

***Image Digitisation Management Models***  
**An Assessment of the JIDI Programme**

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# 1 Executive Summary

## ***Background***

With its JISC Initiative in Digital Imaging (JIDI) the Joint Information Systems Committee (JISC)<sup>1</sup> broke new ground. It was the first large-scale multi-site and multi-foci digital imaging project undertaken in the United Kingdom. This distributed project managed the digital imaging of material from a range of subject domains and led to the creation of some 30,000 images. JIDI had to address issues associated with implementing and managing communication between itself and the participating sites, overseeing distributed tasks, sharing of processes across sites, selecting and implementing standards, and meeting a variety of training needs for staff and participants from a range of backgrounds. A study of the digital imaging landscape at the start of the project produced no comparative projects to which JIDI could turn for direction. As a result the project team — JIDI, the content owners, and their sub-contractors — learned as they went along. This ‘adaptive project management and process development’ approach was essential, as JIDI was doing something that had not been done before.

This report reviews JIDI and the image digitisation management model on which it was based. It takes a brief look at the digital imaging project and funding landscape to see whether there are other models, which JISC might adopt for future work. So far we have not found any adequate model that provides the building blocks necessary to manage distributed digital imaging projects. While the JIDI model is not complete, it does have many of the key elements that a digital imaging model would require and it has shown itself to be extensible.

The recommendations of this review should inform the development of the JISC Distributed Image Service (JDIS) and may contribute to the efforts of funding bodies to structure their funding initiatives. The provision by JDIS of more effective co-ordination of JISC imaging services and resources will be part of the core of the Distributed National Electronic Resource (DNER)<sup>2</sup>. It is essential to bear in mind that here we are only dealing with one type of digitisation, specifically digital imaging. However, the findings and learning points are clearly relevant to a much broader spectrum of concerns for those funding or managing digitisation programmes, including the JISC.

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<sup>1</sup> <http://www.jisc.ac.uk/homepage.html>

<sup>2</sup> <http://www.jisc.ac.uk/dner/>



## ***The Structure of the Report***

This report is divided into nine sections and a number of appendices:

- ◆ Section 1, the Executive Summary, briefly describes the objectives of the report and some of its key recommendations.
- ◆ Section 2 examines the strategic aims of the report, as defined by the call for tender, and provides definitions of terms and symbols used throughout the report.
- ◆ Section 3 examines the role the JIDI management team (core staff, quality assurance advisers, and subject content co-ordinators) played in managing the JIDI programme of work.
- ◆ Section 4 looks at JIDI from the vantage point of twelve of the thirteen participating sites. This discussion is based on an in-depth telephone survey of the participating sites, which was given consistency through the use of a structured questionnaire (Section 14, Participating Survey Instrument).
- ◆ Section 5 details the resource creation and delivery issues from the perspective of a service working to deliver the digital images and associated metadata created by some of the contributing or participating sites. In this case the review has focused on the work of the Visual Arts Data Service (VADS)<sup>3</sup>.
- ◆ Section 6 examines how nine other funders evaluate, manage, and monitor digital imaging projects.
- ◆ Section 7 examines nine other digital imaging initiatives and identifies the lessons that can be gleaned from them which might inform the development of image digitisation management models.
- ◆ Section 8 proposes three digital imaging management models as well as providing detailed models for a number of processes involved in digital imaging (e.g. quality assurance).
- ◆ Section 9 draws general conclusions and brings together all the recommendations from the report.
- ◆ The report includes a number of appendices.

## ***Conclusions***

The JIDI project faced formidable obstacles and started off in a landscape of limited information about digital imaging and image digitisation projects. It succeeded in bringing together thirteen participating sites to build a collection of material in the areas of social history, geology, and

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<sup>3</sup> <http://vads.ahds.ac.uk/>

art. The distributed nature of the project made project management for the core JIDI team a challenging task. The project management methodologies adopted by JIDI contributed an essential element to the success of the project.

Currently there are no comprehensive Image Digitisation Management Models that can be used to manage digital imaging projects from inception through to the summative evaluation phase, although a number of efforts are underway to address these lacunae. A general review of how funding agencies approach the selection of digital imaging projects indicates that the evaluation of digital imaging proposals could benefit from greater rigour and consistency of practice. The management models in use by most projects are 'adaptive and responsive'; as they cannot be described as a clear set of procedures and methods they do not provide consistent and comparable support for the digital imaging process.

For their part, digital imaging projects have not paid enough attention to user needs, and in particular to conducting front-end needs analysis. Most of the evaluation activities are informal and small scale. Few efforts have been based on the use of appropriate needs analysis methodologies.

The review concludes that there are three image digitisation management models that JISC could adopt:

- (1) a funder driven model;
- (2) managed digital imaging programmes; and,
- (3) delivery led or consumer driven models.

The first model is one commonly used by funding agencies such as the Heritage Lottery Fund<sup>4</sup>, the New Opportunities Fund<sup>5</sup>, and the Arts and Humanities Research Board<sup>6</sup>. The second model is a modified version of the JIDI approach. The third approach reflects changes in the digital landscape that have resulted in wider access to the mechanisms for creating digital materials, broader understanding of the issues by a wider range of content owners, competition among digital imaging services, and changes in the costs of digital imaging.

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<sup>4</sup> <http://www.hlf.org.uk/index2.html>

<sup>5</sup> <http://www.nof.org.uk/>

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

### **Key Recommendations**

Recommendations are found throughout this review. They are all brought together in the concluding section of the report (Section 9). Several over-arching recommendations are noted in this summary.

- We recommend that JISC adopt the three models described above and apply them to digital imaging projects or programmes as appropriate.
- Projects need to be encouraged to recognise that it is essential that they get digital imaging right the first time because by analogy with microfilming it will only be under the rarest of circumstances that material which has been digitally imaged will be re-imaged in the future.
- Funding programmes need to treat the digital outputs as though they were tangible assets with a specific economic life. As such, this economic life needs to be defined: for digital images of material at risk of loss (e.g. nitrate film) this should be indefinite; and for material that can be re-imaged in the future (e.g. works of art created with fairly stable media) the economic life span should be established at twenty years.
- The quality of the metadata has a significant impact on the use of images and as a result we recommend that projects be encouraged to budget adequately for their production and quality assurance.
- It is essential that projects be holistic from the start. They need to bring together content owners, project and technical management services, representatives of the potential user community, digital imaging facilities, and quality assurance and delivery teams as a single unit.
- Following a review of how other funders approach the evaluation of digital imaging projects, we concluded that the level of information provided to and considered by evaluators is inadequate. We recommend that JISC adopt the approach to assessing digital imaging proposed at the conclusion of Section 6, Conclusions and Recommendations.
- The monitoring of ongoing projects and their post-completion evaluation by funders needs to be approached with greater rigour.
- Analysis of user needs before beginning a digital imaging project or programme is essential.
- A detailed review of the digital imaging activities at institutional levels needs to be conducted and mapped against this user needs analysis to identify areas where the need for digital images is not being met.

- Realistic costing models must be established that reflect more accurately the costs of imaging, metadata creation, quality assurance, providing access to the images and metadata, and their preservation.
- All projects need to adopt adequate records management strategies.

## 2 Strategic Aims of the Study

### 2.1 Background of the Review

The Joint Information Systems Committee (JISC) funded the JISC Image Digitisation Initiative (JIDI) as part of its effort to support the provision and use of digital images in higher education (HE). JIDI brought together thirteen sites to contribute material to this activity. In an effort to ensure the interoperability, consistency, and broad usability of this material JIDI defined guidelines for best practice, metadata standards, and quality assurance. The successful completion of JIDI coincided with the launching of JISC 5/99 and the DNER. As part of defining the digital imaging activities to be developed within JISC 5/99 and the DNER, JISC and its Image Co-ordinator commissioned a review of JIDI and, more generally, of image digitisation management models. The review took place during July and August of 2000.

The review that follows may also contain material useful to JISC for other future digitisation management programmes (e.g. audio, moving images) in a broader context than digital imaging.

### 2.2 Project Brief

The four main objectives of this report were laid out in JISC's call for tender. This review is to:

1. evaluate the JIDI project and the model it has employed for managing image digitisation, by examining
  - ◆ the quality of the images and metadata
  - ◆ the management models and processes
  - ◆ lessons learned
  - ◆ recommendations for further development and promotion of JIDI image assets or models
2. examine the issues and processes of integrating image assets created by JISC funded parties within the DNER framework
3. create a sense of context
  - ◆ by making comparisons between JISC's image digitisation funding and its co-ordination and other relevant programmes and institutions
4. gather data and examine the issues involved for digitisers and funders, of both localised and centralised models

- ◆ indicate how monitoring and co-ordination could be carried out
- ◆ standards and adherence to them
- ◆ suitability for the DNER
- ◆ usability and accessibility
- ◆ training

Sections 3, 4, and 5 review the JIDI project itself. In Section 3 the JIDI programme is examined from the point of view of the management team and the project's steering committee. Section 4 reports on discussions with the collection owners (otherwise referred to as participating sites throughout this report) and Section 5 examines the issues raised as the Visual Arts Data Service (VADS) attempts to deliver some of the digital images created under the auspices of JIDI. Section 6 examines approaches taken by other funders to the selection, management, monitoring, and evaluation of digital imaging projects. A small number of other projects are reviewed in Section 7 to set the JIDI project in context and provide a platform for comparisons between the various endeavours. The review of JIDI, funders, and projects provides the foundation for a review of these models in action, a topic that is taken up in Section 8.

### 2.3 Key Definitions

The JISC Image Digitisation Initiative (JIDI) involved a number of categories of organisation.

*Co-ordination and Management* – This was handled by a core JIDI team based at the Institute for Learning and Research Technology (ILRT)<sup>7</sup>, University of Bristol.

*Participating sites* – These include the thirteen sites that contributed material for digital imaging under the JIDI programme. The sites were:

- ◆ The African & Asian Visual Artist Archive, University of East London;
- ◆ The Art and Design Archive and The Teaching Examples Collection, Central St Martins College of Art and Design;
- ◆ The British Geological Survey, Edinburgh;
- ◆ Derby Earth Sciences 3D Collection;

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<sup>7</sup> <http://www.ilrt.bris.ac.uk/>

- ◆ Design Council Archive, The Design History Research Centre, Faculty of Arts & Architecture, University of Brighton;
- ◆ The Design Council Slide Collection (DCSC) at the Manchester Metropolitan University;
- ◆ Gertrude Bell Archive, Robinson Library, University of Newcastle;
- ◆ The John Johnson Collection of Printed Ephemera, Bodleian Library, Oxford;
- ◆ The Lawrence Batley Centre for the National Arts Education Archive (Trust) Bretton Hall, Lawrence Batley Centre;
- ◆ London College of Fashion Collection;
- ◆ The Magee Photographic Collection, Magee College, University of Ulster;
- ◆ The Spellman Collection of Music Covers, University Library, University of Reading;
- ◆ Suffrage Banners Collection, Fawcett Library, London Guildhall University.

(Details about the collections are available in Section 4.2 below.)

*Digital Imaging or Digitisation Services* – This activity was supported by:

- ◆ local digital imaging services at the participating sites themselves;
- ◆ iBase<sup>8</sup>; and,
- ◆ The Higher Education Digitisation Service (HEDS)<sup>9</sup>.

*Delivery Service* – the organisation responsible for delivering the digital images to potential users. In some instances the originating institutions (otherwise referred to as the ‘participating sites’) will deliver the digital content, but in many cases delivery will be through the Visual Arts Data Service (VADS). Initially the project was designed to provide content for the Knowledge Gallery, which was designed as the delivery service for digital image content.

*Content Co-ordinators* – Project team members responsible for ensuring that the digital content meets the needs of the community. For the JIDI project these were: Marilyn Deegan for Social History Collections, Sue

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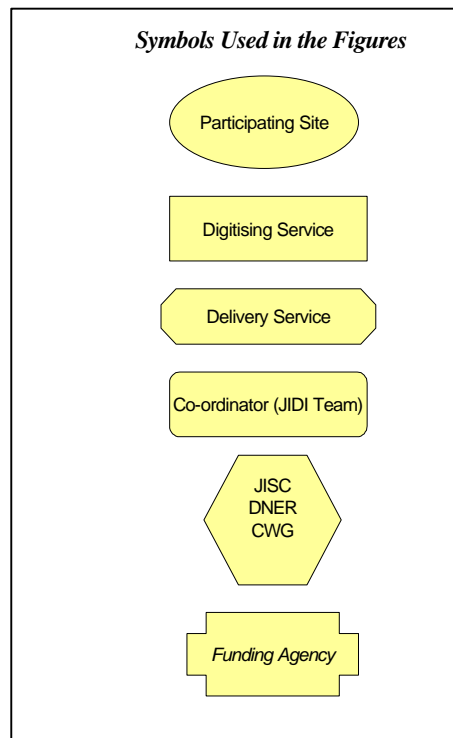
<sup>8</sup> <http://www.ibase.com/>

<sup>9</sup> <http://heds.herts.ac.uk/>

Gollifer for Art and Design Collections, and Paul Browning for Geology Collections.

## 2.4 Symbols

Throughout the figures a number of symbols are used. These are shown below.



## 2.5 Project Team

The Humanities Advanced Technology and Information Institute (HATII)<sup>10</sup> at the University of Glasgow has compiled this report for the Joint Information Systems Committee and its Image Co-ordinator. Seamus Ross produced the report between July and September 2000, with the support of four research assistants (see Section 10.1 below).

## 2.6 Consultation and Literature

This report is built on research and consultation. The project began by reviewing the project documentation produced by the JIDI team (Section 17), and examining the published literature (Section 18) on digitisation models and projects.

Respondents to the interviews agreed almost unanimously that the study was timely and addressed the core issues. The JIDI participating sites, the

<sup>10</sup> <http://www.hatii.arts.gla.ac.uk/>



funding agencies, and the other projects contacted all agreed that there was a need for more explicit models for digital imaging. The models must support both a high level overview of the process and the fine details (e.g. the project monitoring process).

Most of the interviews were conducted by telephone. The project team put together three data collection instruments, designed to ensure the consistent collection of comparable information from the different participants in the interview process. The instruments are presented in Section 14 (Participant Survey Instrument), Section 15 (Funding Agency Survey Instrument), and Section 16 (Comparative Project Survey Instrument). They were discussed with the JISC Image Co-ordinator, Catherine Grout.

During the first few weeks of August 2000 and also, because the study took place during the summer holiday season, the first couple of weeks of September, members of the study team carried out telephone interviews with participants in the JIDI project, funders of image digitisation projects, and a small number of comparative projects. The telephone interviews provided a valuable opportunity to add depth to our understanding of the issues, and to identify and cover topics that have not yet been adequately addressed in the published literature.

## **2.7 Report Context**

This is an independent report to the JISC and does not necessarily reflect the views of the JISC.

## **2.8 Acknowledgements**

The author of this report prepared it with the support of a team of researchers at HATII. HATII is grateful to the staff at the JISC, JIDI, at the Participating Sites, at comparative projects, and at funding agencies for providing us with honest, thoughtful, and reflective assessments of their work, lessons, and experiences.

### 3 The JIDI Project and its Components

#### 3.1 The JIDI Project

The JIDI initiative was designed to work closely with the Image Digitisation Service as envisaged by Mel Collier (then of De Monfort University).<sup>11</sup> JIDI aimed both to provide digital resources and to engage in community education in areas related to digital imaging.

The Higher Education Digitisation Service (HEDS) feasibility report played an instrumental role in getting the project started. It continued to play a central role throughout the life of the project.

JIDI broke new ground. It brought a consistent approach to a heterogeneous project and created best practice examples in the area of digital imaging.

The core JIDI team was based at the Institute for Learning and Research Technology (ILRT), University of Bristol.

#### 3.2 The Role of the JIDI Project Team & HEDS

The JIDI team led the co-ordination of the project. Their aim was to ensure that the participating sites delivered digital images of consistent quality. They also established definitive technical and descriptive metadata guidelines and endeavoured to ensure that these were of high quality. The JIDI project benefited from being co-located with the Technical Advisory Service for Imaging (TASI)<sup>12</sup> at the ILRT in Bristol.

Preliminary work by the Content Co-ordinators for Social History, Art & Design, and Geology defined the shape of the JIDI programme by determining the content that would be created under its auspices. JIDI commissioned HEDS to undertake a feasibility study into the imaging of the collections that the Content Co-ordinators had identified for possible inclusion in the project. The HEDS report was groundbreaking and has influenced many projects well beyond the JIDI. It defined imaging standards for a range of materials and provided crucial details for estimating costs of digital imaging. As the project developed, HEDS fulfilled two further roles:

- ◆ it undertook digital imaging work for several of the participating sites; and,
- ◆ it arranged and managed the sub-contracting of digital imaging work to external service providers for other participating sites.

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<sup>11</sup> 24 July 2000, Marilyn Deegan

<sup>12</sup> <http://www.tasi.ac.uk/>

The participating sites undertook a great bulk of the work. This included preparing material, labelling and packaging it for shipping, creating metadata, carrying out quality assurance, unpacking the items when they were returned from the digitising service and checking to ensure they had been returned in the same condition they had gone out. While many sites took advantage of the support digitisation services of HEDS (or its sub-contactors) could offer, a few decided to conduct the imaging work locally. There were three general reasons why they took this decision:

- ◆ costs;
- ◆ specialised handling required; and,
- ◆ the risks associated with sending the original materials elsewhere.

In some instances the last objection was addressed through the creation of film-based intermediaries, which could be sent away for digital imaging.

JIDI managed the distribution of funds to the participating sites for JISC.

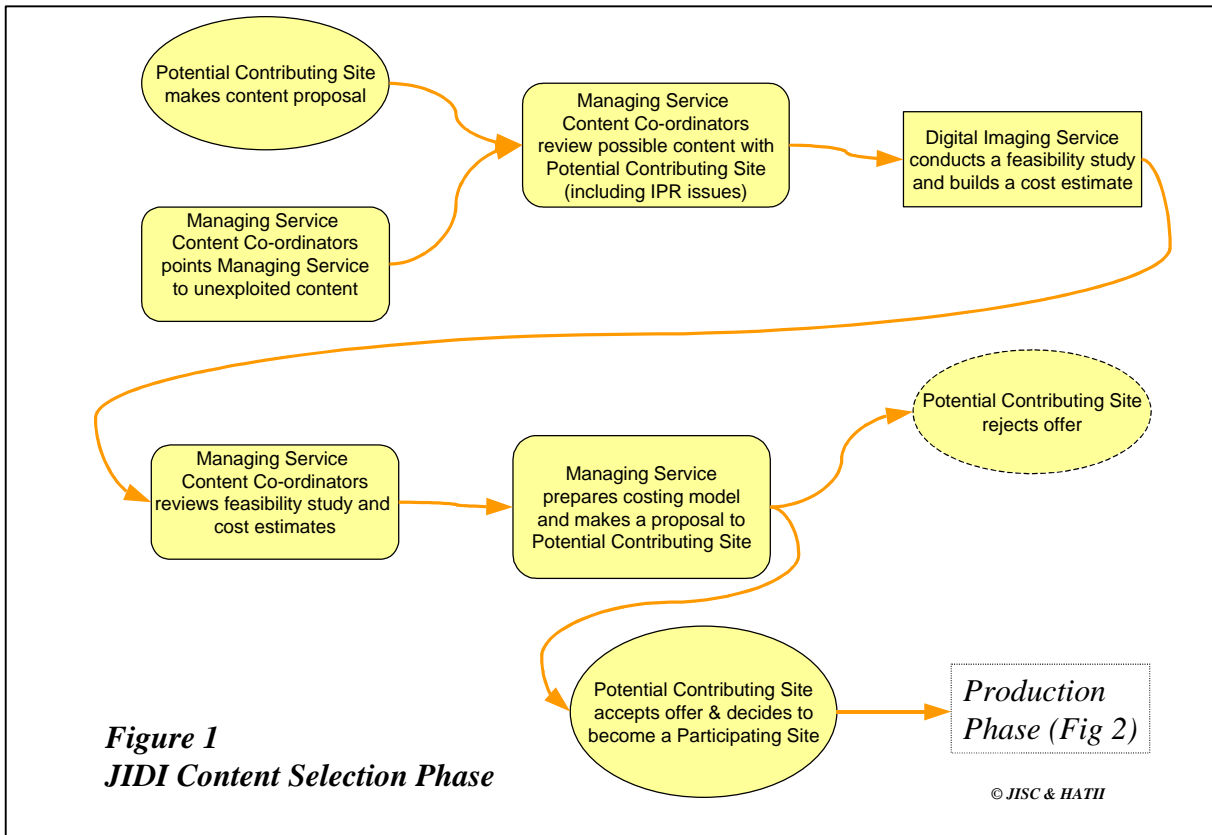
### 3.3 The JIDI Model

The model used by JIDI has three key features:

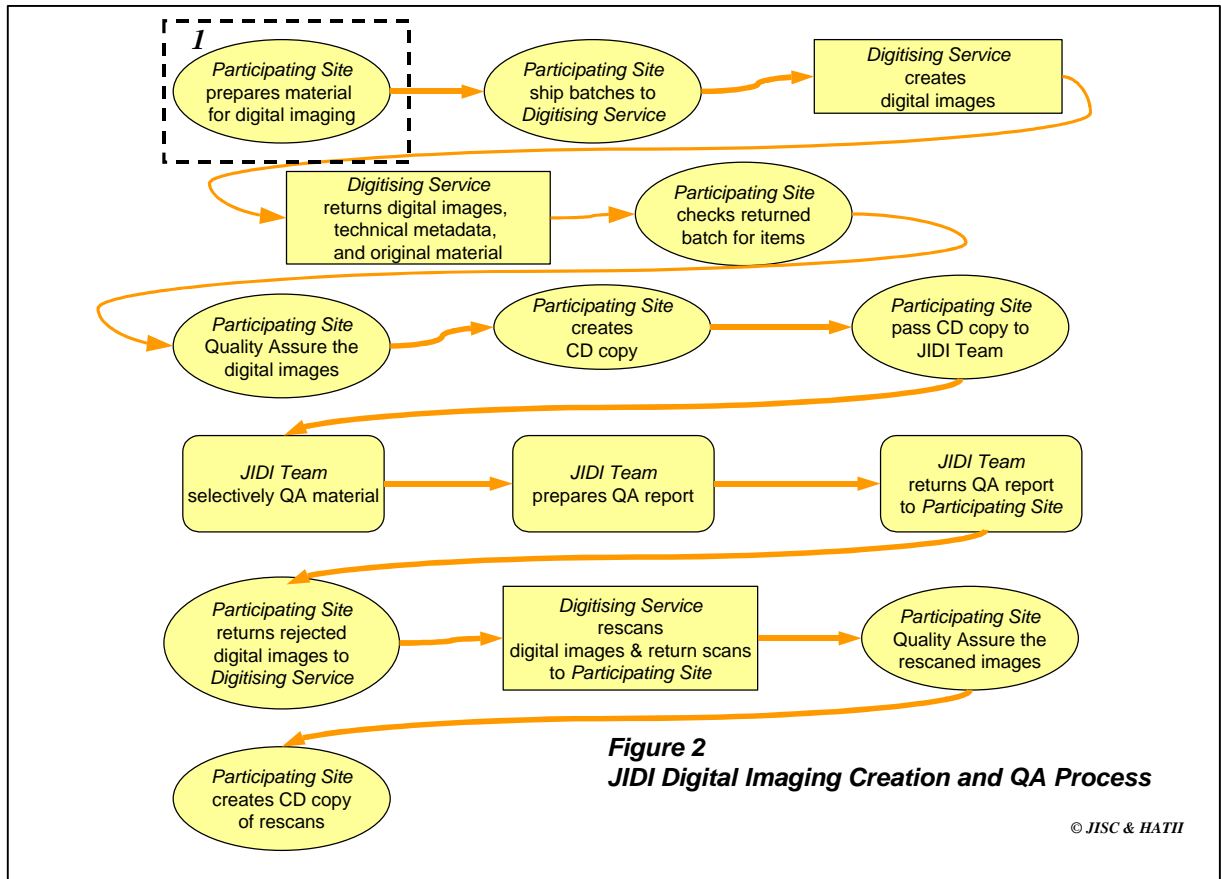
- ◆ it involved subject-managed selection of material for digital imaging from the holdings of participating sites by Content Co-ordinators. The Content Co-ordinators brought subject specific knowledge to the project. They chose the collections after reviewing proposals from potential contributing sites or by using their knowledge of the content held in UK institutions to solicit new participants who would make suitable content available to the programme;
- ◆ it gave a central role to the JIDI team in the quality assurance of the digital images; and,
- ◆ it monitored the processes and managed the project.

The JIDI project began by reviewing sixty-five proposals from forty sites that were seeking support for digital imaging activities. The decision was taken to focus the initiative on images reflecting social history, art and design, and geology. JIDI appointed content co-ordinators (including Marilyn Deegan and Sue Gollifer) to review these proposals, to undertake site visits where necessary, and to identify additional content suitable for inclusion in the project. The content reviewers undertook detailed examinations of the initial content proposals and drew conclusions about the value of the material for teaching and learning. These reports illustrate the thinking that underlies the content created under JIDI. It is worth noting that some material, which had originally been selected for inclusion, had to be dropped because the rights issues associated with it could not be addressed.

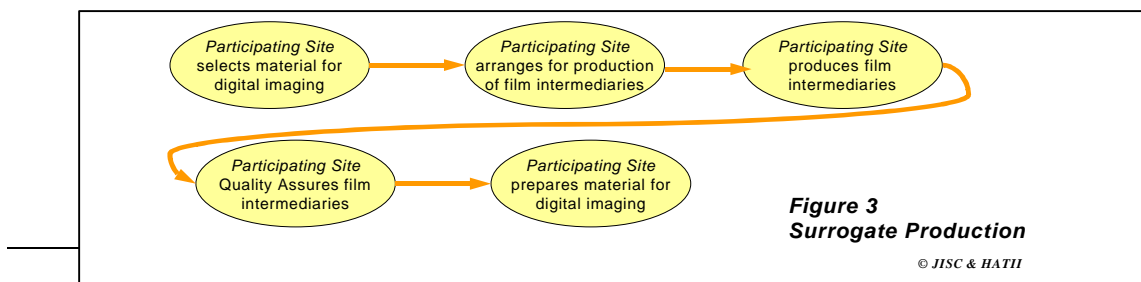
Figure 1 (JIDI Content Selection Stage) shows the process by which material was selected for inclusion and how the costs estimates were generated for the project.



Once the content had been selected and JIDI had offered the participating site a particular level of funding to produce a certain number of digital images, the second phase of the model came into play. This was based on the preparation of material for shipping, digital imaging of the batches, quality assurance, the production of CD copies, JIDI quality assurance work, and rescanning of the images if necessary (See Figure 2: JIDI Imaging Creation and Quality Assurance Process).



In Section 1 of Figure 2 (the area marked off by the dotted line) we can also note another process going on. In some instances the participating site felt that the risk to their material posed either by sending the originals away for digital imaging or from digital imaging from the originals themselves was too great.<sup>13</sup> They addressed these issues by producing surrogates. The process is presented in Figure 3.



<sup>13</sup> There is of course a lingering myth that conventional photography poses less risk to objects than does digital imaging.

### 3.4 A Review of the Activities of the Project

JIDI led a team of thirteen sites to deliver around 30,000 digital images and associated metadata.

JIDI developed a number of reports as a result of its experiences. These are available from its website<sup>14</sup> and include:

- ◆ guidelines for photographing material that is to be digitised;
- ◆ metadata guidelines;
- ◆ detailed statements on copyrights issues;
- ◆ sample licence agreements;
- ◆ quality assurance procedures.

These reports make the guidance and lessons from JIDI available to other projects.

#### 3.4.1 Project Planning

The emphasis of project planning was on:

- ◆ content selection;
- ◆ defining imaging and metadata standards;
- ◆ establishing project management processes and procedures;
- ◆ establishing strategies for managing the outputs from the participating sites;
- ◆ implementing financial management strategies;
- ◆ creating suitable training resources to ensure participants were sufficiently skilled successfully to complete the programme of work.

Not all those sites that initially planned to participate actually did. Some dropped out because of staff changes (Royal College of Art), and others because rights issues (South Wales Coalfield Collection) brought their participation to a halt.

#### 3.4.2 Funding and Cost Modelling

The funding model on which JIDI was founded proved problematic because it established what the available funding would be before it was clear what the project was about, its full extent, and its actual cost. The cost models were imposed on participating sites rather than derived

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<sup>14</sup> <http://www.ilrt.bris.ac.uk/jidi/>

from detailed needs and cost analyses by HEDS and JIDI. As a result some sites found that the costs of digitisation as estimated by the feasibility study were different from the costs that they were expected to bear during the production phase and did not match the available funding. This was in part because the feasibility study was based on a set of idealised conditions and formats.<sup>15</sup> While it included some types of material that would be coming from participating sites, it transpired that it did not represent an accurate cross section of that material (see below Estimated and Actual Costs).

This was in many ways a contributory programme, with JIDI funding part of the costs and the participating sites contributing to or at least absorbing some costs. While most sites kept the actual costs of digitisation within the available funding, and few made any actual cash contributions to the project, most underwrote the costs of metadata creation and quality assurance, and those that used film intermediaries met the cost of their production.

The costs for the JIDI quality assurance specialist were underestimated and his time ran out before the project was completed. Some of the final quality assurance work needed to be carried out by the Project Manager who by that stage had acquired the necessary skills. The contribution of the Quality Assurance Officer (Alan Lock) to the programme was significant and it has left a quality assurance standard that will form the foundation for future work in this area within the HE community.

The costs of digital imaging realised by JIDI were about £11 per image. The JIDI team does not regard this as a realistic figure because it does not take into account hidden costs that were absorbed either by the participating sites or by other parts of the JISC infrastructure (e.g. dissemination costs). This figure is far higher than other projects predicted, but it is probably more realistic. Of course in the JIDI case a number of factors may have limited the economies of scale the project could achieve. These included the fact that:

- ◆ the project was dealing with very heterogeneous material (e.g. negatives, prints, etc.);
- ◆ material was handled by a number of different digitising services; and,
- ◆ different training needs had to be met by the participating sites. This differential skills-base had an impact on project costs where it impacted on staff efficiency and generated redundant effort.

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<sup>15</sup> This problem is common to feasibility studies and workflow models used in many parts of the heritage sector.

**Recommendation:**

- JISC should fund the development of dynamic costing models for digital imaging projects and programmes.

**3.4.3 Workflow**

The feasibility study attempted to estimate workflow, but because the parameters of the project varied over its lifetime these estimates were less precise than hoped for. The section of this report dealing with the work done at the participating sites covers this in more detail (see below Section 4.6 Workflow).

It is important to emphasise that the amount of work involved in providing a clean scan will, of course, depend upon the conditions in which the original slides or photographs have been kept. One of the collections included in the project had been stored in less than ideal conditions and as a result had become dirty. The dust left by these images on the scanner bed during the digital imaging process meant that it had to be cleaned after every four or five scans. As the digitising service had made different assumptions about the cleanliness of the material that it would be scanning based on the pilot, this extra effort had not been factored into the process. The imaging process was slowed down and 'per unit costs' rose as a result.

HEDS had given projects guidance on the conservation care and preparation of the collections for digital imaging. Few participating sites understood the digitisation process from end-to-end (or shelf-to-shelf)<sup>16</sup> and they did not necessarily recognise that it was critical to adhere to this guidance. The guidelines were designed to ensure that material was prepared in ways that enable the imaging process to achieve the highest quality digital sample of the image, and that a consistent level of workflow was maintained.

In general the parameters underlying workflow need to be clearly established so that projects can undertake realistic estimates of the effort involved in digital imaging programmes. Teams putting together projects need access to staff skilled in workflow modelling.

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<sup>16</sup> The phrase end-to-end or shelf-to-shelf is intended to describe the digitisation process from selection and removal of material from their storage location and their being returned to it after digitisation.



### Recommendations:

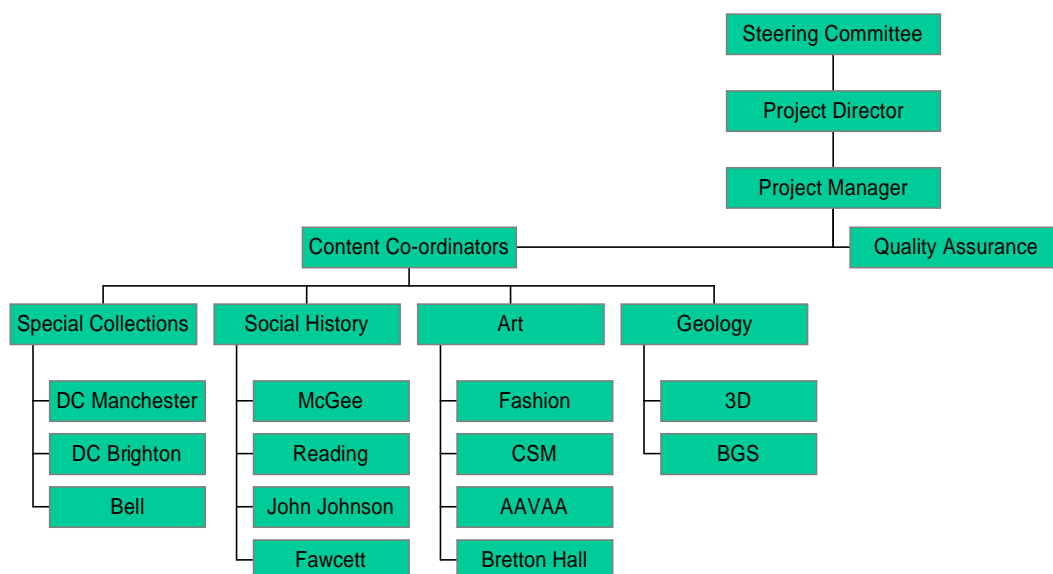
- Projects need to conduct realistic analysis of the workflow issues.
- A template to assist workflow modelling for digital imaging projects should be established, tested, and made available to the HE & FE communities.

#### 3.4.4 Project Management

The process of project management was made difficult by the fact that many of the sites had in the past only been involved with projects using *ad hoc* project management methods. As a result they were familiar with neither the process of project management nor the process of digitisation. As Jane Williams, Project Director until mid-1999, has pointed out, these difficulties could have been overcome had there been adequate training in these areas, and had JIDI been able to fund benchmarked feasibility studies at the participating sites.

The JIDI Project had regular Steering Committee meetings and these were well documented. The project adopted a layer model consisting of technologists and subject specialists. Figure 4 shows how the project team was structured.

