



SAFIR Project Cover Sheet

Project Information			
Project Acronym	SAFIR		
Project Title	Sound Archives Film Image Repository		
Start Date	01-08-2007	End Date	31-12-2008
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Partner Institutions	n/a		
Project Web URL	http://www.york.ac.uk/services/library/elibrary/digitallibrary.htm		
Programme Name (and number)	Repositories and Preservation Programme, start-up and enhancement strand		
Programme Manager	Andrew MacGregor		

Document Name			
Document Title	SAFIR Final Report		
Reporting Period			
Author(s) & project role	Julie Allinson, Project Manager		
Date	30/01/2009	Filename	safir-finalreport-v1.doc
URL			
Access	<input checked="" type="checkbox"/> Project and JISC internal	<input checked="" type="checkbox"/> General dissemination	

Document History		
Version	Date	Comments
0.1	24/10/2008	Internal draft
0.2	10/11/2008	Internal draft (revised)
0.3	22/01/2009	Internal draft (revised after comments from Steering Group)
1.0	30/01/2009	Final version



SAFIR (Sound, Film, Archives Image Repository) Project

Final Report

Version 1.0

January 2009

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Acknowledgements

The Sound, Archives, Film, Image Repository project (SAFIR) was funded by the Joint Information Systems Committee (JISC) as part of the Repositories Start-Up and Enhancement Programme.

The project team members have included Elizabeth Harbord, Julie Allinson, John Byrne, Anthony Leonard, Wayne Britcliffe, Lucy Jaques, Matthew Herring, Peri Stracchino, Frank Feng and Helen Savage.

We would like to thank members of the project Steering Group: Elizabeth Heaps, Julian Richards, John Local and Stephen Town. Thanks also to our Academic Advisory Group: Jenny Doctor, Peter Thompson, Rachel Proudfoot, Sara Slinn, John Mateer, Tim Ayers, Helen Hills and Anthony Masinton.

The project team would also like to extend their thanks to Richard Green, Chris Awre and Simon Lamb from the University of Hull, and Glen Robson and Paul Bevan from the National Library of Wales whose balanced view of Fedora helped us to evaluate it against commercial software. Thanks also to Andrew MacGregor, the JISC Repositories and Preservation Programme and the Repositories Support Project.

Executive Summary

The SAFIR (Sound, Film, Archives Image Repository) Project was established to aid the University of York in starting a much longer project to establish a multimedia repository and flexible centralised Digital Library infrastructure. It was a small project with clear aims to

- 1) Gather and examine user requirements;
- 2) Evaluate and select software based on those requirements;
- 3) Devise policies, processes and profiles to support the ingest of data and the creation of metadata,
- 4) Implement the software with some access control and basic interoperability with other systems
- 5) Review the copyright status of resources and clear any copyright as necessary

The project approach was to devise a work plan and a set of work packages, recruit staff and to focus on key project goals. In selecting an open source software product for the Digital Library infrastructure, the project took a more developmental direction and thus some level of re-planning and flexibility have been required, including agreeing a 6 month extension to the project. The project team work closely together and also with colleagues in Computing Service, the Library and the Virtual Learning Environment team. Engagement with external users and colleagues is critical and has been achieved through an Academic Advisory Group and direct meetings with academics. A Steering Group provides strategic leadership.

The project has achieved its aim and now has a functioning implementation of the Fedora Commons software with the open source Muradora add-on in place to provide a public interface for searching, browsing and accessing objects. Two collections of image objects have been migrated into the Digital Library and a basic level of access control is in place. An extensible metadata creation tool has been developed to create rich image-specific metadata. This tool uses a number of techniques to expedite the process of describing images. A range of policies and public documents have been created to support the development of the Digital Library, including a requirements specification containing high-level model and detailed requirements; and our content model for images, a document which provides a blueprint for how we create, describe and manage images within the Digital Library, including copyright and licensing issues. Intangible outcomes include the expertise we have built and the contributions to other work across the library and repositories community.

Creating a Digital Library is challenging and time consuming, particularly when building a bespoke system as we have chosen to do at York. The project continues to need careful management to ensure users remain engaged without raising expectations, along with good communication and realistic estimates on how long development will take. The decision to follow a software development path was taken in order to build in-house skill and tailor to our specific needs. The success of this will only become known as we roll out our system to users and make further customisations.

