listservs. In this way the project will be reaching out to the vast majority of English speaking communities. It is also at this cycle of the project that the project team will look to publish in a journal (such as *DLib*) and other trade publications (*Research Information* and *Information World Review*). This will be done alongside efforts to increase the Technoratti rating of the project blog and push up the Google ranking overall. This marketing will be aimed at encouraging participation in a final training workshop (ideally in cooperation with the Open Repositories Conference 1st April 2008 in South Hampton).

Objective no. iv.) Support any and all project wishing to deploy repository services on EC2 and S3: The beta release of the project will also give the project time to evaluate the potential for reusing the Machine Image on EC2 for other systems, as well as exploring the possibility of using S3 for storage for other systems. As Birkbeck and Bloomsbury Colleges consortium are currently using ePrints and DSpace initial scoping will occur for plausibility of using EC2 and S3 with these other two architectures¹⁷. From this work the project will release a "public challenge" to these two communities based upon the finding of the scoping report. In the spirit of friendly open source competition we hope to engage these other communities in deploying AWS with their repository platforms. It is also worth mentioning that the Bloomsbury Colleges via their SOURCE project have good relations with several commercial repository vendors including Intralect IntraLibrary, Harvest Road Hive and The Learning Edge's Equella. Fedorazon will maintain this relation to see what other possible component architectures might arise via these proprietary platforms (viz. project SOCKET).

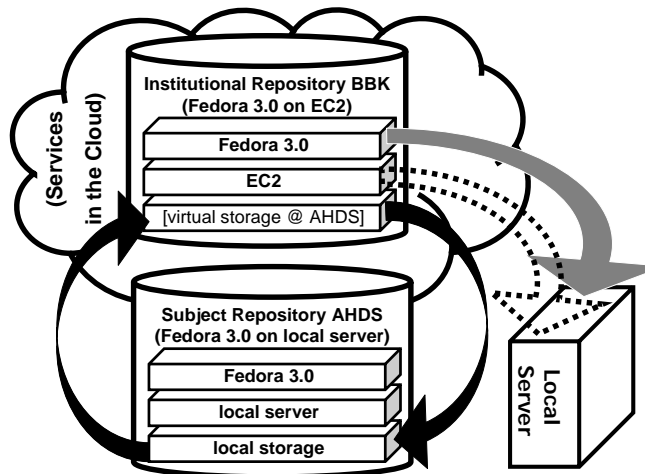
Objective no. v.) Provide robust testing and validation of these services as part of the e-Framework and JISC SOA communities: At the later stages of the beta release, the process of testing and validating the robustness of the services will begin (Fedora <-> EC2 <-> S3). Demonstrable data will be passed through the system¹⁸ to validate the robustness of the three services working with one another. This will also provide us with the opportunity to come up with a forecast for budgetary requirement in using AWS from an institutional setting.

This testing will be documented and developed according to the e-Framework guidelines. In relation to these guidelines the project will also be better placed to help further develop the Service Usage Model of content systems and their Service Level Patterns. This work will provide the foreground to the culmination of this SOA mapping as will be accomplished in the zenith release of the project.

Testing will also take place in regards to the financial safety of AWS. The potential cost of running a full time service on AWS and what the implications, risks and forecast for that costing would be (this is further addressed in the risk management section of this document).

Zenith release (swapping out of service components with other services):

Objective no. i.: Provide OS code and documentation for using Fedora with EC2, S3 and other services: The final stage of the project will be to demonstrate the interoperability of SOA by swapping-out the AWS services with other service components. There will be two demonstrators in this area:



Graph 3: "Swappable" Component Services

Demonstrator no. 1: Replacement of S3 with AHDS storage

One of the unanswered architectures for repositories is how institutional and subject-based repositories will facilitate one another (e.g. where will be the primary place lecturers go to deposit, who will do preservation, who creates the metadata, etc.). One answer to this design problem is to have institutional repositories act as primary deposit and local disseminator (assigning copyright, RAE reference and basic descriptive metadata), and subject based repositories act as preservation services and wider disseminator (assigning more complex and preservation metadata). The dilemma this kind of architecture creates is how the metadata (descriptive, copyright, preservation, et al) will be assigned to a single object so that there are not two separate objects floating around the web with different sets of metadata. The answer is by utilizing the architecture of the web to store the object in a single place, so that metadata is kept with the original content datastream. The replacement of an institutions' S3 storage with an AHDS preservation storage would allow for this architecture, but would take away the burden of an institution having to store the original content data stream themselves. It would also allow for the subject repository such as AHDS to undergo the costly process of preservation (of which they have the expertise where the institution does not), leaving the institution to concentrate on collection development and enhancement. Fedora is supportive of this kind of architecture, allowing the institutional repositories Fedora installation to act as 'switchboard' (object and metadata administration) while the storage facility (the storing of the content datastream) can be saved as part of the subject repository's Fedora instance.

Demonstrator no. 2: Replacement of EC2 by local server configuration

The second service-swap will be to port the configuration of Fedora on EC2 down to a local server within the institution. This final demonstrator is essential so that the institution have an exit strategy. This final stage of the project will be released as Zenith because it requires a closing of the loop from installation of repository onto AWS to taking everything down from AWS. This is perhaps the most important part of the project and so will be put through robust testing.

In addition to demonstrating the portability of Fedora from AWS, the project will also consider further architectures or services that the EC2 could be replaced with, for example a good deal of debate has occurred around interoperability of services via Commercial Middleware (ESBs), Open Standards (OKI-OSIDs) and web service protocols (WS* vs. RESTful). Because of the close affiliation work that is being done by the same project manager as SOURCE, Fedorazon is ideally placed to feed into this work for further development in the JISC-CETIS Enterprise SIG or via the Fedora community itself.