JIDI Project Management Structure



For each category of collection a Content Co-ordinator was appointed (see above Key Definitions). These individuals were responsible for ensuring that the materials selected by the participating sites for inclusion in the project were appropriate and representative. Early on they produced analyses of the material that the participating collections would be bringing to the project.<sup>17</sup> Visits to the participating sites helped to clarify selection, process, and procedures, as well as identify the material. The Content Co-ordinators gave continuity to the relationship between JIDI and the participating sites which proved essential, especially as at a few sites (e.g. AAVAA) there were staff changes early on in the course of the project.

Participating sites entered into a licensing arrangement with JIDI governing many aspects of the process, and in some cases they entered into a further licensing arrangement with a digital imaging service (HEDS or iBase).

One of the main project management issues raised related to the contractual arrangements established for the project. The contract for the digital imaging was between the digital imaging management service (HEDS or iBase) and the participating sites. JIDI had a key role to play in the digital image quality assurance process. However, it was not party to the contracts between the participating sites and HEDS. This made it very difficult for JIDI to play the central role in managing the quality assurance process established in its own contract with the participating sites.

Figure 2 indicates the ideal process that should have operated where the imaging work was outsourced. This did not always prove to be the case. In some instances steps were missed out, which meant that the participating sites accepted images that the more rigorous application of the project quality assurance procedures by the JIDI team would have (and indeed later) rejected.

Several members of the Steering Committee and the JIDI team itself agreed that the management models used both centrally and locally required more attention. There is general agreement that lessons about project management taken from this project could guide tighter procedures and policies on other similar JISC funded projects. For instance, the project needed to be extended several times because of the difficulties with digital imaging. This might have been avoided.

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<sup>17</sup> *The Knowledge Gallery-Image Data Content-Art and Design*, Sue Gollifer, 26 April 1997 and *Report on Visits and Communications for Knowledge Gallery-Content Building Exercise on behalf of JISC*, Marilyn Deegan, 24 April 1997

Recommendations:
<ul style="list-style-type: none"> <li>➤ Contracts for digital imaging need to link all parties involved in the process so that they more accurately reflect the key activities and the role of the players.</li> <li>➤ Formalised project management methods should be adopted by projects.</li> </ul>



### 3.4.5 Digital Imaging

During the life of the JIDI project the view emerged that the digital imaging was creating a non-renewable, but reusable, asset and that content creation needed to reflect a long-term strategic outlook. The project, therefore, emphasised the need to undertake the imaging to the highest possible standard. Some projects took the intelligent decision to create high and low resolution image files at the same time.

Several participating sites photographed material to provide a source for the digital imaging. Using photographs as an intermediary medium depends upon photographic work being carried out to guidelines that anticipate the needs of subsequent digital imaging. As a result there were some initial problems with material created using film intermediaries. These difficulties included:

- ◆ in some cases the edges in the digital images look soft because the photographic process did not recognise that the intermediary was only a step in the digital imaging chain;
- ◆ in other cases the photographers under-exposed the images to bring out fine art lines or to capture the tonal quality of the images. When these materials were then passed to the digital imaging service there was a loss of clarity in the resulting digital images;
- ◆ in other instances tungsten film was used for the photographic work and its blue tint became crystal clear in the digital imaging process.

There was a conflict of philosophies between JIDI, which wanted no post-capture (or post-scan) processing of the image material, and HEDS, which felt that some images could have benefited from post-scan processing. Both approaches have merit. Purists would opt for the former approach; the 'no post-capture processing school' certainly reflects both the generally accepted practice and the realisation that post-capture processing is more expensive than making the adjustments at scan stage. Projects need to find ways to achieve a balance between fitness for purpose, costs, and effort.

Some participating sites were uneasy about sending material from their collections to external service providers for digitisation (e.g. John Johnson Collection). These sites either used or developed in-house digitisation services. The Minutes of the Steering Group and evidence from JIDI indicate that there was great difficulty in achieving consistent products because of the variability in the technology and skills available at the participating sites. This indicates the value of encouraging projects to use a single digital imaging service level agreement that lays down clear guidelines and creates an environment where digital imagers work to a set of calibrated, auditable, and recognised standards.

#### **Recommendations:**

- While it is evident that all processing should be done at capture stage, there may be reasons to permit some post-capture processing. Guidelines for post-capture processing should be clearly established for digital imaging projects and be permitted where the benefits are designed to ensure a 'more accurate' digital image than would be produced only through scanning.
- Fitness for Purpose may provide an appropriate guiding principle in selecting such technical standards as scan resolution and bit-depth, and benchmarking post-processing.
- Technical guidance on digital image laboratory set up and evaluation needs to be established.

#### **3.4.6 Metadata Guidelines & Database**

The interoperability of metadata depends on consistency of standards for recording and encoding. This is especially true of technical and descriptive metadata. JIDI found that nearly all the participating sites needed guidance in defining and creating metadata. JIDI developed and provided such guidance. JIDI identified a need for both metadata guidelines and an application to store the metadata. Initially JIDI considered developing the metadata database centrally, but it became clear relatively early that the long-term viability of the collections would be enhanced by shifting the responsibility for establishing and maintaining the metadata database to the participating sites. Each site was provided with metadata guidelines and an example of encoded metadata.

Work on the development of a JIDI image database was carried out. It was not adopted by all of the participating sites. Some of the sites found

the database too complicated to use. JIDI allowed participating sites to work with what they had available, including Access, Excel, and Filemaker Pro. One participating site used a word processing package — see below Difficulties Encountered with Metadata (Section 5.3).

The JIDI team indicated that without the involvement of the delivery team the metadata proved difficult to develop, test, and validate. In part this is why, as VADS attempts to deliver the material, difficulties are appearing with the metadata that went unnoticed before. The model shown in Figure 5 indicates the process of quality assurance of the metadata.

Recommendations:
<ul style="list-style-type: none"> <li>➤ The key role of metadata needs to be stressed and adequate funding allocated by all digital imaging projects for their creation.</li> <li>➤ Quality assurance procedures for metadata need to be established.</li> <li>➤ Digital imaging projects should always receive advice about the good practice for storage and should be encouraged always to work in the costs of storage and backup into their business plans.</li> </ul>

### 3.4.7 Participating Sites and Local Resources

JIDI and HEDS both found that computing equipment at participating sites was insufficiently powerful to meet the needs of the project. The high-resolution digital imaging carried out by JIDI produced files of sizes that proved difficult for some participating sites to handle. In the case of the Fawcett Collection, for instance, the images were between 50 and 60 MB each and the Collection did not have adequate equipment to view the images on screen for quality assurance purposes.

For projects that produce large file sizes, say between 50 and 100MB, there will be difficulties not only in viewing, but also in copying the CDs. Participating sites found writing CDs to be a time consuming activity (see below).

The impact of the JIDI project on participating sites proved difficult to measure:

- ◆ at some sites ongoing work was displaced by the need to complete JIDI project work;

- ◆ at other sites the opportunity of taking part in this programme gave them fundamental experience and access to technical resources that will make other digital imaging projects possible in the future.

#### **Recommendations:**

- That participating sites demonstrate the availability of or the plans to implement sufficient technical infrastructure before receiving funding for digital imaging.
- That sufficient training resource is available to participating sites to ensure that they are skilled up to create appropriate metadata.
- Institutions taking part in or seeking funding for digital imaging provide an assessment of the impact that the digital imaging activities will have on the local initiatives at the participating sites.

#### **3.4.8 Communication & Training**

Communication between the core JIDI team and the participating sites was by email and phone, and through workshops. During the life of the project here were three workshops each run at a key point. There was a website that was devoted to the project, and email lists. The workshops covered the topics of metadata, rights issues, and quality assurance. The JIDI team stressed the importance of face-to-face communication as the key to making the project a success. Most of the communication was bi-directional, between the JIDI team and the participating sites. Very little communication took place independently of JIDI between the participating sites themselves.

The role of HEDS might have been better defined. A particular difficulty was that JIDI was the ultimate arbiter as to the acceptability of the digital images, yet the contract for digital imaging was between HEDS and the participating site in question. On occasion the participating site 'signed off' images without consulting JIDI; at a later date when JIDI reviewed the images it found them below the acceptable quality threshold and required them to be re-scanned before releasing payment. This problem was created because the contractual relationship between the participating sites and HEDS by-passed the core JIDI team. In the future it is evident that all parties must be involved in the communication processes.

The JIDI team concluded that projects of this kind could benefit from more face-to-face communication.

Training was a key issue. JIDI provided training for participants, but as is evident in the responses of the participating sites to interviews about the process, this was not always thought to be adequate (see Section 4.11 below). While JIDI would not dispute this conclusion, the issue could only have been addressed if more money had been made available for training initiatives related to the project.

Although, on the one hand, the multi-site nature of the project posed communications difficulties, on the other the diverse nature of the team and their shared interests made the project very dynamic.

#### Recommendations:

- In JIDI style projects the central service should be the centre of dialogue.
- Projects need access to more funding streams to enable more comprehensive and regular training.

#### 3.4.9 Quality Assurance

At the start of the JIDI project the digital imaging community in general poorly understood the role of quality assurance. A review of the current published practice and literature on digital imaging shows that, while issues related to selection are hotly debated, quality assurance issues are neglected. It was evident from the work of the JIDI team that quality assurance was 'more difficult, time consuming and expensive than expected' (Minutes of Steering Group, 9 Feb 2000).

It was agreed early on that quality assurance would be a core JIDI function but carried out in collaboration with the technical specialist at the participating sites, as they would be aware of the 'technical limitations of digitising their collection' (SG Mins 3 June 1998). The Steering Group did consider the possibility of pushing the complete quality assurance process back to the participating sites, but in the end it only made a partial shift. This way the project ensured that there was an independent arbiter. The quality assurance process was very complex, involving participating sites, digital imaging services, and JIDI. In some instances the participating sites and the digital imaging service were at one and the same site (e.g. the Design Council Slide Collection (DCSC) at the Manchester Metropolitan University, the John Johnson Collection of Printed Ephemera, the Magee Photographic Collection) but in others the work was outsourced to HEDS (which in turn sub-contracted work to other companies such as Bell & Howell) or iBase. Each facility had to



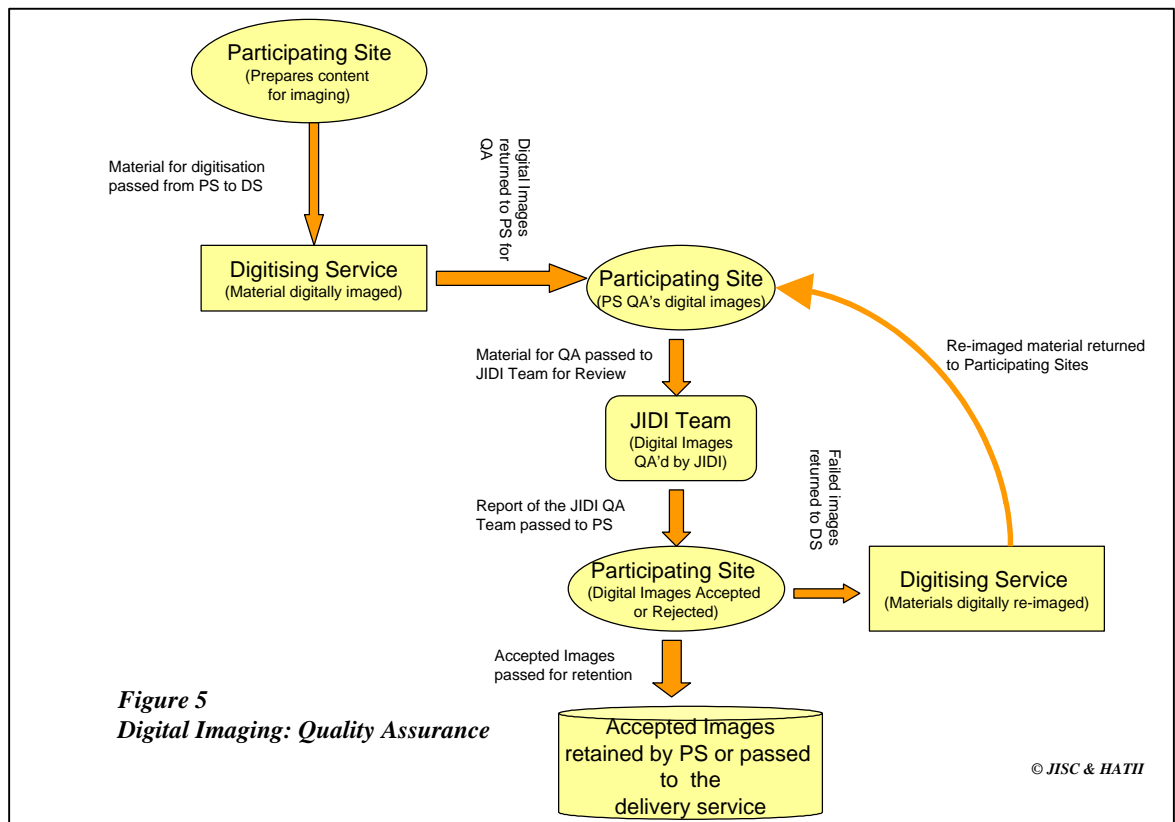
demonstrate that it could meet the quality assurance standards set by the JIDI team.

During the feasibility study the quality assurance process played a key role in identifying broad issues, including: problems caused by incorrect machine settings; overhead lighting casting shadows or creating artificial bright spots; curled originals; and originals that were poorly prepared for scanning. By identifying broad areas that pose imaging problems JIDI was able to identify strategies that could be implemented to eliminate the sources of such problems.

The quality of the images remained a problem throughout the project, although only a small percentage needed to be rescanned. Some problems could not be easily addressed. The Design Council Archive (University of Brighton) was not satisfied with the quality of the digital images created from its collection. Because much of the process of imaging was automated and the slide scanner captured all the content of the slide, including the white borders, the images had a 'muddy' appearance (a result that is technically easy to explain but difficult to address) post-capture (see below).

There was a general recognition that, as JIDI developed its quality assurance processes during the project, the methods would need to be shared with the participating sites. JIDI produced detailed guidelines for quality assurance (see the JIDI website). The objective of the JIDI project was to get the best quality scans from the current generation of technology and to ensure that the images were complete and accurate. The quality assurance training that was provided focused on:

- ◆ the set up of the computer display;
- ◆ the creation of the quality assurance space (environment);





- ◆ the quality assurance process itself.

Recommendations:
<ul style="list-style-type: none"> <li>➤ Clear guidelines for conducting the quality assurance of digital images need to be established.</li> <li>➤ As JIDI has demonstrated, independent quality assurance procedures are essential for digital imaging initiatives. All digitisation projects should ensure they have put independent quality assurance procedures in place.</li> </ul>



### 3.4.10 Monitoring

The JIDI project had adopted a layered process, and this structure might have been better reflected in a layered approach to monitoring activity at the participating sites. This would have ensured that the input from the monitoring reports fed to all the various participants within the project. In addition, monitoring tended to focus on measurement of the quality of the outputs. It might have benefited from conducting qualitative assessment of the processes.

Recommendation:
<ul style="list-style-type: none"> <li>➤ Monitoring processes need to be put in place before digital imaging projects commence.</li> </ul>



### 3.4.11 Evaluation

JIDI was an experimental project that did not have the benefit of a pre-defined evaluation or impact assessment framework. It is fair to say, of course, that at the time JIDI was established evaluation studies, such as user needs and impact analyses for both digital imaging and ICT-based projects more generally, were still in their infancy. There does remain much merit in an approach to selection that depends upon content specialists within particular subject domains; this approach is being developed further through the work of the LTSNs.

Recommendation:
<ul style="list-style-type: none"> <li>➤ No projects should be funded that have not given consideration to evaluation processes and in particular impact evaluation.</li> </ul>

### 3.4.12 Delivery

At the outset of the JIDI project the Knowledge Gallery was intended to provide the delivery mechanism for the images created by the participating sites. The discontinuation of the Knowledge Gallery meant that no delivery mechanism was in place until the end of the project. It also meant that the delivery service did not play a role in the development of the content, and problems that might have been avoided by keeping service issues at the forefront of the project, did not become apparent until late in the JIDI programme.

The Visual Arts Data Service (VADS) has stepped into the breach and is making the arts-based materials available. It has encountered difficulties delivering this material and, as explained in Section 5 below, many of the issues that have arisen might have been averted if delivery experiments had been conducted and issues discussed more widely early on in the JIDI work plan.

#### Recommendations:

- Digital imaging projects should only be funded where plans for the delivery of the digital images have been made before the start of the project.
- The delivery service should have a core role in digital content creation projects from day one.

### 3.4.13 Preservation and Long Term Access

The JIDI team has noted that long-term storage of the original digital files has not been adequately addressed. Few of the participating sites have institutional policies relating to the preservation of digital materials. Those participating sites that lack strategies for preserving these materials, or have not given material to VADS, need to be assisted to ensure the digital assets created by JIDI are secured.

Other reviews by JISC funded services (e.g. AHDS<sup>18</sup>) or research activities (e.g. DAWG) reached the conclusion that few institutions had strategies in place for handling electronic images. It is hoped that the JISC Preservation Focus will act to address the strategic and informational gap about digital preservation in the HE community. This lack of strategic planning at institutional levels has impacted on the JIDI project.

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<sup>18</sup> <http://ahds.ac.uk/>

The economic life of the digital images created by the JIDI programme is indicated by the length of time that participating sites would make the digital assets available, which was agreed at between three and five years (in comparison the New Opportunities Fund has recently adopted three years). This is a very short period, given the investment that was made in the digital imaging.

#### Recommendations:

- The economic life of digital assets should be declared by JISC as indefinite.
- Preservation strategies are essential. Digital imaging projects should either have access to nationally managed preservation arrangements put in place by the funder, or provide clear evidence of access to local preservation facilities.

#### 3.4.14 JIDI's Learning Points

The JIDI project did take a brief reflective look at its work and produced a report entitled *A Selection of Learning Points from the JIDI Project* (16 May 2000). This includes fifty-four points categorised under eight headings (pre-scan, scanning, storage, metadata, quality assurance, copyright, staff, and miscellaneous). Some points are confirmed by the results of other projects, while others are made for the first time.

#### 3.5 Conclusions

The JIDI project represents a significant achievement. It started when knowledge of digital imaging activities was still in its infancy. Many of the lessons that it learned encouraged other activities within the community.

Future digital imaging projects should be put forward as multi-phase initiatives. In Phase I projects would conduct a feasibility study to ensure that their costings are accurate, the processes adequately defined and understood by the project team, and the procedures for quality control and assurance (of both images and metadata) and mechanisms for delivery viable. Phase II, the production phase of the project, would then be an implementation phase. Discussions with HEDS about the digital imaging on the JIDI project indicate that at least one risk with this phased approach needs to be flagged up: the cost estimates for the digital imaging were established for seven JIDI participating sites based on specific volumes (5000 items per site), the material being in particular conditions, and anticipated start dates. In practice, the number of items submitted for imaging by the participating sites was far lower than the

5000 items per site anticipated, in some instances the image material was submitted in poor condition (e.g. the material for imaging had not been properly cleaned before submission), and there were significant delays in start dates. These changes between the feasibility phase and the production phase would normally have resulted in cost increases. They did not do so in this instance because HEDS relied on its relationships with digital imaging service providers (e.g. Xerox<sup>19</sup> and Bell & Howell<sup>20</sup>) to ensure that the projected costs per item were maintained, although the economies of scale had been eroded by the shift in numbers of items.

More emphasis should be placed on the production of publicly available documentation from projects. For instance, although John Eyre from Helix<sup>21</sup> was on the JIDI Steering Committee and could share the results of this project with JIDI, there had been little written material available about the Helix project and as a result it was difficult to take full advantage of the experiences of this earlier project. The JIDI website is a goldmine of information for anyone wishing to start a digital imaging project.

**One clear message that came from the JIDI Steering Committee and from the Core Project team at the ILRT is that projects of this kind depend upon (1) strong project management; (2) careful planning and costings; and, (3) good and clear relationships between the parties.**

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<sup>19</sup> <http://www.xerox.com/>

<sup>20</sup> <http://www.bellhow.co.uk/>

<sup>21</sup> <http://www.helix.slb.com/>

## 4 JIDI Project Participants – Processes & Lessons Learned

### 4.1 Introduction

The JIDI Project was a multi-site, multi-foci project involving communication, distributed tasks, sharing of standards and processes across sites, and diverse training needs. Despite studying the digital imaging landscape at the start of JIDI, no comparative projects were identified which could help JIDI address all the issues that would be encountered during the JIDI project itself. As a result the project team, both JIDI and the participating sites, very much learned as they went along. This 'adaptive project management and process development' was the only way to proceed under the circumstances. It is essential to remember that JIDI was doing something that had not been done before. For example, the role of quality assurance was poorly understood at the start of the project and these guidelines and processes were developed in response to a need recognised during the project itself. Some of the participating sites did not fully comprehend the newness underlying the initiative and the need, therefore, to be adaptive and responsive. This lack of understanding inevitably led to frustration at times on the part of the participating sites. These tensions are evident in the examination of the work and experiences of the participating sites themselves, which is described in this section. Many lessons have been learned from JIDI concerning such areas as project design, project management, digital imaging, quality assurance, training, and evaluation. These lessons are described in the concluding sub-section of this section.

### 4.2 Sketch of the Collections Included in the JIDI Project

The thirteen collections included in the project come from a variety of sources and reflect some of the ranges of uses of digital images in the higher education community. This is a very brief review of the projects:

- ◆ The Arts Council of England<sup>22</sup> and the Gulbenkian Foundation<sup>23</sup> support the African & Asian Visual Artists Archive<sup>24</sup>. It contains a diverse range of holdings such as artist and exhibition slides, posters, artist publications, and files from exhibitions. For the JIDI project the collection digitised approximately 1900 35mm slides. The digital images produced from these slides will be delivered through the Visual Arts Data Service (VADS).

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<sup>22</sup> <http://www.artscouncil.org.uk/>

<sup>23</sup> [http://www.gulbenkian.pt/indexa\\_ing.html](http://www.gulbenkian.pt/indexa_ing.html)

<sup>24</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_aavaa.html](http://www.ilrt.bris.ac.uk/jidi/col_aavaa.html)

- ◆ The Design Council Archive at the Design History Research Centre at the University of Brighton<sup>25</sup> comprises a body of images representing architecture and design both in Britain and abroad. For JIDI 3500 images were digitised from 35mm slides of the original 5" x 7" glass plates. Digital resources created as part of the project are to be delivered by VADS.
- ◆ The British Geological Survey (BGS)<sup>26</sup> collection contains well over 100,000 photographs in a variety of formats. For its contribution to the JIDI project the BGS selected material from its smaller 'Land Survey' collection of some 35,000 photographs. The material was selected from this collection according to its representativeness of various aspects of British geology. The BGS contracted with JIDI to provide 3500 images; 3000 of these images were scanned for the JIDI project, while the additional 500 digital images were the result of scans previously completed under other digital imaging initiatives undertaken by JIDI.
- ◆ The Art and Design Archive and The Teaching Examples Collection of Central St Martins College of Art and Design<sup>27</sup> consist of a wide range of material in the area of fine art and design. It is a unique example of a teaching collection dating from the late-19th and early-20th century. It contains illuminated manuscripts, botanical drawings, oriental prints, wood engravings, textile samples, German film posters, and bookbindings.
- ◆ The John Johnson Collection of Printed Ephemera (Bodleian Library, Oxford)<sup>28</sup> is a large and diverse collection covering such areas as social and typographic history. For its JIDI project the collection focused on soap advertising and political prints. In total 2500 images from the collection were digitised.
- ◆ The Magee Photographic Collection<sup>29</sup> contains over 3000 photographic negatives of pictures of Derry and the North West of Ireland. These photographs are highly sought after by social historians of Northern Ireland as well media outlets such as the BBC and ITV.
- ◆ The London College of Fashion<sup>30</sup> collection consists of over 1000 black and white photographs of all sizes, which document the training and garment design of London's fashion schools.

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<sup>25</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_designbri.html](http://www.ilrt.bris.ac.uk/jidi/col_designbri.html)

<sup>26</sup> <http://www.bgs.ac.uk/home.html>

<sup>27</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_martin.html](http://www.ilrt.bris.ac.uk/jidi/col_martin.html)

<sup>28</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_john.html](http://www.ilrt.bris.ac.uk/jidi/col_john.html)

<sup>29</sup> <http://www.infm.ulst.ac.uk/~mcc/html/mpc.htm>

<sup>30</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_fashion.html](http://www.ilrt.bris.ac.uk/jidi/col_fashion.html)

- ◆ The Suffrage Banners Collection at the Fawcett Library (London Guildhall University)<sup>31</sup> houses banners, designs and other materials used in their manufacture. The collection also holds the design album of a prominent member of the Artists Suffrage League<sup>32</sup> (Mary Lowndes Album).
- ◆ The Lawrence Batley Centre for the National Arts Education Archive (Trust)<sup>33</sup> Bretton Hall Collection of 920 images is divided between two collections. *The Halliwell Collection* (250 images) consists of materials illustrating graphic and industrial design work and paintings by Halliwell and his wife. *The Basic Design Collection* (670 images) includes examples of students' work, slides, and photographs representing Basic Design Courses in UK colleges of Art and teaching programmes in Canada and the USA.
- ◆ The Spellman Collection of Victorian Music Covers (Reading University)<sup>34</sup> consists of approximately 2500 Victorian music covers. The covers are representative of Victorian artistic design and provide a window on the social history of the period. They illustrate trends in printing and lithographic design work during the Victorian era. The study of developments in printing and lithographic design is currently an area of research at the University of Reading. In total 800 items from the collection were digitised.
- ◆ The Gertrude Bell Archive (University of Newcastle)<sup>35</sup> contains slides and photographs of Gertrude Bell's travels in the Middle East (1868-1921). Many of these photographs depict archaeological sites that have vanished. For this reason the collection has become very important to Middle Eastern Archaeology. The archive also contains a small quantity of journals and other written sources.
- ◆ The Derby Earth Sciences 3D Image Collection<sup>36</sup> consists of thirty-five three-dimensional movies of geological specimens. The movies are available in two formats (*QT Movie* for PC and *QT VR*) and are designed primarily as a teaching resource for undergraduate geological science students. The collection also contains images of rare specimens that are not typically available in earth science curriculum.

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<sup>31</sup> <http://www.lgu.ac.uk/fawcett/fawvis.htm>

<sup>32</sup> <http://www.lgu.ac.uk/fawcett/archives/2asl.htm>

<sup>33</sup> <http://naea.leeds.ac.uk/batley.htm>

<sup>34</sup> <http://www.rdg.ac.uk/SerDepts/vl/Lib/Colls/spellman.html>

<sup>35</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_bell.html](http://www.ilrt.bris.ac.uk/jidi/col_bell.html)

<sup>36</sup> [http://www.ilrt.bris.ac.uk/jidi/col\\_derbygeol.html](http://www.ilrt.bris.ac.uk/jidi/col_derbygeol.html)



### 4.3 Project Inception

The participating sites were motivated to take part in JIDI by different objectives. Their reasons included:

- ◆ to gain experience in digital imaging;
- ◆ a desire to increase knowledge about their collections (e.g. public visibility);
- ◆ to reach new audiences;
- ◆ a wish to extend the use of the material by making images available in digital form;
- ◆ as a way of assisting in the conservation of the collections by reducing use (e.g. handling) of originals;
- ◆ enhancing acquisitions to the collections through indicating the diversity of collections in their care;
- ◆ as a way of preserving the information content of the collection (e.g. nitrate film);
- ◆ improving collection documentation through the creation of new metadata;
- ◆ to stimulate research;
- ◆ to provide resources for teaching and learning;
- ◆ as a good way to complement other activities such as ongoing documentation of collections;
- ◆ as a part of larger e-access and e-commerce activities using the collections of the institution.

Collections' different reasons for participating had a significant impact on the way they viewed the outcomes of the project to date.

Curiously, while a number of projects felt that by making material available on the web access to their particular collection would be increased,

- ◆ few of the participating sites could define the audiences that they were intending to reach in detail;
- ◆ none had done market research about the current and potential audiences; and,
- ◆ none could determine whether or not they were now reaching that audience.



**Recommendation:**

- Before beginning digitisation work future projects should clearly identify their primary audiences and conduct research into their needs.

The table below indicates **primary reasons** that participating sites gave for taking part in the JIDI programme. They may well have had secondary reasons or with hindsight have realised that digitisation makes other things possible.

Participating Site	To gain experience in digital imaging	A desire to increase knowledge about the Collection (e.g. public visibility)	To reach new audiences	To contribute to the conservation of the originals	To extend the use of the material by making images available in digital form	To preserve the information content of the collection	To make materials available for teaching and learning	To stimulate research	To complement other work with the collection (e.g. on going documentation)	To develop e-access and e-commerce programme for the collection	As a way to encourage new donations to the collection
The African & Asian Visual Artist											
Central St Martins College of Art and Design Archive											
The British Geological Survey											
Derby Earth Sciences 3D											
Design Council Archive											
The Design Council Slide Collection											
Gertrude Bell											
The John Johnson Collection of Printed											
The Lawrence Bailey Centre for the National Arts Education Archive (Trust) Bretton Hill											
London College of Fashion Collection											
The Magee Photographic Collection											
The Spellman Collection of Music Covers											
Suffrage Banners Collection											

#### 4.4 Planning

The success of digital imaging projects can be enhanced through planning and close working relationships between all the groups involved in the imaging activity. The activities involved in planning digital imaging projects include:

- ◆ selecting material;
- ◆ conservation assessment;
- ◆ risk assessment (e.g. which activities will put material at risk and what is the nature of these risks, which processes are likely to fail and under what conditions and what will be the impact of these failures on the project);
- ◆ deciding whether the imaging will be done from originals or surrogates;
- ◆ workflow modelling to ensure that all the processes are identified, timed, and costed;
- ◆ establishing project management structures and policies;
- ◆ cost modelling;
- ◆ defining quality assurance procedures;
- ◆ deciding whether the digital imaging will be conducted in house or outsourced. If the project decided to do the work in house this was also the stage at which plans were established for the digital imaging equipment if these were not already in place.

Few of the participating sites found themselves in a position to undertake conservation surveys of the material that they were proposing to digitise. In some instances the decision not to carry out these surveys was taken on grounds of costs and available staff time. Some participating sites were unable to carry the costs internally and others concluded that the limited resources that JIDI was making available would not be sufficient to cover the costs of such a report. At least one, the John Johnson Collection of Printed Ephemera, feared that it might be rejected from the programme if it included the costs of a conservation survey in the project plans. In other cases a conservation survey was not conducted because the collections were digitising from 35mm slide surrogates rather than originals (e.g. African & Asian Visual Artists Archive). The Design Council Archive had conducted a conservation review a year prior to the start of its participation in the JIDI project and staff used this report to guide the selection of materials for digitisation.

At the planning stage a number of participating sites decided to use surrogates for imaging. In some cases these surrogates were created specially for this project (e.g. Lawrence Batley Centre and Suffrage

Banners Collection). The Suffrage Banners Collection planned to use negative transparencies of the banners that already existed for scanning. The Mary Lowndes Album was professionally photographed, as no transparencies of it existed. The decision to use surrogates may reflect the perception that digital imaging puts material at higher risk than traditional photography does.

The JIDI's Content Co-ordinators did carry out their own evaluation of the collections that had been proposed for inclusion in the programme of work. Defining a national programme and selecting local material to contribute to the creation of that national resource does represent a valid strategy. Difficulties may arise, however, at two levels. First, when these strategies cut across local needs and, second, where these initiatives deflect effort at a local level from existing strategic plans.

Only a few participating sites reported that they had applied selection methods at item level. The Spellman Collection did not employ a formal selection process to determine what to digitise. The project manager, through familiarity with the collection and its on-going conservation, determined the items best suited to digitisation. An effort was made to pick pieces representative of developments in stylistic/artistic/printing methods. Similarly, before submitting a funding proposal to JIDI, the curator of the collection at the Lawrence Batley Centre selected a few samples from the collection's materials to determine the project's structure and workflow estimates. The collection created 35mm slides using a professional photographer and made these available for scanning. Staff at the John Johnson Collection of Printed Ephemera directed the selection process and selected objects that they thought would be of interest to the HE community and were in good enough condition for digitisation.

The African & Asian Visual Artists Archive selected material for digital imaging that had been created by artists still in residence at the time of the project. They made this decision because they realised that the metadata required by the JIDI project could not be met from existing documentation.

Representativeness was one of the criteria used to select material for digital imaging. The Derby Earth Sciences 3D Image Collection guided its selection of geological samples by reference to the Earth Sciences undergraduate curriculum.

Few participating sites adopted project management strategies. The British Geological Society argued that the project was too small to warrant the use of formal project management. Here again, fitness for purpose must be the guiding principle. While for many of the small contributing sites PRINCE2<sup>37</sup> style project management might have been

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<sup>37</sup> <http://www.prince2.org.uk/>

unnecessarily complex, nevertheless more rigorous reporting might have been helpful (see below).

The participating sites reported that this was also the stage at which they identified the approach to digital imaging that they would adopt. They decided either to conduct the imaging in house or to outsource the work to a specialist imaging service. Where digital imaging work was outsourced, much of the work was passed to the Higher Education Digitisation Service (HEDS), and one project selected iBase to undertake the digital imaging. The Gertrude Bell Archive, the BGS, and the John Johnson Collection of Printed Ephemera decided to conduct digital imaging in house and to use JIDI as an independent quality assurance agency. The London College of Fashion did not prepare conservation or risk reports, although it planned to use original photographs for digitisation. Small representative samples of photographs were sent into HEDS and JIDI for evaluation and costing. Although HEDS is only one supplier of digital imaging services and, indeed, sub-contracted some of the work to external suppliers, it is perhaps surprising that none of the participating sites decided to solicit multiple quotations for digital imaging work.

The African & Asian Visual Artists Archive submitted representative samples of its materials to JIDI and HEDS for evaluation and a rough estimate of the digitisation costs. The collection then entered into negotiations and signed a contract with iBase to do the digitisation work. iBase was eager to gain a foothold in the humanities market and struck a fairly generous deal with the collection. In return, the contract contains a clause entitling the collection to give iBase first refusal on all of its future digitisation projects. The project did not commission any conservation reports as it was digitising 35mm slide surrogates of its originals. In selecting images for digitisation, preference was given to work of artists in residence because the AAVAA recognised that there would be a need to interview some of the artists to create the descriptive metadata. iBase did do some consultancy work with the collection to enable it to manage the digitisation better.

Determining whether the work can be done in-house or should be put out to a digital imaging service needs to be defined at the planning stage. The Spellman Collection of Victorian Music Covers, for instance, conducted initial research to decide whether the project would use the in-house digitisation facilities at the University of Reading. It was determined that costs would be roughly equal. However, the University's facilities could only digitise the Spellman collection on an irregular basis—fitting in the work between other scheduled jobs. Concern over meeting JIDI deadlines led the participating site to contract the work to HEDS. During the planning stage the Magee Photographic Collection considered outsourcing its digitisation to HEDS. Subsequent cost estimates provided by HEDS were deemed excessively high by the

collection's management (they were reported to have been over 300% higher than the initial estimate provided by HEDS). This jump in price convinced the Magee Collection staff that in-house digitisation would probably be more cost effective. It was at the planning stage that the John Johnson Collection rounded up donations of equipment so that the digital imaging could be done in house.