SAFIR is the start of our work to build a Digital Library and has provided a focus for driving the project forward. Over the coming two years we will extend the project, working closely with users to test usability and extending our content collections to incorporate a richer range of digital object types and subject disciplines.

Background

The University of York has an Information Strategy which encompasses the development of interoperable repositories for research data and resources, learning objects and published research outputs; a Web content management system (CMS) and portal; a virtual learning environment (VLE); the library management system (LMS) and a streaming service, amongst others. York is a partner in the White Rose Research Online (WRRO) repository, with the University of Leeds and University of Sheffield. This repository, originally funded as part of the SHERPA project, has achieved an encouraging level of success; 94% of its content is full-text and most is peer-reviewed post-prints. The University of York, through a policy endorsed by both the Research and Information Committees, has approved this repository as a means to widen access to research and increase its impact, and strongly encourages staff to deposit research papers where copyright allows. WRRO has been funded by JISC for its IncReASe (Increasing Repository Content through Automation and Services) project which has seen the repository content grow significantly and its technical services develop in exciting and innovative ways. In addition, Yorkshare, the University's Virtual Learning Environment, has been adopted widely across the University. University policy on the VLE, endorsed by Teaching Committee, states that it should facilitate collaboration and the sharing of digital learning and teaching objects across the institution.

The rationale for the Digital Library, and SAFIR, is that a need was identified to create a repository to store digital resources from various disciplines (e.g. music, art history, forensic phonetics, theatre, film and television, history, psychology) and different formats (sound, archives, film, video, and images). Such resources do not fit into the remit of other University systems, e.g. Yorkshare or WRRO. They may be a source for research, or arise out of research work. York is a research-led University, where teaching is informed by research and thus many resources may be used for both teaching and research. Any repository must therefore meet the needs of a diverse set of users and types of use.

Collections of resources were identified, many before the project started, some of which are already digital. Others require digitisation and, beyond SAFIR, the Digital Library Project will act as a central point for bids to a range of funders to carry out digitisation, as appropriate. In some cases access to resources may need to be controlled, for example where there are rights issues or sensitivity about access to research with human data subjects. Rich metadata will facilitate resource discovery of all the content, as appropriate. The University has particular strengths in humanities research and a major archival collection of national and international importance in the Borthwick Institute for Archives. By their nature the archive collections are unique. Resources identified for inclusion in the new repository include:

- **The University of York Sound Archives:** sound recording collections held at the University of York, available for teaching, research and listening. The Sound Archives specialises in non-commercial, off-air and unreleased recordings, a joint initiative of the Music Department and the Borthwick Institute for Archives, which together manage the collection, preservation and dissemination of recordings in increasingly obsolete media. The University of York is the third Music Preserved Listening Centre, with The Barbican Music Library in London and the Jerwood Library of the Performing Arts at Trinity College of Music in Greenwich. The Sound Archives also hold a significant collection of recordings from the ECM label, the Ray Spencer Jazz Collection and the John R.T Davies collection of 20,000 rare Jazz 78s and LPs.
- **Archives:** the Borthwick Institute plans to digitise its collection of wills and probate records (the largest in the UK outside the National Archives). It is creating a database of ecclesiastical court records with funding the Mellon Foundation and would like to add digital images; and to digitise the Lascelles slavery archives which have been deposited at York from Harewood House. For such projects to be successful, the University must provide the repositories infrastructure, of which this project forms a key part.
- **Film and video:** building on existing work in the departments of English, Sociology, Music and Electronics, the University has created a new department of Theatre, Film and TV which took its first students in 2007. Video and film resources will be central to this new department which will develop innovative technologies for creating and using digital resources.

- **Images:** Several departments (including History of Art, Archaeology and Biology) have large collections of images, currently slides. Many of these are candidates for digitisation.

Aims and Objectives

The overall aim of the SAFIR project was to create the infrastructure for a multimedia research repository or repositories to provide a Digital Library service for the University of York and to populate the Digital Library with a pilot collection of content from within the University. This aim has not changed.