These two demonstrators will be documented from start to finish including testing results and forecasting for budgetary requirements. Overall, these two demonstrators will look to push forward the communities awareness of best-practice in service oriented approaches and the importance of open standards.

Objective no. ii.) Encourage and disseminate the use of Fedora on AWS to JISC projects and communities: Ideally, the 'closing of the loop' in the zenith release will see three qualitative situation arise from the previous two releases: 1.) participation by another repository architecture in the use of AWS (either ePrints and/or DSpace); 2.) A small non-technical HE/FE institution installing and operating Fedora via consultation of the Fedorazon documentation (alongside support from the community); and, 3.) establishment of a new design pattern for repositories that will help better

interoperate institutional and subject repositories (e.g. The Bloomsbury Colleges consortium repository outsourcing some of their storage to AHDS). These milestones will be strived for throughout the project and upon success will be broadcast to the community via listservs, podcasts and community events. The latter is a direct effort to assure Fedorazon has a lasting community impression and therefore sustainability effort. Of course alongside this “trumping of the horn” will be the dedication by Birkbeck to support the project work for as long as the repository team is using these services themselves.

Objective no. v.) Provide robust testing and validation of these services as part of the e-Framework and JISC SOA communities: The final contextualization and validation of this project will be via the e-Framework web site, where each of the service components will be thoroughly documented so their presence in the larger e-Infrastructure will be recognized. The output of this validation process will be documented in service expressions for each of the services. Along with further documentation on how each of these service expressions work with one another in a Service Usage Model.

Timetable and Deliverables:

Alpha Cycle (Oct-Nov 2007):

<p><u>Technical Workpackages:</u></p> <ul style="list-style-type: none"> -Installation of Fedora 2.2 on AWS -Set up default Image on EC2 -Test Environment -Deploy Fedora - defaults -Configure Fedora for tBC consortium¹⁹ -Scope custom AMI(s) for UK&I Fedora community 	<p><u>Documentation and Training Workpackages:</u></p> <ul style="list-style-type: none"> -Help Guide Documentation -eFramework Documentation -Scoping report on roundtable discussion -Download Authentication (Security) -Web Site and Skype for Remote Training -Scoping report on e-Framework participation
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Beta Cycle (Dec-Jan 2007/8):

<p><u>Technical Workpackages:</u></p> <ul style="list-style-type: none"> -Installation of Fedora 3.0 on AWS -Set up default Image on EC2 -Configure Environment -Migrate Fedora 2.2 to 3.0 -Configure Fedora for tBC consortium -Scope custom AMI(s) for Fedora community 	<p><u>Documentation and Training Workpackages:</u></p> <ul style="list-style-type: none"> -Budget Report on Cost of Running Fedora on AWS -Security Report on authorization procedures of AWS -E-Framework Service Expressions Report -Evaluation report of scoping installation on other repository (EPrints/DSpace)
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Zenith Cycle (Feb-March 2008):

<p><u>Technical Workpackages:</u></p> <ul style="list-style-type: none"> -Test EC2 as a switchboard to AHDS storage -Testing AHDS switchboard service -Collect test objects/content -Populating test instance -Porting to Local Server -Testing of Port to Local Server 	<p><u>Documentation and Training Workpackages:</u></p> <ul style="list-style-type: none"> -Developer/System Administration Documentation -Deployment Guide & Configuration Report -Help Guides and Installation Instructions (AHDS and Porting) -Updating Public Fedora Docs and wiki -Face-to-Face Training: AWS/Fedora (OR2008 Conference) -Final JISC project report and sign-off
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Dissemination and Evaluation Mechanisms:

Mechanism no. 1: Systems Environment Configuration Defaults

The Amazon Machine Image is a configurable environment that allows for Fedorazon to create the systems environment of its choice. In the first case, Open Source software (OS) will be the only platform that Fedorazon will use (other than AWS). Given this policy, the project will approach the Fedora community to evaluate which OS systems the community is most likely to use in their own configurations. In addition the project team will also explore the most scalable OS configuration for Fedora. This will include approaching some of the larger installations of Fedora to gain insight (NSDL, OhioLink, Encyclopedia of Chicago, etc.). From these two a default architecture will be selected to assure the ease in pick-up of the installation instructions. As stated before the qualitative aim of this evaluation mechanism will be the success by another institution in using the Fedorazon help documentation to install Fedora on AWS without any hands-on help.

Mechanism no.2: Testing of AWS security

The basic authorization and securities features of EC2 and S3 need to be evaluated for use with HE/FE. Because of the multiple partner institutions in The Bloomsbury Colleges consortium the security options of AWS will be explored in depth. As each institution will require both consortia and institutional access to their collections, the security of AWS will need to reflect this user requirement. From initial testing with S3 it looks that this set-up will not be difficult. However, further testing will occur in regards to more fine grained access and overall security issues. From this testing a report will be issued to explain the results and their implications. It will be broadcast across both JISC and Amazon community portals.

Mechanism no.3: Testing of AWS costing model

Because of the unique costing model of S3²⁰ and EC2²¹, the project will execute a series of tests to forecast the potential costs that may arise over time as repository content collections scale in size. This model will take into account the exponential scaling of repository content alongside further implications such as Moore's law and enhanced competition to the AWS marketplace (i.e. Google and iTunes have the potential to also launch similar services). Recommendations will be made in contrast to the current pricing model that educational vendors often place on institutions (i.e. per-user cost models). It is the projects belief that this new cost model will significantly affect the business models currently adopted in the education sector. It is hoped this costing brief will help lead to other JISC initiatives that can better negotiate community licenses.