#### Recommendations:

- The planning stage needs to be much more formal, involving the putting in place of selection strategies, digital imaging and quality assurance guidelines, and metadata standards.
- Projects should carry out conservation surveys as part of planning digital imaging projects.
- All projects should adopt selection procedures.
- Where feasible, projects could benefit from obtaining multiple quotations for digital imaging work before selecting a supplier.

#### 4.5 Estimated and Actual Costs

The funding set aside for the participating sites varied, depending upon resources available and anticipated need. The projects felt that they had little control over the way funding was allocated to their project and there was a difference between the anticipated and actual costs. In some instances this resulted in the participating site having to bear unexpected costs or members of staff having to put in many unpaid hours. This section looks at how the participating sites appreciated costs both at the start and at the end of the project. Some appear to have made decisions about how to use the available funds before they conducted formal costings, while others attempted to take a more formal approach.

The African & Asian Visual Artists Archive anticipated costs in four key areas:

- ◆ handling and re-boxing negatives;
- ◆ creation of descriptive metadata (requiring consultation with some of the artists);
- ◆ digitisation;
- ◆ quality assurance.

The London College of Fashion anticipated that their costs would include the HEDS digitisation fee, four months' salary for a staff member at the collection to create the descriptive metadata, the one-time purchase of a

computer and *Filemaker Pro* software for the creation and storage of the descriptive metadata, and courier costs to deliver materials to HEDS. The Suffrage Banners Collection used JIDI funding exclusively for the digitisation and creation of descriptive metadata. They bore the costs of staff, preparation of materials for shipping to HEDS and transportation of materials. They also paid for the photographing of the Mary Lowndes Album. Metadata creation was more time consuming than initially planned.

Taking three participating sites as an example, it is easy to see why they found it difficult to estimate their costs. Participating sites considered different costs and none had access to a tested and well-documented costing model.

- ◆ The Lawrence Batley Centre was intended to be 100% funded by JIDI but the institution paid for an overrun of £1500. Costing the project was one of the most difficult aspects of the planning stage, and guidelines or models from JIDI would have helped in carrying out this task. A contingency fund worth approximately 15% of the total project cost was created as a result of the uncertainty. The project anticipated costs for: handling, retrieving/re-shelving materials; photography (creation of 35mm slides); creation of descriptive metadata by in-house library staff; transportation and curator visits to outsourcer; digitisation and creation of metadata; QA carried out in-house by curator.
- ◆ The Magee Photographic Collection Project was to be 67% JIDI funded. The collection estimated the cost of the equipment. It developed a novel method of paying staff and boosting their morale, by allowing them to take home some of the equipment purchased for the project. The University of Ulster would own the equipment but the collection saved on taxes by paying the staff by 'lending' them the computer equipment for both project and personal use. This was seen as a good way to reduce staffing costs and project taxes, while motivating the project team members. Planned costs included: handling/re-boxing negatives; scanning time; creating metadata; quality assurance of batches instead of inspecting every image; and development of the delivery database.
- ◆ The John Johnson Collection of Printed Ephemera guessed the number of images that could feasibly be digitised in a week and used this to calculate its imaging estimates. This figure was then divided into the total number of images to be digitised (2500) and the staff time for  $x$  number of weeks was then calculated. Since most of the equipment was borrowed, the project's budget went almost entirely to wages for the collection staff. The planned costs



included: handling and re-boxing of objects; staff time for the camera operator; staff time for creation/modification of metadata; and additional work done on cataloguing. The project reported that the lack of rigorous and validated costing models had made the estimating of costs difficult. There were large overruns in the cost of the project mainly due to excess staff wages. The question is whether the cost overruns reflected difficulties calculating the real costs of the project, or whether it was inefficiently run and managed through all stages.

A number of participating sites had costs overruns. The Design Council Archive anticipated that JIDI would pay £24,000 for the digitisation by HEDS. The Council was to absorb the costs of a professional photographer to create 35mm slides from original glass plates, the creation and editing of descriptive metadata, and the transportation of 35mm surrogates to HEDS. The project manager stated that she has not yet calculated the final cost for the JIDI project. Costing was very rough and overruns very large. She went on to note four lessons:

- ◆ The collection underestimated the cost of creating and editing descriptive metadata.
- ◆ The collection's metadata were not as complete or accurate as they first believed.
- ◆ The cataloguing work carried out with Getty<sup>38</sup> funding could not be adapted to JIDI guidelines as initially expected. HEDS increased the price per image during the project life cycle and experienced scanning difficulties.
- ◆ The collection's conservation programme and other grant funding probably absorbed most of the digitisation overruns.

A similar story came from nearly all the participating sites: the available funds underestimated the costs of carrying out the programme of work. This is probably to be expected in the absence of an adequate costing model on which to build estimates. Such models are an essential part of managed imaging programmes.

Recommendations:
➤ Dynamic digital imaging cost models need to be developed if projects are to estimate the true costs of digital imaging



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<sup>38</sup> <http://www.getty.edu/grants/index.html>



initiatives (see earlier similar recommendation).

- Even where home institutions are prepared to absorb costs these assumptions should be clearly stated so that the true value of digital imaging activities are recognised.

#### 4.6 Workflow

Almost without exception the participating sites conducted only limited workflow analysis, **which is surprising given the detail of the workflow guidelines produced by JIDI.**<sup>39</sup> While participating sites did attempt to consider workflow issues, their lack of experience in workflow modelling meant that a few minor disruptions completely knocked out their estimates.

The London College of Fashion estimated workflow during the preparation of representative samples sent to HEDS as part of the initial feasibility study. The College discussed with HEDS the size of the batches to be sent out for digitisation and used these results to create workflow estimates; these worked until problems cropped up in the digitisation process (see below). This forced changes in the size of the batches, thereby throwing out the initial workflow estimates. The Suffrage Banners Collection used a few representative examples of its holdings to make rough estimates of workflow. The results proved accurate, except that additional input was required because all the material had to be rescanned; they also underestimated the costs of creating and updating their existing metadata. The Lawrence Batley Centre workflow model was very roughly estimated, the initial examples sent to JIDI providing the basis for this guesswork. Activities that the project considered significant included:

- ◆ retrieval and re-stocking of archived materials;
- ◆ professional photography and 35mm slide generation;
- ◆ initial creation of descriptive metadata by the institutions' library staff;
- ◆ transport of slides and metadata to outsourcer;
- ◆ digitisation by contractor;
- ◆ creating CD-ROMs and updating metadata with technical details;
- ◆ quality assurance by the curator back at the collection;
- ◆ transport of CD-ROMs and metadata to VADS for delivery.

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<sup>39</sup> <http://www.ilrt.bris.ac.uk/jidi/workflow.html>

Without clear guidelines that they could use to benchmark their workflow, most participating sites underestimated the effort involved in the project and therefore the internal costs. The Design Council Archive, for instance, assumed that the creation and editing of digital metadata would be easily incorporated into its Getty funded programme. In doing so it overestimated the accuracy and adaptability of its metadata to JIDI's guidelines and as a result underestimated the effort involved in complying with these guidelines.

The African & Asian Visual Artists Archive did not create a workflow model to establish the costs of undertaking digital imaging, but did benefit from discussions with iBase (its digital imaging service provider). While the British Geological Survey did not formally evaluate workflow, it made a fairly accurate estimate using the information collected and experience gained when running a SCRAN<sup>40</sup> funded digitisation programme. However, this did not prevent it overlooking that many of the items it had committed to scan were held at a different location in the UK so that slides needed to be transported to and from Edinburgh. In this case the impact was fairly trivial, but the implications might have been worse.

The John Johnson Collection of Printed Ephemera (Bodleian Library, Oxford) used a few preliminary examples to estimate the workflow cost associated with the project, but they reported that had not accurately projected:

- ◆ the time necessary to upload/download images to the hierarchical file server;
- ◆ the time necessary to write CD-Rs;
- ◆ the impact that the initial failure to set up the digital camera correctly might have on the project;
- ◆ the impact caused by the late stage at which the quality assurance element of the project was established;
- ◆ the difficulties that could be caused by a breakdown of communication between themselves and the JIDI management team.

Although metadata is considered in more detail below, it is worth noting in relation to workflow that most projects found they had underestimated the significant effort required for metadata creation.

- ◆ The creation of descriptive metadata by the African & Asian Visual Artists Archive necessitated meetings with a number of the artists. This process was anticipated, but they found that they spent more time on metadata creation than planned.

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<sup>40</sup> <http://www.scran.ac.uk/homepage>

- ◆ The Spellman Collection of Victorian Music Covers used a few representative examples of its holdings to make rough estimates of workflow. They reported that in the actual project the creation and updating of existing metadata took more time than initially anticipated.
- ◆ The Gertrude Bell Archive programme ran smoothly until the archive adopted JIDI metadata guidelines, as the workflow model was not set up to deal with JIDI metadata standards additional effort was necessary. The retroconversion of the metadata already created was a time consuming and difficult task and changed the work profile.
- ◆ The Derby Earth Sciences 3D Image Collection made no formal estimates of its workflow. The project manager found that creating the metadata took longer than expected.
- ◆ The Lawrence Batley Centre created its descriptive metadata in *Tallis Notes* and this format had to be converted to an *Access* database. The conversion was contracted out to a third party and was the primary reason for the project's cost overrun.

Recommendation:
<ul style="list-style-type: none"> <li>➤ Generic workflow models need to be established that allow realistic estimates of the effort and time commitments involved in digital imaging projects.</li> </ul>



#### 4.7 Digital Imaging

Participating sites adopted one of two approaches to digital imaging. They either created the images in house or outsourced the work to a digital imaging service. While several projects digitised from original materials, many used film intermediaries (i.e. surrogates) as the target source.

Among those groups that outsourced their imaging work all but one contracted with the Higher Education Digitisation Service (HEDS). The African & Asian Visual Artists Archive outsourced its digitisation and the integration of descriptive and technical metadata to iBase. iBase is relatively new to humanities computing and did have some initial difficulties meeting JIDI's image guidelines.

The Lawrence Batley Centre outsourced its digital imaging to HEDS. The Spellman Collection of Victorian Music Covers relied on HEDS to define the imaging specifications; the digital images were supplied on CD-R, which the participating site accepts as suitable for long-term storage. The London College of Fashion turned to HEDS for its digital imaging, which

was done from the original photographs themselves. The College reported that many of the photographs were very dusty and that this created problems for HEDS because the equipment had to be continually cleaned and re-calibrated. HEDS absorbed the extra costs of this work, as they had failed to calculate the additional costs of this effort despite working with material in the same conditions at the feasibility stage. The Suffrage Banners Collection also used HEDS as its digital imaging service and relied on HEDS' specifications. The quality assurance process identified a failure in the imaging work and all the material had to be rescanned. The Suffrage Banners Collection scanning was done from surrogates.

Among those participating sites that chose to conduct their imaging in house there were few difficulties:

- ◆ The Magee Photographic Collection carried out the digital imaging in house. Staff brought their expertise to bear and developed a method of automating the capture of technical metadata.
- ◆ The John Johnson Collection of Printed Ephemera borrowed the equipment it needed to establish scanning facilities (e.g. digital camera) from other projects. There were some difficulties calibrating the equipment at the start. As a result some material needed to be rescanned.
- ◆ The Gertrude Bell Archive imaging was done in house from either the original negatives or 35mm surrogates. The Archive evaluated both and used the medium that could provide the best digital image as the source.

The British Geological Survey carried out its digital imaging in house. The only difficulty that its professional photographers encountered in the process was a shortage of hard disk space, which meant that scanning had to be done in small batches, written to CD-R, and then space cleared on the disk. The creation of the CD-Rs proved time consuming and prone to failure, slowing the process down. Nearly every participating site reported difficulties creating CD-Rs from their scanned material. The process was not only time consuming, but also prone to a high failure rate. Only the Derby Earth Sciences 3D Image Collection and the British Geological Survey reported storing the digital images on multiple types of digital media; others may have done so, and all should have done so.

The British Geological Survey tried to replicate the advances made in automated technical metadata creation developed by the Magee Photographic Collection and concluded that future projects could benefit from this ability (see the Scottish Archives Network below, Section 7).

Using surrogates introduced some unexpected problems:

- ◆ The digital images of the Design Council Archive were taken from 35 mm slide surrogates produced by a professional photographer,

who had accurately (almost lovingly) reproduced the black and white contrasting borders on the original glass plates. During digital imaging the scanning software automatically adjusted the grey tonal scale in response to the presence of this border. As a result the tonal quality of the digital images did not accurately reflect that of the originals. The problem was caught rather late and as a result not all the material was rescanned. While the quality assurance process and the reporting mechanisms may have been in part responsible for its late discovery, the decision to work with surrogates is probably the root cause of the problem.

- ◆ When reviewing the images of the Lawrence Batley Centre material the collection's curator discovered an unexpected blue tint on a small number of digital images. After some investigation the participating site and HEDS concluded that it resulted from the combination of the nature of the source material (charcoal sketches), the film stock used by the photographer to create the surrogates, and the scanning process. Diagnosing the cause of the blue tint led the project to overshoot its budget very marginally.

Both these problems could have been avoided if the projects had had the imaging done from the originals themselves.

The participating sites that outsourced their digital imaging work left the details of the process to the service provider. They reported that they were not aware of the type of equipment used, the environment in which the imaging was done, what calibration or quality assurance processes the service provider carried out, the skills the staff had, or how the imaging work was managed.

#### Recommendations:

- Digital images should be created from the original materials rather than surrogates, although conservation and handling risks need to be considered in an assessment of whether this approach is viable on a collection-by-collection basis.
- Projects that wish (or need) to carry out their digital imaging in house should ensure that they have either an adequate technical infrastructure in place or sufficient budget to create such an infrastructure.
- There is a need for a standard set of imaging guidelines so that projects do not have to create their own.

#### 4.8 Metadata

The participating sites found that they underestimated the costs, processes, and difficulties involved in collecting, creating and encoding their metadata. While this review has identified the JIDI metadata standards as one of its major contributions to the digital imaging arena, the participating sites found these guidelines difficult to follow. An application for recording the metadata, available to all the participating sites at an early stage in the project, might have helped alleviate this problem.

Different participating sites took different approaches to encoding metadata, resulting in a lack of consistency:

- ◆ The African & Asian Visual Artists Archive recorded the metadata on paper and then input this information into *Word*. The metadata was then migrated to *Excel* and provided to iBase.
- ◆ The Lawrence Batley Centre created its metadata in *Tallis Notes* but subsequently discovered that they would have to be converted to *Access* format, a process that resulted in disruption and extra cost.
- ◆ Many participating sites, including the Design Council Archive, Suffrage Banners Collection, and London College of Fashion, followed JIDI metadata guidelines and entered their descriptive metadata in *Filemaker Pro*. The Magee Photographic Collection also used *Filemaker Pro* to store the metadata, but eventually transferred them to an SQL database to ensure that they could be made accessible over the web easily.
- ◆ The Derby Earth Sciences 3D Image Collection used JIDI metadata guidelines and entered the descriptive and technical metadata into an *Excel* spreadsheet.

Several projects reported they had genuine difficulties understanding the metadata guidelines, or found that they needed to redo work to conform to the JIDI standards.

- ◆ The Lawrence Batley Centre found JIDI metadata standards too detailed and difficult to implement. Project staff also reported that the metadata terminology proved difficult to understand and, as a result, they had difficulties communicating with their digital imaging service.
- ◆ The Suffrage Banners Collection had to create its descriptive metadata especially for the JIDI project. The collection used JIDI metadata standards but had difficulty complying with them in part, it admits, because staff did not fully understand the guidelines. VADS helped the collection sort out its metadata problems.



- ◆ The London College of Fashion found metadata creation was more time consuming than initially planned and the collection just managed to stay within its budgeted timeframe for this activity.
- ◆ When the Gertrude Bell Archive became a JIDI participant it stopped using its own metadata guidelines and adopted JIDI's. Most of the existing metadata had to be retroconverted to the JIDI format, which involved redoing much completed work. The archive had difficulty interpreting the JIDI guidelines.
- ◆ The Design Council Archive reported that it learned while creating the JIDI descriptive metadata that its cataloguing metadata were full of inaccuracies.

Other participating sites, including the Spellman Collection and the John Johnson Collection, had no difficulties creating the required metadata. Both projects built on the metadata they had already created before joining the JIDI programme. **Projects that already have their metadata in place prove lower risk than those that must create both the metadata and the digital images.** The former projects should receive priority for funding.

However, the JIDI programme demonstrated that there are advantages to supporting some projects that do not have all their metadata in place at the outset, especially where the project must conduct new research to acquire the metadata and that research involves accessing the memories or knowledge of individuals to whom access might be limited (if not impossible) in the longer term. For example, the African & Asian Visual Artists Archive followed JIDI metadata guidelines but found that the creation of descriptive metadata required interviewing a good number of the artists. Similarly, the Magee Photographic Collection lacked initial descriptive metadata for many of the images with which it wished to work. The project developed a novel means of collecting the missing data by contacting the local chapter of the *University of the Third Age*, which organises meetings to stimulate intellectual pursuits among active older people. The collection set up a series of three daylong meetings and invited the members of this local chapter to attend. Lunch and refreshments were provided by the collection and two note-takers were hired by the project to capture the key elements of the discussion. The project's images were then displayed to the group and the descriptive data provided by the participants recorded.

While the Spellman Collection had no difficulty merging the technical metadata created by HEDS with its own descriptive metadata, other projects found the process more complicated, either because their teams lacked the technical expertise or because the database in which they had encoded the metadata was not compatible with the application in which the technical metadata had been created. The Design Council Archive had difficulties linking its own descriptive metadata with the technical

metadata created by HEDS. The numbers of sites encountering problems linking the technical and the descriptive metadata and those that managed the process without difficulty were about equal.

The British Geological Survey had a relatively easy time creating and managing its JIDI project's metadata. The BGS was aware of advances in automating metadata capture from discussions with the Magee Collection in Ulster and replicated some of these methods.

Three different approaches to technical metadata operated in the JIDI programme. Those participating sites that outsourced their digital imaging received their technical metadata in *Access* format from the digital imaging service they were using. Those that carried out imaging in house either created the metadata manually in a spreadsheet (*Excel*) or database package (*Access*), or imported the technical metadata automatically to a spreadsheet or database. The Derby Earth Sciences 3D Image Collection, the John Johnson Collection of Printed Ephemera, and Gertrude Bell Archive favoured the former approach, while the Magee Photographic Collection adopted the latter method. There was general agreement that if the process of technical metadata creation were automated it would reduce the possibilities for errors in their creation, the costs of their creation, and the ease with which their could be captured.

#### Recommendations:

- Projects that already have good metadata in place before beginning digitally to image their collections should be a higher priority for 'digital imaging funding' than those that must undertake both digital imaging and metadata creation.
- Methods for capturing technical metadata need to be automated.
- Collaborative projects need access to a single application and/or standard for metadata encoding to ensure consistency and interoperability of the resulting resources.
- Metadata guidelines must be clear, easy to understand, and accompanied by a variety of examples and training materials.

#### 4.9 Quality Assurance

JIDI established quality assurance as a key activity area of the project. Many of the participating sites passed responsibility for quality assurance to JIDI. Unfortunately for those participating sites that outsourced their digital imaging work (e.g. to HEDS or iBase), as we have noted above, the contractual arrangement did not effectively



include JIDI. Participating sites received training in quality assurance and it was intended that they would perform checks of the images as they were returned either from their in-house digital imaging team or from the external digital imaging service. JIDI would then perform further checks as an independent auditor. Participating sites approached their quality assurance role in different ways. Several effectively abdicated quality assurance responsibility to JIDI, but most put in place appropriate quality assurance procedures and used JIDI to audit their work. The layered quality assurance model proved the most effective. Difficulties arose where JIDI did not receive the material soon enough after it had been returned from the imaging service to ensure that the quality assurance report could be acted upon before the window of opportunity for returning the material for re-scanning had lapsed.

- ◆ The African & Asian Visual Artists Archive acknowledged that it passed to JIDI responsibility for quality assurance and focused attention on closely monitoring its outsourcer. The quality assurance process revealed that the digital imaging service was having difficulties obtaining the necessary resolution and fidelity of colour. JIDI played a key role in sorting out these difficulties.
- ◆ Quality assurance was a major problem for the Design Council Archive and the process was complicated by the terms of the contract between the Archive and HEDS and the fact that JIDI was not party to that contract. In a refreshing moment of frankness the Design Council Archive reported that poor communication between all parties, digital ignorance on behalf of the staff at this participating site, poor quality assurance planning and the decision to give HEDS surrogates rather than access to the original medium all contributed to the difficulties with image quality. Once problems with the scans were recognised and the reasons identified, it was very difficult to force HEDS to re-scan the material.
- ◆ JIDI carried out quality assurance work for the BGS. The project had difficulties providing the JIDI quality assurance team (in Bristol) with originals for comparison purposes. This resulted in some re-scans being ordered that might not have been necessary if the quality assurance team had been fully aware of the condition of the original material. The number of re-scans was minimised by the project hiring JIDI Management's Quality Assurance Manager to help oversee the initial set-up of the digitisation system.
- ◆ The London College of Fashion (LCF) and JIDI shared the quality assurance work. A small number of images had to be re-scanned due to the difficulties with dust already described. The LCF admitted that it did not have any formal training or follow formal quality assurance guidelines and that its main concern with quality assurance was ensuring that HEDS had scanned the

material it had been supplied. This effectively meant that JIDI was carrying out the quality assurance process for the project, rather than independently auditing it.

- ◆ Similarly, the Spellman Collection of Victorian Music Covers relied on JIDI to carry out its quality assurance and did not report it had conducted much itself.
- ◆ The value of this independent auditing role was evident in the working relationship between the Suffrage Banners Collection and JIDI. Both conducted rigorous quality assurance work. The independent role played by JIDI proved invaluable in this case as the Suffrage Banners Collection quality assurance effort did not detect difficulties with the images, but the independent review by JIDI led to all 320 images being re-scanned.
- ◆ The Magee Photographic Collection did its own quality assurance and relied on JIDI to fulfil a quality assurance audit function. They agreed that JIDI would only quality assure random batches of images and if any of the batches failed quality assurance then the Magee Photographic Collection would inspect every image in the failed batch. They reported that this strategy was a success and there was no need to do any unplanned quality assurance.
- ◆ The Lawrence Batley Centre for the National Arts Education Archive (Trust) Bretton Hall reported that the key to minimising the amount of re-scanning and post-processing was putting quality control and assurance procedures in place at an early stage (see Digital Imaging).
- ◆ The Derby Earth Sciences 3D Image Collection and the Gertrude Bell Archive both reported that they conducted their own quality assurance work and used JIDI as an independent auditor.

At least one participating site found it difficult to put in place suitable technical infrastructure to conduct quality assurance. Even following training many of the participating sites were concerned that they might not have the technical skills to conduct quality assurance audits of the material to an appropriate standard. Although JIDI's quality assurance guidelines are clearly defined, available on the web, and formed the basis of training sessions, at least two participating sites reported to our interviewer that they were unaware of their existence.

Quality assurance of images was one of the JIDI project's strong points. Surprisingly, none of the projects mentioned the quality assurance of metadata and this proved to be a weak point when the Visual Arts Data Service came to mount the outputs of the JIDI projects for delivery on the Internet (see below Section 5).

**Recommendations:**

- It is essential that in the quality assurance process the character of the originals is fully understood by all those involved in digital imaging, metadata creation, and quality assurance.
- Where surrogates provide the targets for digital imaging the digital image files should be quality assured against the original objects rather than the intermediary<sup>41</sup>.
- The quality assurance of the metadata must be given as high a priority as that of the digital images.

**4.10 Communication**

Participating sites reported that they communicated with the Managing Agent (i.e. the core JIDI team) by telephone and e-mail, as well as through face-to-face meetings and training seminars. In addition, they were expected to submit monthly reports on their progress to JIDI. JIDI used these reports to identify difficulties and planned additional strategic meetings and effort on the basis of the information contained in them. The British Geological Survey, for example, reported that its main method of contact with JIDI Management was e-mail. As the BGS decided to conduct the digital imaging in-house, the JIDI Quality Assurance Manager (Alan Lock) made an initial visit to help set up the digital imaging process. Both the Quality Assurance Manager and the Content Co-ordinators visited many of the participating sites during the lifetime of the project to advise on every aspect of a project from selection to delivery.

The Magee Photographic Collection reported that while the main method of contact between the collection and JIDI Management was by phone and e-mail, there were several face-to-face meetings. An additional planned meeting was conducted as a videoconference. This proved a cost effective mode of communication and should be considered more often by distributed projects.

There was little communication between participating sites, although the British Geological Survey did contact the Magee Photographic Collection to get advice on how to capture technical metadata automatically. Lawrence Batley Centre found the ability to meet other JIDI participants during training very helpful as it facilitated communication between them and provided a source for guidance when this site encountered

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<sup>41</sup> What Michael Ester has referred to as 'matching to scene'.

difficulties. Most participating sites would have appreciated more frequent opportunities to exchange ideas with other sites.

Participating sites reported that the lines of communication were sometimes cumbersome. The Design Council Archive's difficulties with the digital imaging and quality assurance process resulted in part from a breakdown of communication between itself, HEDS, and JIDI Management. The communication problems that arose here stemmed, in part, from the contractual arrangements that had been put in place. As we have seen in other contexts the contracts linked the participating site and the digital imaging service (HEDS or iBase), but did not include the managing agent (JIDI). This proved a major gap in the process as the managing agent was managing the quality assurance and its exclusion from the chain of communication led to difficulties in the management processes. The relationship between JIDI and the participating sites was governed by another contract. Future contractual arrangements should reflect more accurately the information and workflows that are involved in the project.

The African & Asian Visual Artists Archive had frequent face-to-face meetings with its digital imaging service (iBase). Participating sites that had outsourced their digital imaging work met with their supplier when there were problems (e.g. the Spellman Collection of Victorian Music Covers with HEDS). Several participating sites reported difficulties interpreting JIDI guidelines. It was generally agreed that more structured communication, more of which was either face-to-face or based on videoconferencing, might have provided suitable mechanisms for the participating sites to come to grips with imaging, metadata, and quality assurance.

Communication might also have been enhanced if JIDI had established a process model at the very start of the project, showing participating sites what the communication points should be and who needed to be involved in each activity.

#### **Recommendations:**

- Distributed and multi-participant projects should put in place communication plans before commencing work.
- Projects should evaluate the effectiveness of communication plans regularly to ensure that they are proving the best ways to help projects achieve their objectives.

#### 4.11 Training and Advice

During the interviews most participating sites reported that the training they received was inadequate. This ‘training gap’ was especially acute in the areas of digitisation, metadata creation, and quality assurance. Some projects could rely on institutional resources for occasional guidance and technical assistance, but this was neither the norm nor a formalised relationship. For instance:

- ◆ The IT Department at the University of East London<sup>42</sup> did provide some technical expertise to the African & Asian Visual Artists Archive.
- ◆ The Computing Services at the University of Reading provided some technical guidance to the Spellman Collection of Victorian Music Covers.
- ◆ The John Johnson Collection of Printed Ephemera turned to Oxford’s IT Support Services for occasional advice and assistance with technical difficulties.
- ◆ The London College of Fashion and the Suffrage Banners Collection turned to the College’s IT Department for help in setting up their metadata databases.
- ◆ The Magee Photographic Collection enlisted the technical assistance of the University of Ulster IT Support Services.

However, this support was not enough to meet the needs of the participating sites, especially as few institutions had the breadth of expertise required by the JIDI project. The two-day initial course offered by JIDI management appears to have been insufficient to provide collection staff with an adequate grasp of the technical processes of digitisation. As most participating sites outsourced their digital imaging work their depth of digital imaging training was limited. The British Geological Survey arranged four weeks of comprehensive training in digital imaging for their photographers as part of, but not funded by, their JIDI participation. The BGS also paid for JIDI’s Quality Assurance Manager to help set up the project’s digitisation process (see above).

Katherine Baird of the London College of Fashion described the project’s approach to training as a ‘learn as you go’ situation. Some participating sites felt that this was a harsh judgement, but others tended to agree with her assessment. Some of the training difficulties may result from how the participating sites approached JIDI and the services that it had to offer. The Design Council Archive staff felt that their lack of technical training left the Collection’s staff at a disadvantage when it came to evaluating digital images and creating or updating its descriptive metadata. Other

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<sup>42</sup> <http://www.uel.ac.uk/it/index.htm>

projects, such as the Magee Photographic Collection and the John Johnson Collection of Printed Ephemera, reported that they were able to 'turn visits from JIDI Management personnel into unpaid training or information sessions'. The latter site acknowledges that JIDI provided key technical support in correcting initial errors in camera set-up.

The Lawrence Batley Centre team found that staff lacked the training to understand the technical terminology used by the digitisation team, and this created difficulties. The problem emerged when they discovered that the metadata they had encoded in *Tallis* had to be converted to an *Access* format. We have already noted above the difficulties that projects encountered in encoding metadata and suggested that putting appropriate guidelines and application software in place earlier in the process might have helped avoid these problems.

Some of the difficulties with access to training and advice may have resulted from difficulties in communication between JIDI and the participating sites. JIDI staff, the JIDI Steering Committee, the Content Co-ordinators, and TASI together had the appropriate mix of skills to provide any necessary training and advice that the participating sites might have required. *The 'training gap' may have arisen because a 'training needs analysis', really just a brief questionnaire to the participating sites to determine what specialised training they might have required, was not conducted and a training plan for the project not established at the outset.*

Formal training in quality assurance was available to all the projects, although not all took full advantage of it. The views of the participating sites varied on the quality and effectiveness of this training. Some felt that the quality assurance training left them under-prepared to carry out the work and thus very dependent upon their digital imaging services and the JIDI quality assurance services.

Those participating sites that had good technical skills in house were definitely at an advantage, whether they had outsourced the digital imaging or were handling it in house. All participating sites would have appreciated more formal training in digital imaging, quality assurance, and metadata collection, creation, and encoding. Training is though something we almost always identify as a need in technology rich projects; indeed experts for the European Commission have identified training as a core issue in future development of digital collaboration in Europe.<sup>43</sup>

#### Recommendations:

- Where projects are running managed services, adequate training

<sup>43</sup> *Conclusions of experts meeting on coordination mechanisms for digitisation programmes and policies*, Lund See: [www.cordis.lu/ist/ka3/digicult/en/eeurope.html](http://www.cordis.lu/ist/ka3/digicult/en/eeurope.html)



should be provided and this training should be based on a 'training needs analysis' and managed by a training plan established at the outset of the project and reviewed regularly.

- The provision of local technical advice should be formalised through service level agreements (SLAs).
- Structured training should be provided or available to digital imaging projects.

#### 4.12 Delivery Mechanisms

Most respondents noted difficulties with the delivery of the digital images. While a few of the participating sites planned to deliver the digital images using locally available services, others had turned to JISC sponsored data services, specifically the Visual Arts Data Service (VADS) for delivery. For example, the Magee Photographic Collection developed its own delivery mechanisms. Those using VADS have found that they have had to do additional work filling in gaps in their metadata. VADS identified these gaps as it attempted to create a delivery environment and to ensure that the material can be retrieved and meaningfully used by its intended audience.

#### Recommendation:

- Delivery services need to be planned at the outset of digital imaging projects and where these are independent they need to be closely involved in the digital imaging, metadata creation, and quality assurance activities.

#### 4.13 Monitoring

Apart from providing monthly progress reports monitoring was informal. Our interviews indicated that not all sites recognised the importance of monitoring to the success of their programme of work. Several felt the process was unnecessary or like the Derby Earth Sciences 3D Image Collection were part of other initiatives that provided adequate monitoring. They reported that they found the additional layer more trouble than helpful.

Some of the participating sites in the JIDI programme did not feel that the JIDI management team responded quickly enough to the concerns they raised. Participants on other programmes (e.g. projects receiving Heritage Lottery Fund funding) have reported similar communication difficulties. This impression probably resulted in part from the informal

nature of the monitoring process and might not have occurred with a more formal process.

The British Geological Survey had been involved in at least one SCRAN project and found that SCRAN's method of tracking progress, with a structured form, an alternative to the informal monitoring done by JIDI Management. They wondered whether this form of monitoring might not be adopted in the future.

#### Recommendation:

- Formal monitoring arrangements should be required for all digital imaging projects and should include both qualitative and quantitative measures. All measures should be auditable.

#### 4.14 Sustainability

Two kinds of resource sustainability are relevant to participants in the JIDI programme: the possibility of generating income from the digital images created by their JIDI activities; and the long-term preservation of the digital images themselves. However, sustainability of the digital imaging products was not a concern of the participating sites when they joined the JIDI programme. For example, the Design Council Archive stated that it has left sustainability issues of its digital resources to the discretion of VADS, as has the Lawrence Batley Centre. The African & Asian Visual Artists Archive reported that it had not considered issues of sustainability of the digital image resource.

Several projects have recognised that there may be income to be made from the sale of digital images. On a small scale the Lawrence Batley Centre has purchased a CD-Writer with the intention of creating and selling CD-ROMs as a means of generating income. The Magee Photographic Collection is making images available free of charge to researchers, but has been considering how it might charge corporate users. In contrast the BGS has developed an e-commerce site with *Compaq* as a pilot project for underlying the development of its own 'Digital Library'.<sup>44</sup> The Digital Library site is to provide educational access and generate income.

The Design Council Archive and the African & Asian Visual Artists Archive, as with many of the other smaller JIDI programme participants, are relying on CD-Rs as an archival medium, yet few of the participating sites acknowledge the risks associated with using CD-Rs. The projects complain about the time it takes to write CD-Rs, the limited capacity of the medium, and the high number of errors that inevitably occur while writing them, but they continue to use them. Of the other projects

<sup>44</sup> <http://www.bgs.ac.uk/i-shop/brochure.htm>



described here, the BGS appears to have a good data archiving/preservation strategy in place. Images are stored on an archival server and regular tape backups are made. Tapes are stored in more than one location.

All the projects that have placed material with VADS expect that this service will keep their assets safe and accessible for the longer term, but we remain concerned that, from our interviews, none of these projects appears to have had any in-depth discussions with VADS. The projects are placing their trust in VADS for delivery, archiving, and long-term access. VADS itself depends on less than secure long-term funding.

#### Recommendations:

- Digital imaging projects should have business plans that ensure that the deliverables are economically sustainable.
- Digital imaging projects should have preservation plans to ensure the long-term viability of the digital images themselves.