Specific objectives:

- Survey user needs and establish the scope and range of materials to be included in the repository. This objective is unchanged.
- Evaluate available software in the light of user needs, interoperability standards and the JISC information environment. This objective is unchanged.
- Choose the most suitable, cost-effective software to meet user needs and any access control required for rights management. This objective is unchanged.
- Establish policies for repository management e.g. criteria for inclusion, metadata workflow and profiles, data types covered. This objective is unchanged, although its method of execution has been revised a little from the original plan.
- Implement the repository(ies) and ensure interoperability with other local and national repositories and systems. This objective is unchanged. A large proportion of the material being ingested into the repository during this phase needs access restrictions and cannot be shared with other repositories at present. For such resources, interoperability with external systems is not appropriate.
- Assess copyright restrictions on identified resources for inclusion in the repository. This objective is unchanged, although its method of execution has been revised a little from the original plan.

Methodology

This was a short project with a focussed goal (to implement a repository, populate with pilot content and implement a level of access control). It forms part of a much larger 3-year project at York to build a Digital Library infrastructure and as such, the methodology used for the project reflects the methodology used for that project. Work has been structured into work packages, many running concurrently to ensure an iterative progression towards project goals. Where appropriate goals have been revised to fit with larger University and Library objectives and with arising needs, such as the decision to support our History of Art Department in managing their image service.

Implementation

Requirements gathering:

The requirements gathering had two phases. Desk research was carried out to look at the requirements gathered by other similar projects, in particular MIDESS and RepoMMan. This proved useful and complemented the gathering of the individual requirements of our institution. Interviews were then conducted with representatives of Departments where collections of materials had been identified. An informal set of questions were circulated, but interviews were kept discursive and flexible. Notes from meetings were written up, and specific requirements extracted. The approach was fairly lightweight, as the time available was too short to employ more rigorous methodologies or analysis. A number of scenarios were written up from the interviews and have proved useful. The requirements and scenarios identified were written up formally in our requirements specification, a document which also contained a high-level model for the Digital Library based on the OAIS reference model. Detailed requirements from this document were used to form the basis of the software tender document. The requirements gathering process is an ongoing one, and although there is a set of formally documented interviews from October-November 2008, since then we have continued to have discussions and meetings with academics which inform our development and design for the Digital Library. It can be difficult to gather requirements and to turn these into concrete 'functions', as different people have different perspectives, different levels of information and computer literacy. Requirements gathering is a process of understanding what it is that people are trying to do. Other opportunities have allowed the Digital Library team to spend time within the History of Art Department and this has been invaluable for understanding their processes and needs.

Software procurement:

The software procurement activity was conducted as a formal confidential process, because of the involvement of commercial companies. The requirements specification was incorporated into a Digital Library tender document and circulated to suppliers in December 2007. The detailed requirements listing remained confidential until the conclusion of the procurement exercise at which point it was made publicly available. Responses to the tender from commercial companies remain confidential. After an initial review of software options and a series of visits to institutions with experience of the different software options, the project team selected 5 companies to invite to tender. These were Intrallect (IntraLibrary), VTLIS (VITAL), Ex Libris (DigiTool), HarvestRoad (Hive) and Fedora Commons. All gave demonstrations to staff from the University of York, in January 2008, although HarvestRoad decided not to respond to the tender. After reviewing the tenders, Fedora Commons was chosen - the only open source software option on the list. This decision meant that the project timescales needed revising, in light of the necessity to recruit a software developer to the project and to undertake more in-house development work. A 6 month extension was agreed with JISC, moving the project end date to December 2008.

Technical development:

The technical development was planned in 3-monthly phases with key deliverables and a 'wish list'. The development plan document complemented the more generic project work plan and work packages document. The development plan is revisited after each development iteration and the next phases of development are more fully specified at that point. The first development phase ran from April to May 2008 and involved a basic installation of Fedora and the Muradora interface, principally for intelligence gathering before recruiting to the two technical posts. The second phase, July to September, saw our new technical staff in place and we made a start on many of the development goals outlined below. Development goals completed to December 2008 can be summarised as follows:

- Data management: implemented and tested custom metadata editing with xforms for images in Muradora.
- Data Management: planned workflow development. A workflow for moving images asynchronously from desktop to server will be implemented in early 2009.
- Access Control: implemented minimal access control for History of Art CLA-scanned images. It was not possible to implement LDAP or Shibboleth integration within the timescale although this will be implemented soon after the end of SAFIR.
- Access/Datastreams: implemented a more intuitive method for downloading images than that currently in Muradora.
- Ingest: bulk ingest of History of Art and Painton Cowen data and metadata into Fedora.
- Interface: offer a public interface for searching and browsing using Muradora, minimally customised.
- Storage: moved to using Thumper filestore purchased by the project.
- Technical: installed latest versions of Muradora 1.3.3 and Fedora 2.2.3 (security update).
- Usability/Testing: begun planning for user testing with History of Art.
- Housekeeping: implement bug fixing and issue tracking procedures.

Technical development does not exist in isolation and it should be stressed that the development plan focuses on development in its broadest sense, covering work that involves the entire Digital Library team, as outlined in other headings in this section. Regular full team meetings, smaller focussed meetings, regular testing and input into technical 'deliverables' ensure that the development remains on-target, allied to larger project goals and is feasible to implement within the timescales. Involvement of colleagues from Computing Service and drawing on advice from other developers via mailing lists, meetings and individual visits has proved extremely valuable in progressing development work. Technical issues have arisen and have in most cases been solved. Nevertheless these have caused some delays to the project which has meant that some goals could not be fully completed, in particular work on access control.

Policy, workflow and metadata profile development:

There are a number of activities which do not fall under the technical umbrella. During the initial test phase of repository building (April – June 2008), the focus of our work was on data, metadata,

copyright and policy. Much of the work was in research and gathering requirements and we only began to show results when we started to analyse existing data held within our History of Art Department. Several of our deliverables have been rolled into a single document – the image content model. This document captures the decisions and recommendations made for images, in particular the pilot collection from History of Art. It incorporates our metadata profile, recommendations for resource types, our copyright clearance methods, proposed workflow and access control requirements. Additionally, much work on understanding copyright law, copyright clearance processes and the CLA Higher Education photocopying and scanning licence has been happening and has resulted in a set of notes and guidance for what the Digital Library can and can't offer to academics in the History of Art Department, in terms of scanning and digitising materials, guidelines for scanning images, a licensing model for the acceptance of materials into the Digital Library and a Digital Library policy document. The policy document includes a clear take-down policy for dealing with any breaches of copyright. One lesson learnt is that until faced with real-life use cases, it is difficult to devise effective policies. Another is that copyright is a very complex area and although we need to offer some advice we cannot claim that this is legally binding.

Overall project management:

SAFIR has been managed by Julie Allinson, with support from the Project Director, Steering Group and other members of the project team. Regular project and team meeting have ensured the project remained aligned to its purpose and deadlines. Three-monthly Steering Group meetings have allowed for strategic input and steer regarding important decisions, such as the software choice.

Since SAFIR is part of a bigger 3-year Digital Library project at York, there is a bigger team and a more detailed set of project management documents which are not relevant for discussion in this document. Although the project had formal outputs and a time plan, there has been some scope for agility, particular around re-planning and re-negotiating deadlines after we selected an open source software product and thus became a more developmental project. Also, because many of the work packages were designed to run concurrently, we were able to continue working on other tasks whilst awaiting the recruitment of technical staff. It is a real strength that staff recruited to the Digital Library project work closely across both technical and non-technical work elements to ensure that the project achieves its goals. When embarking on a project to build something from scratch it is impossible to develop an entirely rigid plan, there must always be scope for change and flexibility.

Outputs and Results

Tangible outputs from the project are as follows:

- Requirements Specification (https://vle.york.ac.uk/bbcswebdav/xid-89716_3)
- Image Content Model (https://vle.york.ac.uk/bbcswebdav/xid-316149_3)
- Digital Library Image Licence (internal use at present)
- Guidelines for academics and Digital Library staff (internal use at present)
- Digital Library policy (internal use at present)
- A Digital Library (currently at <http://dlib.york.ac.uk:8080/muradora/>), with
 - 1734 images migrated from History of Art
 - 750 images from the Painton Cowen image collection, publicly available under a Creative Commons Licence [pending formal agreement from owner]
 - facilities to search and browse those images (access restrictions permitting)
 - 102 collections into which object are placed
 - access control applied to CLA-licensed content collections
 - an OAI-PMH interface for harvesting Dublin Core metadata about public objects
 - a mechanism for creating rich metadata about images

Work on the project has resulted in the Library service becoming much more embedded in the academic processes of the History of Art Department. We anticipate that this close relationship will be replicated with other departments as the Digital Library develops.