Mechanism no. 4: testing AHDS storage service

In the zenith cycle of the project AWS services will be swamped-out by other services. The first demonstrator replaces S3 with local storage as provided by AHDS. To assure interoperability of the AHDS component services after the swap, testing will occur to validate the workflow of content moving between institutional (BBK) and subject (AHDS) repositories. The report of this work will be submitted under the e-Framework community to support the service level descriptions. AHDS as demonstrated by their letter of support at also interested in expanding this work (appendix 3).

Mechanism no. 5: testing local port

The second demonstrator in the Zenith cycle replaces EC2 with a local server. The transfer of the disk image and configuration variables will be tested to guarantee a 0% loss of data in the migration process. Both demonstrators in the Zenith cycle will be submitted to external groups (JISC-SETIC SIG and/or UKCoRR) for qualitative evaluation. It is also the express interest of the SOURCE project and Birkbeck that these two demonstrators are further explored to establish best practice in repository architectures and workflows. Ideally, these demonstrators lead to further project work with other community members.

Mechanism no. 6: Training and Documentation Impact

Finally the technical documentation, help guides and training materials will be evaluated for number of downloads. This will be followed up by requesting further feedback from the Fedora community and the wider JISC community. Qualitative success factors in this evaluation will be the number of independent institutions contacting the Fedorazon project to say they had successfully installed Fedora without once contacting the project team. Of course, the team will maintain an open door policy to encourage community members to seek support and advice from the team. Project work will be disseminated across JISC repository listservs and UKOLN DigiRepWiki.

Project Management Arrangements:

The project will take place within The Bloomsbury Colleges consortium. This forum has already had a good deal of success in joint projects (holding the largest consortium VLE license in the country) and actively bidding and participating in numerous consortia projects (EMERGE, SOURCE, SHERPA-LEAP, etc). From the community comes a great deal of expertise as well as an immediate audience for the work that Fedorazon will accomplish. It is from this community that the project team will take its cues, so as to assure a set of services that can be used in a divers array of HE/FE institutions.

The project team is made up of three individuals:

- *Project Manager:* Responsible for the overall context of the project to the JISC community and the tendering institutions, including: communication and education to community, budgetary implications, placement in e-infrastructure and overall sustainability. The Project Manager insures that the project outputs have value to the JISC community. The project manager will report directly to JISC and support any queries regarding the projects scope and/or objectives.

- *Development Team Manager*: Will ensure quality standards and schedule of technical deliverables is maintained. The Development Team Manager also ensures that communication channels remain open between all parties. The Development Team Manager will also handle work units that require deeper understanding of the project vision or direct communication with the client in order to be carried out effectively. A number of on-site trainings are included in the work units. These trainings would be delivered by the Development Team Manager.
- *Deployment Specialist*: Is a system administrator who understands both Fedora and AWS. He is responsible for much of the technical experimentation of this project. The Deployment Specialist plays a key role in the success of this project. This specialist will have unique insights and understanding of not only the deployment process but also what other system administrators will need in the way of documentation, creating an invaluable bridge between knowledge and users.

Project Stakeholder Engagement:

The three sets of stakeholders that the Fedorazon project will engage are:

1.) Leading JISC HE/FE institutions:

- The initial intention of Birkbeck was to proceed with using AWS for its own purposes. However, because of the prompting by Paul Walk at UKOLN this project is being brought forward to JISC as it holds significant value to the JISC community if correctly tested and documented. Accordingly, UKOLN (both Paul Walk and Bryan Kelly) have endorsed this project based upon the need to “explore alternative content deployment strategies, in particular examining issues arising from a highly distributed delivery platform” (see appendix 2).
- AHDS has also endorsed this project as in their words it will “lower immediate and future technical barriers in adopting repositories and its results will be of great value to the HE community” (see appendix 3).
- Additionally, verbal consent has been given by the project manager of the SHERPA-LEAP consortium (Martin Moyle) in considering the Fedorazon project as a sustainability mechanism that will support the University of London as its content repositories grow in size and scope.
- Finally, this work will fit in well with the e-Framework (as advised by Phil Nicholls, PsyDev Consultancy), thereby further increasing the take-up of the e-Framework website and community.

2.) JISC community members:

- The significant advantage of this project is that it supports all HE/FE colleges in the JISC community no matter how large or small their central computing services are. If the AWS hardware and business model are adopted it could easily lead to all institutions adopting repositories without any worry for scalability. This places direct focus on the collection and enhancement of repositories by institutions that no single JISC project could claim to accomplish so rapidly.
- The Fedorazon project also has the potential to enable the greater collaboration of JISC projects. For example, as the Depot begins to encourage all institutions to collect repository content, the Fedorazon project could be an immediate outlet for project looking to take on the business of their own repositories. Since the SOURCE project (as a big brother project to Fedorazon) is creating bulk-migration tools, it is easily foreseen that SOURCE tools could provide the migration of content from the Depot to an institutions own AWS installation of Fedora. This is one of many potential opportunities just waiting to be taken advantage of by Fedorazon.
- Finally, it is the written support of The Bloomsbury College Librarians that points to the success of this project (see appendix 4). The exemplary community model of The Bloomsbury Colleges consortium²² offers a range of support and diversity that will assure robustness and attention to detail as the project proceeds. Since Fedorazon will be thinking from the point of view of six different specialty research institutions the user cases and ease of adoption will be fully considered in the project scope. This collection of institutions also assures a diversity in type of content that can be used for testing.