#### 4.15 Evaluation

With one exception, participating sites did not report that they planned to evaluate the success of their digital imaging programme or the uses to which potential users put the images. The Gertrude Bell Archive has a post-graduate library science student from the University of Northumbria doing an informal evaluation of the project as part of a dissertation. The archive has allowed her to attach a questionnaire as a web form to the archive's website. In addition the archive is hoping to conduct a formal review and evaluation of its digital resources as it develops plans for future digital imaging work.

The Magee Photographic Collection has not conducted a formal evaluation of how the digital resources meet the user's expectations. However there has been a surprisingly large interest in the collection since the project's end and this has included a dramatic increase in the number of photographic donations to the collection. The Derby Earth Sciences 3D Image Collection will conduct an evaluation through TRIADS programme in which it was a participant.<sup>45</sup>

Other projects reported that they were not going to carry out evaluation work, as this was not funded as part of the JIDI programme; for example,

- ◆ The African & Asian Visual Artists Archive has not attempted to determine if the created digital resources meet the needs of its users.

<sup>45</sup> <http://www.derby.ac.uk/assess/newdemo/mainmenu.html>

- ◆ The Lawrence Batley Centre did not undertake any formal evaluation of potential audiences or their desire for particular digital resources.
- ◆ The Spellman Collection of Victorian Music Covers has not assessed the audience for the digital resource or studied how these resources would be utilised.

In the future digital imaging projects should consider conducting front-end, formative, and summative evaluations of user needs, by using focus groups, interviewing collection users, and interviewing non-users of the collection.

**Recommendation:**

- Digital imaging projects should ensure that they have an adequate evaluation strategy in place from project inception stage.

#### **4.16 Conclusions and Recommendations from Review of the JIDI Projects**

The participating sites all benefited from the project. Some found that they under-estimated the resources that they needed to commit to the project while others were able to complete their agreed work programme within budget. A number of participating sites felt that they needed to take stock of their digital imaging needs before beginning any new projects. They felt, however, that the opportunities to contribute to the programme had made it possible for them to undertake work and develop skills that they could not have pursued without the JIDI experience.

The records management processes of the JIDI project did not extend from the centre to the participating sites. For instance, the John Johnson Collection of Printed Ephemera informed us that the camera operator had developed imaging guidelines, but when we asked for a copy as part of our data collection exercise they could not be found<sup>46</sup>. Project records management guidelines would establish which documents are to be retained and for how long, which are to be destroyed and at what stage, as well as the lines of responsibility for records management.

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<sup>46</sup> This should not be interpreted as laying criticism at the door of this project, but merely provides an illustration of the key need to establish records management strategies before embarking on any Project of this kind.

### Additional Recommendations:

A number of recommendations were made in this chapter. In addition to these our review leads us to recommend that:

- Filenaming conventions need to be established at the outset of projects. They require substantially more planning than many projects give to them.
- While TIFF files should continue to be the primary file for HE/FE, the benefits of emerging formats should be considered (including PNG).
- More reflection on the different kinds of digital images that are needed in the FE/HE community should be carried out.
- JIDI's emphasis on one-time digital imaging should be encouraged in all future projects.
- More consideration needs to be given to the issue of sustainability.
- Projects need to focus on archiving and longevity of digital images.
- Monies from JISC need to be seen in the context of kick-starting larger proposals rather than funding discrete initiatives.
- Contract complexity needs to be drastically reduced.
- The suitability of the institutional technical infrastructure needs to be considered when establishing projects.
- More focus needs to be put on the long-term uses of images and especially CBIR. (However, CBIR is not going to be a substitute for good metadata (see Section 5 below)).
- There is a need for more co-ordination between the various groups funding digital imaging activities.
- A strategic overview of (a) the needs for digital imaging in HE and FE should be undertaken, (b) the collections in HEIs and FEIs that might be tapped to meet these needs should be identified, and (c) the current activity of institutions in the areas of digital imaging noted.
- Monitoring processes need to be formalised and should include both structured reports from the participating sites and quarterly site visits.
- Digital imaging initiatives need to focus on the use of materials in teaching and learning. For instance, all projects should have an education strategy.
- Evaluation of user needs and expectations from digital images needs to be conducted.
- The HE and FE community should use the auspices of the DNER to establish an image delivery service. This need not be a single site, but

might be a multi-site service built from existing (e.g. VADS) and new services.

## 5 Resource Creation & Delivery Issues

### 5.1 Introduction and the Role of the Visual Arts Data Service (VADS)

As we noted earlier, JIDI originally intended to deliver its images through the Knowledge Gallery, but when this project did not take off, JIDI had to seek an alternative delivery mechanism. The Visual Arts Data Service (VADS) was called in at a late stage to manage the mounting for access of the outputs of several of the participating sites. A small amount of extra funding was made available for this purpose, as a one-off payment. This support will meet many, although probably not all of the costs associated with this work. Systems Simulation, a third party developer, was engaged by VADS to create a suitable database. VADS will be mounting the images in three resolutions: thumbnail, quarter size, full size.

VADS is evaluating the metadata and images, linking them together, and ensuring that the output of each participating site is coherent, consistent, and usable. The area of greatest concern has turned out to be the metadata produced by the participating sites.

### 5.2 VADS Assessment of the Materials

#### 5.2.1 Assessment Background

When confronted with the material at least one member of the VADS team felt 'that from the quality evident in some of the metadata, the availability of expertise and advice from the JIDI steering committee members could have been more fully exploited'. For instance, the AAVAA participating site only realised towards the end of 1999 that because it had created its metadata within a table in *Word* rather than in a database package, it could not be used in any search-driven environment. The issue was addressed, but rectifying the mistake was time-consuming and could easily have been avoided had the training been comprehensive and the tools for metadata creation available to the project earlier.

With the benefit of hindsight the VADS team questioned JIDI's decision to concentrate on image capture at the expense of metadata compilation. Since image digitisation is something that can be, and in many cases was, outsourced, a greater focus on the metadata would have been more prudent, as those who work with the collections are the only people who can complete this stage of the project. The AAVAA project found it necessary to return to the original artists to help establish metadata; had they not participated in the project they might not have noticed the gaps in their documentation. If the existence of many incomplete metadata are

not discovered until collections have already exhausted the time and budget for the project, they are unlikely to be able to go back and tidy up to the desirable standard without incurring the expense locally.

The VADS team noted that many of the participating sites will have used JIDI as a blue-print for further digitisation within their institutions, and the practices (both good and bad) that they introduced in creating JIDI metadata are likely to be replicated in future metadata created by new digital imaging initiatives within their institutions.

From a delivery point of view, VADS found that rigorous controls over the way material was submitted and the quality of information were crucial. The data submitted on disk to VADS have been problematic in a number of ways. For instance,

- ◆ there was no clear inventory or report explaining what was being submitted;
- ◆ there were multiple copies of various data with little indication of which were the most up to date and which superseded.

VADS reached the conclusion that planning for, and incorporation of, delivery requirements should be a significant element from the outset of a digitisation project.

### **5.2.2 General Conclusions Drawn From Assessment**

A review of the datasets provided to VADS has led us to make several observations. Several of these relate to metadata, although metadata is covered in more detail below (Difficulties Encountered with Metadata, Section 5.3).

- ◆ VADS has found that assessing each set of digital images when it comes in from the participating sites requires a substantial investment of effort as it involves viewing thousands of large file-sized images held on a multitude of disks; VADS is solving this through JPEG generation software to make the image-data volumes more manageable as well as deliverable. With hindsight, stipulating that delivery-sized images be created at source would have obviated this step. This suggestion is validated by the reports from a few participating sites which took this initiative.
- ◆ The diversity of software packages used to store the metadata posed difficulties.
- ◆ VADS encountered difficulties in identifying the links between tables within databases, and between databases and images — a problem exacerbated by a lack of documentation.
- ◆ Participating sites interpreted the metadata guidelines in different ways.

- ◆ There is a lack of consistency in the terminology used in descriptions. The project could have benefited from more terminological control, although it is important to recognise that this could prove difficult for multi-foci projects similar to JIDI; but at the very least, syntax controls can be observed across multi-foci projects.
- ◆ While metadata must meet local needs, cataloguing for identified users at the expense of potential users will have implications for usability and thus interoperability with other electronic resources. This is a general problem that will impact on the future of interoperability between projects. Any funding models must attempt to achieve consistency through use of funding level control, co-ordinated project management control, or managed best practice.
- ◆ VADS has concluded that communication between the participants in the project could have been improved and this would have brought benefits to the process of metadata creation and enhanced the material submitted to VADS for delivery.
- ◆ VADS has found that conceptual keywords are missing from the metadata associated with most images. It is widely agreed that hierarchical keywords are necessary to at least three levels if effective tools are to be put in place for finding images. Had the participating sites used keywording and subject indexing (e.g. LCC or AAT), it would have been feasible to develop a robust browse structure. VADS would have to undertake a cataloguing project to edit each of the delivered collections individually to achieve any kind of browsing structure.
- ◆ A review of the images and metadata suggests that the training of staff at the participating sites was of variable quality.
- ◆ The fact that the digital images are no more expensive to create than the actual metadata needs to be more widely recognised. The VADS team emphasised the importance of investing in local resources for metadata creation, since this is one part of the digitisation cycle that cannot be outsourced, and requires specialist subject and collection knowledge (e.g. AAVAA created metadata elements by directly interviewing artists about their work).
- ◆ VADS found the JIDI project more of an umbrella project rather than the multi-site and multi-foci project that it has been described as by others. A particular strength in their view lies in the fact that it brought participants together that otherwise would not have worked together and as a result the participants could cross-fertilise each other's initiatives.

- ◆ VADS agrees that there is a need for regular and formal monitoring visits to digital imaging projects. This could be combined with on-site spot quality assurance examination of metadata and images.
- ◆ Varying delivery issues indicate that in some cases there was a difference between the objectives of the participating sites and those of the JIDI project as a whole.
- ◆ Preservation of the digital data requires further development. VADS will be employing central data warehousing facilities that the AHDS is intending to develop.<sup>47</sup> Until a data warehouse is available the CDs will be stored at the participating site and VADS.<sup>48</sup>
- ◆ The VADS team concluded that the participating sites would have benefited from more frequent get-togethers and more days of training;
- ◆ Insufficient documentation was submitted in the first stage to link filenames and numbers one to the other, the CDs holding the images submitted to VADS for mounting contained redundant files, files had different types of filenames, and some CDs were mis-packaged with different labels on the outer packing case from the labels on the inner CD.
- ◆ In some cases when CDs were replicated they have not been given different names (e.g. 10 becoming 10a or 10b) to indicate that they went through different incarnations, and as a result the developmental chain is not clear. Guidelines need to be established covering the documentation of digital images on portable media. Clear guidelines are needed about the process of replication and production of CDs.
- ◆ Had VADS (or any delivery service) been given copies of the metadata and digital images earlier in the project lifecycle they might have been able to identify problems at a stage when they could be addressed without creating new work for the participating sites. Learning and responding to lessons early in the project lifecycle is a key to ensuring the success of initiatives of this kind.

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<sup>47</sup> The current Arts and Humanities Data Service (AHDS) Strategic Plan emphasises the need to develop preservation infrastructure.

<sup>48</sup> Although my visit to VADS would suggest that the storage conditions really are not appropriate, the Service is really doing all it can within its limited budget and space constraints.



### 5.3 Difficulties Encountered with Metadata

VADS is reviewing the metadata accompanying the collections, which were submitted to it for mounting on the Internet. As of October 2000 they had a chance to review the metadata from four collections:

- ◆ The Art and Design Archive and The Teaching Examples Collection Central St Martins College of Art and Design;
- ◆ Design Council Archive, The Design History Research Centre Faculty of Arts & Architecture, University of Brighton;
- ◆ The Lawrence Batley Centre for the National Arts Education Archive (Trust) Bretton Hall, Lawrence Batley Centre;
- ◆ Suffrage Banners Collection, Fawcett Library, London Guildhall University.

In each instance VADS has produced a brief report and passed a series of questions back to the participating sites that originated the metadata. In general these indicate a number of shortcomings.

- ◆ Some projects defined their own database or spreadsheet for representing and storing the metadata they created, but in some cases they did not create a structure that mapped in sufficient detail with the metadata guidelines established by JIDI (e.g. Central St Martins College).
- ◆ Frequently 'mandatory' JIDI fields had not been adopted by participating sites at all, or were adopted but were not consistently or regularly populated with data.
- ◆ Elements such as spelling, punctuation, and capitalisation were not addressed consistently by all the participating sites.
- ◆ Elements such as spelling, capitalisation, and punctuation were not consistent throughout the metadata provided from each participating site.
- ◆ Frequently inconsistent terminology was used. At the simplest level this problem could be seen in the diversity of ways a single project might indicate that no date was known for the object. The options adopted by projects include 'no date', 'n.d.', 'N.D.', or they just left the field blank.
- ◆ Inconsistency across fields was also observed. Within a given data set descriptive words (keywords) could be found within the subject, description, or even material field. While this would not affect resource discovery (because free text searches will be implemented), the inconsistencies will be evident to the user when the record is displayed.

- ◆ Technical, collection, and organisation metadata were not always given the same importance as object metadata, and were therefore not incorporated into the overall metadata submission.
- ◆ Detailed documentation, giving an inventory of the images and detailing which were rendered obsolete by subsequent re-scanning, was absent.

This checking of the metadata and the images by VADS before delivery has proved time consuming. This could have been reduced if more attention had been paid to quality assuring the metadata by participating sites and JIDI. Whether other JIDI collections will prove less time consuming for VADS to handle remains to be seen.

#### 5.4 Conclusions and Recommendations

As much of the detailed material we have presented from VADS is critical, it should be balanced with some positive reassurance of the success of JIDI. Polly Christie in an e-mail of 8 August 2000 summed up the achievements of the project:

The lessons learnt have been hard, and sometimes, I dare say, painful for those concerned. However, now that VADS are beginning to see some of JIDI's collections on-line, we can see the achievements of JIDI and that it has been worth all the sweat!! ... As a learning experience I think JIDI was highly successful.

It is evident that VADS is performing a key role in ensuring that the Art-based digital collections created by the JIDI project are made accessible to acceptable standards. VADS is also interested in how this material will be used in learning and teaching and is investigating this issue. The Pictiva Project<sup>49</sup> will encourage teaching uptake of the material and VADS will try to generate interest in this way. It hopes to use focus groups to examine issues related to the use of the collections, ease of use, and ways of use.

After preparing four collections for web delivery, VADS' work draws our attention to nine key lessons:

- ◆ the metadata must be subjected to quality assurance procedures of similar rigour to that used in checking the images;
- ◆ more attention needs to be paid by those creating metadata to its consistency and encoding;
- ◆ more training in metadata creation would have brought benefits in terms of consistency of encoding and representation;

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<sup>49</sup> <http://vads.ahds.ac.uk/learning/pictiva/>

- ◆ the checking of the metadata for delivery should not be done at the very end of the project, but should be an ongoing process during the life of the project;
- ◆ costs of delivering the images, including pre-mounting checks of the metadata and the images, need to be included in the cost planning for projects;
- ◆ the use of conceptual and hierarchical keywords is essential;
- ◆ user needs surveys and evaluation (e.g. front-end and formative) would have assisted in the definition of a stronger product;
- ◆ the delivery service should be involved in digital imaging projects throughout their lifecycle and they should make an early review of the outputs from the project to ensure that materials are of a standard that can be easily mounted and distributed;
- ◆ VADS suggests that attention needs to be given to the selection of material for inclusion in image digitisation projects and argues that a model for content selection is needed based on broad DNER / funder requirements.

The experience it has had of re-deploying third party image resources and in particular mapping to standards to create a union catalogue and cement interoperability is valuable for the DNER as a whole. It highlights the complexities of integrating a diverse range of third party resources into interoperable cross-searchable databases.

**Recommendations:**

The experiences of VADS clearly lead us to recommend:

- that the intended delivery service be involved from project inception to ensure that plans for imaging, metadata, costing, and interface design take into account issues associated with the delivery environment and the needs of the user audience;
- that user needs surveys should be a central element of the design of any digital imaging programme;
- that the quality assurance of metadata be conducted independently, rigorously, and throughout the digital imaging project;
- that projects adopt conceptual and hierarchical keywording;
- that projects focus more attention on the terminological and syntactical consistency of the metadata they are creating and the ways in which it is encoded;
- that projects put emphasis on all aspects of staff training in digital imaging activities.

## 6 Views of Other Funders & Policies Sources

### 6.1 Introduction

In an attempt to understand the experiences of other funding bodies in the area of digitisation the project team contacted funding agencies both in the UK and abroad. The results show:

- ◆ a lack of consistency in practices;
- ◆ divergence of objectives;
- ◆ a need for more co-ordinated thinking on both national and international levels.

### 6.2 The Funding Agencies

JISC is one of many groups that are supporting digital imaging. In an effort to determine whether or not funders used digital imaging models in deciding which projects to support and how these projects were then monitored, we sought information about practices from a small number of other institutions that were supporting digitisation work. To carry out this work we developed a data collection instrument (see Section 15) and used this to manage how we collected information from these funding agencies. The funding institutions that contributed to this report were:

- ◆ Economic and Social Research Council (ESRC)
- ◆ Arts & Humanities Research Board (AHRB)
- ◆ Scottish Cultural Resource Access Network (SCRAN)
- ◆ New Opportunities Fund (NOF)
- ◆ Heritage Lottery Fund (HLF)
- ◆ Research Support Libraries Programme (RSLP)
- ◆ Ameritech American Memory Project, Library of Congress, USA.
- ◆ The National Endowment for the Humanities (NEH)
- ◆ National Science Foundation (NSF)
- ◆ Digital Library Federation (DLF)

#### 6.2.1 Economic and Social Research Council <sup>50</sup>

The ESRC<sup>51</sup> supports a number of activities connected with digital imaging, at its data centres (e.g. Data Archive<sup>52</sup>, IBSS On-line<sup>53</sup>, CRER

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<sup>50</sup> Key staff were on holiday and this interview was conducted by email.

Online<sup>54</sup>, Qualidata<sup>55</sup>) and related information gateways (SOSIG<sup>56</sup>), some of which are co-funded by the JISC. The annual investment in these data services is roughly £1.2m per annum. They also fund one-off projects, some of which are concerned with the visualisation of geographical data.

In terms of purpose, the main aim is to provide a supporting infrastructure for research and research related activities within the social sciences across the HEI sector. The key materials involved are grey literature, journal abstracts, typescript documents, 'datasets' (broadly defined), and metadata.

Each data service carries out periodic reviews of its holdings to establish which might be prioritised for digital imaging, and also runs user focus groups to establish its strategy in this area. Advisory bodies with experts drawn from across the social sciences also assist in this process.

In terms of broad strategy, the ESRC data sets policy delineates the need to preserve key holdings selectively within the social sciences through digital imaging. However, the detailed implementation of this commitment rests with the individual data services.

Monitoring and evaluation of digitally imaged materials is bound up with the annual reporting process, and periodic reviews of data services.

### 6.2.2 Arts & Humanities Research Board

The Arts and Humanities Research Board<sup>57</sup> started funding digital imaging projects in 1998. It funds only projects where digitisation is needed to conduct research or to enable it to take place (e.g. Research Enhancement Programme). It does not fund projects that have as their sole aim the creation of a suite of digital images. It has funded around twelve projects. During 2000-1 there was an increase in the number of applications, twenty percent of which were successful – this tallies with the average for all other types of application. The quality of the applications compared favourably with those received from other activities.

The AHRB supports the imaging of all the material listed in the questionnaire (see Section 15, Q22). In addition it provides funding to support imaging of archaeological sites. It primarily aids projects in order to support research, but it also wants the products to be available

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<sup>51</sup> <http://www.esrc.ac.uk/>

<sup>52</sup> <http://www.data-archive.ac.uk/>

<sup>53</sup> <http://www.lse.ac.uk/IBSS/> International Bibliography of the Social Sciences

<sup>54</sup> [http://warwick.ac.uk/fac/soc/CRER\\_RC/](http://warwick.ac.uk/fac/soc/CRER_RC/)

<sup>55</sup> <http://www.essex.ac.uk/qualidata/>

<sup>56</sup> Social Science Information Gateway, <http://www.sosig.ac.uk/>

<sup>57</sup> <http://www.ahrb.ac.uk/>

to the public. Higher education institutions form the primary audience for AHRB research support and the main community likely to benefit. The use of digitisation to preserve the analogue assets is not a priority for the AHRB, although it does recognise that digitisation may bring preservation benefits.

While management of collections at institutional level might produce surveys of holdings that link institutional research objectives to collection development, including digitisation, the AHRB does not require that applications for funding be supported by collection surveys. Applicants are directed to the AHDS (Arts and Humanities Data Service) for advice on standards. The AHRB has an ICT policy<sup>58</sup> was jointly prepared with the AHDS – where applicants are encouraged to deposit the materials at completion. The C&IT policy also suggests management approaches, including PRINCE2. However, the AHRB is very much aware that the degree of formalisation of management standards for a particular project is one of many factors that influence the quality of the final output. To this end it states that there is ‘a strong case for carefully planning, organising and monitoring the process of creating a digital resource’; this includes technical evaluations carried out by the AHDS

Metadata, image digitisation, and quality assurance approaches all need to be described by the applicant.<sup>59</sup> Neither conservation nor risk assessments are required of the applicant. The AHRB application form has a detailed section on the projected cost, by year, of the research, including salaries for staff and research students, consumables, and special costs.

Applicants must demonstrate that the products are sustainable. The preferred route to attain this is through depositing the materials with the AHDS; however, applicants can provide this through their own institution without penalising their application. A delivery system must be defined if the project is to receive support, and since the materials are usually deposited with the AHDS, it is a public sector delivery service. It is therefore appropriate that the AHDS is involved in the planning of the project. According to the AHRB, the long-term preservation strategy of the AHDS depends on migration, which is ‘particularly suited to preserving the intellectual content for future access and re-use of data resources’.

All applications are peer-reviewed and if an application should fail the AHRB provides applicants with a detailed report. Interim and summative project reports from funded projects are subjected to peer review. These are all peer-reviewed. It is the quality of the research that is assessed by the reviewers. Since the AHRB funds projects to support

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<sup>58</sup> [http://www.ahrb.ac.uk/strategy/c\\_it\\_policy.htm](http://www.ahrb.ac.uk/strategy/c_it_policy.htm)

<sup>59</sup> [www.ahds.ac.uk/ahrb.html](http://www.ahds.ac.uk/ahrb.html)



both research and the dissemination of research, it assesses the effectiveness of this dissemination. The evaluation strategies for all the schemes supported by AHRB cover the service as a whole, rather than individual projects.

### 6.2.3 Scottish Cultural Resource Access Network

SCRAN<sup>60</sup> started funding digital imaging projects in 1996 and has supported more than 300 projects. SCRAN, which is registered as a charitable company, holds all the resources produced by projects it has funded. Funds for projects are allocated in two ways; monies granted as direct aid in support of a project and those resources committed centrally to support the 'in-house finishing' of a project. The 'grant aid' figure, is the represents the support given to the successful applicant. This figure is match by contributions from the applicant to the costs. SCRAN's own in-house 'finishing' of the completed projects involves a standardisation procedure, including editing and colour balancing. Around two-thirds of all money offered by SCRAN has been spent on digital imaging projects.

In 2000 there was an increase in the number of applications. The success rate remained comparatively high at sixty percent. In terms of other types of application received, the quality of digital imaging bids seems higher. The possible reasons for this revolve around the nature of the other applications rather than reflecting a difference in the quality of the actual applicants themselves. Primarily, the other main application type consists of bids for multimedia essays that will be delivered either on CD-ROM or the web. SCRAN has found the applications for funds to create multimedia essay are usually at an early stage of development when they are submitted. Where a concept shows promise SCRAN will assist the applicant to develop the proposal into a fundable project. The ill-formed nature of some of the multimedia applications reflects several factors: multimedia essays depend upon a range of technologies, the effective integration of diverse kinds of information is difficult, and there are still too few professionals with the ability to build multiple paths through information.

The primary objective for supporting these projects is 'educational access'. Where educational possibilities can be shown SCRAN will support the digitisation of any of the materials listed in Q22 in Section 15. However, an emphasis is placed upon artefacts, photographs, and works of art. To date these three areas are the least well represented in the applications and therefore the products. SCRAN supports representations of 3-Dimensional objects and environments (landscapes, buildings).

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<sup>60</sup> <http://www.scran.ac.uk/homepage/>



The main concern for funding digital imaging projects is to create a resource for teaching and learning. Lifelong learning and public access are accorded high priority. This follows naturally from the desire to support content development by educational institutions. Projects that benefit primary and secondary schools, further education institutions, museum users, lifelong learners, and public library users all share the top priority for funding.

Applicants are not required to conduct a collection survey before identifying materials for imaging. Within the application form, however, they are required to offer a small narrative which describes the collection and why this particular material was highlighted for digitisation. Conservation assessments items prioritised for digitisation are not required either. SCRAN has created a 'lightweight' version of PRINCE2 for use on SCRAN projects.

Applicants are required to produce a risk assessment for their project. Projects must implement digitisation guidelines that have been created by SCRAN. The metadata guidelines that SCRAN expects projects to employ were created in-house with reference to others that were available at the time of production. They were drafted almost at the same time as Dublin Core and Spectrum, but were not created from these standards. SCRAN controls the format of the metadata. The projects input these data into a database provided by SCRAN. Thus SCRAN ensures standardisation; Dublin Core is the standard recommended for describing digital imaging content.

There are no requirements for projects to establish formal quality assurance procedures; SCRAN handles quality assurance itself. Similarly, projects need not produce costed models as SCRAN has pre-defined costing structures against which funding is pegged. These costing models are kept under review and revised as technology and processes change. SCRAN only funds digital imaging and metadata creation it does not fund delivery mechanisms as SCRAN manages this process itself. Currently SCRAN is developing a digital preservation strategy.

An editorial committee evaluates all applications. They are judged in relation to SCRAN's resource base: the primary aim of current funding is to fill gaps in the resource. The editorial committee is separate from the educational committee. Despite SCRAN's objective of creating an educational resource, the education committee does not play a large part in the selection of projects. It assesses what resources institutions are using and how they are used; for example, schools have very different aims and methods of use than a higher education institution.

Project evaluation covers metadata, image quality, and selection and how the end product fits into the resource-base SCRAN is building. It

commissions reviews from experts within a relevant field. The projects themselves have to undertake an evaluation of how they are meeting the needs of users at the front-end and during the project (for example, formative evaluation). An application that displays it has an expert consultant on board, is looked upon favourably.

SCRAN has implemented a rigorous policy on monitoring projects. The guidelines fit closely with the adapted PRINCE2 management policy. The projects have to submit a report each month that highlights activities, targets, and problems. SCRAN uses a system that automatically triggers letters to the projects reminding them that a report or deadline is due shortly. This enables them to be proactive in their monitoring, rather than letting a situation develop where projects fall behind through lack of communication.

SCRAN, as the provider of the end product, undertakes all monitoring of the impact of the resource. For example, a recent review interviewed both users and non-users of the SCRAN resource, asking why they used it – or did not, as the case may be – and what they found good about it.

#### **6.2.4 New Opportunities Fund**

The New Opportunities Fund (NOF)<sup>61</sup> is funding roughly £50 million worth of the digitisation of learning materials across a large range of subjects to support lifelong learning. The call for proposals was issued in August 1999, and awards will be finalised in the spring of 2001. There were initially 343 applicants, and this has been pared down to 233, with just over 150 funded. The NOF only funds digitisation projects under this initiative, as part of a wider initiative for developing ICT resources for libraries and schools. It is supporting content creation and learning, rather than preservation of materials.

In funding content creation for learning and education, NOF is looking beyond formal education. The only material it will not support is the digitisation of core curriculum materials for schools, but it will support the digitisation of resources ancillary to this. The source materials to be digitised will depend on the project, but it plans to support all the media types mentioned in the questionnaire (see Section 15, Q22), plus the digitisation of video, film, and sound. There will be some requirement for partnership funding; the projects are likely to be required to find a percentage of the funding through partnership with other institutions. NOF encouraged some of the projects that applied in similar areas to work together. While there were benefits to come from cutting costs (especially in the areas of project management and infrastructure), the collaborative environment will bring other benefits.

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<sup>61</sup> <http://www.nof.org.uk/>

The primary reason for funding the digital imaging projects is to increase public access, but also to encourage lifelong learning and create a teaching and learning resource. Although it is not a focus of the funding, some element of preservation may be involved as a by-product in the creation of these resources. It is hoped that the projects will reach as wide an audience as possible, including primary, secondary, further and higher education, and the community at large. Indeed, all areas referred to in question 24 (see Section 15) are supported.

The guidelines for the projects to follow were drawn up by UKOLN (see 6.3.1), which has had experience with digital material. While NOF is aware of the importance of good practice, it recognises that it would be counterproductive and excessively bureaucratic to specify absolute guidelines for every area that the projects cover. Instead they have chosen much more of a middle path where it is suggested that some things must be done, some things could be done, and some things should be done. Projects are encouraged to adopt the project management strategies used by Re:source<sup>62</sup>. NOF is currently preparing one-day workshops for the funded projects, covering a range of issues from digitisation to metadata, to project management.

Many of the issues are currently being resolved regarding the structure of projects and how they will be monitored, or evaluated. Even though UKOLN has prepared some guidelines for the projects, these are still subject to review (see below). Issues regarding metadata and quality assurance have still to be adequately addressed. Projects must demonstrate that their institutions can sustain the digital resources for at least three years after the grant-aid ends.

In the first round, the applications are assessed for their suitability via an internal desk based assessment. Expert advice is then sought regarding the technical requirements of a project and their cost. The ability of the organisation to cope with the management of the grant is also assessed. An expert panel will be put in place to make reviews and recommendations, and the projects will be subject to a technical and financial overview.

At the time of the interview on which this report is based NOF was just in the process of developing its monitoring procedures. It is expected that NOF will contract experts to conduct the technical monitoring to maintain the quality of the projects. In the process of developing its monitoring mechanisms NOF has been examining how other organisations have handled the monitoring processes. The monitoring procedures are built into the terms and conditions of any grant.

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<sup>62</sup> <http://www.resource.gov.uk/>

### 6.2.5 Research Support Libraries Programme<sup>63</sup>

The Research Support Libraries Programme started funding work in digital imaging in 1999, after protracted discussions as to the usefulness and relevance of such funding. Eventually it was agreed that digital imaging brought benefits. It was agreed not to fund any entirely digital imaging projects: the funded projects are rich and cover all aspects of libraries, so the digital imaging that it does fund is, to date, only an element of larger projects. Consequently at August 2000 it was difficult to specify how much money has been granted towards digital imaging, but by September 2000 at least eight out of the sixty projects were involved in some digital imaging. These projects together form an expenditure of £1.7 million.

The RSLP will fund digital imaging, metadata creation, the development of digital imaging infrastructure (although this is taken to be part of the proposal), the training of project staff, and the development of delivery infrastructure. The RSLP will fund all set-up costs of a project, but post-programme the maintenance of such facilities must come from the institutions own budget. The funding of training for users is not considered an eligible cost.

Since the RSLP had, at the time of the interview, only been funding projects for two years it is difficult to say whether the numbers of applicants for the funding of digital imaging projects has increased, or whether the present number can be taken to be a proportionate representation of the number of projects they can expect to incorporate digital imaging in the future. It is expected that applications for projects with a digital imaging element will increase in the future. However, the standard of applications at the time of this interview had been disappointing and this was especially true of those involving digital imaging.

RSLP supports digital imaging initiatives, although access and conservation are the main justifications for funding. While the digital imaging of printed books or serials is not generally supported, there is support for digitisation of manuscripts, including handwritten scripts, typescript documents, and unbound printed documents, and in some cases photographs. Textiles and works of art are excluded. Initiatives that will aid research have priority. If any other benefits come out of the digital image initiatives, such as creating a teaching and learning resource, these would be considered a bonus. The higher education community is the main audience for RSLP initiatives.

While no formal collection survey is required, there is an expectation that applicants will know their collection. This knowledge (or lack thereof) has been obvious in the applications reviewed to date, especially as

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<sup>63</sup> <http://www.rslp.ac.uk/>

applicants build their case for why one part of a collection should merit digitisation rather than another. RSLP guidelines on proposal preparation encourage applicants to build a detailed case and as part of the assessment procedures this case is reviewed. RSLP does not provide guidelines produced for this, but there are guidelines for proposals and if applicants follow these, the need to provide justification for digitisation should become apparent. Reviewing the quality of such materials is part of the assessment procedures. These reviews involved consultation exercises and an assessment panel. No conservation assessment of the material to be digitised is required.

Projects are encouraged to adopt a rigorous project management strategy and proposals should demonstrate extensive competence in this area in the first instance. RSLP steers projects clear of Prince and recommends its own management methods; training in which is outsourced to the Office of Public Management.

Applicants are expected to demonstrate that they have considered the risks their project is likely to encounter but need not prepare a formal risk assessment. RSLP encourages projects to follow the image guidelines emerging from E-lib (v2), the AHDS and HEDS. For Archival purposes it encourages the use of EAD, for printed material MARC, and for online resources Dublin Core.

The RSLP does not have its own image digitisation guidelines, but formally refers projects to the E-lib standard guidelines (version 2), and the guidelines produced by the AHDS and HEDS. Projects are expected to follow the EAD metadata guidelines, and any project not seen to have been applying standards would not get funding in the first place. For archival purposes it encourages the use of EAD; for printable material, MARC; and if for online access, Dublin Core. Projects should follow E-lib quality assurance standards or create their own auditable quality control and assurance guidelines.

Applicants submit costed models are part of the proposal application, and guidelines describing these are issued as part of the application pack.

RSLP has addressed the sustainability issue by requiring institutions to sign up at the highest level (such as the Chancellor of a University). This senior level commitment combined with an exit strategy should ensure the long-term viability of the project deliverables.

Projects must define their own delivery plan. Acceptable options include project-specific systems, commercial services, or a public sector delivery service. Delivery plans must be outlined in the proposal. Projects are also encouraged to develop their own digital preservation strategies.

All applications, including those involving digital imaging, are assessed in the same way. An assessment panel reviews outline applications.

Projects that show potential are invited to submit a full proposal which is subsequently evaluated by four independent assessors and an assessment panel of twelve individuals. The evaluation process may take two or three months. This might result in a grant subject to special conditions. There are no special digital imaging assessors, but in some cases technical consultation is undertaken, and advice is taken from organisations such as AHDS and from other individuals within higher education.

Proposals are subjected to comprehensive evaluation. RSLP uses restricted monitoring procedures. It requires an annual report, including financial statement, from each project. It reserves the right to seek supplementary reports and conduct site visits. A final project report at the end of the period of funding is included in the closedown procedures. The projects must set up a management group, composed of, mainly, academics who are likely to represent the potential user community. RSLP intends to put in place a mechanism to measure the impact of its support, including image digitisation projects, when more projects reach the end of their period of funding.

