



Formative Evaluation of the  
JISC Digitisation Programme Phase 2

Final Report

Glenaffric Ltd  
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## Executive Summary

The main focus of the final report of the formative evaluation of the JISC Digitisation Programme Phase Two is a synthesis of evaluation findings, illustrated with case studies focusing on key aspects of the evaluation themes. The report also includes a brief outline of the strategic and policy context for the Programme and the approach to evaluation that was commissioned by JISC, and a commentary on general issues of interest arising from the Programme and the evaluation process. It concludes with some recommendations for JISC and other funders, for future digitisation projects and for the wider sector.

There were sixteen projects in the Phase 2, which ran from March 2007 to March 2009 and constituted an investment of £12 million funded by HEFCE with contributions from the Welsh Assembly Government.

The Evaluation Plan for the Phase 2 Digitisation Programme presents five key areas to be evaluated

### *1. Content Creation*

In terms of actual content digitised, the projects have met and in many cases significantly exceeded the targets outlined in their initial plans.

Projects have provided access to previously hidden materials, including resources that were not visible, not usable, or conceptually obscured.

Aggregated resources have critical mass when they are recognised in the field as a definitive and authoritative source for academic purposes.

The aggregation of previously dispersed resources can have unanticipated and serendipitous outcomes for teaching and research.

The selection of materials for digitisation is generally determined by significance (important or popular resources), representativeness (exemplification and/or diversity), comprehensiveness (completion of a recognised set of resources), quality, and technical and legal practicalities.

### *2. Adoption of Standards*

There is a wide range of standards adoption in the programme both in terms of the technical standards themselves, and in practice of the projects in relation to the adoption of the technical standards.

Higher quality images and more accurate data capture require new investment in hardware, revised workflows and developing skills.

A significant contribution to standards development was made in the publication of a METS schema for audio, and in understanding metadata issues relating to mass digitisation initiatives.

The use of evolving and non-stable XML-based standards posed some challenges.

Metadata creation is a non-trivial and time-consuming exercise requiring expertise.

The early development and implementation of clear and robust workflows for the appropriate stages and digitisation processes is essential.

In some cases, dedicated specialist support for IPR and copyright clearance may be required. Some projects adopted a risk management approach with a clear takedown procedure.

Manual processes have implications for coordinating updates and maintaining the integrity of the digitised resources.

The terms of the HEFCE licence are designed to protect the project legacy and the investment in digital materials on behalf of the sector.

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### *3. Innovation in Sustainability and Business Models*

The development and deployment of sophisticated business models is a key factor in the sustainability of the digitised resources.

Many projects have reported their reliance on continued support from the host organisations for the ongoing upkeep of the digitised resources and the maintenance of online access.

Partnership working and liaison with other organisations is key in the development of business models to support the sustainability of the digitised resources. There needs to be a sustainability plan or consortium agreement to address collaborative responsibilities for maintaining and developing the digitised resources.

Different potential models of website usage have been explored, including subscription payments for added-value services, advertising revenue, and charges for international access.

Institutional support for sustaining digitised resources depends on the extent to which these are viewed as an asset which is worth developing, and/or which the institution is prepared to maintain and develop for and on behalf of the sector and the wider public

To be fully sustainable, digitisation needs to be a core activity that is embedded in institutional processes and practice for learning, teaching and research.

### *4. Resource Discovery, Personalisation and Contextualisation*

Most projects took a pragmatic approach to engaging users in the development of the resources. Information on user views and requirements was mainly sought through focus groups of students testing usability and functionality, feedback forms on websites, and consultation with experts.

Some of the projects demonstrated particular innovation in the extent to which the digitised resources and their environment could be personalised to the context and requirement of individual users, including innovative use of web-based functionality, the development of education materials, and engaging in dialogue with users.

Feedback from users was acted upon in the selection of materials for digitisation and the enhancement of the digitised resources, the provision of guidance and educational materials, and the development of amended and improved structures for access.

Particular emphasis was placed on the need to engage with users as early in the project as possible, and on building processes for engaging users into the project plan from the outset.

A small number of the projects adopted a narrow interpretation of user engagement, with activities less geared towards an iterative and dialogic approach, and more in terms of 'pushing' information and resources at users.

The programme highlighted the dilemma of letting users decide what is important for them, or providing documentation to facilitate decision-making about relevance and appropriateness.

Most projects scaled back on original plans to use emerging social networking platforms and processes to engage users, mostly because of technical issues or security concerns. However, some explored issues relating to user-generated content and devolved responsibility for the ongoing maintenance of digitised collections.

Several projects have articulated plans to include provision for further user involvement in the ongoing development of the resources.

Developments in support of resource discovery have added to the conceptual accessibility of the digitised collections. The need for particular measures to address the sustainability of contextualised materials for resource discovery was identified.

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Users are increasingly well informed about what they expect to find and how they wish to interact with the digitised resources. Meeting these expectations requires institutional investment not just in digitisation but also in online infrastructure, environments and platforms, and in provision for responding to enquiries and updating the resource.

### *5. Capacity Building*

Phase Two projects which were building on Phase 1 demonstrated their developing expertise and capacity in the refinement of technical processes, arrangements for project management processes, and in particular in the development and use of standards and protocols.

Investments in hardware have enhanced the organisational infrastructure for future digitisation initiatives.

Project teams require generic management and information management expertise, financial and business awareness. They need to have a range of technical and specialists skills, legal expertise, an understanding of academic research and quality management processes, and an understanding of the pedagogical potential of the digitised resources.

The Digitisation Programme represents organisations with world-class reputations and project leaders have established diverse centres of excellence representing various aspects of digitisation.

Three basic models of project management were deployed: the appointment or secondment of internal staff, temporary employment of external staff, and partnership between the academic institution and an external agency.

In summary, the Phase Two Digitisation Programme was a significant and important innovation programme focusing on resources of national interest and scholarly value. The priorities outlined in the JISC Digitisation strategy have been comprehensively addressed. Projects were concerned with the digitisation of resources in a wide range of base media. Expertise has been developed within institutions in all the stages of the digitisation process as well as generic technical and management skills. A developing community of experts has been supported across very different institutions and organisations, including ancient and new universities, schools, further and higher education, public sector and private enterprise. The digitised resources have been publicly launched to great interest and acclaim. A striking aspect of the programme has been the focus on user engagement, and an exploration of the possibilities that are opened by social networking channels and user-generated content. While fulfilling an identified need and addressing the priorities outlined in the JISC Digitisation Strategy, the programme has also served to create further demand for digitised resources, and has presented a different set of challenges in meeting the demand that has been created, the expectations that have been raised and the potential that has been uncovered.

## 1 Introduction

### 1.1 The JISC Digitisation Programme

This is the final report of the formative evaluation of the JISC Digitisation Programme Phase Two. It includes a brief outline of the strategic and policy context for the Programme and the approach to evaluation that was commissioned by JISC. The main focus of the report is a summary and synthesis of evaluation findings in respect of the questions outlined in the Programme Evaluation Plan. The formative evaluation report includes a commentary on general issues of interest arising from the Programme and the evaluation process, and concludes with some recommendations for JISC and other funders, for future digitisation projects and for the wider sector. The report also presents a number of project case studies or vignettes illustrating key aspects of the evaluation themes.

The first phase of the JISC Digitisation Programme ran from 2004 – 2007, with six projects funded through a £10 million investment by the Higher Education Funding Council for England (HEFCE) under the JISC Capital Programme.