3.) Institutional Champions:

- The project within the walls of Birkbeck will be supported by the Library and Central Computing Services. Its overall placement within the ethos of Birkbeck will be managed by the eLearning Group which reports directly to the teaching committee. As it is placed within the library the considerations for all types of content will be paramount (research, teaching, learning, admin, et al). Its connections with the SOURCE project will also help it to easily assimilate into the repository work that has been ongoing for the past four years at Birkbeck.

Risk Assessment:

An initial risk assessment has revealed the following concerns:

- Amazon going out of business / being taken over by another company (business being dissolved): While this is unlikely, in terms of long term strategy for risk assessment of this service it must be taken into account. This is precisely why the zenith cycle of the project will demonstrate the porting of the service to a local server.
- Duplicate services flooding the marketplace: While the market place that AWS currently is controlled by them, it is very likely further services will be rolled out by other companies with vast server architectures (Google, iTunes, MSN). While this competition would be welcomed (ideally driving down cost), the risk is the various standards that these companies might decide to push forward (i.e. Oracle only configurations or specific web standard support). Fedorazon will monitor this progress and evaluate any potential parallel services that arise so as to provide a full implications report.
- Automated attack on AWS download/compute: Because of Amazon's unique cost model the cost of using their services are levied according to amount of data stored (S3) and amount of computing elasticity required. This would potentially enable automated attacks to occur on a open system (such as a open access repository) where a robot could continually download content causing cost to be increased. Measures will be put in place to either limit the credit card amount or monitor the downloads and the IPs they are coming from. This is also a concern for other sectors so a watching brief will be put in place for potential solutions.
- Simplicity of authorization model: Currently S3 uses a single token for each "storage bucket" this requires a degree of consideration both for the simplicity of this authorization model and its complexity for consortium agreements. Upon first glance it appears complexity of authorization can be achieved via the repository software, yet due consideration must be made for who has the access to the S3 storage itself.
- Rise in the cost of AWS as a commercial service. While Moore's Law would seem to suggest that this cost will go down, nonetheless a watching brief will be established to observe and report on any trends by AWS. Initially, AWS in the classroom discounts would suggest that Amazon will drop prices for the education sector.
- Further risk assessment will be undertaken at the start of the project as part of the alpha cycle and JISC project plan documentation.

IPR Statement:

As the work we will be doing straddles both proprietary and open-source communities the BSD license will be used in any code creation or configurations to assure that the code is reusable by any and all parties concerned. The Fedorazon project intends to encourage the greater collaboration between the education sector and business sector (as well as government) so as to achieve a greater level of code reuse via SOA means.

Sustainability:

The sustainability of the project will in the first instance be carried on by the SOURCE project as it will use AWS for further testing and in the second instance by Birkbeck College and the Bloomsbury Colleges Consortium where it is intended to be the primary platform for repository services. Sustainability to the JISC community will primarily be carried out through the documentation that will be created during the course of the project. This documentation will look to support the Fedora community, other repository communities (ePrints/DSpace) and the e-Framework community. Also, in the spirit of open source Birkbeck will continue to support the services it endorses and will do its utmost to support further queries and questions in regards to repositories on AWS beyond the life of the project.

Budget (see appendix 8 & 9):

The £20000.00 being requested from JISC will primarily be spent upon the creation of robust documentation and preset Fedora configurations for use by any HE/FE institution. Essentially the payload for JISC will be an easy to install Fedora installation without any need to make plans for further server configurations or maintenance. Birkbeck is putting forward £7347.00 to fund the work it is already undertaking in regards to AWS for its own use and purposes.

Previous Experience of the Project Team (appendix 5-7):

As stated before, Birkbeck already has the team in place which is undertaking this work. The project manager leads the SOURCE project for the Bloomsbury Colleges Consortium and is a central advisor to several University of London repository projects. The Development Team Manager is an active Fedora developer, having worked on the core Fedora code and APIs himself. The Deployment Specialist has a long and successful career in setting-up servers and enterprise scale systems.

Appendixes:

- 1.) Letter of Support: Birkbeck College Secretary
- 2.) Letter of Support: UKOLN (UK Office for Library Networking)
- 3.) Letter of Support: AHDS (Arts and Humanities Data Service)
- 4.) Letters of Support: The Bloomsbury College Librarians
- 5.) CV: Project Manager
- 6.) CV: Development Team Manager
- 7.) CV: Deployment Specialist
- 8.) Project Budget
- 9.) fEC Budget

Appendix no.1.) Letter of Support: Birkbeck College Secretary



18 June 2007

JISC Executive
Northavon House
Coldharbour Lane
Bristol
BS16 1QD

Dear Sir

JISC Circular 04/07: JISC Capital Programme : Fedorazon Project

I am writing on behalf of Birkbeck, University of London. I am pleased to be able to confirm the support of the College for the *Fedorazon* project bid under the JISC Repositories and Preservation Programme. The project builds upon the SOURCE project which has been funded by JISC, led by Birkbeck, and involving other members of The Bloomsbury Colleges (Birkbeck, the Institute of Education, London School of Hygiene and Tropical Medicine, Royal Veterinary College, School of Oriental and African Studies and the School of Pharmacy). The *Fedorazon* project offers an innovative way of achieving long-term scalability for institutional digital archiving to support learning, teaching, and research. We believe the project will enable the growth of repository architectures so as to meet the resource demands of researchers, teachers and learners as the digital scholarly record continues to grow. It will enable libraries to scale up their repository architectures over time (as data grows and as more users require access). It also helps lead the way for other libraries in Higher and Further Education to install and run a repository without having to invest significant resources in hardware and specialist computing expertise. Above all, it will further support JISC as a community where the opening up of digital resources by institutions will benefit research, teaching and learning overall.