#### **6.2.6 The National Endowment for the Humanities<sup>64</sup>**

The National Endowment for the Humanities (NEH) funds a range of initiatives and here we concentrate only on its Research Programs. An early project with a digital imaging component funded through this programme is the Lincoln Legal Papers Project<sup>65</sup> (Illinois Historic Preservation Agency<sup>66</sup>), which began in 1995. Only the editorial aspect of the project was actually funded, but as it progressed digital imaging became a more significant part of its activities. Since then a number of projects that contain an element of digital imaging have been granted funding. The research programme initiative does not support applications solely for digital imaging. Like the AHRB, the Research Programs primarily fund research, which may involve some digitisation. In terms of monetary value, these projects have been awarded by 2000 around \$1 million of \$20 million awarded under the programme, but it should be borne in mind that the amount given to actual image production is a fraction of this figure.

While during 2000 the number applications including digital imaging have increased, the number remained relatively small. These projects have a comparatively high success rate. Fifty percent of these applications have attracted support from the NEH. This compares to the average of around twenty to twenty-five percent for projects that do not

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<sup>64</sup> <http://www.neh.gov/index.html>

<sup>65</sup> <http://www.papersofabrahamlincoln.org/>

<sup>66</sup> <http://www.state.il.us/hpa/>



have a digital imaging component. There was no real explanation for this; the quality was 'at least as good as other types', but probably no better. Initially it was thought that perhaps projects that included digital imaging appeared to be more cutting-edge and to be pushing out the boundaries of research. An examination of these projects showed that the digitisation element made them look more comprehensive (see examples below) and robust. The applicants are not exploring or exploiting the technologies for the sake of it, but using them to enhance the 'traditional' research or editing they are carrying out.

During the interview two projects were described as exemplars of the genre: the Piers Plowman and Arthurian Illuminated Manuscripts project. Arthurian Manuscripts were digitised as part of a project seeking to explain the role pictorial representations played in the interpretation of the text they accompanied.<sup>67</sup> Here new technologies were being used to enable researchers to ask new questions. In the case of Piers Plowman at UVA researchers used digital images to improve the editing process itself. 'Editors of electronic texts, unlike earlier editors of printed editions, need not suppress or conceal editorial disagreement nor impose spurious notions of authority.'<sup>68</sup> Both projects used digital imaging to aid and illuminate editorial decisions and enhance the research. NEH aims to enhance research in the humanities, but it also anticipates that the projects it funds will have a wider on education and public access.

NEH does not press applicants to adopt particular standards. During the application process the onus is firmly on the applicants to ensure that all imaging processes, including the standards they are using (such as metadata, imaging guidelines, and delivery), are fully described and justified. Since the applications it receives are from many different fields, and since technologies change so rapidly, it would be restrictive to constrain an applicants choice of standards and technologies. Experts assess the technical aspects of proposals during the peer review process.

Applicants need to explain how the research will be disseminated, but as the funding is intended for research there is no emphasis on delivering or sustaining the images themselves. The usual form of dissemination is either CD-ROM or the web. Monitoring is carried out during the project by peer review. When evaluating projects, both specialist and general groups take a number of projects and assess which are the best before reporting back to the NEH. In assessing the impact of the projects it funds, the NEH collects reviews and other statements about the finished work.

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<sup>67</sup> <http://vrcoll.fa.pitt.edu/STONES-WWW/MASHHomepage/lancelot-project.html>

<sup>68</sup> Hoyt N Duggan, *Creating an Electronic Archive of Piers Plowman*, (1994)

<http://jefferson.village.virginia.edu/piers/report94.html>

### 6.2.7 National Science Foundation<sup>69</sup>

The National Science Foundation (NSF) supports academic-based research in US institutions in the field of physical and natural sciences, with the exception of medicine. The NSF makes over 20,000 individual grants per year, and has annual expenditure of over a billion dollars. For at least twenty years it has been funding research into digital imaging. Since 1994, the Information and Intelligence Systems department has been giving grants for the research and development of digital imaging systems. It does not fund the creation and conversion of digital corpora, but rather research into the technologies surrounding the use of digital images, and the discovery and analysis technologies. The projects are very diverse. Six projects were funded in the 1994-1998 call, and thirty-five projects were funded in the 1998 onwards call.<sup>70</sup> The first six received a total funding of \$25 million, \$10 million of which came from the private sector, generally from large corporations including Intel, Microsoft, and Cisco. The second round has a higher budget of over \$115 million per annum, with additional partnership funding coming from the large companies. The second call attracted over 400 applications and had an 8% success rate. The quality of the applications in the second round was much higher than in the first, but while the technical proposals were of very high quality, they lacked proposals that examined social impact or economic modelling. The increase in the number of applications over the two calls is seen as indicative of the growing significance of the digital library as an area of research and development.

The NSF does not fund the creation of digital resources, but it ranks the increasing of public and educational access to digital resources as a primary reason for funding digital imaging initiatives.

The philosophy of NSF Digital Libraries Programme is that 'community wisdom is more profound than our own', so it believes in the sharing of ideas and the creation of environments (e.g. seminars, workshops, virtual spaces) to make it easy for specialists to be brought together.

NSF varies its monitoring regime depending upon the scale of the project; larger projects make bi-annual public progress reports, and there are two principal investigation meetings every year where projects brief peers on their progress (including successes and failures). The NSF fosters dialogue between the research projects as this is seen as a mechanism to cross-fertilise activity. At three years the terms of the grants themselves are short and mid-way through the funding cycle projects need to initiate the process of applying for their next grant. The results of this and other NSF programmes suggest that this cycle ensures that the quality of work remains high throughout.

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<sup>69</sup><http://www.nsf.gov/>

<sup>70</sup> Information about these projects can be found at [www.dli2.nsf.gov](http://www.dli2.nsf.gov).



The application, available from the NSF website, includes workflow and costing forms which cover everything from staffing to equipment and travel. The NSF funds is working (however informally) to develop partnerships with other organisations that can fund the creation of digital resources so that larger integrated projects can be undertaken involving training, research and content creation. Future programmes in digital libraries and imaging will benefit from international collaborations, and NSF begun collaboration at EU-level und the IST Programme and with the JISC.

The NSF believes that its research is having an impact on developments, but has carried out no studies to assess this. It does recognise the key importance of studies of usage of the digital resources, for example looking at how users are using and accessing the Perseus project website<sup>71</sup>, and how changes in the network status affect users' navigation of sites. NSF might conduct such work in the not too distant future.

#### **6.2.8 Ameritech American Memory Project, Library of Congress, USA.<sup>72</sup>**

The Library of Congress does not fund any external digital image projects itself. However, for the past three years it has been involved in the Ameritech American Memory Project. Ameritech donated \$2 million to the Library of Congress to fund an initiative that would digitise artefacts and objects and integrate them into 'American Memory'<sup>73</sup>, an historical programme for the National Digital Library Program. Five million items from eighty collections are now online. The project, which began in 1996, made its first grants in 1997. Funding of the projects has now ceased, and most are completed. Of the \$2 million, \$1.75 million was distributed to projects, the remainder went to the administration of the scheme. Twenty-three projects, representing 12% of the applications, were funded under the scheme. Lack of funding lay behind the decision to fund so few projects. The quality of applications increased in the second and third calls, and this probably reflected improvements in the guidelines provide to applicants as well as an increasing understanding among applicants of the issues. LoC managed its lack of experience in grant giving by seeking the support of the NEH.

This initiative aimed to provide free public access to collections, promote of lifelong learning, produce resources and contextual aids for K-12 education, and facilitate, if only in a small way, the preservation of damaged material. The project primarily supported the digitisation of photographs, posters, books and serials, printed documents, and some

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<sup>71</sup> <http://www.perseus.tufts.edu/>

<sup>72</sup> <http://lcweb2.loc.gov/ammem/amhome.html>

<sup>73</sup><http://memory.loc.gov>

typescript documents and unbound printed documents. As primarily pre-1920s material was digitised no rights issues were involved. The creation of contextual essays and other material was also funded when these were to be used in a learning and teaching setting. The main audiences for these projects were taken to be primary and secondary schools and lifelong learners, but in practice they have proved very popular with family historians and genealogists.

Collection surveys were not required as part of the project, but those applications that had included them and used it to justify the selection of material for digitisation were more likely to gain funding. No formal project management guidelines were required, but as part of the application process applicants provided a workplan for lifetime of the project (an average of the eighteen months). Some LoC in-house guidelines outlining the production process used by the LoC were available to applicants. While the applicant process did not require the submission of conservation assessments, it was suggested that the best proposals came from organisations that had undertaken them.

No risk assessments were required, however, after talking through this questionnaire with the staff at the LoC they indicated that they would investigate how these might be used in the future.

Although some image digitisation guidelines were made available by the LoC applicants were free to propose their own methods. Projects were expected to use descriptive metadata. New metadata creation was not normally supported, although the conversion of existing records into another format was. Metadata were encoded in the LoC's own DTD format, which was in place before the TEI issued any guidelines, but since those were published, projects were pointed towards the TEI as guidelines for dealing with texts. Where appropriate Dublin Core and MARC were suggested. Procedures for quality control and assurance were taken into account when evaluating the proposals. Technical information was made available on quality assurance, but none was accessible for pictorial images, and this has been noted as a weakness.

As a requirement of funding initiatives had to integrate into the American Memory project. Projects could either link to American Memory Project or pass their data sets to it to be held centrally, which most initiatives eventually did. This meant that the projects would be sustained beyond the funding period. There is no formal digital preservation strategy, but there is work going on in this area.

The Project did not the training of project staff and the development of delivery infrastructure, nor the training of users.

Three different panels evaluated applications. The first dealt with the theoretical benefits of the digitisation of the collection and consisted of archivists, historians, and librarians. If that panel recognised the merit in the application it was passed to a technical panel, which evaluated the IT

issues of the project. A third panel examined management issues and created a coherent overview of the issues of individual projects and projects as a group. There were also other criteria, such as choosing projects with an appropriate geographical spread, variety of content, and regional and ethnic spread, which influenced which projects were selected.

After projects were funded little formal evaluation and monitoring was conducted as there was no money available to support site visits. Initiatives submitted a report every six months and formally handed over data at the end of the funding period. Projects could submit their reports online and this material was checked thoroughly. There were more problems with metadata in projects than anything else. Formal assessment of the overall impact of the programme remains a possibility. Informal feedback has been amazingly positive and the products have been widely adopted in the learning setting.

#### **6.2.9 Digital Library Federation<sup>74</sup>**

Although the Digital Library Federation (DLF) does support aspects of digital imaging, it is not a grant giving body. The steering group decides on viable projects and opportunities and commissions research and initiatives, in the hope that they will go on to secure funding and become independent initiatives. It sees its role in this area as incubating services and encouraging them to find funding from other sources. Many of the activities focus on reviewing and recommending standards and strategies for all areas of the digital library. As such, many of the questions in our questionnaire were not relevant to the structure of the DLF.

The DLF started work in the digital imaging area around the start of 1999, and by 2000 had supported four or five projects related to digital imaging. These range from smaller projects with an annual budget of \$50,000 to larger projects with a budget of \$200,000. However, in the larger projects this funding also relates to other aspects of the project and is not just digital imaging. The projects are not digitisation projects themselves, but initiatives to encourage and aid other individual projects.

The DLF supports the development of digital imaging techniques and initiatives for research or development, for use in digital libraries, for information sharing, for prototyping techniques, and for the development of organisational models of digital services. It has funded and produced guides to digital imaging, and is working on the development of a shared image service. Examples are the development of shared image collections, initiatives in the preservation of electronic

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<sup>74</sup> <http://www.diglib.org/dlfhomepage.htm>

scholarly journals, metadata-harvesting abilities, and the development of project architectures.

The DLF does not recommend any specific project management strategies, but encourages sensible, goal-oriented, economically sensitive structures in its research. Any initiatives or projects must be sustainable and useful, and have some intrinsic element of preservation. It encourages dialogue between its members, and has a strategic plan, which encompasses a large area of digital resources.

This model of collaborative sharing of expertise between institutions has much to recommend itself and its possibilities for the UK could be considered further.

### 6.3 Policy Sources

#### 6.3.1 The UK Office for Library and Information Networking (UKOLN)<sup>75</sup>

UKOLN does not fund any digitisation projects. It provides policy, research and awareness raising services to the UK library, information, and cultural heritage communities. For example, UKOLN developed the standards document for the NOF-digitise programme.<sup>76</sup>

The guidelines were drawn up by individuals at UKOLN and Re:source, who have much experience of digitisation, in consultation with others, such as members of SCRAN, when guidance in the more technical areas was needed. The guidelines aim to produce a basic guide that will alert users with no prior experience of digitisation to the main issues in the field. Standards used were basically the standards that UKOLN advocated for the library sector, such as Dublin Core. The guidelines note that it is difficult to put standards in place for some areas, as the technologies and best practices are in flux. The document aims to make projects aware of what they must do, what they should do, and what they could do.

### 6.4 Conclusions and Recommendations

This review shows that funders do not have a consistent strategy and approach to digital imaging. These are areas that are in need of development. As a result, we would recommend that funding bodies develop a shared approach to the selection, costing, management, and monitoring of digital imaging projects that could support the diverse objectives that funders have. This would foster the creation of resources that are suitable for interoperable use and avoid the redundancy of effort on the part of funders as they attempt to develop guidelines. The Library

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<sup>75</sup> <http://www.ukoln.ac.uk/>

<sup>76</sup> The standards produced are available at:  
<http://www.peoplesnetwork.gov.uk/nof/technicalstandards.html>

of Congress reported that in the second funding stage of the American Memory project, the quality of applications improved when the funder provided the applicants with more detailed guidelines on how to prepare an application.

Three kinds of guidelines are needed. These include guidelines for:

- ◆ applicants for funding, on the kinds of strategic documentation (e.g. risk assessments) and processes they need to put in place before seeking funding, at project start-up phase, during the project, at initial delivery stage, and after the project finishes;
- ◆ applicants, on how to prepare this documentation (e.g. workflow) and to establish project management processes;
- ◆ funders, on how to interpret and assess this documentation and to monitor and evaluate those projects that receive funding.

Funders should develop guidelines for digital imaging projects to ensure that the applicants produce the most robust proposals possible. The specific areas in which guidelines need to be established, and for which documentation needs to be assessed by funders, include the following.

- ◆ A collection survey that can enable institutions to make informed choices about which material to select for digitisation is essential if 'cherry-picking' is to be avoided and a good cross-section of our heritage is to be digitised.
- ◆ Statement of the priorities for digitisation.
- ◆ Description of the project management methodologies that will be used.
- ◆ Description of the conservation assessments of the material to be submitted for digitisation under the project.
- ◆ Detailed analysis of the workflow and associated costings. The parameters describing how this is carried out need to be clearly defined so that application evaluators can determine whether or not these workflow models and associated costs are realistic.
- ◆ A risk assessment (e.g. risks to the materials, project management, cash, outputs, impact on the organisation — i.e. does the originating body have sufficient infrastructure and skills to undertake the project).
- ◆ Statement of the digitisation guidelines that will be applied by the project. If the project is undertaking this work in house, then this should include a step-by-step description of the process, how it will be audited, and what standards will be used at every stage of the process. If the project is outsourcing this work, then the call for tender, tender evaluation criteria, and the proposed contract

between the project and the outsourced digitiser should be submitted.

- ◆ Statement of the metadata that the project will create and how they will be encoded and audited. It should cover technical, administrative, and descriptive metadata.
- ◆ Description of the quality assurance processes that the project will apply and how these will be tracked and their completion documented.
- ◆ Evidence that the delivery mechanism has been established.
- ◆ A preservation strategy that is linked either to the institution's own digital preservation strategy or to that of an organisation that will undertake the long-term preservation of the material on the part of the project.
- ◆ Evidence that the digital resource once created can be sustained by the organisation (this should include evidence that the projected financial plans include funding for maintenance and support of digitisation).
- ◆ Statements as to how the project will evaluate user expectations and needs of the system.
- ◆ If the project is a multi-site project, a description as to how the communications between the partners will be managed and documented.
- ◆ A statement of the project's record management strategy.
- ◆ A dynamic cost model.

This makes the preparation of a digitisation project a very formal process but, given the scale of investment that goes into a project, this would be advantageous.



## 7 Views of Comparative Projects

### 7.1 Introduction

To gain a perspective on digital imaging and other image digitisation management models currently in use we looked at nine other projects. While this is a relatively small and mainly UK-based sample, it provides a window onto the image management issues confronted by projects. None of the projects included in this review could be said to be truly comparative to the JIDI project because they are almost all single-site and single-focus, whereas, as we have noted above, JIDI is a multi-site, multi-foci project. The projects selected include:

- ◆ Corpus Vitrearum Pilot Digitisation Project, Courtauld Institute
- ◆ Insight, Tate Gallery (HLF Funded, initially known as British Artists Information Project)
- ◆ Manchester Metropolitan University, Department of History of Art, Design Council Slide Collection
- ◆ TLTP History Courseware Consortium
- ◆ Wiltshire Wills Project, Wiltshire and Swindon Record Office
- ◆ Scottish Archives Network (SCAN), National Archives of Scotland
- ◆ Foxe Project, University of Sheffield
- ◆ Broadside Ballads Project, Bodleian Library, University of Oxford
- ◆ Colorado Digitisation Project

The projects that contributed to this section of the investigation were, like the participating sites, refreshingly honest. Several of the projects share similar characteristics but in many ways most are different. What emerges is that many of the difficulties faced by JIDI are generic to digital imaging projects.

### 7.2 Sketch of the Comparative Projects

- ◆ During this pilot project the *Corpus Vitrearum Medii Aevi*<sup>77</sup>, supported by Arts and Humanities Research Board (AHRB) funding, digitised 3500 images of mainly medieval stained glass from the Courtauld Institute's own collection and from material held at the National Monument Record (NMR) in Swindon. The project worked from surrogates. There were no rights issues associated with the material that could not be easily addressed.

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<sup>77</sup> <http://www.kcl.ac.uk/humanities/cch/drhahc/drh/abst95.htm>

The entire collection consists of 30,000 images. This pilot project produced a prototype website, produced archival quality digital images, extended access to more than 10% of this collection beyond the confines of the Courtauld, and evaluated the feasibility of digitising the whole collection.

- ◆ The British Artists Information Project, now Insight, at the Tate Gallery<sup>78</sup> aims to digitise all art works in the Tate's collection: more than 50,000 items, 35,000 of which come from the Turner bequest. The images will be digitised at archival quality, and will be available online.<sup>79</sup> The project commenced in April 2000 and will run until 31 December 2001. So far just over 52,000 images have been digitised. The project encountered significant rights issues with some artists or their estates (e.g. Picasso) refusing to permit digital presentation of images of works by the artist.
- ◆ Strictly speaking, the Manchester Metropolitan University, Department of History of Art, Design Council Slide Collection project<sup>80</sup> was initially one of the JIDI projects, but it later received funding from the Research Support Libraries Programme (RSLP). The Design Council Slide Collection consists of 22,500 35mm slides, covering the period of British Design from 1945 until 1990, when they stopped developing this resource. The contents also serve as a record of which areas of design the Council funded during this period. This collection was donated to the Department of History of Art at the Manchester Metropolitan University. In September 1998 the department was given funding from JISC to digitise a representative sample of the collection, and subsequently digitised 2804 of the images. RSLP then gave a further grant for a three-year project, commencing in August 1999, to digitise 11,000 more of the images. It is hoped that this will encompass all the images in the collection for which the Design Council owns the copyright or can easily obtain permissions.
- ◆ The History Courseware Consortium<sup>81</sup> worked under the Teaching and Learning Technology Programme (TLTP) to develop computer based tutorials. Twelve tutorials on themes including *Women's History*, *The Coming of Mass Politics*, *The Industrial Revolution and Post-Industrialisation*, and *The Pre-Modern Period* were completed. The delivery of high quality learning and teaching materials involved the digital imaging of resources to illustrate and illuminate the tutorials.

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<sup>78</sup> <http://www.cultivate-int.org/issue1/axis/>

<sup>79</sup> [www.tate.org.uk](http://www.tate.org.uk)

<sup>80</sup> <http://www.artdes.mmu.ac.uk/had/catalogue2001.htm>

<sup>81</sup> <http://www.gla.ac.uk/~histltp/infoshee.htm>



- ◆ The Broadside Ballads project ran from the start of 1996 until mid 1999, cataloguing, microfilming, and creating digital images of 30,000 broadside ballads that are housed in the Bodleian Library.<sup>82</sup>
- ◆ The John Foxe Project<sup>83</sup>, funded by the Arts and Humanities Research Board (AHRB), is producing a digital edition of the *Acts and Monuments of the English Martyrs*. The edition will be true in both structure and content to the 1583 publication, the last edition in which John Foxe was involved. The 2,183 pages of the 1583 edition, plus all preliminary and concluding material, are being digitally imaged, transcribed, and encoded using SGML. Eventually the project will produce a critical edition showing the development of the *Acts and Monuments* including the earlier English editions of 1563, 1570, and 1576, with reference to the Latin editions of 1554 and 1559.
- ◆ The Wiltshire Wills Project<sup>84</sup> aims to catalogue, microfilm, digitise and repair, where necessary, the 90,000 wills and inventories which form the outstanding Salisbury Diocesan Probate collection. The Wills and Inventories cover roughly 500,000 pages. The project is funded for three years by a Heritage Lottery Fund grant, with matching funding provided by local sources. Work has begun at the Wiltshire and Swindon Record Office. The Wiltshire Wills Project has three primary objectives. The first is to catalogue the documents, creating a public access database. The second is to produce preservation copies of the wills to archival standards, for example microfilms. The third is to produce high-quality digitised images of the documents and to make them available to the public at terminals in the Record Office in Trowbridge and at Swindon Reference Library.
- ◆ The Scottish Archives Network<sup>85</sup> (SCAN) is 75% funded by the Heritage Lottery Fund to develop a union catalogue of Scottish Archives, to create special archives services (for instance online websites), and to image digitally nearly half-a-million wills produced from the middle ages through to the third quarter of the 19<sup>th</sup> century. In total the project will image some three million pages.
- ◆ The Colorado Digitisation Project<sup>86</sup> is a collaboration of Denver Public Library, the Colorado Historical Society, and the Denver

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<sup>82</sup> The ballads can be accessed at [www.bodley.ac.uk/ballads/](http://www.bodley.ac.uk/ballads/)

<sup>83</sup> <http://www.shef.ac.uk/uni/projects/bajfp/>

<sup>84</sup> [http://www.wiltshire.gov.uk/heritage/html/wiltshire\\_wills.html](http://www.wiltshire.gov.uk/heritage/html/wiltshire_wills.html)

<sup>85</sup> <http://www.scan.org.uk/index.html>

<sup>86</sup> <http://coloradodigital.coalliance.org/>

Art Museum. Between 1996 and 2000 the programme imaged and made available on the web some 55,000 images.

### 7.3 Project Inception

There remains great variation in the approaches that projects take to:

- ◆ the process of selecting material for inclusion in digital imaging programmes;
- ◆ evaluating the conservation implications of digital imaging;
- ◆ identifying and addressing the risks associated with projects.

The *Corpus Vitrearum Medii Aevi* (CVMA) ensured that the images created by its pilot project included a representative sample of the collection after conducting a collection survey. As this was a pilot they focused on including among the sample images from across the range of formats and qualities. The aim was to assess accurately the possibilities and problems that might be associated with digitally imaging the entire collection. The selection was done before the project applied for funding and gave the CVMA an argument for its bid to conduct a full-scale project.

Where digital imaging initiatives are designed to create a comprehensive record of the collection then collection assessments for selection purposes are not strictly necessary. For example, as the Insight aims to image digitally the entire Tate collection, there was no need to conduct a collection survey to select material. The Broadside Ballads (Bodleian Library, Oxford) collection was already well known before it applied for funding, and because of the time scale in which the application was drawn up (one afternoon) there was not time to undertake a full collection survey. However, as with the Insight project, there was no necessary justification for such a survey, as all of the material in this collection was to be digitised. The Wiltshire Wills Project was conceived as a way to create digital images of the entire collection of Wills so a collection survey was unnecessary for selection purposes. The collection consists of hand-written documents (although some 19<sup>th</sup> century wills have a printed element). However, as many of the materials are unbound and of variable formats and conditions, and even the character of the bound volumes varies from volume to volume (some have no gutters, others have almost no margins, some have colour), the project did conduct a review of the materials before making its final digital imaging plans.

The Design Council Slide Collection did not conduct a detailed collection survey of what is a fairly uniform collection of 35mm slides. They did however undertake a general survey of the subject material so that they would avoid digitising images that were being captured by the Design Council Archive (Brighton). A list of broad topics within the subject area

of the collection was drawn up, and images selected on an *ad hoc* basis, guided mainly by the knowledge of the collection manager, to ensure that a representative sample of the overall collection was selected. There was no formal documentation about this process, although discussions took place with JIDI regarding the possible duplication of materials with the Brighton digitisation project.

The TLTP History Courseware Consortium carried out digital imaging to meet the needs of its tutorial authors. From the outset the Consortium intended digitally to image printed books, printed documents, unbound printed documents, typescript documents, handwritten documents, reproductions of artworks, and photographs as part of the project. The Project's sole purpose was to create a series of teaching and learning resources. The primary target audience, and the one for which the material was designed, was higher education (HE). Other target audiences included further education (FE), overseas HE, secondary schools, distance education, and computer-mediated learning. Authors therefore selected material that they felt would help them produce materials that would enable the learning and teaching objectives of the programme.

CVMA, Insight, the Design Council Slide Collection, and the Broadside Ballads Project, did not conduct conservation assessments before beginning the projects. The CVMA felt that they were familiar with the conditions of the photographs and that little could be learned from a further study. Staff at the Design Council Slide Collection concluded there was no need for a conservation report as the collection is in fairly uniform condition: the format of all the source material was the same (35mm slides none of which were showing evidence that they were decaying). While the Insight did not carry out a conservation assessment, the digital imaging methodologies they were to employ were discussed with specialists in the different art historical media to ensure that the art would not be put at risk at any stage.

As some of the Wills included in the Wiltshire Wills Project are in poor condition a conservation survey was essential:

- ◆ to determine what repair should be done before digitisation;
- ◆ to decide how the material should and could be handled;
- ◆ to identify and address any other special considerations (e.g. how to handle seals, ties, and pins).

SCAN conducted a general conservation assessment of the collection and then of each object prior to its digitisation. These assessments were conducted by a professional conservator, and are detailed in a database. The John Foxe Project used a rare copy of the 1583 printing of the *Acts and Monuments of the English Martyrs* as the source for its edition and the digital images. Before disbinding this copy the project had it examined

by a conservator to assess its condition and to make recommendations as to how it should be handled.

CVMA, Insight, Broadside Ballads, and the Design Council Slide Collection (DCSC) did not prepare risk assessments before starting their respective projects. The DCSC took advice from HEDS. The Insight did not prepare a risk assessment as part of its original proposal, but it has put in place a risk register, which is now updated regularly. The Wiltshire Wills Project's risk assessments were prepared as part of the project plan and they put a high emphasis on the technological risks. SCAN undertook a risk assessment on the impact of handling, and the condition of documents pre- and post-digitisation.

These nine projects had a variety of reasons for conducting the work. The primary reasons projects gave for digitally imaging their material were:

- ◆ public access;
- ◆ improved conservation;
- ◆ reduced risk to original materials through handling;
- ◆ efficiency savings by reducing staff intervention in the delivery of material.

Secondary reasons included:

- ◆ creation of preservation copies;
- ◆ enhanced research initiatives; and,
- ◆ the creation of educational opportunities for the material.

Insight is digitally imaging original artworks and photographs of artworks, including paintings, photographs, and sculpture. No textual sources are being digitised. The main reason for carrying out this digital imaging project is to increase public use of, and widen access to, the material, and to replace the costly catalogue publication process. The aim of the project is to produce a web deliverable resource providing a comprehensive view of the collection of the Tate, and to provide access to people who either do not or cannot visit the galleries themselves. The target audience for this initiative is seen to be Museum users, but the hope is that by making material available, new users and uses of the material will emerge.

The Design Council Slide Collection's first aim was to increase public access to the collection, but also to provide a greater resource for research and teaching, and to create the opportunity for new research. The audience for this project was presumed to be higher education and researchers, as it was not thought that the general public would be interested in the collection, but no one will be excluded from looking at the material.

The Broadside Ballads were stored in a variety of ways, including in boxes, bound into volumes, and mounted on single cards. Three main reasons underlay the decision to image the material digitally:

- ◆ to increase public access to the collection (ballads are a neglected source of value to Social Historians, Art Historians, and specialists in English Literature);
- ◆ to promote the creation of research;
- ◆ to aid in the conservation of the ballads, which are in quite poor condition.

At the time that the project received its funding, microfilming was still the established approach to preservation copying. Digitisation was then viewed only as a way to improve access. As a consequence of this debate the project took the decision both to microfilm and digitise.

The John Foxe Project will be digitally imaging printed books, typescript documents, and handwritten scripts. The first priority for digitising this material was the enabling of research, with preservation, teaching and learning resource creation and wider access as secondary considerations. Widening public access was identified as the last priority. The primary intended audience for this material is researchers and postgraduates, followed by higher education and further education. Use by schools, archive users or national library users will be possibilities; although these potential uses are not shaping the project.

The main aim of the CVMA for digitising this collection was to improve public access, followed by the creation of a teaching and learning resource (the Courtauld has a licence to use these images as part of its teaching programmes). Preservation was an indirect reason to digitise, as was the creation of a research resource. The process itself was an experiment. The CVMA hope that other projects can learn from the results of this study. Higher education was taken as the main audience for this project, but it is hoped that it will benefit the wider academic community, and make the collection better known to a general audience.

SCAN's first priority is to ensure wider access, followed by preservation, public access, and revenue generation. The primary target audience is the general public, followed by archive users, with HE, FE, and schools all sharing third priority.

The Wiltshire Wills Project's main priorities for carrying out this digitisation were both to increase public access to the records, and to preserve the originals. These issues were interwoven because the condition of some of the wills is quite poor, and the public will not be allowed access to them in the future as their condition deteriorates further. Therefore, digitisation should allow access to the documents without harming the originals further, and indeed, the originals will be conserved during the project so will be in a better physical condition at

the end of the project than at its start. The digitisation aims to create a learning and teaching resource. Other reasons for digitisation include encouraging lifelong learning (the documents are very interesting for family historians and genealogists), and enabling of research (as the database will make it easier to access the information within the documents). The project hopes that the digitisation will encourage a wider access to the materials, and the nature and scope of the project means that the process of digital imaging has an experimental edge. Revenue generation is not a primary concern of the project, although it is hoped that they can earn income from selling high quality images of the documents. The target audience for this work is predominantly archive users such as family historians. However, the Wiltshire and Swindon Record Office hope that those in higher and further education institutions, and especially postgraduate students, will use the resource for research.

For projects, the decision to image digitally material reflects the aims of the institutions involved, the needs of their user base, or the aims of the researchers who initiated the project. This plurality of approach is reflected in the objectives of different funding bodies, as we saw in Section 6 of this study.

#### **7.4 Planning and Project Management**

Projects take different views on the use of formal project management standards. The Design Council Slide Collection did not adopt any project management strategies during its JIDI phase, but under the RSLP they were able to take part in sponsored project management training days. As a result they reported that they came to a more formal view of project management. There were much more detailed project plans given from the RSLP than JISC (these are available from the website). The TLTP History Courseware Consortium developed its own management strategy, comprising an Advisory Committee, on which all members of the Consortium were entitled to representation (upwards of 40 individuals), a Steering Group with eight members, and then the Management Team at Glasgow and the Production Team at Southampton. Other projects such as Insight, SCAN, Wiltshire Wills, and the John Foxe Project have reported that they adopted more formal processes. SCAN, for instance, has adopted the PRINCE2 methodology, as have a number of other HLF supported projects. While good project management is a key to the success of projects, whether they are large or small, overly intrusive project management models tend to have a negative impact on project progress. This suggests that projects need to put in place management systems that are relevant to the needs and objectives of the project at hand.



**Recommendations:**

- All projects should define the project management strategies that they intend to use at the outset.
- All projects should adopt clearly defined project management structures.

**7.5 Workflow**

Defining workflow is something that projects are coming to recognise as a critical element of the planning stages. The experience of many projects is that pilots have a central role to play in defining the workflow for larger projects. The CVMA had a vague workflow model before beginning its pilot, but the whole point of the pilot study was to get a suitable workflow model in place. The fact that the CVMA came to understand the process of digitisation was one of the major successes of its pilot. The Design Council Slide Collection also used a pilot to define its strategy and approach to digitising the whole collection, using the small sample as a testing ground. While they agree that workflow modelling is important in this process, their experience indicates that, given the limited understanding in this arena of the processes involved, pilots provide the best way to test assumptions about costings, workflow, and project management.

The John Foxe Project undertook workflow modelling because it needed to convince the British Academy that the project was feasible and accurately costed. These costs were based on the labour required. They found, for instance, that having the volume scanned at the British Library (Boston Spa) was more efficient than imaging it locally. SCAN carried out two main workflow-modelling exercises: trial digitisations with the camera, followed by throughput and file size experiments. This work was undertaken in collaboration with the Genealogical Society of Utah (GSU).

Insight took a different approach. Many of the methods used in this project resulted, not from experimentation, but from the experience members of the team had running similar projects at other institutions. This was a very dynamic process, and no formal experiments were undertaken, although the indexing and imaging teams prepared reports, which contributed to the overall workflow model developed by Insight. The Wiltshire Wills Project carried out many tests to establish the procedures that would be necessary to complete the imaging. They also examined the cost of the exercise. For example, how long it would take for the cataloguing and how much time it would take to put the documents through the digitisation processes.

Recommendations:
<ul style="list-style-type: none"> <li>➤ Workflow modelling should be carried out by all projects either as a pilot or using a workflow modelling strategy.</li> <li>➤ There is a general need for a workflow modelling strategy to be tested, widely available, and used in digital imaging projects.</li> </ul>



## 7.6 Estimated and Actual Costs

In developing its costings for the initial project the CVMA was guided by the HEDS recommendations, and the experiences of Steering Group members. They sought and obtained an AHRB grant of £56,000. The grant period started at the beginning of 1999 and ran until the August of 1999. Insight (formerly British Artists Information Project) funding came from the Heritage Lottery Fund, as part of a larger grant for the Tate Gallery Centenary Project. Of the £25 million grant nearly £500,000 was ring-fenced for the Insight project. The Heritage Lottery Fund granted 70% of the funding with the remainder coming from private donors. The Insight costings were carried out on various levels; a general proposal including 'ballpark' figures on equipment and throughput was submitted to the HLF, but once the Trustees approved the grant these figures were examined in detail and finalised.