Phase Two of sixteen projects ran from March 2007 to March 2009, and constituted an investment of £12 million funded by HEFCE with contributions from the Welsh Assembly Government. The projects were:

Project	Lead Institution	Acronym/Short Name <sup>1</sup>
<i>19<sup>th</sup> Century Pamphlets online</i> <a href="http://www.britishpamphlets.org.uk/">http://www.britishpamphlets.org.uk/</a>	University of Southampton	19 <sup>th</sup> Century Pamphlets
<i>A Digital Library of Core e-Resources on Ireland</i> <a href="http://www.jstor.org/action/showJournals?browseType=collectionInfoPage&amp;selectCollection=ireland&amp;cookieSet=1">http://www.jstor.org/action/showJournals?browseType=collectionInfoPage&amp;selectCollection=ireland&amp;cookieSet=1</a>	Queen's University Belfast	Irish e-Resources
<i>Archival Sound Recordings 2</i> <a href="http://sounds.bl.uk/">http://sounds.bl.uk/</a>	British Library	ASR2
<i>British Cartoon Archive Digitisation Project</i> <a href="http://www.cartoons.ac.uk">http://www.cartoons.ac.uk</a>	University of Kent	Cartoons
<i>British Governance in the 20<sup>th</sup> Century, Cabinet Papers 1914 – 1975</i> <a href="http://www.nationalarchives.gov.uk/cabinetpapers/">http://www.nationalarchives.gov.uk/cabinetpapers/</a>	The National Archives	Cabinet Papers
<i>British Newspapers 1620 – 1900</i> <a href="http://newspapers.bl.uk/blcs/">http://newspapers.bl.uk/blcs/</a>	British Library	British Newspapers
<i>Electronic Ephemera: Digitised Selections from the John Johnson Collection</i> <a href="http://johnjohnson.chadwyck.co.uk/marketing/index.jsp">http://johnjohnson.chadwyck.co.uk/marketing/index.jsp</a>	University of Oxford (Bodleian Library)	Electronic Ephemera
<i>First World War Poetry Digital Archive</i> <a href="http://www.oucs.ox.ac.uk/ww1lit/">http://www.oucs.ox.ac.uk/ww1lit/</a>	University of Oxford (Oxford University Computing Service)	WW1 Poetry
<i>Freeze Frame: Historic Polar Images</i> <a href="http://www.freezeframe.ac.uk">http://www.freezeframe.ac.uk</a>	University of Cambridge (Scott Polar Research Institute)	Freeze Frame

<sup>1</sup> References to individual projects in this report subsequently use these acronyms/short names.

Project	Lead Institution	Acronym/Short Name
<i>London Broadcasting Company/ Independent Radio News Archive</i> <a href="http://radio.bufvc.ac.uk/lbc/">http://radio.bufvc.ac.uk/lbc/</a>	Bournemouth University	LBC/IRN
<i>InView: Moving Images in the Public Sphere</i> <a href="http://radio.bufvc.ac.uk/lbc/">http://radio.bufvc.ac.uk/lbc/</a>	British Film Institute	InView
<i>Modern Welsh Journals Online</i> <a href="http://welshjournals.llgc.org.uk/">http://welshjournals.llgc.org.uk/</a>	National Library of Wales	Welsh Journals
<i>Historic Boundaries of Britain</i> <a href="http://www.visionofbritain.org.uk/index.jsp">http://www.visionofbritain.org.uk/index.jsp</a>	University of Portsmouth	Historic Boundaries
<i>Pre-Raphaelite Resource Site</i> <a href="http://www.preraphaelites.org/">http://www.preraphaelites.org/</a>	Birmingham Museum & Art Gallery	Pre-Raphaelite Resource
<i>The East London Theatre Archive</i> <a href="http://www.elta-project.org/home.html">http://www.elta-project.org/home.html</a>	University of East London	ELTA
<i>UK Theses Digitisation Project</i> <a href="http://ethos.bl.uk/Home.do">http://ethos.bl.uk/Home.do</a>	British Library	UK Theses

## 1.2 Background and Context

The JISC Digitisation Programme is located within a strategic and policy context that is strongly supportive of digitisation initiatives. The UK government's e-Strategy of 2005 (Harnessing Technology: Transforming Learning and Children's Services)<sup>2</sup> made repeated reference to the provision of digital content and emphasises the need for a concerted effort by the digital content industry, innovative educators and education researchers together, to demonstrate the potential of next-generation technologies for education. The updated strategy published by Becta in 2008 on behalf of DCSF and DIUS (Harnessing Technology: Next Generation Learning<sup>3</sup>) re-emphasises and confirms the importance of access to high-quality digital resources for the achievement of government objectives and the implementation of policy.

The 2005 Higher Education Funding Council for England (HEFCE) Strategy for e-Learning<sup>4</sup> included an implementation strand on learning resources and networked learning with the following objectives:

- Develop a comprehensive and coherent approach to the development and use of resources for learning and teaching, including digital resources and discovery tools
- Enhance the quality of digital resources and tools for learners provided by JISC, and sources for teaching, learning, research and innovation.

The revised approach to HEFCE's strategy for e-learning published in March 2009, Enhancing Learning and Teaching through the Use of Technology<sup>5</sup>, includes a revised implementation strand entitled 'Learning resources and environments' with example development goals relating to the development and use of digital resources.

The overarching JISC Strategy 2007 – 2009 Strategy outlined the following priorities, all of which have a direct or indirect bearing on the work of the Digitisation Programme:

<sup>2</sup> [http://publications.dcsf.gov.uk/default.aspx?](http://publications.dcsf.gov.uk/default.aspx?PageFunction=productdetails&PageMode=publications&ProductId=DFES-1296-2005)

[PageFunction=productdetails&PageMode=publications&ProductId=DFES-1296-2005](http://publications.dcsf.gov.uk/default.aspx?PageFunction=productdetails&PageMode=publications&ProductId=DFES-1296-2005)

<sup>3</sup> <http://publications.becta.org.uk/display.cfm?resID=37348>

<sup>4</sup> [http://www.hefce.ac.uk/pubs/hefce/2005/05\\_12/](http://www.hefce.ac.uk/pubs/hefce/2005/05_12/)

<sup>5</sup> [http://www.hefce.ac.uk/pubs/hefce/2009/09\\_12/](http://www.hefce.ac.uk/pubs/hefce/2009/09_12/)

- Providing world class infrastructure (JANET, Access Management, Content)
- A wide range of advisory services including support on accessibility and inclusion, legal questions, strategic planning, internet training skills, plagiarism and digital imaging issues
- Support across all activities in an institution – research quality enhancement, management of research, effective learning and teaching
- Stimulating innovation
- Joining up infrastructure and services across all of education where appropriate.

Within this context, the JISC Digitisation Strategy<sup>6</sup> (February 2008) prioritises the digitisation of collections that:

- Make the hidden visible: enable access to and use of difficult or impossible to access collections;
- Address a recognised need or gap within learning, teaching or research provision;
- Map to a particular area of the curriculum or research interest;
- Inspire new avenues of research, or new approaches within learning and teaching;
- Contribute to creating critical mass within a given area or help to create a theme across previously unassociated materials;
- Would not otherwise be funded, or be able to attract significant funding from other sources;
- Are at risk from being lost to our community through sale, deterioration or disaggregation

This strategy articulates JISC's aspiration to create digital collections that are:

- **Standards based:** employ and develop standards for digital capture and description, and digital preservation
- **Interoperable:** deploy the standards specified within the JISC Information Environment for interoperability and offer excellence in resource discovery
- **User Focused:** have been created with a high level of user engagement, offer a high quality user experience and where users have been actively engaged in the design of interfaces and delivery mechanisms
- **Innovative:** explore new approaches and embrace current developments in technology
- **Contextualised:** are accompanied by contextual examples to help take up for learning and research
- **Sustainable:** where suitable service provision and business models can be put in place to ensure future sustainability and preservation
- **Legal:** where all third party rights including copyright have been cleared for a minimum ten year term educational use, re-use and deposit in archives or repositories.