Yours faithfully

A handwritten signature in black ink, appearing to read "K. Harrison".

Keith Harrison
College Secretary

From the Secretary & Clerk
to the Governors
Keith Harrison BA

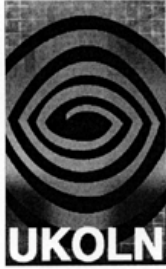
Malet Street
Bloomsbury
London
WC1E 7HX

Tel 020 7631 6257
Fax 020 7631 6224
Email k.harrison@bbk.ac.uk
www.bbk.ac.uk



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2006

Appendix 2: Letter of Support: UKOLN



UKOLN
c/o The Library
University of Bath
Bath
BA2 7AY

15/06/2007

Re. Bid for funds for Project 'Fedorazon'

We would like to extend an expression of support on behalf of UKOLN, for the proposal 'Fedorazon', which seeks to explore the potential benefits to an institution deploying a repository in a remote, commercially provided and supported infrastructure.

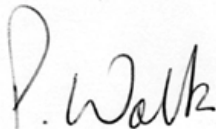
The ideas outlined in this proposal reflect UKOLN's current intention to explore alternative content deployment strategies, in particular examining issues arising from a highly distributed delivery platform.

We are encouraged by some of the proposal's specific points, notably:

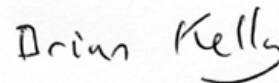
- a risk-managed approach
- a defined and tested exit-strategy
- the distribution of components in a loosely-coupled environment

An investigation into this approach for repository deployment is timely as we believe that our community can learn from the example set by commercial content-repositories (e.g. *Slideshare*).

We look forward to sharing ideas, expertise and experiences with this project.

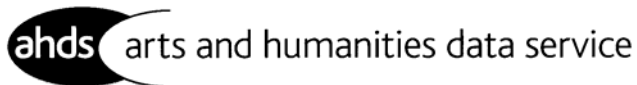


Paul Walk
Technical Manager
UKOLN



Brian Kelly
UK Web Focus
UKOLN

Appendix 3.) Letter of Support: AHDS



AHDS Executive
King's College London
26-29 Drury Lane (3rd Floor)
London, WC2B 5RL
Tel: 0207 848 1988
Fax: 0207 848 1989
Email: info@ahds.ac.uk
<http://ahds.ac.uk/>

Mr. David F. Flanders
Birkbeck College London
Malet Street
Bloomsbury
London
WC1 7HX

20th June 2007

To Whom It May Concern

Re: JISC Repositories and Preservation Programme - FEDORAZON Proposal, Birkbeck College London

I write to confirm, on behalf of the Arts and Humanities Data Service (AHDS), our full support for the proposal submitted by Birkbeck College, London entitled 'FEDORAZON', under the 'Repository Start-Up and Enhancement Projects' Call II- 'Rapid Innovation projects: Enhancing repository content' for Projects under the JISC Capital Programme 'Repositories and Preservation'.

This project is a significant initiative to lower immediate and future technical barriers in adopting repositories and its results will be of great value to the Higher Education community.

Yours sincerely,

Sheila Anderson
Director of the AHDS

Appendix no. 4.) Letters of Support: The Bloomsbury College Librarians



JISC Executive
Northavon House
Coldharbour Lane
Bristol
BS16 1QD

JISC Circular 04/07: JISC Capital Programme

Fedorazon Project

Dear Sir or Madam,

I am writing on behalf of The School of Pharmacy, University of London. We are a member of the Bloomsbury College Librarians which provides access to digital resources –both tools and architectures- on a collaborative basis with the Bloomsbury Colleges consortium. The Bloomsbury Colleges consortium consists of University of London colleges in the Bloomsbury area of London and includes Birkbeck, the Institute of Education, London School of Hygiene and Tropical Medicine, Royal Veterinary College, School of Oriental and African Studies and the School of Pharmacy.

We support the Fedorazon project bid being led by Birkbeck, under the above call. We believe the project will enable the growth of repository architectures so as to meet the resource demands of researchers, teachers and learners as the digital scholarly record continues to grow. This project directly supports JISC's investment in repositories by enabling libraries to scale up their repository architectures over time (as data grows and as more users require access). This project will help lead the way for other libraries in Higher and Further Education to install and run a repository without having to invest significant resources in hardware and specialty computing expertise. Above all, it will further support JISC as a community where the opening up of resources by institutions will benefit research, teaching and learning overall.

Yours Sincerely,

Michelle Wake
Head of Library and Information Services

The School of Pharmacy
University of London

29-39 BENTLEY STREET
LONDON WC1N 1AN

T 020 7753 5800
F 020 7779 0622

WWW.PHARMACY.UCL.AC.UK

JISC Executive
Northavon House
Coldharbour Lane
Bristol
BS16 1QD

JISC Circular 04/07: JISC Capital Programme

Fedorazon Project

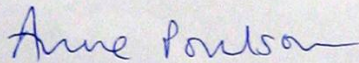
Dear Sir or Madam,

I am writing on behalf of SOAS, University of London. We are a member of the Bloomsbury College Librarians which provides access to digital resources –both tools and architectures- on a collaborative basis with the Bloomsbury Colleges consortium. The Bloomsbury Colleges consortium consists of University of London colleges in the Bloomsbury area of London and includes Birkbeck, the Institute of Education, London School of Hygiene and Tropical Medicine, Royal Veterinary College, School of Oriental and African Studies and the School of Pharmacy.