The Universities Funding Council, and its successors HEFCE<sup>87</sup>, SHEFC<sup>88</sup>, HEFCW,<sup>89</sup> and DENI<sup>90</sup> provided all the funding for the TLTP History Courseware Consortium. The first grant was received in 1993 with a second grant in 1997. Several universities, including Glasgow, absorbed overheads.

The Design Council Slide Collection received its funds from the JIDI programme initially, and later from the RSLP programme. It started from a top-down rather than bottom-up costing plan. When JIDI promised the funding for digitally imaging the DCSC collection, it specified the amount of money that would be given and the amount of scanning DCSC would do (guided by a feasibility study conducted by HEDS on behalf of JIDI). In reality, the project did not quite meet the targets set by JIDI, but this was not seen as a problem, as the project was really an investigation into how such a collection could be digitised. The JIDI funding ended in 1999, when and the RSLP funding started. There was no real change in the working processes developed with the JIDI funding

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<sup>87</sup> <http://www.hefce.ac.uk/>

<sup>88</sup> <http://www.shefc.ac.uk/>

<sup>89</sup> <http://www.wfc.ac.uk/hefcw/>

<sup>90</sup> <http://www.deni.gov.uk/>



when the RSLP took over the funding. JIDI provided full funding, whereas the RSLP funded the digitisation and 70% of the cataloguing costs. The University met the remainder of the costs (no exact monetary figures were available).

The Broadside Ballads Project, although hastily costed, reported that they had by chance gotten the costing right. The time taken to create and convert the catalogue entries was estimated, how long it would take to do the data entry, image analysis, and content analysis was calculated, and storage and microfilming costs were estimated. The project did not get all the money for which it had applied. Decreasing costs in equipment and storage, among other factors, enabled the project to achieve everything it had initially set out to do.

On the John Foxe Project both digitisation and publication costs were covered by the British Academy<sup>91</sup>. Costs for producing full text transcriptions are being met by the AHRB. Sheffield University contributed the overheads.

The SCAN project was costed on the basis that it would be completed in three years, calculating the staff and technical set up that would be needed to meet that target. Based on these models the project employed quality control, project management, data preparation, indexing and conservation staff. The project funding comes from the Heritage Lottery Fund, Genealogical Society of Utah (GSU), and National Archives of Scotland (NAS). The funding proportions are: HLF, 75%; GSU, 12.5%; NAS, 12.5%.

The Wiltshire Wills project was funded by the HLF and received a grant of £200,000. The first payment was received in May 1999, and this was conditional on gaining partnership funding. Wiltshire County Council, Swindon County Council, and many local groups including the Wiltshire Family Historic Society, Somerset and Dorset Family history societies, and private donors gave funding. The costings were based upon estimates prepared by professional scanning firms, which were experienced with working with business documents but not archival materials. The cost estimates that they proposed were lower than what appears likely to be the actual costs.

Since projects all use different costing models and different approaches there is no easy way to compare them. However, such comparisons are essential if we are to determine that digital imaging initiatives are achieving value for money.

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<sup>91</sup><http://www.britac.ac.uk/>

Recommendation:
<ul style="list-style-type: none"> <li>➤ A costing model should be developed and funding bodies and projects should be encouraged to adopt it.</li> </ul>



## 7.7 Digital Imaging

The main problem for projects was that standard imaging guidelines are not widely available. As a result many projects have to develop their own.

- ◆ As far as imaging guidelines go, the Design Council Slide Collection followed the workflow and technical guidance of both JIDI and TASI. The team sought published guidelines, but also depended on advice from TASI. It was pointed out that the VADS guide to good practice was not available then, and indeed, this project helped to establish it.
- ◆ No digital image guidelines were followed by the John Foxe project, as there were not many available at the project's beginning and those that were did not meet the needs of the project at practical levels. An in-house image specification was developed. It is worth noting that the digital imaging was undertaken mainly by the British Library<sup>92</sup> and to a lesser extent by Cambridge University Library<sup>93</sup>. One of these organisations used a conservator to carry out the imaging and the other a professional photographer. The results achieved by the photographer were the better of the two.
- ◆ The Broadside Ballads faced a similar problem when it started, and indeed, this project helped to set various guidelines for JISC/JIDI. However, they worked themselves to establish suitable standards and techniques.
- ◆ Insight used its experienced workers to develop its imaging guidelines. The project benefited from investing in experienced and knowledgeable staff.
- ◆ SCAN developed its digital image guidelines in association with GSU before digitisation began.
- ◆ The Colorado Digitisation Project developed its own digital imaging guidelines and defined its own specialised studio requirements.

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<sup>92</sup> <http://www.bl.uk/>

<sup>93</sup> <http://www.lib.cam.ac.uk> Cambridge provided images of pages that were missing from the copy of the 1583 edition that Professor Collinson had lent to the Foxe project.

- ◆ The TLTP History Courseware Consortium did not follow any special imaging guidelines.

There is a general need for a digital imaging workbook that would provide a source for best practice, that would be regularly revised, and that would be comprehensive enough to support the selection of the appropriate practices for particular projects.<sup>94</sup>

Recommendation:
<ul style="list-style-type: none"> <li>➤ The UK funding agencies should invest in a digital imaging workbook to avoid the projects reinventing processes from scratch, time and time again.</li> </ul>



## 7.8 Metadata

Here again, projects show a plurality of approach. This plurality reflects the different requirements projects have for metadata. The fact that they do not adopt a single standard may have longer-term implications for interoperability of resources and preservation. The capture of technical metadata needs to be streamlined, probably through the use of more automated processes for capturing this material, as developed by the Magee Photographic Collection (see above) or SCAN (see below).

CVMA followed VADS' metadata guidelines. As it was a condition of the grant that the results of the project were deposited in VADS, the project had to adhere to their guidelines. The project also had to conform to the NMR data standards.

SCAN developed in-house metadata guidelines, but hopes that they are generic enough that they will be adopted by other collections. These comprised four main categories: process information, preservation information, context (of the original material), and content (index description). Some of these metadata are being recorded automatically from information passed from the camera. The remainder of the data is being entered using workflow application software developed by the GSU.

Insight did set up its own standards for indexing, image capture, and image-processing metadata, which are encoded in a database provided by iBase.

The Design Council Slide Collection met the requirements and guidelines for metadata issued by JIDI, with the project also following the Visual Resources Association's Core Categories Guidelines (Version 2). This was

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<sup>94</sup> See current (2000-1) work being undertaken by NINCH, Cornell, and following Lund.

used for the encoding of the metadata and, one of the reasons it was adopted was because of the way it maps to Dublin Core. JIDI's guidelines were found to be helpful and useful, but because of the range of collections they had to cover, they proved too generic for this particular collection. Because the JIDI documentation assumed that the scanning itself would be outsourced, the recommendations were also found to be low on technical information. The RSLP was happy for the project to continue using the same standards and techniques and did not provide any further guidelines.

For the Broadside Ballads Project, there were no metadata guidelines in place when this project began although the project did not store any image acquisition metadata, they were fastidious about saving catalogue metadata in the form that was suitable for their (Allegro) database. The catalogue records also met appropriate cataloguing standards.

The TLTP History Courseware Consortium did not follow metadata guidelines for its imaging as the project was geared for publication. However, the HTML mark-up for each image included comprehensive copyright information and this was also held in a database. Similarly, as the John Foxe Project was geared for publication it did not use particular metadata standards.

There are many emerging standards in this area (e.g. RLG guidelines), but each project seems to define the metadata guidelines that will best meet its needs. This draws attention to one of JIDI's strengths: it was able to enforce metadata standards across a spectrum of projects.

#### **Recommendation:**

- There is a need for international consensus on technical and descriptive metadata for digital imaging projects.

## **7.9 Quality Assurance**

Quality assurance poses problems for nearly all digital imaging projects. There would appear to be number of reasons for this: (1) there are few guidelines for quality assurance procedures; (2) few staff are adequately trained to carryout the work; (3) there is a need for more robust sampling strategies; (4) quality assurance needs to be done by an independent review team; and (5) the technical and environmental infrastructure required for quality assuring images is not always available at host institutions.

- ◆ The CVMA set its own quality assurance standards. The image quality was guided by HEDS standards. However, the project staff

does not feel that they carried out enough quality assurance on the images themselves, and suggest this is an area where more guidance could be given to projects.

- ◆ Insight did set up its own quality assurance procedures. Images and textual metadata were checked periodically. Every two weeks a random selection of material was chosen and monitored for its quality.
- ◆ The Design Council Slide Collection used the JIDI quality assurance workshops to acquire the skills to quality assure its images. The guidelines issued were built into a very informal workflow model. A photographer on the team who had experience of quality assurance of photographic images and this helped. To ensure the quality of the images around 15% of them were checked thoroughly: two or three per CD prepared were checked.
- ◆ The Broadside Ballads Project developed its own quality assurance standards, where each image batch was fully sampled. In the end the project reviewed every single digital image.
- ◆ The John Foxe Project did not adopt quality assurance standards used by another body. Instead evaluating image quality was based on the digitiser's judgement and samples provided to the British Academy. This worked: for example, some images were rejected on such quality grounds as lack of focus or poor colour balance.
- ◆ Quality control standards at SCAN were procedural and included two quality assurance staff checked all images for completeness, focus, numbering and against colour charts for tolerances and values.

It is evident that the benefits to the DCSC came from its earlier participation in the JIDI programme in terms of the metadata and quality assurance standards to which it was exposed. Clearly there is a general need for:

- ◆ more work to be carried out on defining best practice in the area of quality assurance;
- ◆ more emphasis on training members of the community to carry out quality assurance work; and,
- ◆ structures to ensure that such quality assurance work is independently applied.

Before interviewing these nine projects we thought the lack of strategies for quality assuring metadata might have been peculiar to the JIDI. This did not turn out to be the case. Few of these projects put the same emphasis on quality assuring metadata that they put on quality assuring the digital images.

### 7.10 Communication and Management

Each project approached the problem of communication and management differently. Several put very formal strategies in place, either because their funding agency required them to do so, or because their previous project management experience indicated that this was necessary.

- ◆ The CVMA did not adopt a formal management strategy. The project appointed a steering committee, which at its monthly meetings considered reports including flowcharts and throughput information. The steering group members were drawn from the National Monument Record, VADS, JIDI, HEDS, and staff from the Humanities Computing Centre at King's College London<sup>95</sup>.
- ◆ Insight adopted the Tate's internal management guidelines and adapted them where necessary to this project.
- ◆ The TLTP History Courseware Consortium was multi-site and multi-foci. Communication was managed through steering group meetings and email, telephone and fax.
- ◆ The small size of the Broadside Ballads Project made it unnecessary to adopt formal monitoring approaches, but team members met every several weeks initially during the project and these meetings became much more frequent towards the end of the project.
- ◆ The John Foxe Project is split across two sites, with the director and research staff in Oxford and production staff in Sheffield. The Sheffield site has its own administrative director. The project director reports to an Advisory Board and the British Academy exercises tight control through twice yearly project committee meetings. Communication between sites was managed in different ways: with the British Library (Boston Spa) there were meetings, particularly at the beginning, also including the British Academy; but with Cambridge University Library a standard contractual agreement was drawn up, minimising the need for meetings and special communications.
- ◆ SCAN adopted PRINCE and provides regular monitoring reports to the Heritage Lottery Fund. The Wiltshire Wills Project adopted the Wiltshire County Council project management strategies. It evaluates its work through monthly meetings. HLF monitors meet with the project quarterly.

Monitoring is variable. Some funders, such as the HLF, employ rigorous procedures that in turn require the projects to develop their own

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<sup>95</sup> <http://www.kcl.ac.uk/humanities/cch/>



strategies. Whether rigorous monitoring is necessary in all cases is difficult to ascertain from this sample. Of course, the experience of the HLF shows that it does play a critical role in alerting monitoring teams to difficulties early enough in the cycle to avoid projects unravelling altogether.

### 7.11 Training and Advice

There is a general need for training in digital imaging, metadata, quality assurance, and evaluation strategies. Most projects report that they did not receive training before commencing.

- ◆ The CVMA reported, for instance, that staff did not receive any training, either formally or informally. All learning was done ‘on the job’, and there was a steep learning curve for all three staff. To ensure they understood the issues they went through at least one example of every type of record as a team. It was a very much a hands-on learning experience.
- ◆ The Broadside Ballads Project team did not receive training in the area of digital imaging or associated processes when they undertook the project, so all skills were learnt very much on the job.
- ◆ Staff on the John Foxe Project had no formal training. It turned to Sheffield, the British Academy, the British Library, and the Cambridge University Library for advice.
- ◆ The TLTP History Courseware Consortium offered staff no formal training, but it did provide them with access to sources of advice in some areas. This came from other TLTP projects, Computers in Teaching Initiative Centre in History (CTICH), and lawyers.
- ◆ In the case of the Design Council Slide Collection, the only formal training received during the project was the RSLP project management course, although there were some generic JIDI workshops which were very helpful because they allowed the project staff to meet others who were carrying out similar projects and this helped with problem solving. JIDI provided some general quality assurance workshops, which were helpful. The Design Council Slide Collection turned to TASI, JIDI, and much later on, VADS for advice.
- ◆ Staff on the Wiltshire Wills project received formal training in project management from Wiltshire County Council, and training on digital imaging on the HATII digitisation summer school. Advice was taken from the Research Library Group (RLG) and the project employed a consultant from HATII. They built on the RLG’s guidelines on technical metadata.



- ◆ Core staff on the Insight project had experience in digitisation before joining the project. Any new staff are trained by more experienced staff, in what is a very organic process. Insight has not yet found it necessary to turn to any external sources for advice, save consulting the project monitor from the Heritage Lottery Fund.
- ◆ SCAN digital image training was also provided on recruitment through a mix of internal and external programmes. This included quality assurance training. Other training was provided on document handling by internal conservation staff. GSU and RLG staff also provided advice.

Training is a weak point in most digital imaging programmes. In many of the early projects staff seem to have acquired the skills 'on the job'. This had an impact on workflow, costs, quality, and the final products.

<b>Recommendation:</b>
<ul style="list-style-type: none"> <li>➤ Projects should be encouraged to include an adequate training budget within their proposals and business plans and funders should recognise the benefits to funding this element of projects.</li> </ul>



## 7.12 Delivery Mechanisms

The projects in this sample followed one of three approaches to delivery:

- ◆ they developed their own delivery services;
- ◆ they arranged to use those provided by other bodies;
- ◆ or they adopted a hybrid model and both created their own delivery service and used an external service.

Insight has chosen a project specific delivery system. The digital products are online under the Tate website. Insight will also be mounted on the Tate intranet for use by staff for curatorial and research purposes. Access points will be made available in the gallery spaces for the general public to access the digital collection. At SCAN a project specific delivery system will be employed. Delivery considerations were examined at the design stage; they are linked to the development of e-commerce services. The John Foxe Project will employ a project specific delivery system. The Broadside Ballads Project developed its own delivery system to mount the resource on the Internet under the Bodleian website. The data were not deposited with any other service so that they could maintain control of it, and it is being integrated into the new Oxford digital library service.

The Design Council Slide Collection turned to VADS to handle the delivery of its material. The first phase of the project ended when the

CDs containing the images were formally handed over to VADS to be mounted on their server.

The hybrid approach was taken by the CVMA. The CVMA will employ VADS as a delivery service, and will also hold the data on either the King's College or the Courtauld Institute's own server, and in the NMR's data repository. The implementation of suitable delivery mechanisms were required by the AHRB, but the multi-delivery solution was designed to satisfy the funders, the institution which housed the project and much of the analogue resource, and one of the content providers. By using VADS it hopes that the digital resources will be sustainable and preserved, but it does not want to be dependant on VADS entirely, hence the justification of holding copies of the data on other servers and with other organisations.

Delivery services are not given sufficient attention at the project planning stage. Projects often underestimate the costs of delivery and very rarely include estimates for the longer-term costs of maintaining and updating the delivery service.

### **7.13 Monitoring**

The AHRB did not seem to monitor the CVMA imaging project during its life, but left monitoring to the project's own steering group. They were responsible for making sure that the money was spent properly, that the standards were adhered to, and that the project finished on time.

Insight is monitored by issuing progress reports to the steering committee, to the Tate's Information Strategy steering group, to all staff in the Tate via the Tate intranet and to the HLF. Other staff review these reports qualitatively. The funder employs a monitor to assure the progress of the project. At the initial meeting the level of feedback required by the monitor was agreed, and technical issues were sorted out. The project came to a site level agreement with the monitor so as to avoid any necessary paperwork whilst ensuring that their work could be monitored.

JIDI monitored the Design Council Slide Collection by means of periodic status reports. The project was required to submit information on the number of images scanned and produce an end of service report. The RSLP has a much more stringent system, whereby documentation is monitored and project plans and progress reports are produced. However, the RSLP did not monitor quality assurance. It did not ask to see a sample of the images. The main lesson learnt from these evaluations was the importance of quality assurance (from the JIDI monitoring).

An advisory committee and a steering group monitored the TLTP History Courseware Consortium. The former met twice a year and the latter four times. Formal reports were submitted to all these meetings,

which were supplemented by local management meetings every two weeks. The National TLTP team monitored the project mainly through annual reports and assessing deliverables at key stages.

The Broadside Ballads Project reported that the JISC did not monitor the project at all for the first year. After that, reports were delivered every six months. The project reported that it did not learn anything from these evaluation procedures, and felt that they were just an exercise that they had to go through to get paid.

The John Foxe Project submits progress reports to the British Academy and these are discussed at committee meetings. At key stages deliverables are monitored by the AHRB's peer review process. In the case of the Wiltshire Wills Project, the HLF monitored the progress of the project by means of three monthly meetings and regular reports. Good records are required and this is especially true for financial materials. The team learnt from this process that they did not know enough about digitisation and that they should consult experts in the field. Similarly, on the SCAN project staff was provided with formal management training on-site by an external consultant in advance of the project. The HLF employs quarterly review meetings and monthly reports to monitor the project. NAS and GSU monitoring takes place through regular committee and departmental meetings.

Recommendation:
<ul style="list-style-type: none"> <li>➤ Monitoring systems should be proportionate and bring benefits to the project and to the funder.</li> </ul>



#### 7.14 Sustainability and Preservation

Few projects adequately address the issue of sustainability of digital resources when they develop their business case, although there are some notable exceptions, such as SCAN. Where there is a significant institutional commitment to the digital resource and it will form a core element of the institution's access or conservation strategy, then sustainability tends to be less of an issue. The Tate has adopted Insight as a core element in its future access plans; it has clearly stated its intention to maintain the digital resource and guarantee that it is sustainable. By the time the funding for the Wiltshire Wills Project comes to an end the Wiltshire and Swindon Record Office hopes to have implemented a strategy to sustain the resource.

The History Courseware Consortium's digital resources will, the project reports, be sustainable through mastered CDs and server backups. Copies of the CD-ROMs have been deposited in the British Library and

are distributed to all UK HE institutions for handling charges only. The consortium lacks a digital preservation strategy, but widespread dissemination may prove as good an approach as any.

Insight put a preservation strategy in place; images are backed up online and masters are archived on archive stable CDs stored in secure offsite locations. The Tate will maintain responsibility for this, with new master copies being made every five years or so, after the project funding ends. At SCAN the materials will be sustainable because the project has been underwritten by the NAS. A digital preservation strategy is in place involving media of multiple types and formats. Copies of the data will be held at the NAS and the GSU. The John Foxe Project has put a preservation strategy in place for the digital material: images were scanned at the highest possible resolution; masters are held in TIFF format on CD, magnetic tape, and hard disks. A copy will be deposited in the British Library.

Projects face a general problem with ensuring that the resources they produce are sustainable beyond the life of the project. Even where projects attempt to address the technical preservation issues, they still face difficulties with the economic costs of sustaining these resources.

### **7.15 Evaluation**

The projects included in our study recognised the key role that evaluation studies have to play in shaping initiatives. This includes the projects that have not conducted (or did not conduct) studies of this kind.

Neither CVMA nor the Design Council Slide Collection conducted user evaluations. The CVMA prepared an end of project report, but this was a self-reflective rather than evaluative document. The CVMA reported that, while it thought formal evaluations had much to contribute to the project, the funding for this activity was not available. However, it has built support for this work into plans for the subsequent project. The Insight project has put a number of processes in place to ensure that its outputs will meet the needs of users. The project steering group and other staff in the Tate are looking closely at user needs and the methods that might be put in place to evaluate the outcomes of Insight. Once the project becomes more advanced it will be incorporating feedback from the general public into the development of the system. The Broadside Ballads Project interface for the website was tested by users and their feedback integrated into the development of the system. It was also tested on a variety of different platforms.

The TLTP History Courseware Consortium used formal evaluation mechanisms to drive the development of its materials. The advisory group and the steering group initially tested a prototype tutorial and the results of this exercise fed into the process of refining the prototype. Once this was formally completed it was evaluated in teaching and

learning contexts at twelve institutions and put out for external evaluation. The initial evaluation made a significant contribution to the design of the first tutorial and all subsequent ones. The project learned that simplicity, ease of use, short text passages with hyperlinks to resources, and low-resolution images provided a better product. It adopted 72 dpi (dots per inch) resolution images as the project standards as they found that these adequately captured the necessary information content for the purposes of this project, and dramatically improved the network-based delivery of material. The understanding that resulted from this initial evaluation led to a change in the underlying technology that was used by the TLTP-HCC; it shifted from Microcosm to HTML. All further products were formally evaluated, and the developments responded to the lessons from these evaluations, but none had as fundamental an impact on the direction and approach of the project as the first evaluation did.

The John Foxe Project has involved the research team, which is actually using the digital resource, in the evaluation of the product throughout its development. The project has also consulted with academics who are not Foxe specialists but who are likely to use the resource. The project learned lessons about the image resolutions users require and the functional expectations that users have of the system (e.g. the ability to zoom in on details). In a similar vein, the Wiltshire Wills Project conducted a user survey to ensure that the outputs would meet their needs. This provided a lot of information about user expectations in terms of digital image quality, functionality of the system (e.g. zoom, cut and paste, searching tools), expectations from printed surrogates of the digital images, and what they are prepared to pay for different resolution images.

The Images of England Project, although it did not formally contribute to this study, provides a good example of an approach to evaluation that might be more widely adopted.<sup>96</sup> While it does not focus on the images alone, but is attempting to look at the overall look and feel of its delivery mechanisms, the way in which the project has run the process itself provides valuable lessons.

#### **7.16 Conclusions and Recommendations for JISC arising from these Projects**

It is worth noting that few of these projects encountered rights issues. In most cases the institutions that initiated the projects already held the rights in the material that the projects were imaging. The DCSC did encounter difficulties. It reported that attempting to handle the rights issues associated with the materials might impede future digital imaging from the collection. This report does not delve into rights issues, but it does recognise the risks that these issues pose to digitisation projects.

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<sup>96</sup> <http://www.imagesofengland.org.uk/>

These projects demonstrate that JIDI's impact extended well beyond the thirteen participating sites. It influenced projects funded under other programmes and even funded outside the HE community.

There is wide recognition of the importance of carrying out evaluation studies at all stages of digital imaging projects among those who conduct these sorts of projects, but the funding for these projects frequently does not include sufficient support for them to carry out the evaluation work. All funders should be encouraged to ensure that evaluation and impact studies are an accepted element of digital imaging projects.

Fitness for Purpose must be a guiding principle in digital imaging projects. Evaluation studies play a key role in ensuring this. Some of these projects are driven by academic research agendas (e.g. the John Foxe Project, CVMA), others are driven by teaching and learning objectives (e.g. TLTP History Courseware Consortium), and still others by improving public access to and understanding of cultural assets (e.g. Broadside Ballads, Insight, SCAN, and Wiltshire Wills). Of course, more than one objective might underlie the decision to create digital images. For instance in the cases of SCAN and Wiltshire Wills, access and preservation were key reasons for undertaking digital imaging.



## 8 Digital Imaging Models & Models in Action

### 8.1 Introduction

The work of JIDI and its participating sites successfully delivered a formidable suite of digital materials. The JIDI approach has much strength, as was evident in the earlier sections of this report. The aim of this section is to look at the models that are available for managing digital imaging initiatives within the UK higher and further education communities and indicate their respective strengths and weaknesses. Section 8.2 looks at the overarching digital imaging models, while Section 8.3 examines detailed issues that need to be addressed, whichever model is adopted, and recommends some approaches to these issues (such as content needs analysis, training, and quality assurance).

### 8.2 Broad Digital Imaging Models

The motivations that drive funding agencies vary. Research funding bodies, such as the AHRB in the UK or the NEH in the US, support the creation of digital images either where these are a by-product of research driven endeavours, or where they enable research to happen that might otherwise be impossible. The HLF supports digital imaging where it improves access, assists conservation and preservation, and in part where it brings educational benefits. For NOF projects that have lifelong learning at their core are priorities for support. Other bodies focus on the provision of support for digital imaging where it generates materials that will contribute to teaching and learning initiatives. These various motivations have an impact on the ways in which these bodies evaluate applications and on the relationships that they have with the projects that they fund. From the vantage point of JISC, there would seem to be three possible approaches that it could take to digital imaging:

- ◆ JISC as funder;
- ◆ JISC as manager of digitisation programmes;
- ◆ JISC as purchaser of content, and guidelines for best practice.

#### 8.2.1 Funder Driven Model

The funder driven model puts the emphasis on the definition of the call for proposals and the selection of projects for funding. In a strategically targeted call it should be possible to encourage and support projects that will fill existing and anticipated needs for digital images for learning, teaching, and research. In making agreements to fund proposals the funding agency can stipulate the standards and practices that projects must follow. This will make it feasible for disparate projects to produce



consistent and interoperable resources. There is an increasing realisation that the establishment of guidelines for digital imaging, metadata, quality assurance, and delivery is essential.

The model depends upon the funding agency putting in place monitoring procedures to ensure that through the process of developing digital resources the products are of suitable quality. The problem is that monitoring digital imaging initiatives is an expensive activity. There are three basic strategies for monitoring imaging projects:

- ◆ monitoring the products;
- ◆ monitoring the process;
- ◆ a hybrid approach in which both products and processes are monitored.

Process monitoring is probably the most cost effective from the perspective of the funder. It depends primarily upon ensuring that documentation and reporting procedures are in place that enable the monitor to assess the processes in use by the project and to establish how these are managed. The weakness of this approach is that many of the problems with digital imaging arise, not as a result of poorly defined processes (although this does happen), but because those processes are poorly implemented. During the initial phase of the Images of England project, for example, well-defined processes were in place; nevertheless, the project found that, although the outsourcers understood the issues related to digital imaging, they implemented the guidelines incorrectly, and this resulted in poor image quality. The issue was addressed through a review of the way in which the processes were being implemented. However, it was a review of the products and not the processes that had thrown up the difficulties with the imaging work.

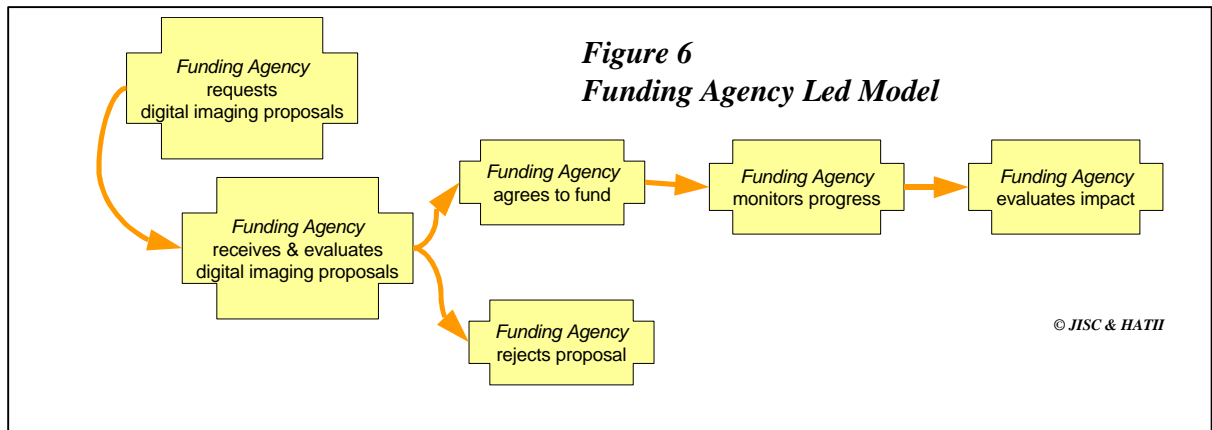
Monitoring the products is technically a labour intensive way to oversee digital imaging activities. This output-managed approach depends upon a clear definition of the project deliverables and the development of a product-monitoring schedule. From a review of the JIDI project it would appear that the output monitoring process would involve the examination of at least the following deliverables:

- ◆ the digital images;
- ◆ metadata;
- ◆ documentation;
- ◆ delivery interface;
- ◆ preservation strategy.

This requires monitoring guidelines, auditing procedures, and pre-defined sampling strategies.

Probably the most effective, but most expensive, monitoring approach depends upon the monitoring of both process and product.

It is worth remembering that our investigation of funders showed that their approaches to digital imaging were not consistent and that few had rigorous monitoring procedures in place. Guidelines are needed for project monitoring, which can be used by funders at both national and institutional levels.



The funding model puts the emphasis on four areas of activity at the funding agency:

- ◆ the development of the call for proposals;
- ◆ the establishment of rigorous proposal assessment procedures;
- ◆ the definition of guidelines for imaging, metadata, documentation, quality assurance, delivery mechanisms, and impact evaluation (an alternative approach would enable proposers to indicate what guidelines they proposed using and the funder would decide whether or not these provided an acceptable approach);
- ◆ the creation of project reporting and monitoring procedures.

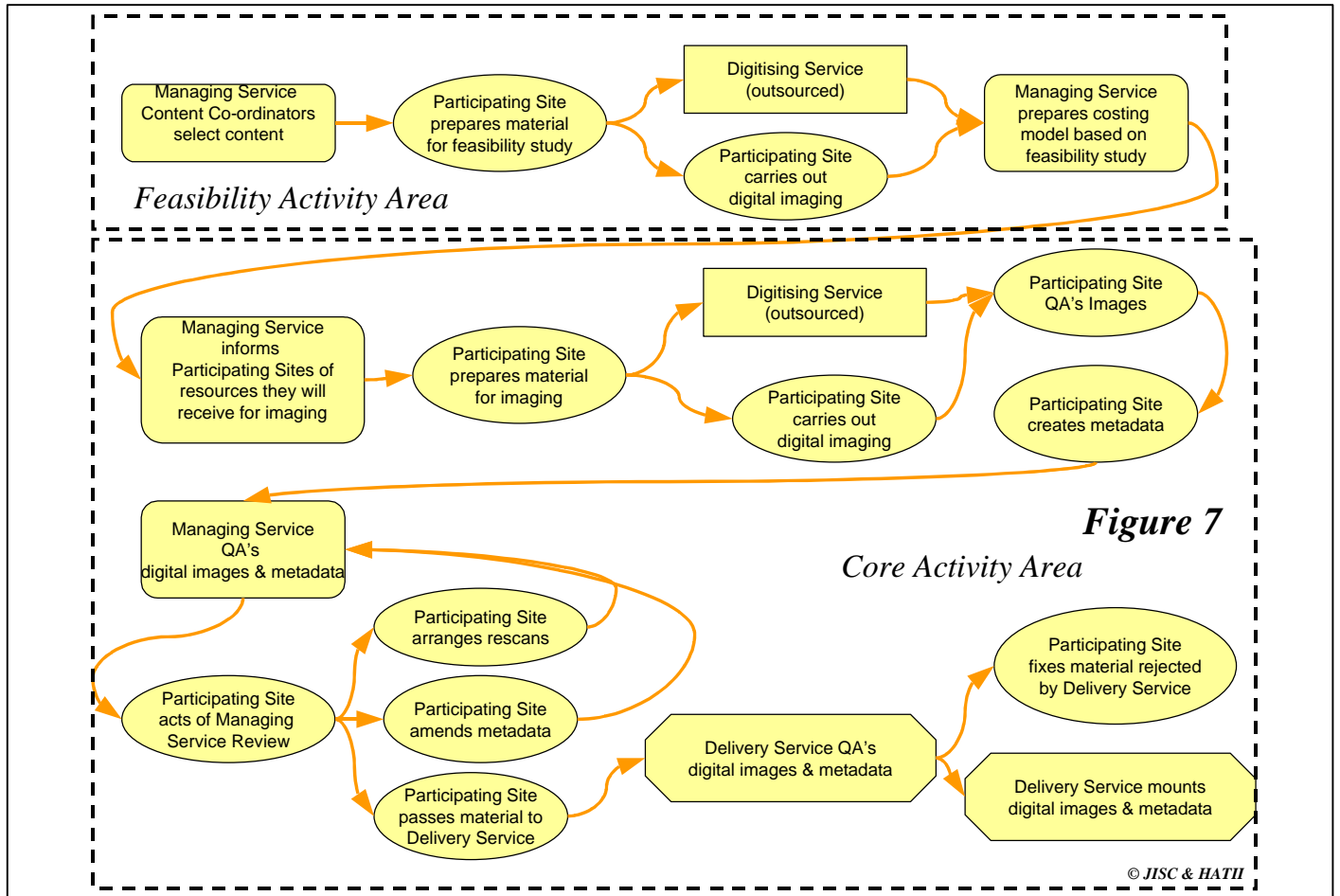
### 8.2.2 Managed Digital Imaging Programmes

In this second model JISC runs a managed digital imaging programme. This approach is very much the strategy used during the JIDI project.