The Digitisation Strategy states that JISC will work with other funders and strategic agencies within the public sector in the UK to co-ordinate digitisation policy and to ensure that overlaps in digitisation programmes can be minimised. JISC will work to ensure that collections digitised through its funding reach audiences beyond its own community, and will seek sources of funding to ensure that its digital collections can be contextualised to meet the particular needs of these audiences. JISC will strive to ensure that its Digitisation programmes are exemplars of best practice and that all lessons learned about the process of digitisation are captured and

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<sup>6</sup> Available from <http://www.jisc.ac.uk/digitisation>

disseminated widely to the JISC community and beyond. JISC will work to ensure that the collections it digitises are presented in as compelling a way as possible, and can link to other sources of quality content in order to create critical mass.

### 1.3 Programme Evaluation

In February 2008, JISC commissioned Glenaffric Ltd to undertake the formative evaluation of the Phase Two Digitisation Programme. The main aims of the evaluation were:

- to evaluate key outcomes and benefits realised through the Phase Two Digitisation Programme
- to collect, interpret and synthesise evaluation data with particular emphasis on five priority areas that have been identified by the JISC Executive
- to ensure that relevant and sufficient evaluation data is collected from a variety of sources and through a range of methodologies

The formative evaluation is based on a high-level evaluation plan that was produced by the programme managers. This presents five key areas to be evaluated, based on the outcomes and benefits described in the Digitisation Programme Definition Document<sup>7</sup>:

- Content creation
- Adoption of standards
- Innovation in sustainability and business models
- Resource discovery, personalisation and contextualisation for the use and re-use of resources
- Capacity building

The work of the formative evaluation was structured in two stages:

- Stage One: Collecting and interpreting baseline data relevant to the five key areas to be evaluated
- Stage Two: Collecting, interpreting and synthesising evaluation data from projects as well as other sources of information

Stage One was completed in July 2008 with the submission of an interim report and baseline review of the five top-level evaluation themes. The interim report included a revised evaluation plan for the Programme (see Appendix A) which was presented to the Digitisation Advisory Board in Spring 2008.

## 2 Methodology

### 2.1 Background and General Approach

From the outset, the evaluation of this Programme was contextualised within the overarching Evaluation Framework that had been developed for the JISC Capital Programme to provide a common evaluation schema to measure the benefits of each of the Programme strands and the Capital Programme as a whole.

The Digitisation programme team developed an initial evaluation plan for Phase Two, drawing on the priorities articulated in the JISC Digitisation Strategy and based on the common schema outlined in the Capital Programme Evaluation Framework. The team had also taken steps to engage the projects in a process of thinking about their own project evaluation activities in the context of this programme-level evaluation plan at an early stage. An evaluation workshop for the projects took place in September 2007 based on the JISC 'Six Steps to Successful

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<sup>7</sup> JISC Programme Definition, Digitisation Programme Phase 2, v.0.3, 18 December 2007

Evaluation<sup>8</sup> approach. The sixteen projects in Phase Two were subsequently invited to review their evaluation plans in the light of the Six Steps approach and the overarching evaluation plan for the Digitisation Programme, and to discuss these revised plans with the evaluation consultants in a supportive capacity.

This informal support process continued following the formal commission of the formative evaluation. Telephone discussions were arranged with project managers and key team contacts to help them to focus on the potential benefits to their projects from focusing in a formative capacity on the programme-level evaluation questions, and also to encourage projects to think about ways in which their own project evaluation activities could inform the programme-level evaluation.

Formative evaluation is concerned with helping the projects to draw out the value of their own activities and achievements. A principal function of the formative evaluation of the Phase Two Digitisation Programme was to support the projects in undertaking their own evaluation by encouraging reflection on the relationship between project outputs and outcomes, and the programme-level evaluation themes.

## **2.2 Evaluation Plan**

The evaluation team has also reviewed relevant programme documentation, including background reports and publications, project plans (including evaluation plans), interim reports, project and programme web pages. Following this review and discussions with the project teams and consultation with the programme management team, the evaluation plan was slightly revised and amended. The main focus of these amendments was to express the evaluation questions in a consistent way, and to facilitate evidence gathering in support of meaningful responses from the projects and other stakeholders.

## **2.3 Interim Report**

The interim formative evaluation report of July 2008 included two main elements: a stakeholder analysis and a baseline review. The report also included a summary of the strategic and policy context for the JISC Digitisation Programme and a brief commentary of some emerging issues of interest.

The need for a detailed stakeholder analysis was clarified by the JISC Digitisation Conference in July 2007, which emphasised that addressing the key challenges of digitisation requires greater collaboration between all the relevant participants – publishers, collection curators, funding bodies, user communities, vendors and standards bodies. From the outset, projects in the Phase Two Digitisation Programme were encouraged to plan, implement and review their activities in terms of the role of and impact on key stakeholders. The stakeholder analysis for the formative evaluation was derived mainly from information in the projects' own plans, and subsequent discussions with project and programme representatives. The analysis confirmed a wide range of intended beneficiaries across all education sectors in the UK, international academic communities, various professional bodies and the general public. It also indicated that the projects have established relationships with a concomitant wide range of partner organisations, professional bodies, copyright owners and advisory groups who were in a position to broker relations with the intended beneficiaries in order to maximise the benefits of the programme.

The interim report also presented a summary of the evidence provided by the projects in respect of the evaluation questions and baseline indicators outlined in the Programme Evaluation Plan. The main purpose of the baseline review was to present a coherent picture of

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<sup>8</sup> <http://www.jisc.ac.uk/media/documents/elearningcapital/evaluationhandbook.pdf>

the situation with regard to the five top-level programme themes prior to the commencement of Phase Two project activity, in order to evaluate effectively the achievements of the programme in these areas. A further objective in undertaking this exercise was to raise projects' awareness of the five evaluation themes and to encourage reflection on their own intended project outputs and outcomes in evaluative terms. The information was derived mainly from secondary sources (project plans, interim reports and other documentation) but also from primary sources including interviews and discussions with project representatives. Baseline evidence was presented in terms of general issues relating to the background and context of the Programme, illustrated with specific examples drawn from project documentation, reports and interviews.

## 2.4 Evidence Gathering

In the spirit of supportive and reflective evaluation, the evaluation team were in contact with the project teams throughout the Programme. A light-touch approach to evaluation evidence gathering was adopted with a view to ensuring that the evaluation was helpful to the projects' core activities. The programme team also commissioned a number of studies and reports in the course of the programme, and it was felt important not to overburden the projects with additional requests for visits and meetings with the purpose of gathering evaluation evidence. Instead, telephone conversations provided a means of gathering evidence in respect of the programme evaluation themes while encouraging projects to reflect on their own activities.

In keeping with this formative and supportive approach to evidence gathering, an evaluation workshop focusing on the Digitisation Programme Evaluation Framework took place as part of a programme meeting held in Oxford in October 2008. This included an update and discussion on key findings and issues of interest emerging from the evaluation, and areas where further evidence is required. The workshop adopted an Appreciative Inquiry (AI) approach to facilitate an appreciative understanding of programme outcomes and their wider implications. AI is a four-stage process focusing on:

- Discovery – appreciating ‘the best of what is’
- Dream – envisioning ‘what could be’
- Design – co-constructing ‘what should be’
- Deliver – sustaining ‘what will be’

A report on the discussions that took place on these four stages was produced for the programme team, and forms part of the body of formative evaluation evidence drawn on in this report.

Evaluation evidence has been drawn principally from the formal reports produced by the projects in the course of the programme (interim and final reports) as well as supporting documentation and reports. External reports that were produced by supporting studies commissioned at programme level also provided a source of evaluation evidence. These included an overview report at the start of Phase Two of the understanding, requirements and use of metadata in the projects<sup>9</sup>, a Digital Preservation Study<sup>10</sup>, and a report on Sustainability and Revenue Models for Online Academic Resources produced for the JISC Strategic Content Alliance<sup>11</sup>.