We support the Fedorazon project bid being led by Birkbeck, under the above call. We believe the project will enable the growth of repository architectures so as to meet the resource demands of researchers, teachers and learners as the digital scholarly record continues to grow. This project directly supports JISC's investment in repositories by enabling libraries to scale up their repository architectures over time (as data grows and as more users require access). This project will help lead the way for other libraries in Higher and Further Education to install and run a repository without having to invest significant resources in hardware and specialty computing expertise. Above all, it will further support JISC as a community where the opening up of resources by institutions will benefit research, teaching and learning overall.

Yours Sincerely,

Anne Poulson
The Librarian
School of Oriental & African Studies (SOAS)



JISC Executive
Northavon House
Coldharbour Lane
Bristol
BS16 1QD

JISC Circular 04/07: JISC Capital Programme

Fedorazon Project

Dear Sir or Madam,

I am writing on behalf of London School of Hygiene & Tropical Medicine, University of London. We are a member of the Bloomsbury College Librarians which provides access to digital resources –both tools and architectures- on a collaborative basis with the Bloomsbury Colleges consortium. The Bloomsbury Colleges consortium consists of University of London colleges in the Bloomsbury area of London and includes Birkbeck, the Institute of Education, London School of Hygiene and Tropical Medicine, Royal Veterinary College, School of Oriental and African Studies and the School of Pharmacy.

We support the Fedorazon project bid being led by Birkbeck, under the above call. We believe the project will enable the growth of repository architectures so as to meet the resource demands of researchers, teachers and learners as the digital scholarly record continues to grow. This project directly supports JISC's investment in repositories by enabling libraries to scale up their repository architectures over time (as data grows and as more users require access). This project will help lead the way for other libraries in Higher and Further Education to install and run a repository without having to invest significant resources in hardware and specialty computing expertise. Above all, it will further support JISC as a community where the opening up of resources by institutions will benefit research, teaching and learning overall.

Yours Sincerely,

Caroline Lloyd
Head of Library & Archives Service

To Note: At the time of submission the physical recommendation letter from the IoE had not yet arrived. Below is the email confirming the letter was signed and sent. If a digital copy of the letter is required please make a request to d.flanders@bbk.ac.uk

From: Stephen Pickles [<mailto:S.Pickles@ioe.ac.uk>]

Sent: Tue 19/06/2007 11:26

To: Philip Payne

Subject: RE: JISC bid, Project Fedorazon

[Letter sent](#)

[Stephen](#)

Appendix no. 5.) CV: Project Manager

David F. Flanders	Work Experience	
	Oct. 2006 – Current	<p>The Bloomsbury Colleges Consortium (University of London): Project Manger for JISC funded SOURCE project.</p> <ul style="list-style-type: none"> • Oversaw development of web services and tools for use with Repository architectures, e.g. bulk-migration tools for complex objects • Managed agile development process from user case studies to UI design • Established a consortium based repository for teaching and learning content • Developed further University workflows for the archiving of digital content
	Aug. 2004 – Sept 2006	<p>Birkbeck Library (University of London): Multimedia Developer</p> <ul style="list-style-type: none"> • Developed learning objects for information literacy skills throughout college • Designed digitisation workflow for slide library as digital visual image service • Researched and reported on HE digital repository use for multimedia content
	Aug. 2004 – Oct. 2004	<p>The British Library, Learning Department: Lead consultant in a bid for tender to research e-learning in museums, libraries and archives.</p> <ul style="list-style-type: none"> • Authored BL research and report towards an MLA e-learning strategy • Pioneered learning object technology within the BL learning department • Trained curators and other staff in managing online content in CMS • Coordinated e-learning usability test groups for external colleges
	June 2004 – Aug. 2004	<p>Armadillo Systems (New Media Co.): Database and Digitisation Assistant working with 'Turning the Pages' (British Library Digital Learning Programme) http://www.bl.uk/collections/treasures/digitisation6.html</p> <ul style="list-style-type: none"> • Researched and created comprehensive client database of museums and libraries in the EU, UK and US with potential for e-learning software sales. • Established client networks for a soft-sales approach (long-term investment) • Participated in the digital production and editing of two digital manuscripts • Quantitative research into 500+ learning institution web sites for D/B
	Sept. 2002 – April 2004	<p>Pelham Arms Productions Ltd: web designer (p/t during masters degrees)</p> <ul style="list-style-type: none"> • Used DreamWeaver MX to create CSS, XML & PDF downloadable web site • Trained three staff members -with no prior web experience- to update site
	June 1999 – Nov. 2002:	<p>The National Multiple Sclerosis Society: Assistant to the Event Coordinator</p> <ul style="list-style-type: none"> • Provided key support and encouragement for VIPs during fundraising events • Established sales relationship for annual donations and events participation • Average VIP donation: \$10K-\$80K per annum / no. of VIPs: 30-90 per event • Executive clientele included: British Petroleum, FedEx, Texaco, and EBay
	Sept 2000 – June 2001	<p>The University of Colorado: live-in Resident Advisor in all male computer and electrical engineering dorm.</p> <ul style="list-style-type: none"> • Supervised and advised forty-five computer engineers in their 1st year at Uni • Organised community events and provided study skills workshops
	Summer 1998/ Summer 1997	<p>Norlin Library, The University of Colorado: Library Desk Clerk</p> <ul style="list-style-type: none"> • As such, participated in student lead task force to test and integrate e-journals into the university virtual learning environment. • Trained incoming clerks in Chinook Indexing Catalobue (1mil+ items)
	Education	
	Oct. 2003 – Sept. 2004	<p>MSc in Information Sciences, University of Brighton, <i>School of Computer, Mathematics and Information Science.</i> Dissertation Title: "Digital Content in Museums, Archives and Libraries", work/study at British Library.</p>
	Oct. 2002 – Sept. 2003	<p>MA in Renaissance Literature and Culture, University of Sussex, <i>School of Humanities.</i> Dissertation Title: "Communication of Drama in Early Modern England", Tutors: Dr. Margaret Healy & Dr. Brian Cummings.</p>
	1997-2000	<p>Bachelor of Arts, University of Colorado, USA. School of Arts & Sciences, Boulder.</p> <ul style="list-style-type: none"> • Degree emphasis in English Literature and Communication Studies