Results (intangible outputs):

Across all of our work elements, there has been a vast learning curve, both in terms of learning new technology, devising metadata profiles, understanding copyright and licensing issues, and devising appropriate workflow and procedures. Much that has been learnt is not reflected in the above list of outputs but will be invaluable as the Digital Library progresses.

Outcomes

Objective: *Survey user needs and establish the scope and range of materials to be included in the repository*

- The project produced a requirements specification comprising of two sections. The first was an architecture for the Digital Library as a whole, a high-level model based on OAIS which would be useful externally as an overview of how this project has designed its Digital Library, and internally as a starting point for development. The second section identified detailed requirements and was used to form the basis of our software evaluation. This document remains useful for the project as an aspirational list of functionality and a broad framework for the Digital Library. As a public document it may help others undertaking a similar procurement or requirements gathering exercise.

Objective: *Evaluate available software in the light of user needs, interoperability standards and the JISC information environment*

- The software evaluation process was largely confidential and resulted in the selection of Fedora, an open source software platform. Users were given the opportunity to attend demonstrations and Academic Advisory Group members were given access to demonstration systems, thus enabling a variety of views to be considered. Involvement of the Computing Service in the decision ensured compatibility of any solution with the technical infrastructure at York. JISC deadlines meant that the process was focussed and streamlined. This may have resulted in a less comprehensive study of available options, but ultimately enabled the momentum of the project to be maintained and the goals to be achieved. The basis for the software tender (the requirements specification) is publicly available and can be used by others embarking on a similar process.

Objective: *Choose the most suitable, cost-effective software to meet user needs and any access control required for rights management*

- The choice of software was made on time, as per the project plan. In choosing open source software, the University recognised the need for future extensibility and flexibility, whilst accepting that immediate goals may be delayed. In joining the growing Fedora/Muradora communities worldwide, York can contribute to the development and ongoing sustainability of the software.

Objective: *Establish policies for repository management e.g. criteria for inclusion, metadata workflow and profiles, data types covered*

- This objective has been fulfilled in both tangible and intangible ways. The first section of the requirements specification documented some broad policy decisions. The Image Content Model document acts as both a design blueprint for image objects as handled by Fedora and also a statement of policy and recommendations for images. Other policy and guidance documents have also been created. Wherever possible, outputs are public, and may prove useful for others in the community embarking on similar projects. At all times, we have aimed to base our approaches on existing practice. For metadata we have drawn on an existing standard (VRA Core 4) and for our data recommendations, policy and copyright processes, we have consulted TASI, AHDS and other expert sources.

Objective: *Implement the repository(ies) and ensure interoperability with other local and national repositories and systems*

- In selecting open source software and engaging the Computing Service and VLE team in the software procurement process we have ensured that there is future capacity for further integration with University systems. The software evaluation demonstrated that Fedora supported a range of interoperability standards and could be customised to work with others. It could also be integrated with our authorisation (LDAP) infrastructure. Offering an OAI-PMH target was seen as a minimum for interoperability and is a standard feature of Fedora. Richer interoperability and integration is planned, but will take time and development and cannot be realised within the SAFIR timescale.
- The York Digital Library implementation of Fedora with Muradora has been realised. A functional repository is in place, with content, access control and a mechanism for creating metadata. This latter builds on Muradora and its use of xforms. By taking this

approach we have taken a risk, in that few implementers of Muradora have customised metadata creation to any degree, but we believe that this risk will pay off and will ultimately benefit the community. Once stable, we will be better placed to contribute code to the Fedora, Muradora and xforms communities.

- The SAFIR phase of the Digital Library project has seen us realise our goal of establishing a repository. Very soon, that repository will be made available to members of the University, in particular our History of Art Department. The impact of this is yet to be evaluated, but for the first time images from the Department's digital image collections will be available beyond the confines of a single slide library PC and staff and students of the Department will be able to access collections of images from their desktop. The service we have established with History of Art will see these collections grow as Digital Library staff scan and acquire images for the Digital Library, at the direct request of academics.