Regular discussions have also taken place with the programme managers throughout the formative evaluation. These meetings have served both as an opportunity to reflect on the

<sup>9</sup> The metadata overview report was produced by the programme metadata consultants in late 2007

<sup>10</sup> This was undertaken by the Digital Preservation Coalition, the Digital Archives Department of the University of London Computer Centre and Portico

<sup>11</sup> <http://www.jisc.ac.uk/contentalliance> The report was produced by Ithaka (<http://www.ithaka.org>)

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activities and achievements of individual projects and the programme as a whole as well as providing evaluation evidence.

## **2.5 Analysis and Reporting**

A coding frame was developed for the analysis of the evaluation evidence, based on the questions in the programme evaluation plan (Appendix B). Project reports were then reviewed and coded using this framework as a basis for the final evaluation report. The key sections of the report present findings from the projects in respect of the five top-level evaluation questions. These findings are illustrated with case studies focusing on particular projects, selected in discussion with the programme managers to illustrate the breadth and range of digitisation contexts and activities in the programme. This takes into consideration the range of media that were digitised (paper-based, audio, video, artwork, photographs), historical and contemporary material, technologies used and developed, different contexts for ownership and stewardship of the artefacts, and institutional and organisational structures of responsibility.

## **3 Content Creation**

### **3.1 Planned and Actual Outputs**

The evaluation was tasked with reviewing the extent to which the projects have created the digitised content as outlined in their initial bids and confirmed in their project plans, with reference to any ongoing negotiations with the programme team in respect of anticipated deviance from the plans for content creation. The scope and scale of the planned and actual digitised content that was produced by these projects is summarised in the table at Appendix C. This summary indicates that (with one exception<sup>12</sup>), projects met and in many cases significantly exceeded the targets outlined in their initial plans in terms of actual content digitised. On occasion the relationship between planned and actual content is slightly obfuscated by a change in the way the amount of content is reported (for example, the number of journals, titles or articles planned for digitisation is then reported in terms of pages scanned, or the numbers of reels of tape planned for digitisation reported in terms of hours of visual or audio content available).

Less tangible and quantifiable than the actual content that has been digitised is the evaluation of the value-added aspects of the digitised content: the extent to which projects have enhanced the scholarly and public value of resources through the creation of critical mass in a particular subject area, the aggregation of previously dispersed material, and/or providing access to material that was previously hidden or hard to reach.

The majority of projects were engaged to some extent at least with enhancing access to hidden or hard to reach resources for a range of potential users. Some projects were specifically concerned with aggregating previously dispersed material, leading to the development and recognition of a critical mass of resources for academic scholarship, integration into the curriculum (for schools and further education as well as higher education), and supporting the public interest.

### **3.2 Access, Aggregation and Critical Mass**

One of the key programme objectives in supporting the creation of digitised content was that key stakeholders should be able to access material that was previously 'hidden' or hard to reach. On one level, this relates to the opportunity to access, browse and download material that would be unavailable or problematic to view in its physical state. It also includes access to

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<sup>12</sup> The reduction in the scale of the titles and pages planned for digitisation by the Welsh Journals Online project was agreed with JISC following consultation with the programme managers.

resources that are 'hidden' in that they were not currently visible, or not currently usable, or conceptually hidden in terms of restrictions imposed by the locus of control of the physical content. Some projects have also been concerned with providing online access to digitised materials alongside ancillary or supporting materials.

The question of what actually constitutes critical mass in terms of the creation of digitised material has been the subject of some evaluative reflection at programme level. The consensus was that an aggregated resource has critical mass when it is recognised in the field as a definitive and authoritative source for academic purposes. Critical mass also represents a momentum which drives the ongoing development of the resource. An issue of interest for the programme is the extent to which critical mass can be ascertained at a definitive and recognised point in the aggregation process, or is only really appreciated in retrospect when the accumulated resource is validated and further developed through ongoing use.

The programme was also concerned with the aggregation of previously dispersed material into coherent sets of resources for enhanced academic study and use by stakeholders in a wide range of academic contexts as well as for enhanced public appreciation and understanding. Several projects have commented on the scholarly and pedagogical potential – often unanticipated and serendipitous – of the digital aggregation of physically separate resources.

### 3.3 Selection

Although not specifically identified as a theme for evaluation, the selection of materials for digitisation has emerged as an issue of interest for content creation. Each of the projects has been involved in some way in selecting resources to be digitised from a broader collection, series or corpus. Criteria for selection were largely determined by:

- Significance (resources deemed or accepted to be particularly important or popular)
- Representativeness (exemplification of key elements and/or diversity in a collection)
- Comprehensiveness (completion of a recognised set of resources or filling in gaps)
- Quality (physical state of artefacts appropriate for digitisation)
- Practicalities (technical requirements, copyright issues)

The selection of materials for digitisation was informed by, and in most cases endorsed by, project advisory boards, management boards and steering groups. Some projects consulted within the relevant academic community, or took advice from curatorial specialists. Only one project specifically mentioned making reference to published guidance for selecting material for digitisation<sup>13</sup>.

#### **Summary of Key Points for Content Creation**

*In terms of actual content digitised, the projects have met and in many cases significantly exceeded the targets outlined in their initial plans.*

*Projects have provided access to previously hidden materials, including resources that were not visible, not usable, or conceptually obscured.*

*Aggregated resources have critical mass when they are recognised in the field as a definitive and authoritative source for academic purposes.*

*The aggregation of previously dispersed resources can have unanticipated and serendipitous outcomes for teaching and research.*

<sup>13</sup> Ayris, P. (1998) Guidance for selecting materials for digitisation. In: Joint RLG and NPO Preservation Conference: Guidelines for Digital Imaging, 28-30 September 1998, Warwick, UK, <http://eprints.ucl.ac.uk/492/>

*The selection of materials for digitisation is generally determined by significance (important or popular resources), representativeness (exemplification and/or diversity), comprehensiveness (completion of a recognised set of resources), quality, and technical and legal practicalities.*

## Case Studies in Content Creation

### Accessing Under-used Resources – 19<sup>th</sup> Century Pamphlets Online

Pamphlets played an important role within 19<sup>th</sup> century political discourse, representing diverse contemporary perspectives, often polemical in nature. They are a valuable primary source that can complement other sources, such as newspapers, periodicals or parliamentary papers. However because of their ephemeral nature, they are often scarce and difficult to access and so are underused within research or teaching and learning activities.

The 19th Century Pamphlets Online project was sponsored by Research Libraries UK (RLUK), funded by JISC and led by the University of Southampton. The overall aim of the project was to provide researchers, teachers and learners with online access to significant collections of 19th century pamphlets held within UK research libraries. In order to achieve this aim, the project drew on the pamphlet holdings of seven research libraries (Bristol, Durham, Liverpool, London School of Economics, Manchester, Newcastle and University College London), choosing collections that focused on the political, social and economic issues of the day.

From 1999-2002 a large retrospective cataloguing project, sponsored by the Research Support Libraries Programme (RSLP) and CURL (now RLUK), catalogued nearly 180,000 19th century pamphlets from 21 research libraries. That project greatly assisted researchers in finding pamphlets via local library catalogues and the combined academic and national library catalogue, Copac. However, having discovered the existence of a pamphlet, a researcher is then often faced with the barrier of a time-consuming and expensive journey to a distant library to view it, since 19th century pamphlets are usually held within special collections and seldom loaned out. In linking digitised pamphlets to the existing catalogue records created under the RSLP/CURL project, the 19th Century Pamphlets Online project took a further and vital step: ensuring that researchers, teachers and learners do not just discover the existence of 19th century pamphlets, but are able to access many of them directly.