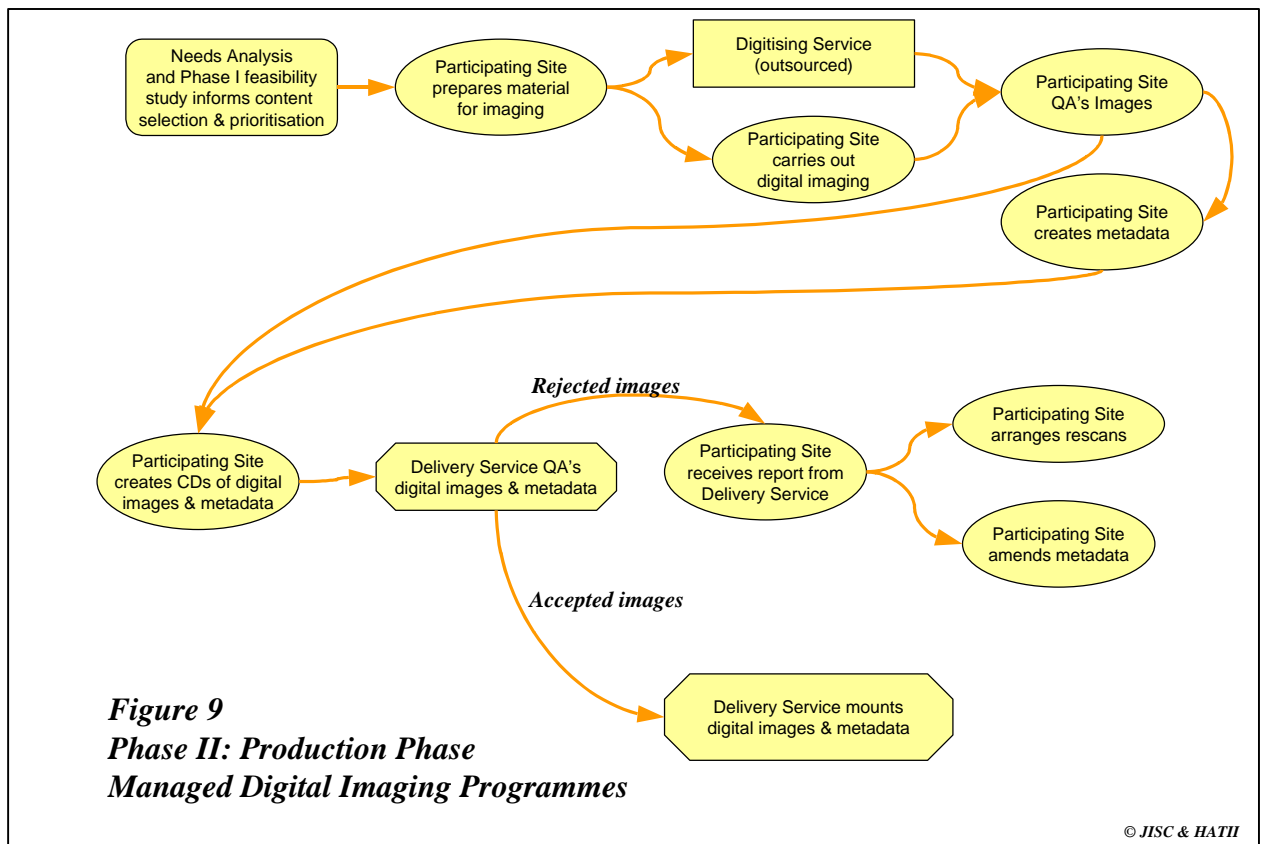
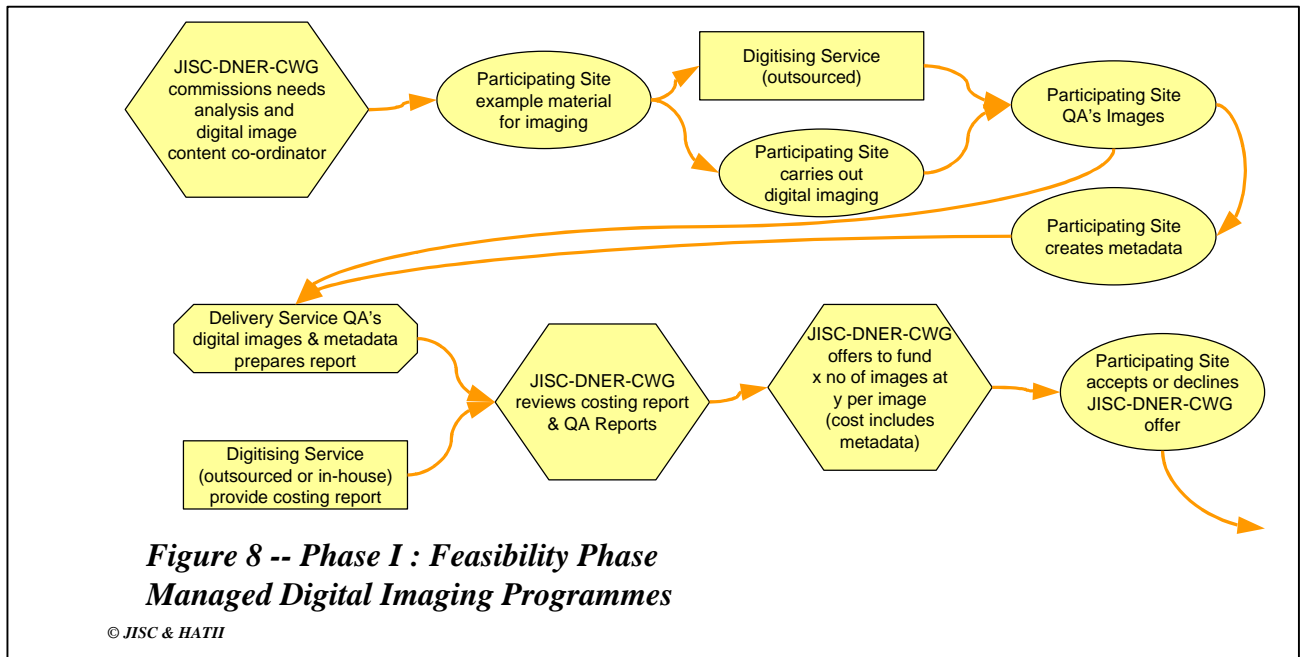
The weaknesses lie in the costs, the complexity of projects of this kind and the tendency for them to become umbrella initiatives rather than managed and coherent programmes. There are two key strengths in this model:

- ◆ the role of the content co-ordinators;
- ◆ the quality assurance procedures.

The model allows participating sites either to carry out their digital imaging work in-house or to outsource it. Figure 7 lays out the JIDI Imaging model as it was applied during the JIDI project. This model is characterised by imposed cost models and redundancy in quality assurance.



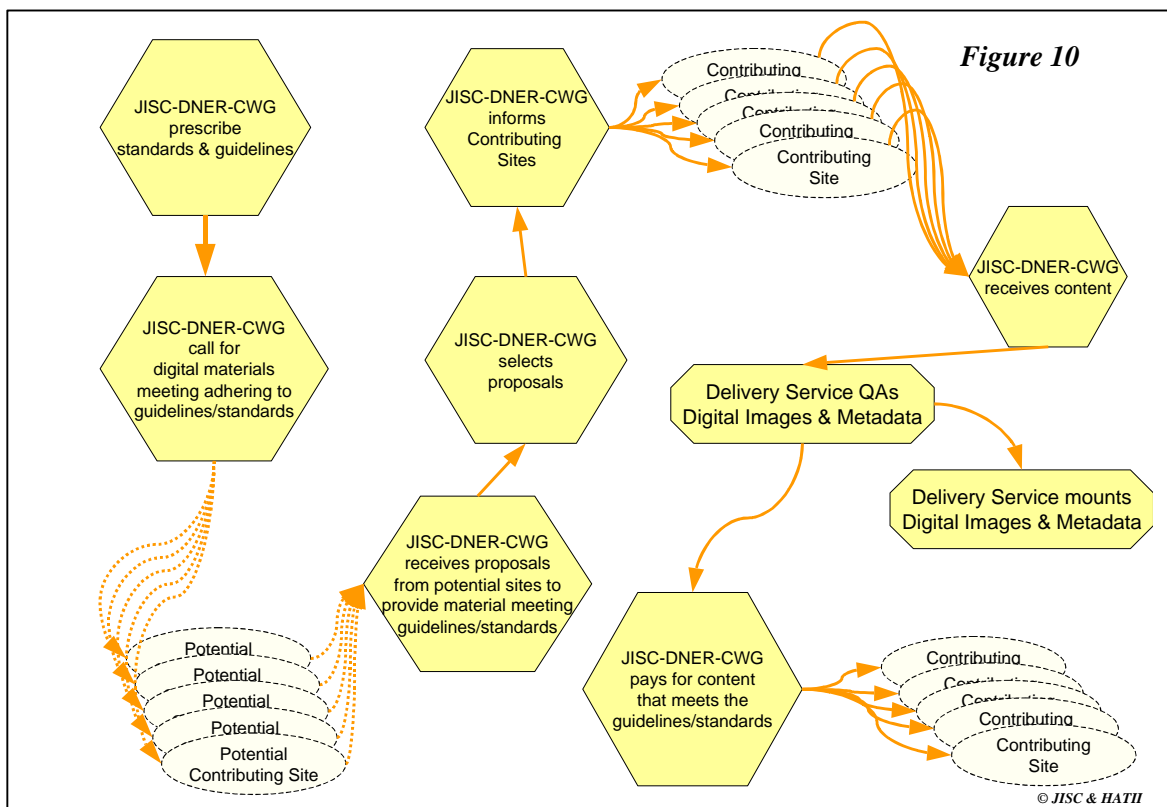
The difficulty with the JIDI 1 model is that it has interposed additional steps in the process that are unnecessary. An alternative (see Figures 8 and 9) would be to break the digital imaging activities into two explicit phases: a feasibility phase and a managed digitisation phase. In addition, the managed digitisation phase could be streamlined by having the independent quality assurance done by the delivery service and not by an additional intermediary organisation as in the existing JIDI model.



### 8.2.3 Delivery Led or Consumer Driven Model

The DNER depends upon the development of resources to particular standards if these resources are to be interoperable and consistent. As an alternative to a funding driven model, JISC could establish a delivery driven model, in which guidelines for digital materials (e.g. images, metadata, delivery interfaces) are prescribed for potential suppliers of digital resources. In this model creators of digital images agree to sell or lease their material to the DNER, and the DNER only pays for materials that adhere to its prescribed standards or image creation guidelines. This model involves the least infrastructural development on the part of JISC and is the least interventionist. This model:

- ◆ assumes that the delivery mechanisms are managed by JISC or at least audited by it;
- ◆ assumes that the DNER is in the business of purchasing content and not managing digital imaging activities;
- ◆ reflects the existence of JISC funded advisory services such as TASI and data preservation services such as the AHDS and Essex Data Archive;
- ◆ depends on JISC identifying the needs of the HE/FE community;
- ◆ is responsive to changes in learning, teaching, and research needs in the HE/FE environment;
- ◆ enables content owners to contribute to the programme rather than participate in it;



- ◆ is risk adverse because it shifts all the content creation, quality assurance, and project management risks back to the originating institutions (i.e. contributing sites);
- ◆ uses monetary mechanisms to ensure that content meets prescribed digital imaging and metadata creation guidelines;
- ◆ requires no monitoring by JISC of individual projects;
- ◆ renders the establishment of a management infrastructure unnecessary, thereby removing some of the complexities of digital imaging projects.

In comparison with the available models, the delivery led or consumer driven model:

- ◆ offers JISC the best return on its investment;
- ◆ poses JISC the lowest risk;
- ◆ builds on existing infrastructure;
- ◆ does not preclude JISC from providing training and technical support to the contributing sites, but does not require that it do so; and,
- ◆ does not preclude JISC from providing instruments or guidelines to assist contributing sites in managing metadata creation, the purchase of digital imaging services, or the quality assurance procedures.

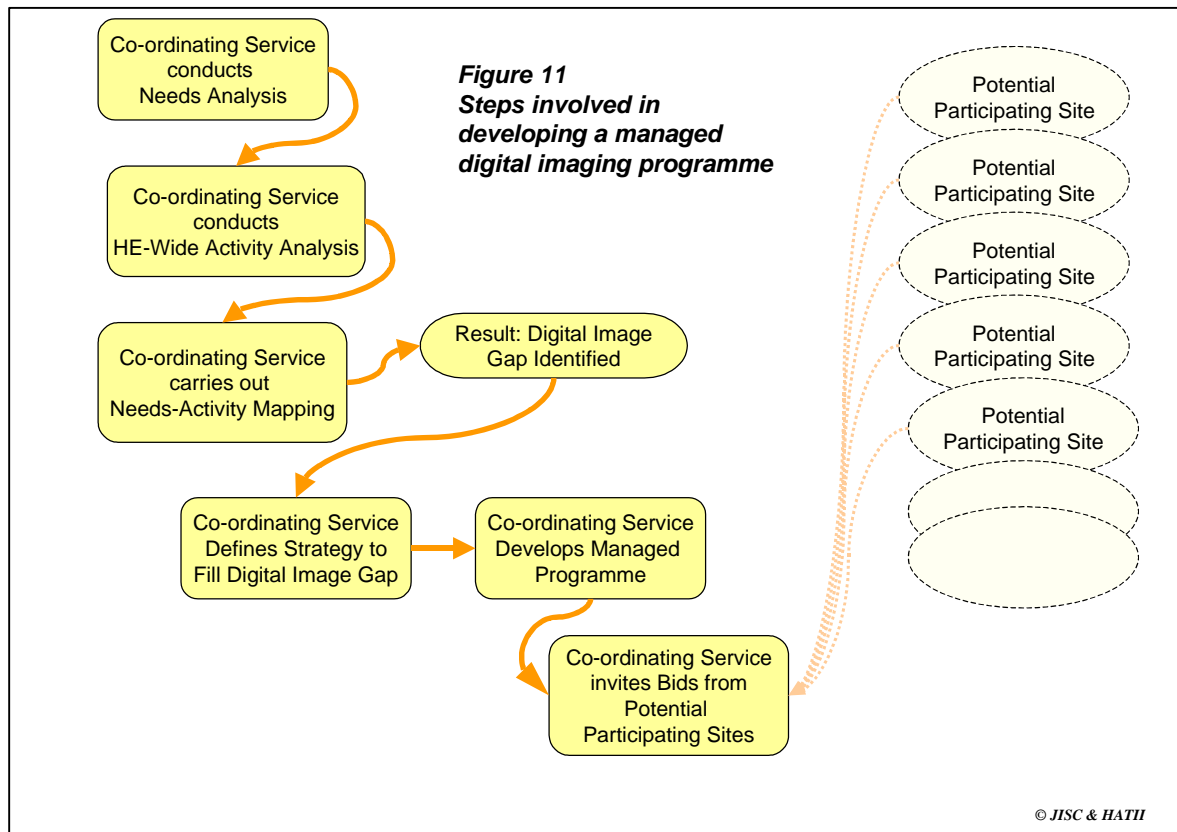
This approach helps to generate a marketplace for digital image content within the HE/FE community. The creation of a digital imaging market is the key step in ensuring the unlocking of digital content held in HE/FE institutions.

### 8.3 Defining a Digital Imaging Programme

The current models for developing digital imaging programmes in use by such funding sources as the Heritage Lottery Fund, the New Opportunities Fund, the Scottish Cultural Resource Access Network (SCRAN) and many other organisations are 'proposer or recipient driven models'. While this approach has many strengths and should be encouraged, there is clearly a need for an alternative model that is driven by an explicit examination of the needs for digital materials within the higher and further education communities. The figure below (Figure 11) provides an indication as to how such an approach might work. It builds on the strategy that JIDI employed at the beginning of its project, but adds several steps. JIDI started with a general call for potential participating sites to come forward with proposals. It then used subject specialists to select from these proposals a coherent programme of material. The digital imaging landscape has changed radically since JIDI

began. Now a number of institutions are funding the creation of digital materials and an even larger number are undertaking digital imaging work. As we have noted earlier, it is unclear as to whether or not these initiatives are successfully meeting the needs of the HE & FE communities. This suggests that new managed programmes should begin by carrying out needs analysis and review of existing initiatives to ensure that new materials fill gaps rather than duplicate existing resources. Once the needs analysis and institution activity review have been mapped, it should be possible to plan a strategically targeted digital imaging programme.

There will be a need to define digital imaging content whether JISC adopts a managed digital imaging programme or a delivery led model. This approach, therefore, could be used in conjunction with other digital imaging support models.



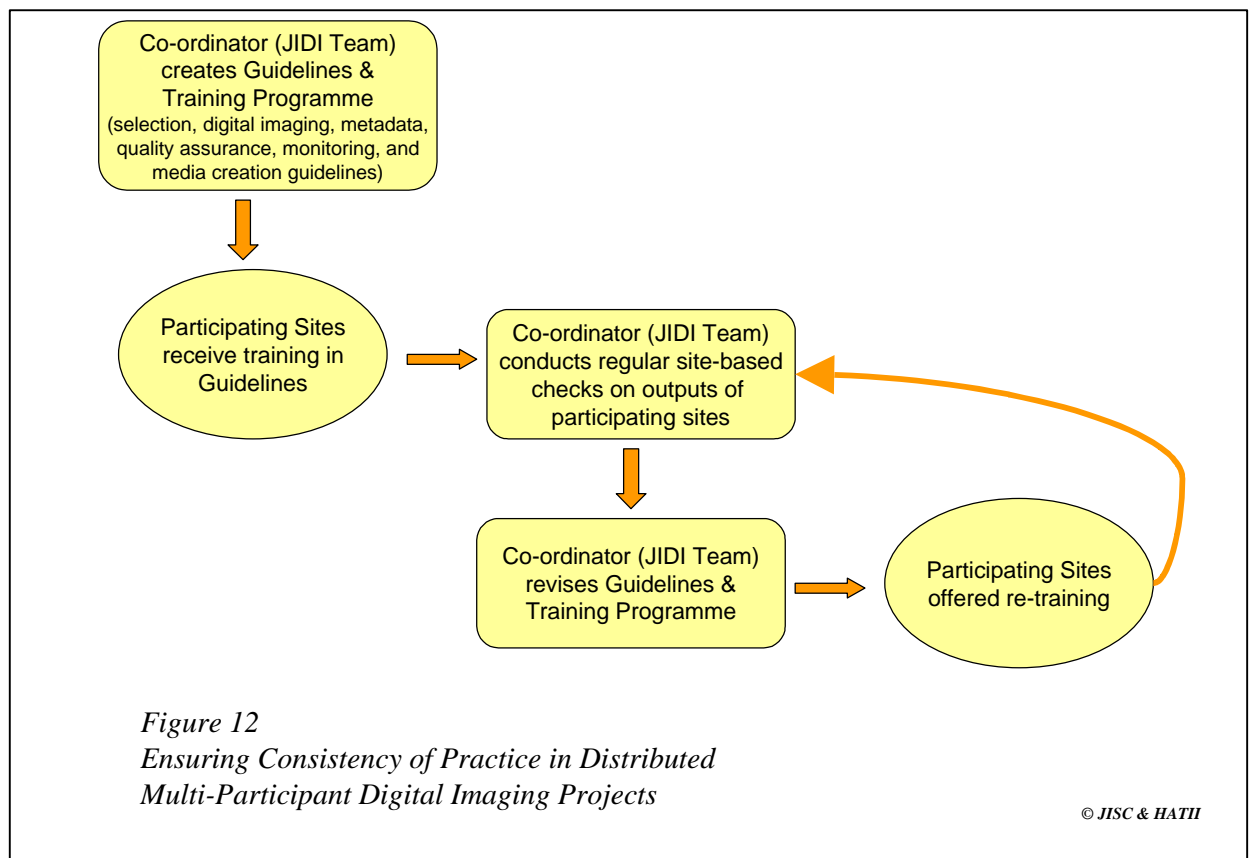


### 8.3.1 An Evaluation Strategy for Digital Imaging Proposals

The process of evaluating digital imaging projects has been rather *ad hoc* in the past. Our discussions with funders had indicated that there might be more rigorous ways to select projects for funding. Two of these selection models are presented here: single evaluation model or content driven multi-phased evaluations.

### 8.3.2 Training

A strategic way to ensure the success of distributed, multi-foci, and multi-participant projects is through the development of adequate guidelines and suitable training programmes to make sure that all the distributed teams are working to the same standards and guidelines. The provision of training should be established at an early stage and should cover such areas as: (a) selection of material for digitisation, (b) user needs analysis, (c) preparation of material, (d) digital imaging, (e) metadata creation, (f) quality assurance, (g) monitoring work, (h) media creation, and (i) evaluation.



The review of the work undertaken by the participating sites indicated that they could have benefited from more training in all aspects of digital imaging. While we recognise that training is expensive, the costs associated with digital imaging programmes suggest that investment

made in training would be well placed. A series of one or two-day formal training modules delivered during the first year of digital imaging projects, with additional training in subsequent years based on the monitoring of project outputs, would provide a programme of training linked to the progress of the project.

Training modules are needed during the first year in:

- ◆ evaluating user needs;
- ◆ project management;
- ◆ initiating outsource digital imaging contracts or managing in-house digital imaging projects, depending upon which approach the contributing or participating site has adopted;
- ◆ metadata creation;
- ◆ quality assurance.

The areas of metadata and quality assurance were the two that posed the most difficulties to sites that participated in the JIDI project, and which other projects have recognised as problematic.

### 8.3.3 Communication

One of the main difficulties with multi-site and multi-foci projects is communication. The Internet Learned Early Journals Project<sup>97</sup> has also found this to be the case. Much recent research into the area of collaborative projects is attempting to address this issue. Although email, the web, phone calls, and video conferencing all offer ways for groups to share information, face-to-face meetings are a key to the successful delivery of collaborative projects. If the JISC adopts a managed digital imaging model, then it will be necessary to put in place more rigorous and effective communications models than have been used on distributed projects in the past.

It would make sense for such a programme to use a battery of methods to ensure effective communication between the participating sites, the co-ordinating service, the digitisation services, and the delivery services. This should include:

- ◆ a one-day workshop twice a year at which all parties have a chance to give short presentations and to discuss key issues in breakout groups (this should be a separate endeavour from the training activities described above.);
- ◆ bi-annual visits by staff from the co-ordinating service to the participating sites;

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<sup>97</sup> <http://www.bodley.ox.ac.uk/ilej/description.html>

- ◆ active use of web-boards to allow participating sites to share information;
- ◆ scheduled weekly telephone contact between the participating sites and the co-ordinating service;
- ◆ wider use of video conferencing;
- ◆ making sure that communication between the participating site and both the digitisation service and the delivery service is conducted simultaneously with the co-ordinating service, to avoid gaps in communication.

During the project it might be useful to poll the participating sites annually for their views on whether communication with the co-ordinating service is working effectively. This information could be used to identify areas for improvement or new communication methods.

The JIDI project involved several different types of content and the communication between the participating sites themselves provided an important mechanism for cross-fertilisation. The participants felt the opportunity had not been exploited as fully as it might have been, but of course this is in part down to the participating sites themselves.

#### **8.3.4 Outsourcing or In-house Digitisation**

More emphasis on cost and risk modelling will help determine whether outsourcing or in-house digitisation provides better results. Projects frequently misunderstand the process of digital imaging and its technical demands, with the result that in house initiatives often produce lower quality digital materials than external agencies do. On the other hand, institutions often find it difficult to manage external imaging companies without model service level agreements or guidelines for contract management, and because content owners and external digital imaging firms frequently speak very different languages.

#### **8.3.5 The Use of Surrogates for Digital Imaging**

A number of participating sites used film-based intermediaries for digital imaging. For some materials, such as oversized works of art, this is still the most effective way of delivering the material for digital imaging. Wherever possible, though, the use of surrogates should be avoided in favour of working directly with the originals. For this reason the use of conservation and risk assessments in the process of planning projects is essential. Many of the risks that conservators see in the use of digital imaging could be addressed, as they have by the Insight (Tate Gallery) team through ensuring that conservators and curators are aware of the processes involved in digital imaging.

### **8.3.6 Quality Assurance**

Projects need to establish independent quality assurance procedures. The difficulties with the metadata provided to VADS by some of the participating sites are not surprising, since most of the projects managed the procedures internally, but did not have sufficient numbers of staff to ensure that quality assurance was done independently. Furthermore, there is a lack of sampling models to use when selecting images for quality assurance. At the outset it is essential not only that quality assurance procedures are put in place, but also that the participating sites (or contributing sites) have adequate infrastructures in place to be able to implement the quality assurance guidelines successfully.

Quality assurance should involve comparison between the digital image with the original materials to ensure the highest quality results. This is what Michael Ester has referred to as 'matching to scene', and is especially important where film intermediaries have been interposed between the original and the digital image. This conclusion is supported by the work of several of the projects included in the JIDI programme.

### **8.3.7 Project Management Guidelines**

The likely success of projects is enhanced where project management has been thought through carefully and appropriate structures put in place. For larger projects such as SCAN, Images of England, or the Local Heritage Initiatives ICT system development, PRINCE2 has been found the most suitable approach. For other projects, including those funded by SCRAM, the use of a cut-down version of PRINCE2, ('the Quintessential Prince') may be suitable. There are alternatives, such as those used by the Wiltshire and Swindon Record Office, the Tate Gallery, the TLTP History Courseware Consortium, or the John Foxe Project.

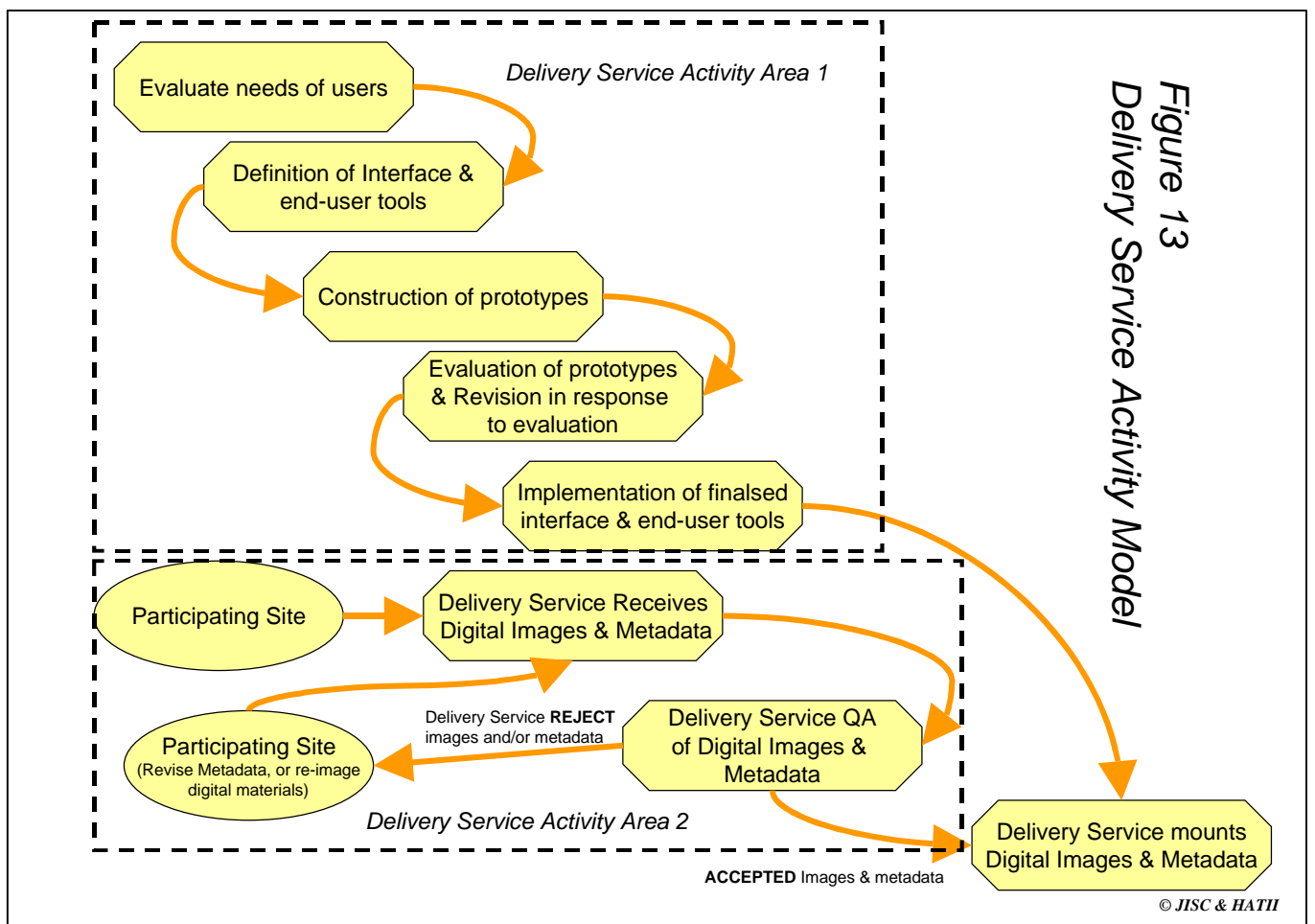
### **8.3.8 Risk Management**

Many projects overlook the importance of developing a risk register. Identifying the risks that projects are likely to encounter, implementing methods to avoid them occurring, defining how the project will know when a risk has arisen, and establishing strategies for addressing them are critical to developing a programme of work and to ensuring that the project can respond to unexpected change.

### 8.3.9 Role of the Delivery Service

The delivery service has two core roles to play in the supply of digital image materials. It defines the interface and tools that will be available to the end-user, and it provides the quality assurance on the materials that are to be delivered.

The activities of the delivery service have been divided into two activity areas. In the first (Area 1 in Figure 13) it conducts user evaluations to define the interface tools, creates prototypes, evaluates the prototypes, and eventually delivers the finished product. In the second phase (Area 2 in Figure 13) it adds the content to the system after quality assuring it.



### 8.3.10 Strategies for Monitoring the Programme

The amount and intensity of monitoring a project requires will depend upon which model is adopted and the objectives of the programme. If the funder model or the managed model is used, then formal monitoring procedures need to be put in place. In Section 8.2.1 the differences between product and process monitoring have been outlined. It was suggested that a combination of the two approaches would provide the lowest risk approach to monitoring digital imaging projects. However, we have noted that the delivery led model does not require JISC to use any monitoring procedures. It focuses on review of the products that are delivered for mounting. This is an accept-or-decline review stage. Project monitoring programmes need to be benefit driven. Benefits must be clear to funders and grantees, otherwise grantees will lack the motivation to comply with the requirements of project monitoring. There should be a clear relationship between the project management infrastructure and project monitoring methods.

## 8.4 Conclusions and Recommendations

There is no good comprehensive model for digital imaging currently available that can support drill down into individual activities. What is clear from the JIDI project is that it defined a model that helped it to achieve its objectives. This model was responsive to the changing context of the digital imaging landscape in which JIDI was working.

Here we recommend three models

- ◆ a funder driven model;
- ◆ a multi-site and multi-foci managed model;
- ◆ a delivery led model based on consensus-developed standards.

These are not the only approaches that can be taken to the creation of digital resources and these models can be used in conjunction with other approaches, such as collection or institution driven digital imaging programmes. All three models work very effectively with a higher and further education needs-based approach to the identification of digital image requirements. This approach to needs analysis is suggested in section 8.3.1 above.

The fundamental question that JISC must ask is whether it intends to be one among many funders of digital imaging activities, or whether it wishes to make a more substantial contribution to the digital imaging landscape. One of the successes of JIDI was that it raised community awareness about the strategies and difficulties involved in digital imaging. It demonstrated that, even with good quality assurance guidelines in place, it was still difficult to achieve quality products. A crucial element behind the success of JIDI was the independent quality

assurance procedures that it put in place. The funder driven and delivery led models do not provide sufficient mechanisms for monitoring the digital imaging process and depend upon output measurements for monitoring the success of projects.

On the other hand, the multi-site and multi-foci managed digitisation model is cumbersome because it involves a layer of management that the delivery led model does not require. However both models should achieve the same results. The delivery led model will be the lowest risk model for JISC because it only pays for resources that meet the standards JISC lays down at the point at which it enters into an agreement to purchase materials from a contributing site. It does not need to have multi-quality assurance steps as it buys the product rather than the product and the process.



## 9 Conclusions and Recommendations

### 9.1 Conclusions

The Executive Summary captures the main conclusions of the report. Here we wish to bring together the recommendations to ease the reader's access to the report as a whole.

It is fair to say that the participants in the JIDI project all came with different philosophies and objectives. This confluence brought both strengths and weaknesses to the project. We have seen the significant role that JIDI played in the developing digital imaging landscape.

Communication is key to the success of these projects and all participants need to be bound by service level agreements and clearly aware of their obligations and those of the other project participants.

It is also evident from a review of other funders that there remains a need for more work to be done to assist applicants in developing proposals, in defining how needs analysis and evaluation studies will be carried out, and in identifying the appropriate funding and management models.

This review has given us the opportunity to identify the strengths of JIDI that should be implanted in other projects and to make recommendations for funders, projects, and institutions to adopt when planning digital imaging activities.

#### 9.1.1 Summary Recommendations

The table below gathers together the recommendations made throughout the report. There is some overlap between them, but this is to be expected as they originate from looking at the problem from different angles. It provides a reference to the section where the recommendation is originally made.