Appendix no.6.) CV: Development Team Manager



Matt Zumwalt

Founder and Director of Product Development, MediaShelf LLC, 2006 to present

Matt has assembled an expert team centered around web development, user interface design, media technology, marketing and technical training, providing solutions that seamlessly integrate with client's existing work flow, web presence and brand.

Fedora Experience

Leading an effort with the core Fedora developer team to extend and streamline Fedora's REST API

Presented in US and Europe on Integrating Fedora and XForms 2007

One of 20 invited attendees at the Fedora Architecture Summit in March 2007

Extensive experience with Fedora's SOAP APIs

Active contributor to the Fedora Wiki, contributing numerous noteworthy pages

Background

Strong project management experience

Skillful in translating client needs into formal requirements while applying solid principles of software design

Five years of experience with Linux system administration

Three years experience with web application development

Knowledgeable in multiple programming languages including Java, Ruby, LISP, PHP, Tcl, Python, C and C++

Proficient with Linux, BSD, Mac OSX, Windows and SGI

Professional Highlights

Founder Pollen3D, 2005

Designed an MPEG-4 3D Audio Content Authoring Tool.
Managed design team which included: User Interface Designers, Developers, Networking Specialist and Graphic Artists.

Linux Web Server Administrator and Web Designer, 2004-06

Webmaster, Office Network Administrator, Kagyu Thubten Choling Monastery, NY, 2004-06

Social Secretary for University of York Cinematography, 2002-03

Volunteer Organizer for Students for a Free Tibet, University of Washington, 1999-02

Community Youth Organizer, District 202, Minneapolis, MN, 1996-99

Education

Master of Science, Electrical Engineering, University of York, 2002-2003

Bachelor of Arts, Comparative Religion, University of Washington 1999-2001



Appendix no.7.) CV: Deployment Specialist

Jonathan Dahl

Jonathan Dahl is a software developer with four years of web programming experience, including almost two years with Ruby on Rails. Jonathan has been lead developer on over a dozen web sites that use Ruby on Rails.

SKILLS

Project Experience: Test Driven Development, Deployment and Scaling, Source Control, Continuous Code Integration, Data Modeling, Server Architecting, Project Management, Training

Databases: MySQL, PostgreSQL

Operating Systems: Linux/Unix, Mac OS X, Windows

Languages: Ruby, Ruby on Rails, PHP 4 and 5, ASP 3.0, XHTML and CSS, Javascript, SQL

PROFESSIONAL HIGHLIGHTS

- Co-founded Slantwise Design in 2003, a web development agency that now specializes in visual design, XHTML/CSS, and Ruby on Rails.
- Lead application architect at Slantwise Design, including extensive Ruby on Rails experience.
- Co-founder of the Ruby Users of Minnesota, the Twin Cities Ruby user group.
- Experience with test-driven development, version control, continuous integration, Capistrano, and related practices and technologies.
- Strong project management experience using agile project management methodologies (including Scrum).
- Excellent verbal and written communication skills.

PROJECT HISTORY

Woodrow Street Technologies September 2006 to February 2007

Lead Developer - Was one of three lead Ruby on Rails developers on a large Rails startup. Worked on a development team that included eight Ruby developers and four Java developers. Managed two major subsystems, and developed a video transcoding suite using Ruby.

SaySwap, Inc. May 2006 to September 2006

Project Manager and Lead Developer - Managed the development of SaySwap, an online video game trading startup built using Ruby on Rails. Led a team of three other Rails developers and two web developers.

IMAR Group July 2005 to March 2006

Project Manager and Lead Developer - Led development of several business tools for IMAR, a manufacturer of competition waterski boats. Tools include a dealer extranet and an order manager. Uses Ruby on Rails and MySQL.

Archiver's August 2005 to November 2005

Project Manager and Lead Developer - Managed production of an ecommerce application for Archiver's, a nationwide retailer of craft and scrapbook supplies. Integrated with Windows software that was used to create and upload digital photo books and photo cards, which were then ordered and tracked via our system. Uses Ruby on Rails and MySQL. Also built several smaller applications, including a store calendar tool that allows each retail store to maintain its schedule of classes.