Comprehensiveness was a key criterion for selection, identifying collections that could be scanned in their near entirety. To provide a wide and balanced range of content, complete collections were chosen from Durham, Liverpool, Manchester, Newcastle and UCL. Within these collections, individual pamphlets were deselected for one of four reasons:

- the pamphlet was in copyright
- the pamphlets was published outside the bounds of the 19th century
- the pamphlets was already digitised (or sent for digitisation) from another collection
- the pamphlet was incomplete or too fragile to digitise.

For two further institutional collections a selection strategy was adopted. Staff were asked to identifying sub-collections or individual pamphlets on the basis of:

- their relevance to key debates of the time
- their usefulness in addressing gaps in the digitised collection
- feedback and demand from collection users
- replacements for copies held in smaller collections that were incomplete or too fragile to digitise

The pamphlets are available within JSTOR and will be freely accessible to UK users for at least 25 years. Pamphlets are a new form of content for JSTOR. Over the course of the project JSTOR decided to preserve the facsimile look of the images that were supplied by the project team. In time, JSTOR expects to provide more sophisticated faceted browse options and to more closely integrate the pamphlets with relevant journal collections.

### **Creating and Sustaining Critical Mass – First World War Poetry Archive**

The First World War Poetry Digital Archive project has digitised and made freely accessible over 4,500 items relating to some of the major British poets of the First World War as well as a wealth of contextual material from the Imperial War Museum and National Archives (audio, video and photographs). Intended for researchers, lecturers, teachers, and students across the educational sector, the freely accessible web site brings together items that have previously been hidden away or difficult to access, and also presents a virtual reassembly of dispersed physical collections located across a number of institutions.

In addition, the project has launched The Great War Archive of over 6,500 items of memorabilia submitted by the general public which previously remained hidden away in people's homes and at risk of being lost forever. With the launch of the archive they are now freely accessible to the public and help to unlock alternative literatures of the First World War which help to inform and enrich the Poetry Archive itself.

The project has facilitated the development of critical mass in scholarly terms through the potential exploitation of synergies between the digitised poetry archive and ancillary artefacts and memorabilia in the Great War Archive. This project was also building on an earlier JISC-funded project focusing on the work of one poet, Wilfred Owen. Through this progression, the Archive has been developing a reputation for the care that is taken in processing original artefacts, the quality of the digitised outputs, and the positive implications of increased access to the resources for students, researchers and the general public. Streamlining processes and developing expertise resulted in efficiencies which actually enabled the project to digitise significantly more items than was initially envisaged (7,000 items were delivered against an anticipated 4,000).

The series of digitisation initiatives supported by JISC has served to prove that digitisation presents opportunities rather than threats to the literary estates and those responsible for maintaining and developing them. Critical mass has been established with this phase of digitisation activity and further estates are now actively pursuing the possibility of adding their resources to the digitised collection of First World War poetry. The success of the Great War Archive has shown that involving the general public in the digitisation and curation of collections can produce both collections of worth, and economies of scale.

### **Making the Hidden Available – LBC/IRN Archive**

At 2.00pm on Tuesday, March 3 2009, the brand name 'Independent Radio News' disappeared from commercial radio news bulletins across the UK after nearly 36 years, to be replaced by Sky Radio News. At that moment, an iconic name in independent news journalism was lost. The significance of the London Broadcasting Company/Independent Radio News (LBC/IRN) Archive project undertaken by the Centre for Broadcasting History Research at the University of Bournemouth thus assumed an even greater importance than was conceived at its outset. 'Independent Radio News' as a name has been consigned to the history of broadcasting, and in time it may be that resources such as this archive will be the only way in which academics and students of broadcasting and journalism will be able to understand its role and original identity.

The aim of the project was to digitise the LBC/IRN Archive and create a complete on line searchable database. Commercial radio began in 1973 and the archive consists a wide range of

material from this date until 1996 relating to news and current affairs, including documentary programmes, phone-ins, general features, and some drama. The LBC content contains an independent radio service for the London area.

The records of early commercial radio were held on 10 inch reel tapes in a bespoke storage facility, along with catalogue information which provided supplementary detail referencing the audio. The only option for locating an interview or news item of interest was to spend hours listening to material on a 10 inch reel player. The principal achievement of the project has been to provide greater accessibility to the data for the purposes of research. Without this project these important radio transmissions would have been virtually lost to posterity through their inaccessibility. These tapes, along with updated catalogue information, are now available on the web with intuitive and user-friendly search facilities.

The digitised collection includes comprehensive coverage of all news items within the time period. Other items were selected on the grounds of their adjudged political and historical importance, and the innovative nature of the content. Unusual or rare examples of audio were also selected. One of the major highlights of the project was the spontaneous donation of new materials from the private archives of individual collectors of broadcast material and professional companies. It is envisaged that the project will continue to gather momentum and this offers possibilities for both increasing the scope of the materials, and enhancing the existing data in the online database.

## **4 Adoption of Standards**

The evaluation was tasked with considering how projects contributed to the development of technical standards and best practice in digitisation, including procurement processes and workflow. This review is set within the overarching context of the role of the programme in providing leadership and dissemination of innovation and good practice in the use and development of technical standards and digitisation processes.

The rapid pace of technological development presents digitisation initiatives with both opportunities and challenges. Higher quality images and more accurate data capture require new investment in hardware, revised workflows and developing skills. New products raise questions about the quality of some of the older, existing digital images. In this context, the JISC Digitisation Programme has demonstrated what is possible, raised expectations and developed a momentum which now needs to be nurtured and sustained.

### **4.1 Technical Standards Used**

The following table presents a summary of the standards adopted by the projects in Phase Two of the JISC Digitisation Programme. These are the main technical standards identified in the project reports, reflecting projects' awareness of standards and efforts to comply with recognised national and international standards. There is a brief description of the metadata standards used in this programme and their sources at Appendix D.

Projects	Standards											Repositories			
	Dublin Core	METS	MODS	MIX	PREMIS	MARC21	EAD	SPECTRUM	ISAD(G)	UK-ETD	OAI	TEI	Dspace	Fedora	JSTOR
19 <sup>th</sup> Century Pamphlets		✓	✓	✓	✓	✓									✓
e-Resources on Ireland															✓
Archival Sound Recordings 2	✓	✓	✓							✓					
British Cartoon Archive	✓		✓					✓					✓		
Cabinet Papers 1914 – 1975	✓	✓		✓											
British Newspapers 1620 – 1900	✓	?													
Electronic Ephemera	✓	✓	✓			✓									
First World War	✓										✓				
Freeze Frame							✓	✓	✓			✓			
Independent Radio News Archive		✓													
InView															
Modern Welsh Journals Online		✓	✓								✓		✓		
Historic Boundaries of Britain															
Pre-Raphaelite Resource	✓	✓	✓					✓							
East London Theatre Archive	✓			✓	✓	✓	✓		✓						
UK Theses										✓	✓				

Seven of the sixteen projects used the Dublin Core Metadata Element Set (DCMES) to describe their resources in terms which facilitate their discovery. Extensive use was also made of the Metadata Encoding and Transmission Standard (METS) for encoding descriptive, administrative and structural metadata regarding objects within a digital library. METS was used as a wrapper for other standards-compliant formats where required. The Library of Congress' MIX schema has been used by three projects for managing digital images. Metadata Object Description Schema (MODS) was used for creating bibliographic element sets for supplementary resources, which are intended to carry selected data from existing MARC21 catalogue records as well as to enable the creation of original resource description records. Two projects used the Preservation Metadata Implementation Strategies (PREMIS) data dictionary and supporting XML schemas for the preservation of digitised materials.

Projects that have produced digitised resources which have been deposited in repositories such as JSTOR, Dspace and Fedora have used the standards specified by these repositories.

Where there are gaps in the table this does not necessarily mean that technical standards have not been applied. The Irish Journals project will meet the standards required for publication by JSTOR<sup>14</sup>. The technical work in respect of the resources produced by Electronic Ephemera was undertaken by Capita Total Document Solutions<sup>15</sup> under the aegis of the commercial partner ProQuest<sup>16</sup>. InView has undertaken digitisation in compliance with the standards and formats recognised by the BFI National Archive.