Objective: *Assess copyright restrictions on identified resources for inclusion in the repository*

- Images for our pilot collection were assessed. Many needed to be restricted under the terms of the CLA Higher Education photocopying and scanning licence. We have achieved this restriction. Others could be made publicly available, on agreement with the rights holder. The Painton Cowen collection will be made available under a Creative Commons licence. York would be happy to share information about the licences and copyright clearance processes developed for SAFIR.

Conclusions

The SAFIR project has achieved what it set out to do, to begin the task of building a multimedia repository infrastructure for the University of York. The project has successfully implemented software for the storage layer (Fedora Commons), along with an interface (Muradora) and has populated that repository with a pilot collection of images. It has implemented a degree of access control, developed metadata profiles, recommendations, policies, licences and copyright clearance procedures, implemented a basic level of interoperability and gathered knowledge and expertise. SAFIR has been a success although there is much more work ahead at York. There is a balance to be struck between taking time to consult and absorb best practice in order to make the best, sustainable decisions and the pressures of immediate needs and project deadlines. Having a JISC deadline has kept the project focussed and although we have tried to ensure that the right decisions were made, we may have sacrificed "best possible" in order to meet an immediate need, for example in our metadata profile decisions or our use of Muradora as an interface. In choosing open source software, in particular Fedora Commons, our development and implementation path is made longer, but the benefits of increased flexibility, building sustainable in-house skill and working in the wider context were seen to outweigh the benefits offered by a commercial solution. Whether this was the right decision remains to be seen, but the enthusiasm and commitment of the Digital Library team have galvanised around that decision. We have already faced a number of technical delays because of unforeseeable issues with the software and we must continue to ensure that sufficient development time is allocated to tasks. We have significant concerns about the maturity and support of some of the software tested for the project. Managing expectations and working with users is an ongoing process and requires significant attention. Long delays between user testing will lead to frustration and potentially to the development drifting away from user needs. We have worked hard to keep users engaged, but the rigorous, real-life testing awaits us after the end of SAFIR and thus we cannot yet know whether our service genuinely meets the needs of its users. Running a JISC project is more than simply receiving funding, it gives us the opportunity to engage with others, share experience and attend events, yet much still has to be done in-house and duplication of the work of others is inevitable to a degree. Were this short JISC project to have been York's only funded push towards establishing its multimedia repository, we would have now been facing a very difficult task of making a partial system attractive without the promise of further development. Having an additional funding stream and the long-term commitment of the Library & Archives means that SAFIR can be built upon and our project can move towards establishing a vital service for York in our next phase.

Implications

This project is really only the beginning for York and because of the ongoing commitment to the project that we can continue to build on the SAFIR outputs. The choice of an open source software architecture and the flexibility of Fedora means that the development path is ours to define. There are many ways in which we can develop our Digital Library and limits will naturally be imposed by funds

and staff capacity. Future JISC opportunities may enable us to undertake focussed development, particularly around digitising collections and building custom tools for ingest and access. York is now a member of the growing Fedora/Muradora community in the UK and Ireland and our contribution to those groups can only benefit the wider community. In time we will be able to expose open access collections for harvesting or cross-searching by others. Our work on selecting software, defining our image content model and devising policies is public and can be freely used by others embarking on similar projects. For York, we have established the infrastructure which can help both the Library and University develop its services in the virtual space.

Recommendations

- 1) Scale: Small amounts of funding can only have limited effect and require a significant commitment by the institution, far and above the equal matched figure. We recommend that JISC consider this when offering such small levels of funding, although we do not wish to discourage funding across a wide range of institutions, which has been enabled by this Programme.
- 2) Integration & advocacy: These take significant amounts of time and effort within an institution and beyond and should not be underestimated in relation to funding.
- 3) Training & support: Although JISC does offer useful events and training opportunities, these are often very broad and require significant travel or time away. JISC might usefully offer more financial support and an easy to access mechanism for more specialised technical support or training, e.g. use of consultants for problem-solving, bespoke training courses.

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