Various

Project Manager and Senior Developer - Developed smaller websites and Content Management Systems for the following companies, using Ruby on Rails:

Amity Technology | Boutique Sleep | Sugar Sand | Gekko Sports | Trinity Schools | IATSE Local 13
Home Valu Interiors/Drexel Interiors | Radline Holding, LLC | RedPhone

EDUCATION

Master of Arts in Church History, Trinity International University, 2001-2003
(Coursework complete, thesis in progress)

Bachelor of Arts in Philosophy, Wheaton College, May 2000
(Coursework in Computer Science)

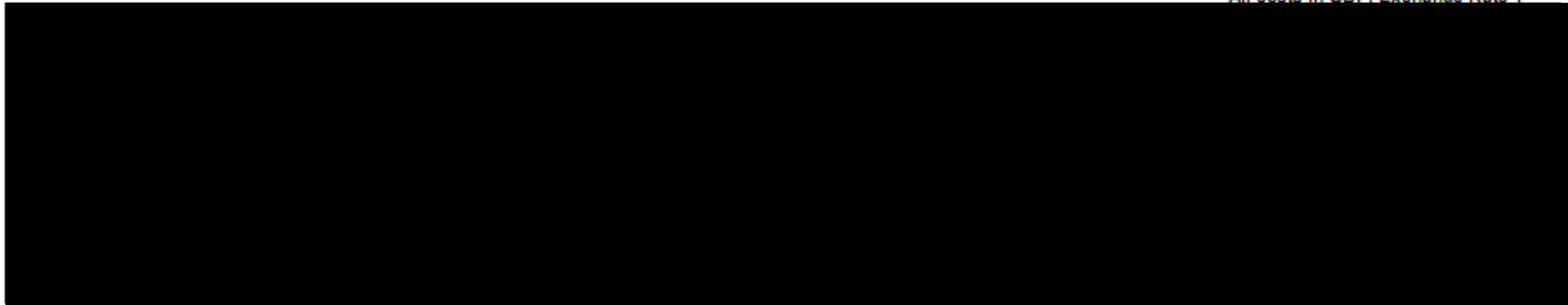
Appendix no.8.) Project Budget

Project Budget: Fedorazon			
6 month project (Oct 2007 - March 2008)	JISC Contribution Requested	Institution Contribution	Total
Travel & Subsistence			
Travel & Accomodation	2000	0	2000
Training	500	0	500
Education and Outreach	500	0	500
Equipment			
Fedora 2.2	0	0	0
Fedora 3.0	0	0	0
AWS Simple Storage Service (S3)	1000	1000	2000
AWS Elastic Computing Cloud (EC2)	1000	1000	2000
Server	3036	1964	5000
Dissemination / Documentation			
London Training Rooms and Lunch	0	0	0
Fedora Wiki	0	0	0
Blog and RSS Feed	0	0	0
Learning Objects	0	0	0
Evaluation			
Fedora Listserv	0	0	0
Other (please specify)			
Estates Office Cost	0	465	465
Indirect Costs	0	2918	2918
Total			27347
Total Institutional Contribution		7347	7347
Total requested from JISC	20000		20000

Appendix no.9.) fEC Budget

Inflation

All costs in GBP, Exchange Rate 1



Facilities & Equipment Cost

Inflation	Charge Type	Description	Vat Type	Vat %	Unit	Unit Type	Basic	Vat Cost	Income	Cost
Category : Equipment										
0%	Directly Incurred Costs	Equipment	Standard rate	17.50	1	item	7,660	1,340	9,000	9,000
		Total	Equipment				7,660	1,340	9,000	9,000
		Total	Facilities & Equipment Cost				7,660	1,340	9,000	9,000

Non Staff Cost

Inflation	Charge Type	Description	Vat Type	Vat %	Unit	Unit Type	Basic	Vat Cost	Income	Cost
Category : Consumables										
0%	Directly Incurred Costs	Consumables	Standard rate	17.50	1	item	426	74	500	500
		Total	Consumables				426	74	500	500

Category : Overseas Travel

Total	1 Feb 07 Research - Office Based	:	3,382	3,382
Total	Estates & Indirect Costs	:	3,382	3,382

Other Income

Description	Income		
Fixed Amount	0		
Fee * Quantity	0		
Total	:	0	
Grand Total	:		27,347 27,347

Index : LW- London Weighting , NI- National Insurance , OA-Other Allowances , SA- Superannuation

References:

- 1 This has been a solution by both the Bloomsbury Learning Environment using Blackboard VLE and by Birkbeck using WebCT VLE. It is also worth noting that neither of these centralized proprietary services have been any where near 95% up time.
- 2 "web cloud" is a system designers' term for the "open web", see glossary.
- 3 It is important to note that while this is the same company as Amazon.com it is under a different management branch of the company.
- 4 The scalability issues and architecture around such hardware configurations as virtualization and clustering are an example of a whole domain of knowledge outside of an institutions expertise.
- 5 <http://aws.amazon.com/>
- 6 <http://aws.amazon.com/s3>
- 7 <http://aws.amazon.com/ec2>
- 8 please note that S3 could be replaced by any storage service)
- 9 http://www.csee.usf.edu/~anda/papers/AmazonS3_TR.pdf
- 10 <http://www.aber.ac.uk/compsci/Research/bio/robotsci/>
- 11 <http://www.amazon.com/Why-Use-AWS%3F-home-page/b?ie=UTF8&node=15763371&me=A36L942TSJ2AJA>
- 12 http://en.wikipedia.org/wiki/Moore's_Law
- 13 <http://www.source.bbk.ac.uk>
- 14 <http://emerge.elgg.org/about.php>
- 15 <http://www.bloomsbury.ac.uk/idc/>
- 16 <http://theartofinnovation.com/>
- 17 At the writing of this bid the OS repository system Alfresco has also become of interest as it has considerably advanced in the business sector over the past year
- 18 considerable data has already been collected via the Bloomsbury College Consortium as part of the SOURCE project
- 19 OAI-PMH, XACML, LDAP, PostgreSQL, Mulgara, SSL-apache
- 20 <http://www.amazon.com/gp/browse.html?node=16427261>
- 21 http://www.amazon.com/b/ref=sc_fe_l_2/104-5275130-8901553?ie=UTF8&node=201590011&no=3435361&me=A36L942TSJ2AJA
- 22 <http://www.bloomsbury.ac.uk/>