<sup>14</sup> <http://www.jstor.org/>

<sup>15</sup> <http://www.capita-tds.co.uk/>

<sup>16</sup> <http://www.proquest.co.uk/>

## 4.2 Processes and Workflow

An obvious, but not universally applied, example of good practice in digitisation is the early development and implementation of clear and robust workflows for the appropriate stages and processes. Some projects commented on the importance of establishing and clarifying workflow arrangements at an early stage in the project planning process. Projects also reported on refinements and adaptations that were made to workflow processes throughout the project life cycles. Some changes were instigated as more efficient and effective means of achieving the project objectives became apparent, often through developing staff skills and enhanced knowledge. Other changes took place in response to quality assurance requirements. Copyright clearance and intellectual property rights (IPR) issues had a particular bearing on the refinement of workflow processes for some projects.

## 4.3 IPR and Copyright Clearance

It is a consistent finding in the evaluations of JISC development programmes that projects underestimate the time and resources required for the negotiation and clarification of intellectual property rights. The evaluation of Phase One of the Digitisation Programme included a recommendation to use existing resources such as the JISC Legal Information Service to obtain advice about IPR. The programme managers took steps to ensure that projects were aware from the outset that IPR issues would require addressing, and provided sources of information and guidance to support projects in sorting their IPR issues. Nonetheless, the Phase Two project final reports still highlight IPR as a major drain on project resources. Projects underestimated the time required for rights clearance, which on occasion resulted in delays and impacted on achievements in other areas of the project.

Prior to this programme, it seems that several of the institutions (as holders or gatherers of the collections) had worked on the basis of ad hoc arrangements with other owners or providers of contributions. Several made reference to 'gentlemen's agreements' in their negotiation of rights and responsibilities regarding the digitisation of materials, the provision of online access, contextualisation and reuse. Digitisation initiatives with a long development history, with precedents in previous work, perhaps working with a range of funders, stakeholders and interested parties, reach a 'tipping point' where the gentlemen's agreement is no longer sufficient to address the commercial, legal and technical issues that a large-scale digitisation project entails. For many of these initiatives, the Phase Two Digitisation Programme represented that tipping point. Agreements based on ad hoc arrangements needed to be clarified. Verbal acceptances and loose concordats did not present sufficient assurance about rights for commercial providers.

Furthermore, as a general observation both the projects and the programme managers have noted that they underestimated the time, effort and legal consultation required to comply with the terms of the HEFCE licence. There was a particular issue with the 'perpetuity' clause whereby institutions agree that if they are not able to provide access to the digitised content in the future, they will provide HEFCE with a copy of the digitised material for HEFCE to deliver itself. This condition is made to protect HEFCE's investment on behalf of the sector, and would be implemented only in the eventuality of an institution withdrawing access to the digitised resources. However, it has presented particular challenges for some projects on grounds of content, for those dealing with commercial partners, and in particular for projects working with contemporary material. Several projects have suggested that a shorter licence document and more flexible terms would have helped them.

The programme managers were able to exercise some flexibility with the terms of the licence for some projects, such as the addition of a stipulation that institutions could withdraw materials if

there was a good reason for so doing. In agreeing this amendment, the probability of such an eventuality had to be weighed against the risks of non compliance with the licence as a whole to the project legacy and JISC's investment in digital materials on behalf of the sector.

### **Summary of Key Points for the Adoption of Standards**

*There is a wide range of standards adoption in the programme both in terms of the technical standards themselves, and in practice of the projects in relation to the adoption of the technical standards.*

*Higher quality images and more accurate data capture require new investment in hardware, revised workflows and developing skills.*

*A significant contribution to standards development was made in the publication of a METS schema for audio, and in understanding metadata issues relating to mass digitisation initiatives.*

*The use of evolving and non-stable XML-based standards posed some challenges.*

*Metadata creation is a non-trivial and time-consuming exercise requiring expertise.*

*The early development and implementation of clear and robust workflows for the appropriate stages and digitisation processes is essential.*

*In some cases, dedicated specialist support for IPR and copyright clearance may be required. Some projects adopted a risk management approach with a clear takedown procedure.*

*Manual processes have implications for coordinating updates and maintaining the integrity of the digitised resources.*

*The terms of the HEFCE licence are designed to protect the project legacy and the investment in digital materials on behalf of the sector.*

## **Case Studies in the Adoption of Standards**

### **Archival Sound Recordings 2 and Metadata for Digital Audio**

The groundbreaking ASR1 project, funded by the JISC from 2004 to 2006, delivered 12,000 archival audio recordings and images online. ASR2 was funded by the JISC for a period of two years from 2007 to 2009 to deliver online additional archival audio. ASR2 set out to digitise recordings, to clear rights and make available online approximately 24,000 audio recordings, supported by images and added-value features. Over the last five years, the ASR1 and ASR2 projects have explored new ways of providing access to the vast wealth of music, spoken word and environmental sounds held in the British Library Sound Archive. The ASR2 project has again selected significant audio collections from the Sound Archive, digitised them, cleared rights for academic use and beyond, and made them available online.

The work of the ASR2 team has contributed to the technical understanding and practice in the digitisation of audio collections within the British Library and in the wider community of experts in this field. A significant contribution has also been made to global standards for audio metadata with the development and publication of a Metadata Encoding and Transmission Standard (METS) schema for audio. The technical team conducted a mixture of mass digitisation techniques and bespoke audio transfers. Where possible, the project sought to undertake mass digitisation to reduce costs and to ensure effective use of the contractors and the facilities. Much has been learned through this work about how to undertake these processes and under what circumstances mass ingest is appropriate.

Along with another British Library hosted project within the Phase 2 Digitisation Programme focusing on the digitisation of UK Theses, ASR2 used the Open Archives Initiative (OAI) protocol which defines a mechanism for harvesting XML-formatted metadata from repositories.

The ASR2 team also attempted to implement a Total Quality Management (TQM) approach to quality assurance in this phase of the Digitisation Programme. This was a significant development from Phase 1 where a sample of 1 in 50 audio files was selected for quality assurance. Key lessons learned from this approach included the need to undertake quality assurance at the time of digital transfer with spot checking conducted at regular intervals. Technical services were able to undertake much closer supervision of quality on a much more regular basis than was possible under ASR1 because of closer supervision of contracted engineers. The aspiration to TQM had a positive impact on quality even if TQM was not fully achieved.

The success of ASR2 rests not so much on the amount of material digitised but on the quality and rarity of what has been digitised. All the material is now preserved in perpetuity at the UK's national library, where it is available on the premises for the benefit of researchers and the general public and, once rights have been cleared, online to a wider community.

### **Developments in Digitisation Process Workflow: Cabinet Papers 1914 – 1975**

Through this project, The National Archives are able to provide an entire online collection of searchable digitised images of Cabinet Papers as well as providing relevant information and study guidance for both teachers and students of British 20th-century history.

This project broke new ground for The National Archives in the use of Optical Character Recognition (OCR) technology. The ease of access that the OCR provides to the documents is of great value to research, however this project has also discovered the limitations of OCR in its inability to recognise images, foreign text etc. and the use of manually transcribed metadata is useful here in ensuring access to the document. The sheer quantity of digitised content used by the Cabinet Papers project has precipitated a move forwards in The National Archives' processes for the handling and loading of documents for digital storage and presentation. New processes have been developed for Quality Assurance (QA) and correction of OCR and for managing document releases within the collection.