<b>Recommendation</b>	<b>Section</b>
JISC should fund the development of dynamic costing models for digital imaging projects and programmes.	3.4.2
Projects need to conduct realistic analysis of the workflow issues.	3.4.3
A template to assist workflow modelling for digital imaging projects should be established, tested, and made available to the HE & FE communities.	3.4.3
Contracts for digital imaging need to link all parties involved in the process so that they more accurately reflect the key activities and the role of the players.	3.4.4
Formalised project management methods should be adopted by projects.	3.4.4
While it is evident that all processing should be done at capture stage, there may be reasons to permit some post-capture processing. Guidelines for post-capture processing should be clearly established for digital imaging projects and be permitted where the benefits are designed to ensure a 'more accurate' digital image than would be produced only through scanning.	3.4.5
Fitness for Purpose may provide an appropriate guiding principle in selecting such technical standards as scan resolution, and bit-depth, and benchmarking post-processing.	3.4.5
Technical guidance on digital image laboratory set up and evaluation needs to be established.	3.4.5
The key role of metadata needs to be stressed and adequate funding allocated by all digital imaging projects for their creation.	3.4.6
Quality assurance procedures for metadata need to be established.	3.4.6
Digital imaging projects should always receive advice about the good practice storage and should be encouraged always to work in the costs of storage and backup into their business plans.	3.4.6
That participating sites demonstrate the availability of or the plans to implement sufficient technical infrastructure before receiving funding for digital imaging.	3.4.7

That sufficient training resources be available to participating sites to ensure that they are skilled up to create appropriate metadata.	3.4.7
Institutions taking part in or seeking funding for digital imaging provide an assessment of the impact that the digital imaging activities will have on the local initiatives at the participating sites.	3.4.7
In JIDI style projects the central service should be the centre of dialogue.	3.4.8
Projects need access to more funding streams to enable more comprehensive and regular training.	3.4.8
Clear guidelines for conducting the quality assurance of digital images need to be established.	3.4.9
As JIDI has demonstrated, independent quality assurance procedures are essential for digital imaging initiatives. All digitisation projects should ensure they have put independent quality assurance procedures in place.	3.4.9
Monitoring processes need to be put in place before digital imaging projects commence.	3.4.10
No projects should be funded that have not given consideration to evaluation processes and in particular impact evaluation.	3.4.11
Digital imaging projects should only be funded where plans for the delivery of the digital images have been made before the start of the project.	3.4.12
The delivery service should have a core role in digital content creation projects from day one.	3.4.12
The economic life of digital assets should be declared by JISC as indefinite.	3.4.13
Preservation strategies are essential. Digital imaging projects should either have access to nationally managed preservation arrangements put in place by the funder, or provide clear evidence of access to local preservation facilities.	3.4.13
Before beginning digitisation work future projects should clearly identify their primary audiences and conduct research into their needs.	4.3

The planning stage needs to be much more formal, involving the putting in place of selection strategies, digital imaging and quality assurance guidelines, and metadata standards.	4.4
Projects should carry out conservation surveys as part of planning digital imaging projects.	4.4
All projects should adopt selection procedures.	4.4
Where feasible, projects could benefit from obtaining multiple quotations for digital imaging work before selecting a supplier.	4.4
Dynamic digital imaging cost models need to be developed, if projects are to estimate the true costs of digital imaging initiatives.	4.5
Even where home institutions are prepared to absorb costs these assumptions should be clearly stated so that the true value of digital imaging activities are recognised.	4.5
Generic workflow models need to be established that allow realistic estimates of the effort and time commitments involved in digital imaging projects.	4.6
Digital images should be created from the original materials rather than surrogates, although conservation and handling risks need to be considered in an assessment of whether this approach is viable on a collection by collection basis.	4.7
Projects that wish (or need) to carry out their digital imaging in house should ensure that they have either an adequate technical infrastructure in place or sufficient budget to create such an infrastructure.	4.7
There is a need for a standard set of imaging guidelines so that projects do not have to create their own.	4.7
Projects that already have good metadata in place before beginning digitally to image their collections should be a higher priority for 'digital imaging funding' than those that must undertake both digital imaging and metadata creation.	4.8
Methods for capturing technical metadata need to be automated.	4.8

Collaborative projects need access to a single application and/or standard for metadata encoding to ensure consistency and interoperability of the resulting resources.	4.8
Metadata guidelines must be clear, easy to understand, and accompanied by a variety of examples and training materials.	4.8
It is essential that in the quality assurance process the character of the originals is fully understood by all those involved in digital imaging, metadata creation, and quality assurance.	4.9
Where surrogates provide the targets for digital imaging the digital image files should be quality assured against the original objects rather than the intermediary	4.9
The quality assurance of the metadata must be given as high a priority as that of the digital images.	4.9
Distributed and multi-participant projects should put in place communication plans before commencing work.	4.10
Projects should evaluate the effectiveness of communication plans regularly to ensure that they are proving the best ways to help projects achieve their objectives.	4.10
Where projects are running managed services, adequate training should be provided and this training should be based on a 'training needs analysis' and managed by a training plan established at the outset of the project and reviewed regularly.	4.11
The provision of local technical advice should be formalised through service level agreements (SLAs).	4.11
Structured training should be provided or available to digital imaging projects.	4.11
Delivery services need to be planned at the outset of digital imaging projects and where these are independent they need to be closely involved in the digital imaging, metadata creation, and quality assurance activities.	4.12

Formal monitoring arrangements should be required for all digital imaging projects and should include both qualitative and quantitative measures. All measures should be auditable.	4.13
Digital imaging projects should have business plans that ensure that the deliverables are economically sustainable.	4.14
Digital imaging projects should have preservation plans to ensure the long-term viability of the digital images themselves.	4.14
Digital imaging projects should ensure that they have an adequate evaluation strategy in place from project inception stage.	4.15
File naming conventions need to be established at the outset of projects. They require substantially more planning than many projects give to them.	4.16
While TIFF files should continue to be the primary file for HE/FE, the benefits of emerging formats should be considered (including PNG).	4.16
More reflection on the different kinds of digital images that are needed in the FE/HE community should be carried out.	4.16
JIDI's emphasis on one-time digital imaging should be encouraged in all future projects.	4.16
More consideration needs to be given to the issue of sustainability.	4.16
Projects need to focus on archiving and longevity of digital images.	4.16
Monies from JISC need to be seen in the context of kick-starting larger proposals rather than funding discrete initiatives.	4.16
Contract complexity needs to be drastically reduced.	4.16
The suitability of the institutional technical infrastructure needs to be considered when establishing projects.	4.16
More focus needs to be put on the long-term uses of images and especially CBIR. (However, CBIR is not going to be a substitute for good metadata (see Section 5 below)).	4.16

There is a need for more co-ordination between the various groups funding digital imaging activities.	4.16
A strategic overview of (a) the needs for digital imaging in HE and FE should to be undertaken, (b) the collections in HEIs and FEIs that might be tapped to meet these needs identified, and (c) the current activity of institutions in the areas of digital imaging noted.	4.16
Monitoring processes need to be formalised and should include both structured reports from the participating sites and quarterly site visits.	4.16
Digital imaging initiatives need to focus on the use of materials in teaching and learning. For instance, all projects should have an education strategy.	4.16
Evaluation of user needs and expectations from digital images needs to be conducted.	4.16
The HE and FE community should use the auspices of the DNER to establish an image delivery service. This need not be a single site, but might be a multi-site service built from existing (e.g. VADS) and new services.	4.16
That the intended delivery service be involved from project inception to ensure that plans for imaging, metadata, costing, and interface design take into account issues associated with the delivery environment and the needs of the user audience.	5.4
That user needs surveys should be a central element of the design of any digital imaging programme.	5.4
That the quality assurance of metadata be conducted independently, rigorously, and throughout the digital imaging project.	5.4
That projects adopt conceptual and hierarchical keywording.	5.4
That projects focus more attention on the terminological and syntactical consistency of the metadata they are creating and the ways in which it is encoded.	5.4
That projects put emphasis on all aspects of staff training in digital imaging activities.	5.4
All projects should define the project management strategies that they intend to use.	7.4



All projects should adopt clearly defined project management structures.	7.4
Workflow modelling should be carried out by all projects either as a pilot or using a workflow modelling strategy.	7.5
There is a general need for a workflow modelling strategy to be tested, widely available, and used in digital imaging projects.	7.5
A costing model should be developed and funding bodies and projects should be encouraged to adopt it.	7.6
The UK funding agencies should invest in a digital imaging workbook to avoid the projects reinventing processes from scratch, time and time again.	7.7
There is a need for international consensus on technical and descriptive metadata for digital imaging projects.	7.8
Projects should be encouraged to include an adequate training budget within their business plans and funders should recognise the benefits to funding this element of projects.	7.11
Monitoring systems should be proportionate and bring benefits to the project and to the funder.	7.13

*Appendices*  
*Image Digitisation Management Models*

## **10 Section**

### **10.1 The Project Team**

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Research Assistants:

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Michael Olsen, HATII, University of Glasgow

Peter McKinney, HATII, University of Glasgow

Melissa Terras, University of Oxford

### **10.2 Acknowledgements**

In addition to those who took part in the interviews (see Section 11 below) the project would like to thank:

Skip Cox, JIDI Project Manager

Catherine Grout, JISC Image Co-ordinator, Kings College, London

## 11 Section – Interview Participants & Survey Respondents

### 11.1 Visits

- ◆ Visual Arts Data Service (VADS), Surrey Institute of Art and Design (Phillip Purdy and colleagues)
- ◆ Institute for Learning and Research Technology, University of Bristol (Skip Cox, Karla Youngs, Grainne Conole)
- ◆ National Preservation Office, The British Library (Vanessa Marshall)

### 11.2 Email Exchanges & Unstructured Telephone Interviews

- ◆ Polly Christie, Data Management Officer, Visual Arts Data Service, Surrey Institute of Art & Design, University College
- ◆ Simon Tanner, Higher Education Digitisation Service (HEDS)
- ◆ Simon Olding, Heritage Lottery Fund

### 11.3 Interviews with JIDI Steering Committee

- ◆ Vanessa Marshall, Director, National Preservations Office. Chair 1999-
- ◆ Jane Williams, ILRT, Project Director until mid 1999 when she became head of JISC ASSIST (Activities, Services and Special Initiatives Support Team)
- ◆ Skip Cox, ILRT, University of Bristol, JIDI Project Manager
- ◆ Marilyn Deegan, University of Oxford, Overall Subject Co-ordinator and Social History Subject Co-ordinator
- ◆ Karla Youngs, TASI Manager, ILRT, University of Bristol
- ◆ Catherine Grout, Manager, VADS

### 11.4 Collection Managers

- ◆ David Bailey, The African & Asian Visual Artist Archive - University of East London
- ◆ Katherine Baird, London College of Fashion Collection
- ◆ Elizabeth Coatsworth, Design Council Slide Collection (DCSC) at the Manchester Metropolitan University
- ◆ Tom Graham, Gertrude Bell Archive, Robinson Library, University of Newcastle

- ◆ Bob McIntosh, Librarian and Project Manager, The British Geological Survey Edinburgh
- ◆ Sonia Kielty (Bretton Hall) The Lawrence Batley Centre for the National Arts Education Archive (Trust) Bretton Hall, Lawrence Batley Centre,
- ◆ David Knott, The Spellman Collection of Music Covers, University Library University of Reading
- ◆ Julie Anne Lambert, The John Johnson Collection of Printed Ephemera, Bodleian Library, Oxford
- ◆ Ted Leath, The Magee Photographic Collection, Magee College, University of Ulster, Magee College
- ◆ Prof. Don MacKenzie, Derby Earth Sciences 3D Collection
- ◆ Catherine Moriarty (Project Manager) The Design Council Archive, The Design History Research Centre Faculty of Arts & Architecture, University of Brighton,
- ◆ Lucy Rushin, Art and Design Archive and The Teaching Examples Collection Central St Martins College of Art and Design
- ◆ Christine Wise, Suffrage Banners Collection, Fawcett Library, London Guildhall University

### 11.5 Funders

- ◆ Caroline Arms Ameritech American Memory Project, Library of Congress, USA.
- ◆ Dr Dan Greenstein, Executive Director, Digital Library Forum.
- ◆ Stephen Griffin, National Science Foundation Dan Greenstein, Digital Library Federation
- ◆ Dr Michael Hall, National Endowment for the Humanities
- ◆ Dr Michael Jubb, Director of Programmes, the Arts and Humanities Research Board
- ◆ Ronald Milne, Research Support Libraries Programme
- ◆ Sarah Mitchell, New Opportunities Fund
- ◆ Jeremy Neathey, Economic and Social Research Council
- ◆ Simon Olding, Director of Policy, The Heritage Lottery Fund
- ◆ Sarah Ormes, The UK Office for Library and Information Networking (UKOLN)
- ◆ Bruce Royan, Chief Executive, SCRAN

### 11.6 Comparative Projects

- ◆ Ian Anderson, TLTP
- ◆ John Davis, Manchester Metropolitan University, Department of History of Art, Design Council Slide Collection
- ◆ Lucy Jefferis, Wiltshire Wills Project, Wiltshire and Swindon Record Office
- ◆ Michael Heaney, Broadside Ballads Project, Bodleian Library, University of Oxford.
- ◆ Michael Pidd, Foxe Project, University of Sheffield
- ◆ Rob Mildren, SCAN, National Archives of Scotland
- ◆ Simon Grant, Insight (formerly British Artists Information Project), Tate Gallery (HLF Funded)
- ◆ Tim Ayres, Corpus Vitrearum Pilot Digitisation Project, Courtauld Institute

## 12 Section – Acronyms

<b>AAVAA</b>	African & Asian Visual Artists Archive
<b>AHDS</b>	Arts and Humanities Data Service
<b>AHRB</b>	Arts and Humanities Research Board
<b>BAIP</b>	British Artists Information Project
<b>BGS</b>	British Geological Survey
<b>CTICH</b>	Computers in Teaching Initiative Centre for History, Archaeology & Art History
<b>CVMA</b>	<i>Corpus Vitrearum Medii Aevi</i>
<b>DCA</b>	Design Council Archive
<b>DCSC</b>	The Design Council Slide Collection
<b>DLF</b>	Digital Library Foundation
<b>DNER</b>	Distributed National Electronic Resource
<b>ESRC</b>	Economic and Social Research Council
<b>GSU</b>	Genealogical Society of Utah
<b>HE</b>	Higher Education
<b>HEDS</b>	Higher Education Digitisation Service
<b>HLF</b>	Heritage Lottery Fund
<b>ILRT</b>	Institute for Learning and Research Technology (University of Bristol)
<b>JDIS</b>	JISC Distributed Image Service
<b>JIDI</b>	JISC Initiative in Digital Imaging
<b>JISC</b>	Joint Information Systems Committee
<b>LCF</b>	London College of Fashion
<b>LoC</b>	Library of Congress
<b>NAS</b>	National Archives of Scotland
<b>NEH</b>	National Endowment for the Humanities
<b>NMR</b>	National Monument Record
<b>NOF</b>	New Opportunity Fund
<b>NSF</b>	National Science Foundation
<b>RLG</b>	Research Libraries Group
<b>RSLP</b>	Research Support Libraries Programme
<b>SCAN</b>	Scottish Archives Network



<b>SCRAN</b>	Scottish Cultural Resource Access Network
<b>TASI</b>	Technical Advisory Service for Imaging
<b>TLTP</b>	Teaching and Learning Technology Programme
<b>TRIADS</b>	Tripartite Interactive Assessment Delivery System
<b>UKOLN</b>	UK Office for Library and Information Networking
<b>VADS</b>	Visual Arts Data Service
<b>TLTP- HCC</b>	TLTP History Courseware Consortium

### 13 Letter to Interviewees

Dear xxxx

The Joint Information Systems Committee (JISC) of the Higher and Further Education Funding Councils in the UK has over the past four years supported digital imaging projects. As part of its review of the JISC Image Digitisation Initiative (JIDI) and in an effort to develop plans for future initiatives in digitisation initiatives within the higher and further education communities, JISC has commissioned a review of digital imaging management models. The Humanities Advanced Technology and Information Institute (HATII) at the University of Glasgow is carrying out this evaluation for JISC.

We would be very grateful if you could help us in this activity. Attached is a questionnaire. We are not at this stage expecting you or your organisation to complete the questionnaire. We would be very grateful if you could read it through. One of my colleagues Ann Gow, Michael Olsen or Melissa Terras will be contacting you by telephone to arrange a phone-based interview. During this interview they will walk through the questions with you and note down your answers.

Your participation in this is extremely important as the JISC is attempting to develop a framework for future digital initiatives and wishes to place this work in the context of other funding, imaging and delivery strategies.

We recognise that we will be asking you to give up about 30 minutes from your busy schedule to answer these questions by telephone. Once the report is completed and accepted by the JISC, HATII will forward you a copy of its report in the event that you may find it useful in informing your own future thinking on digital imaging funding/projects.

with all best wishes

Seamus Ross

## 14 Section – Participant Survey Instrument

### *Image Digitisation Management Models: Collection Instrument*

**Collection**

.....

**JIDI Interview ID Number**

JIDI.....

*[Day/month/initials/interview no.]*

#### **Interview details**

- 1 Date of interview: \_\_\_\_/\_\_\_\_/2000
- 2 Interview Type: Face-to-Face \_\_\_\_ Telephone: \_\_\_\_
- 3 Location of interview (if face-to-face): \_\_\_\_\_
- 4 Interview conducted by: \_\_\_\_\_
- 5 Start time: \_\_\_\_\_
- 6 Finish time: \_\_\_\_\_

#### **Organisation & Person Being Interviewed:**

- 7 Formal Name of Organization: \_\_\_\_\_
- 8 Name of Individual being Interviewed:  
\_\_\_\_\_
- 9 Title: \_\_\_\_\_

10 Address: \_\_\_\_\_

11 Telephone Number: \_\_\_\_\_

12 Fax Number: \_\_\_\_\_

13 Email: \_\_\_\_\_

**Collection Holding Institution:**

14 Name of Department (for visit):

15 Title of Project:

16 Name Project Director/Manager:

17 URL/other reference/further published info on project:

**Project Inception & Planning**

18 What was the motivation for your institution to take part in the programme?

19 Did you conduct a conservation review of the material that what was to be digitally imaged before finalising the material that would be selected for imaging?

20 Did you prepare a risk assessment as part of your digital imaging proposals?

Yes ?                      No ?

If yes, are there guidelines that they should follow in producing these proposals?

21 How was digital imaging managed?

22 What project management strategies has your project adopted (e.g. PRINCE2)?

### **Costing & Workflow Planning**

23 How were the costs estimated?

24 Did the projected costs accurately reflect real costs of the project?

25 What factors did you include in your costings?

26 How did you cost the project?

27 Did your institution have to underwrite part of the project?

28 How was the workflow estimated and was this done accurately?

29 What activities did you include in your workflow models?

### **Communication**

30 Did you find participation in a distributed project created new problems?

31 Did participation have positive aspects and what were these?

32 What protocol was used to enable communication between the JIDI project management team and the collection holders?

33 Did you feel that the JIDI management team kept you informed about progress of the project and how did they do this?

### **Digital Imaging**

34 Was the imaging conducted:

Inhouse ? Using an External Service ?

If inhouse what difficulties did you encounter?

If inhouse, what digital imaging guidelines did you follow

If yes, could we have a copy of this document?

Were these in-house developed guidelines or were these created by another agency?

Inhouse ? Developed elsewhere ?

If you used an external service:

how was this managed?

did you encounter problems validating the quality of imaging work?

how did you manage the process of ensuring items needing to be rescanned were rescanned?

### **Metadata & Quality Assurance**

35 What metadata guidelines did you use?

36 How did you create the metadata (e.g. in a spreadsheet, in a database, as a text file)?

37 Which staff created the metadata (e.g. curatorial, library, clerical, administrative)?

38 Describe the quality assurance procedures that you used to ensure the quality of the images that you created?

- 39 How as quality assurance handled?
- 40 What impact did the project have on your own institution or the work of your group?
- 41 How were the rights of your institution in digital images and the original material protected?
- 42 What was your involvement in defining services for delivering the digital images created from the material in your care?

### **Training & Advice**

- 43 What formal training did staff on your project receive?

<b>Area of training</b>	<b>Tick if Formal</b>	<b>At what stage</b>	<b>Provided Internally or Externally</b>
Project Management			
Digital Imaging			
Quality Assurance			
Other <i>(please specify)</i>			

- 44 What sources of advice did you turn to?
- 45 How useful did you find the training and guidelines you received from JIDI?

What of this training and guidance did you find most useful?

What further guidelines would you have found useful, if any?



- 46 How have you established that the digital resources created by your project are sustainable?

Is this a stated policy and if it is what evidence do you require?

- 47 What digital preservation strategy has your project put in place to ensure the long term access to the digital images created as part of the project?

### **Monitoring & Evaluation**

- 48 How was your participation in the JIDI project monitored and managed?
- 49 Did you have to complete any reports as part of the JIDI management of the project?
- 50 What evaluation programmes have you put in place to ensure that the outputs meet the needs of users?

### **Comments on the Project**

- 51 Did you take away from the project what you expected?
- 52 Could rank the reasons why your institution took part in the JIDI Project?  
*[If more than one purpose, please rank in order or priority.]*

Reasons for funding digital imaging	Tick, as appropriate	Priority
Preservation		
Public access		
Teaching and learning resource		
Social Inclusion		
Life Long Learning		
Creation of Research		
Experiment		

Wider access		
Revenue generation		
Other (give details)		

53 Which of the following audiences did you intend to reach through your project? [Check all that apply and rank in order of priority]

Possible Audience	Intended Audience ?	Order of Priority?
Primary and secondary schools		
Further Education		
Higher Education		
Postgraduates		
Lifelong learning		
Distance learning		
Computer-mediated learning		
Museum users		
Public library users		
Archive users (e.g. family historians)		
Government		
Private sector		
Other (please specify)		

54 Will you undertake future digital imaging initiatives following this project?

General Comments:

**Followup Activities:**

**(1) Thank you email sent on: \_\_\_\_\_/\_\_\_\_\_/2000**

**(2) Request made for the following documents:**

Document Requested	Date Requested	Date Recieved
Collection Survey Report		
Conservation Survey		
Image Digitisation Guidelines		
Metadata Guidelines		
Quality Assurance Guidelines		
Costing Guidelines		
Workflow Guidelines		
Evaluation Guidelines		
Monitoring Guidelines		
Preservation Guidelines		
Measurement of Impact Guidelines		

## 15 Section – Funding Agency Survey Instrument

### Image Digitisation Management Models

*Data Collection Instrument*

**Name of project/program/organization/individual**

.....

**JIDI Interview ID Number**

**JIDI.....**

[Day/month/initials/interview no.]

*Interview details*

1. Date of interview: \_\_\_\_/\_\_\_\_/2000
2. Interview Type: Face-to-Face \_\_\_\_ Telephone: \_\_\_\_\_
3. Location of interview (if face-to-face): \_\_\_\_\_
4. Interview conducted by: \_\_\_\_\_
5. Start time: \_\_\_\_\_
6. Finish time: \_\_\_\_\_

### **Organisation & Person Being Interviewed:**

7. Formal Name of Organization: \_\_\_\_\_
8. Name: \_\_\_\_\_

9. Address: \_\_\_\_\_

10. Telephone Number: \_\_\_\_\_

11. Fax Number: \_\_\_\_\_

12. Email: \_\_\_\_\_

### **Funding**

13. Does your organisation fund digital imaging?

Yes      ?              No      ?

14. In what year did you start funding work in this area?

15. How many projects have you funded so far in this area?

16. How much money have you spent on funding these kinds of projects?

17. What proportion is this of your organisations total grant giving?

18. Do you receive an increasing number of applications in this area?

19. What is the average success rate in this area?

20. What is the quality compared to applications funding areas?

### **Aims of Funding**

21. What are the objectives which underpin support for digital imaging initiatives?

22. Which of the following source materials do you support the digital imaging of? [Check all that apply]

Source Material	Tick, if you support imaging of this material
printed books or serials	
printed documents (e.g. pamphlets)	
unbound printed documents	
typescript documents	
handwritten scripts	
artifacts	
reproductions of artworks	
photographs	
textiles	
works of art	
other (please specify)	

23. Could rank the reasons why your organisation funds digital imaging projects? [If more than one purpose, please rank in order of priority.]

Reasons for funding digital imaging	Tick, as appropriate	Priority
Preservation		
Public access		
Teaching and learning resource		
Social Inclusion		
Life Long Learning		
Creation of Research		
Experiment		
Wider access		
Revenue generation		

Other (give details)		
----------------------	--	--

24. For which of the following audiences is appropriate for applicants to seek funding from your institution? [Check all that apply and rank in order of priority]

Possible Audience	Intended Audience?	Order of Priority?
Primary and secondary schools		
Further Education		
Higher Education		
Postgraduates		
Lifelong learning		
Distance learning		
Computer-mediated learning		
Museum users		
Public library users		
Archive users (e.g. family historians)		
Government		
Private sector		
Other (please specify)		

### Models used & guidelines

25. Do you require applicants to conduct a collection survey before identifying materials for digital imaging?

Yes ? No ?

If no, was there some other document applicants provided establishing priorities for digital imaging?



If yes, do you provide guidelines for these surveys?

If yes, how do you review them?

26. Do you encourage projects to adopt project management strategies?

If yes, What project management strategies do you encourage them to adopt (e.g. PRINCE2)?

27. Do you require applicants to provide copies of conservation assessments of the material to be digitally imaged?

Yes      ?                  No      ?

If yes, do you provide guidelines for these assessments?

If yes, how do you evaluate these assessment?

28. When considering digital imaging proposals do you require applicants to produce risk assessments for:

<b>Assessment Category</b>	<b>yes</b>	<b>no</b>
material		
the project itself		
cash flow		
outputs		
impact of the project on the organisation		

If yes, are there guidelines that they should follow in producing these proposals?

29. Do you require applicants to follow particular image digitisation guidelines?

Yes ? No ?

If yes, could we have a copy of this document?

If no, does your organisation recommend particular imaging guidelines prepared by other bodies?

Yes ? No ?

If yes, which one?

30. Does your institution have particular metadata guidelines that it expects digital imaging projects to use?

Yes ? No ?

If yes, could we have a copy of this document?

If no, does your institution recommend particular guidelines prepared by other bodies?

31. Do you require applicants encode metadata in a particular format?

Yes ? No ?

If yes, would you send us a copy and can you describe the format?

32. Which standards do you recommend projects use for describing digital imaging content?

<b>Standard</b>	<b>Tick, as appropriate</b>
Dublin Core	
EAD	
MARC	
TEI Header	
Other ( <i>please specify</i> )	

33. Do you require applicants to use particular quality assurance standards for digital imaging?

Yes      ?                  No      ?

If yes, would you send us a copy?

If no, do you expect projects to establish formal quality assurance procedures?

Yes      ?                  No      ?

34. Do you expect applicants to produce costed models based on detailed statements of costs and work flow (i.e. time and motion studies) in designing a project?

Yes      ?                  No      ?

If yes, do you provide guidelines for applicants to follow in producing these statements?

35. Do you require projects to demonstrate that their institutions are able to sustain the digital image resources they create following the completion of the grant funded phase?

Yes      ?                  No      ?

If yes, is this a stated policy?

Yes ? No ?

What evidence do you require?

How do you assess the accuracy of these projections?

36. Which of the following activities are costs that your institution is willing to fund?

<b>Supported</b>	<b>Tick as appropriate</b>
Digital Imaging	
Metadata Creation	
Development of digital imaging infrastructure	
Training of project staff	
Development of delivery Infrastructure	
Training of users	

37. Do you require projects to define the delivery mechanisms before supporting the project?

Yes ? No ?

If yes, which of the following approaches to delivery do you find acceptable?

<b>Delivery Options</b>	<b>Tick, as appropriate</b>
Project specific delivery system	

Commerical delivery service	
Public sector delivery service (e.g. AHDS <sup>98</sup> )	
Funding sponsored delivery mechanism	
Funders own delivery mechanism	
Other	
Please specify:	

38. Do you require that the delivery service be involved in planning of the project?

39. Have you put in place a digital preservation strategy?

Yes ?            No ?

If yes, may we have a copy of it

### **Evaluation, Monitoring, and Impact**

40. How does your institution evaluate applications to digitally imaged materials?

Please describe these processes?

If there is written documentation available please provide these.

41. What aspects of digital imaging projects do you evaluate and how is this work done?

42. What evaluation programmes do you expect projects that you fund to put in place to ensure that the outputs meet the needs of users?

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<sup>98</sup> AHDS = Arts and Humanities Data Service

Types of Evaluation	Tick as appropriate
Front-end (Before)	
Formative (during)	
Summative (after)	

43. How does your agency monitor image digitisation projects that it funds?

Yes      ?                  No      ?

Can we have a copy of your monitoring guidelines and documents?

44. How does your institution assess the impact of the image digitisation projects it funds?

At what stage does your organisation establish these for each project?

45. Why does your organisation fund digitisation projects?

46. General Comments:

**Followup Activities:**

**(1) Thank you email sent on:** \_\_\_\_\_/\_\_\_\_\_/2000

**(2) Request made for the following documents:**

Document Requested	Date Requested	Date Received
Collection Survey Guidelines		
Conservation Survey Guidelines		
Image Digitisation Guidelines		
Metadata Guidelines		
Quality Assurance Guidelines		

Costing Guidelines		
Workflow Guidelines		
Digital Preservation Strategy		
Evaluation Guidelines		
Monitoring Guidelines		
Measurement of Impact Guidelines		

## 16 Section – Comparative Project Survey Instrument

### Image Digitisation Management Models

#### Collection Instrument

**Name of project/program/organization/individual**

.....

**JIDI Interview ID Number**

JIDI.....

[Day/month/initials/interview no.]

#### **Interview details**

1. Date of interview: \_\_\_\_/\_\_\_\_/2000
2. Interview Type: Face-to-Face \_\_\_\_ Telephone: \_\_\_\_
3. Location of interview (if face-to-face): \_\_\_\_\_
4. Interview conducted by: \_\_\_\_\_
5. Start time: \_\_\_\_\_
6. Finish time: \_\_\_\_\_

#### **Organisation & Person Being Interviewed:**

7. Formal Name of Organization: \_\_\_\_\_
8. Name of Individual being Interviewed:  
\_\_\_\_\_
9. Title: \_\_\_\_\_
10. Address: \_\_\_\_\_
11. Telephone Number: \_\_\_\_\_
12. Fax Number: \_\_\_\_\_
13. Email: \_\_\_\_\_
14. Project:



15. Name of Department (for visit):
16. Title of Project:
17. Name Project Director/Manager:
18. URL/other reference/further published info on project:

### **Project Inception & Planning**

19. Did you conduct a collection survey before identifying materials for digital imaging?  
 Yes  No
20. If no, was there some other document establishing priorities for digital imaging?
21. Did you prepare a conservation assessment before beginning your project?  
 Yes  No  (If yes, ask for a copy)
22. Did you prepare a risk assessment as part of your digital imaging proposals?  
 Yes  No  (If yes, ask for a copy)
23. Which of the following source materials are you digitally imaging? *[Check all that apply]*

<b>Source Material</b>	<b>Tick, if you support imaging of this material</b>
printed books or serials	
printed documents (e.g. pamphlets)	
unbound printed documents	

typescript documents	
handwritten scripts	
artifacts	
original artworks	
reproductions of artworks	
photographs	
textiles	
other ( <i>please specify</i> )	

24. Why are you or did you carry out this digital imaging project? [*If more than one purpose, please rank in order of priority.*]

Reasons for funding digital imaging	Tick, as appropriate	Priority
Preservation		
Public access		
Teaching and learning resource		
Social Inclusion		
Life Long Learning		
Creation of Research		
Experiment		
Wider access		
Revenue generation		
Other (give details)		

25. Who are the target audiences for your digital imaging work? [*Check all that apply and rank in order of priority*]

Possible Audience	Intended	Order of

	Audience?	Priority?
Primary and secondary schools		
Further Education		
Higher Education		
Postgraduates		
Lifelong learning		
Distance learning		
Computer-mediated learning		
Museum users		
Public library users		
Archive users (e.g. family historians)		
Government		
Private sector		
Other ( <i>please specify</i> )		

26. What workflow models or experiments did your project carry out before beginning work?

27. Please describe how your project was costed?

### **Funding**

28. Where did your project get its funding?

29. When did you receive your grant?

30. Is the project fully funded or is it part funded by your institution or some other body?

Fully funded  Part-funded

31. If part-funded, please provide details of the source and percentages of the partnership funding?

**Guidelines (in all cases ask for copies)**

32. What project management strategies has your project adopted (e.g. PRINCE2)?

33. Did you follow any digital imaging guidelines did you follow?

Yes  No

34. If yes, what were they?

35. Are these in-house developed guidelines or were these created by another agency?

Inhouse  Developed elsewhere

36. Did you follow any metadata guidelines for digital images does your project follow?

Yes  No

37. If yes, what metadata guidelines did you follow?

38. Do you encode metadata in a particular form?

Yes  No

If yes, would you send us a copy of these encoding guidelines?

39. If you received guidelines from your funder could you comment on the suitability and effectiveness of these?

40. While many projects are focused on a digitising material held by a single institution, others focus on digitising material held in a number of institutions. Could you classify which of the following categories your project belongs to?:

Project Type	Tick, which is appropriate
single site & single focus	

single site & multi focus	
multi site & single focus	
multi site & multi focus	

41. If multi-site what methods did you implement to manage communication between the sites of the different participants?

42. What formal training did staff on your project receive?

<b>Area of training</b>	<b>Tick if Formal</b>	<b>At what stage</b>	<b>Provided Internally or Externally</b>
Project Management			
Digital Imaging			
Quality Assurance			
Metadata Creation			
Other <i>(please specify)</i>			

43. Did you turn to any sources of advice did you turn to?

Yes  No

If yes, what were these sources of advice?

44. What particular quality assurance standards or procedures does your project use to ensure the quality of the digital images and the metadata it is creating?

Would you send us a copy?

### **Delivery and Sustainability**

45. What delivery mechanism did you or will you employ?

Delivery Options	Tick, as appropriate
Project specific delivery system	
Commerical delivery service	
Public sector delivery service (e.g. AHDS <sup>99</sup> )	
Funder sponsored delivery mechanisms	
Funders own delivery mechanism	
Other	
Please specify:	

46. Was the delivery service involved in the design of the digital imaging project?

47. How have you established that the digital resources created by your project are sustainable?

Yes  No

If yes, is this a stated policy and if it is what evidence do you require?

48. Have you put in place a digitisation preservation strategy?

Yes  No

49. If yes please describe the strategy and if it is documented please could you let us have a copy?

### **Evaluation**

50. How are you monitoring your digitisation projects?

(Request a copy of the monitoring procedures that the organisation uses).

---

<sup>99</sup> Arts and Humanities Data Service

51. What evaluation programmes have you put in place to ensure that the outputs meet the needs of users?
52. What methods did your funder employ to monitor the progress of your project?
53. What did your project learn from these evaluation programmes?

### **Future of the Project and Future Work**

54. Will the project continue to develop this resource by adding more digitally imaged material to it?
55. Now that you have this experience in place will begin new digital imaging projects?

General Comments:

### **Followup Activities:**

**(1) Thank you email sent on:** \_\_\_\_\_/\_\_\_\_\_/2000

**(2) Request made for the following documents:**

**(2) Request made for the following documents:**

<b>Document Requested</b>	<b>Date Requested</b>	<b>Date Recieved</b>
Collection Survey Report		
Conservation Survey		
Image Digitisation Guidelines		
Metadata Guidelines		
Quality Assurance Guidelines		
Costing Guidelines		
Workflow Guidelines		
Evaluation Guidelines		

Monitoring Guidelines		
Preservation Strategy		
Measurement of Impact Guidelines		



## 17 Documents Reviewed

### 17.1 Documents Provided by the JIDI Team

*A Selection of Learning Points from the JIDI Project (16 May 2000)*

JIDI Project Plan

JIDI-Quilt Proposal for JISC Circular 5/99

Reports for JISC CEI 5/99

- ◆ Project Report
- ◆ Collection Status Report
- ◆ JIDI II suggestions brief outline

Minutes of the JIDI Steering Group (10 meetings)

- ◆ 14 January 1998
- ◆ 16 March 1998
- ◆ 3 June 1998 at Loughborough University
- ◆ 13 October 1998 at Centre Point, London
- ◆ 20 January 1999 at ILRT, Bristol
- ◆ 14 May 1999 at ILRT, Bristol
- ◆ 4 August 1999 at ILRT, Bristol
- ◆ 27 October 1999 at Loughborough University
- ◆ 2 December 1999 at the National Preservation Office, London
- ◆ February 2000 at Oxford University

Knowledge Gallery Agenda, 16 & 17 June 1997

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Image Data Content Document for Knowledge Gallery Meeting, 16 & 17 June 1997

The Knowledge Gallery-Image Data Content-Art and Design, Sue Gollifer, 26 April 1997

Report on Visits and Communications for Knowledge Gallery-Content Building Exercise on behalf of JISC, Marilyn Deegan, 24 April 1997

Metadata for the Knowledge Gallery-Recommendations to CEI for the Selection and Description of Networked Image Resources, Tony Gill, 7 April 1997

Joint Image Systems Committee- Proposal for an Image Data Resource Services (undated)

AXIS the National Artists Register, Visual Arts Information Service, Leeds Metropolitan University (undated)

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