The Cabinet Papers project has provided detailed diagrammatic overviews of the overall project workflow, and detailed overviews of the workflow for five other key processes: editorial process, redactions checking, load of documents, web changes, and testing process. These diagrams present a transferable model on which future digitisation projects could base their planning and implementation, and represent a significant further output for the programme. In particular, the project encountered some issues with versioning and developed robust new processes for handling these within the existing management structure. Processes were also developed to facilitate the load of documents, and improvements were made in the interface between the Archives' DocumentsOnline system, the web pages and the search facility.

The Cabinet Papers site has been tailored to the needs of its projected users in a drive to make the content, not only available and accessible to the public, but usable and relevant for the intended audience. Part of this user centred design process has been the creation of the study packages and educational information available on the site. The large amounts of additional content involved in this project has allowed The National Archives to increase its experience of using internal content management systems and the Cabinet Papers site now provides a structured set of informative pages that can be added to and expanded in the future.

### **InView – Transferable Methodology for Digitising Moving Image Archive Material**

The InView project was run by the British Film Institute (BFI), based at the BFI National Archive, the J Paul Getty Jnr Conservation Centre at Berkhamsted and BFI in central London. Through a curated and thematic approach for selecting and explaining moving image material, InView aimed to demonstrate how some of the key social, political and economic issues had been

represented, illustrated, expressed and debated through moving image media forms. The project aimed to deliver for the first time, a contrasting range of film and video content drawn from currently dispersed collections which, joined together, would create a unique resource.

Efficient and economic resource consumption throughout the course of the project resulted in the digitisation of approximately 1,000 hours of digitised video material, which is some two-thirds more than the original project target. These digitised moving images are accompanied by documents and associated resources for the enhancement of learning, teaching and research within the areas of the arts and humanities.

The original condition of the materials (particularly film items) was known to be variable. The project team carried out initial evaluation work to establish both the standards that should be adopted for the digitised products, having regard to both JISC's published standards and those already employed by other projects and services (both JISC supported and non-JISC supported). While BFI benefits from world-class technical expertise and talent in the both the film archive and video technology fields, the team understood the importance of surveying developing technologies and operational techniques. This would ensure that the solutions eventually adopted would not only be optimised, but would be of the greatest benefit to the BFI in the longer term.

It was decided that all of the moving image material should be ingested by the digitisation system from videotape. The system should be capable of handling common formats but also extended to incorporate other formats as well. A digital sub-master file was created from which the deliverable transcodings were struck. This not only enabled BFI to create replacement deliverables, but also over time to create deliverables in different formats and to different specifications as required .

Having evaluated and defined the standards by which the materials would be digitised, the next step was the definition and procurement of the technology to be implemented. This was undertaken through a user requirements analysis combining the essential technological capabilities required with the essential functionalities required by both BFI National Archive and the project team. Once the procurement processes had been completed a complex process of evaluation, testing and calibration of the equipment began.

During the production stage, films and videos were selected, prepared, and subject to rigorous quality control procedures. Once the content was digitised, cataloguing and contextualisation work moved the project forward to completion. All material encoded by the project is held in a digital asset management environment. BFI's InView and information technology teams worked jointly to integrate digital assets and metadata for service through the InView website, which is integrated with the Shibboleth single sign-on system for accessing academic content.

Through this process project has succeeded in selecting, preserving, digitising, contextualising and serving digital video and still image content via a web delivery resource that delivers contextualisation and descriptive filmographic metadata to users within UK higher and further education. Volume delivery targets have exceeded those originally agreed. The preservation work has produced real benefits for the national collection and some titles have been made available to academic audiences for the first time since their original release.

The digitisation methodology and workflow that was developed for InView embraces a range of formats and can be applied to other film and video archives. It has been tried and tested in BFI National Archive, and it is expected that the work of this project will lead to additional online access and further digitised materials being made available.

## 5 Innovation in Sustainability and Business Models

### 5.1 Background and Context

The JISC Digitisation Conference in 2007 identified the development and deployment of sophisticated business models as a key factor in the sustainability of the digitised resources, and in capitalising on the expertise that was gained by individuals and organisations through engagement with the digitisation process. Recognition of the inter-dependence of appropriate business models and sustainability was reflected in the design of the Phase Two Digitisation Programme. Projects were encouraged to consider issues relating to the ongoing sustainability of the digitised resources from the outset, and establish business-oriented structures and processes for sustainability in association with lead institutions and partner organisations. Digitisation initiatives were explicitly encouraged to avoid reliance on further funding rounds for the ongoing support, maintenance and development of the resources.

Within the lifetime of the Phase Two Digitisation Programme, JISC initiated a process aimed at gaining a more systematic understanding of the mechanisms for pursuing sustainability in not-for-project projects. The first stage was completed in March 2008 with the submission of a report on Sustainability and Revenue Models for Online Academic Resources.<sup>17</sup> The intention was to establish context for a conversation about whether further work in this area is worthwhile, and if so, to help prioritise areas of inquiry that would be helpful both to funders and to new projects. The study outlined the sustainability challenge facing online academic resources, defining 'sustainability' in economic rather than environmental terms as 'having a mechanism in place for generating, or gaining access to, the economic resources necessary to keep the intellectual property or the service available on an ongoing basis'. It described parameters for creating a structure and culture for sustainability in higher education, and means of creating and leveraging value for institutions. It also outlined a range of revenue-generating options for online academic resources, and appended the Ithaka Framework for Sustainable Not-for-Profit Innovation.

In the course of the Programme, JISC also commissioned a dedicated study with the aim of gaining a detailed understanding of the preservation element of the projects.<sup>18</sup> An internal report for the JISC in April 2009 identified aspects of good practice in digital preservation, and highlighted areas and projects where further work was merited or interventions required to address issues relating to the preservation of the digitised resources.

The study has identified a number of themes, including the need for preservation policies, collection management procedures, robust preservation infrastructures, and sustainability. The most significant findings were:

- Without a written preservation policy, the long-term usability, authenticity, discoverability and accessibility of the digital collection is at risk.
- Without defined collection and content management procedures, the long-term usability, authenticity and discoverability of the digital collection is at risk.
- Without maintaining digital collections on a suitable digital preservation infrastructure, the long-term usability and accessibility of the digital collection is at risk.

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<sup>17</sup> Sustainability and Revenue Models for Online Academic Resources, March 2008, Kevin Guthrie, Rebecca Griffith, Nancy Maron. A follow-up report entitled Sustaining Digital Resources: An On-the-Ground View of Projects Today was published in July 2009 – see <http://sca.jiscinvolve.org/business-modelling-publications>

<sup>18</sup> The JISC Digitisation Programme Preservation Study was undertaken by the Digital Preservation Coalition, the Digital Archives Department of the University of London Computer Centre and Portico.

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- Without a plan for sustainability, the long-term usability and accessibility of the digital collection is at risk.

The study has also proposed a definition of digital preservation as a starting point for the digitisation community:

Digital preservation is the series of management policies and activities necessary to ensure the enduring usability, authenticity, discoverability and accessibility of content over the very long-term. The key goals of digital preservation include:

- usability – the intellectual content of the item must remain usable via the delivery mechanism of current technology
- authenticity – the provenance of the content must be proven and the content an authentic replica of the original
- discoverability – the content must have logical bibliographic metadata so that the content can be found by end users through time
- accessibility – the content must be available for use to the appropriate community

In the course of the preservation study, a detailed analysis was undertaken on a project-by-project basis of the platforms used by each project for the presentation of the digitised resources, the size of the objects and nature of the content, the metadata standards used, and the intended community of users. Information specifically relating to digital preservation was also presented, relating to the timeframe for access, backup procedures, the approach to preservation adopted by each project, the use of appropriate preservation processes, plans for sustainability, and ability to ship archival packages for commercial use.

In the context of these two detailed studies, this section of the evaluation report highlights aspects of interest illustrated by particular projects and innovative examples in the effective use of business models that address sustainability and digital preservation issues.

## **5.2 Sustainability Strategies**

Many projects have reported their reliance on continued support from senior managers within the host organisations for the ongoing upkeep of the digitised resources and the maintenance of online access. This continued support is contingent on a number of critical factors, including tangible criteria relating to revenue generation, organisational structures and technical support as well as intangible issues such as personal commitment and the perceived value of the resource for the institution.

From the project final reports, it is clear that in the vast majority of cases, as work on these initiatives progressed the role of partnership working and liaison with other organisations took on increasing importance for lead organisations in the development of business models to support the sustainability of the digitised resources. A key message is the need for a sustainability plan or consortium agreement to address collaborative responsibilities for maintaining and developing project resources.

Different potential models of website usage have been explored by projects in this Programme. Users can pay to subscribe for value-added information, sites can depend on advertising revenue, sites could be free for UK HE institutions, with overseas users paying a fee. Raising funding for sustainability and further development may depend on revenue from the content, re-licensing, micro payments, working with business partners, sharing the burden with other public institutions, and seeking additional special funding.

### 5.3 Wider Context for Sustainable Digitisation

Two fundamental sustainability issues are highlighted by this programme: the first concerns the preservation of the digitised resources, and the second the further development of digital collections to maintain and enhance their relevance and usefulness. Project and programme activities have focused on the preservation of the digitised assets and maintaining access to the resources that have been created. However, the sustainability models that have been developed in partnership with commercial organisations have limitations in terms of guaranteeing the further development of the resource. Arrangements with commercial partners generally confirm free access to the digitised resource for the public sector in the UK, with the commercial partners marketing the resource with a view to securing external subscriptions to support this access. It is unlikely to fit the business plans of commercial partners that they might develop the existing resource without additional funding or at the very least a strong commercial imperative.

The burden of sustaining the collection through development therefore rests with the owners. How institutions respond to this responsibility without a project-dependency culture hinges on a number of factors, not least the extent to which the institution views the resource as an asset which is worth developing, and/or which the institution is prepared to maintain and develop for and on behalf of the sector and the wider public. This touches on the key question of institutional approaches to digitisation, specifically whether this is perceived as a peripheral activity undertaken by specialists for specialists, or a core activity that is embedded in institutional processes and practice for learning, teaching and research.

Planning for sustainability also depends on engaging with academic users of the resources and encouraging their both their exploitation for research and their integration with the curriculum. Models of joint ownership are being explored whereby groups of academics are formed to identify potential uses. Continuing user groups are also providing suggestions for refinements in the ways materials are presented, and in some cases taking ownership of the processes for changing and refining the presentation of the digitised resources. Projects have noted that contextualised material is particularly difficult to sustain. Over time that challenge may lessen as users take on more responsibility and contextualise resource for us and provide additional resources to the collection.

The terms and objectives of the Enriching Digital Resources<sup>19</sup> strand of the Digitisation Programme offer some insight into this context of sustainability through institutional engagement. The main focus of this strand is on the enhancement of existing digital resources to maximise their use for teaching, learning and research. A further key element for sustainability in this programme strand is the sharing of resources and expertise at a regional level, a kind of small-scale mutual self-supporting digitisation service. The timescale for this activity strand overlapped with the timeframe of Phase Two (Enriching Digital Resources runs from October 2008 – September 2009) and so did not present a ready solution for Phase Two projects seeking further funding to consolidate their activities. Enriching Digital Resources also represents a more modest (£2 million) investment in keeping with its focus on the use of existing digital collections rather than the creation of new resources.

The Phase Two Digitisation Programme is one element in a series of digitisation initiatives supported by JISC. These initiatives have taken place in a wider organisational context which includes national initiatives such as the Strategic Content Alliance<sup>20</sup> and multilateral discussions with key national and international digitisation experts and organisations. Within this wider context, there is scope for the creation of services from the body of expertise that has been

<sup>19</sup> <http://www.jisc.ac.uk/whatwedo/programmes/digitisation/enrichingdigi.aspx>

<sup>20</sup> <http://www.jisc.ac.uk/contentalliance>

developed, consolidated and enhanced through this Programme to support future digitisation initiatives undertaken by JISC and others. The digitisation processes and workflows produced by the Cabinet Papers project at The National Archives and the technical expertise of specialist units such as BOPCRIS at the University of Southampton are examples from this programme of expertise that could be made available on a service basis.

### **Summary of Key Points for Innovation in Sustainability and Business Models**

*The development and deployment of sophisticated business models is a key factor in the sustainability of the digitised resources.*

*Many projects have reported their reliance on continued support from the host organisations for the ongoing upkeep of the digitised resources and the maintenance of online access.*

*Partnership working and liaison with other organisations is key in the development of business models to support the sustainability of the digitised resources. There needs to be a sustainability plan or consortium agreement to address collaborative responsibilities for maintaining and developing the digitised resources.*

*Different potential models of website usage have been explored, including subscription payments for added-value services, advertising revenue, and charges for international access.*

*Institutional support for sustaining digitised resources depends on the extent to which these are viewed as an asset which is worth developing, and/or which the institution is prepared to maintain and develop for and on behalf of the sector and the wider public*

*To be fully sustainable, digitisation needs to be a core activity that is embedded in institutional processes and practice for learning, teaching and research.*

## **Case Studies in Sustainability and Business Models**

### **Electronic Ephemera and Public/Private Partnership**

The John Johnson collection at the Bodleian Library in Oxford is widely recognised as one of the most important collections of printed ephemera (everything relating to printing that does not appear in the book) in the world and generally regarded as the most significant single collection of ephemera in the UK. Containing 1.5 million items ranging in date from 1508 to 1939, it spans the entire range of printing and social history, and contains a high proportion of unique material which has remained hidden to researchers up until now.

Market research conducted by both ProQuest and the Bodleian prior to the project provided evidence of the widespread appeal and potential uptake of digitised selections from the John Johnson Collection, and served to confirm that the full richness and value of the Collection would only become truly apparent when readers were able to explore online a significant cross-section of the Collection for themselves.

The sustainability model is based on the commercial sale of the digital materials by ProQuest outside the UK. While the resource is freely available to all further and higher education institutions, schools and public libraries in the United Kingdom, ProQuest was granted the rights to the online delivery of the images for five years in the first instance (subject to renewal thereafter) and will realise its investment in the resource through subscription sales overseas. In line with ProQuest's long-term business strategy, much of the revenue generated by these sales is used to fund continued free access to the resource within the UK; to cover the costs of hosting and updating the service; to promote the resource both in the UK and abroad; and to provide customer service.

The project partners were both committed to the delivery and support of digital resources in the long-term. The Bodleian already had in place a formal commitment to ensuring that any digital

collections resulting from the institution's own collections must remain viable and accessible in perpetuity. A Consortium Agreement was drawn up by both parties for submission to the JISC, providing a framework within which the long-term availability of the resource within the UK would be determined, and to take into account the remote possibility that revenues from overseas sales may not be sufficient to support free provision of the resource to UK users.

Digitisation was undertaken by Capita Total Document Solutions, a company with which ProQuest already had a long-established commercial relationship. This provided both economy of scale and clear guarantees about the quality and delivery of the digital images. The project's formal relationship with Capita was managed by ProQuest, drawing on their experience in directing previous large-scale digitisation projects, with the two parties signing a Digitisation Agreement which included modifiable appendices outlining specifications for scanning, file-naming, transport, storage and handling.

Following the launch of the online resource in March 2008, ProQuest and the Bodleian have worked closely on promoting the resource and investigating ways further to enhance both the content and functionality.

### **19<sup>th</sup> Century Pamphlets in partnership with JSTOR/Ithaka**

The 19<sup>th</sup> Century Pamphlets project based at the University of Southampton's BOPCRIS Unit recognised from the outset the challenge faced by large consortia digitisation projects in preserving and sustaining the resources they create. Which of the many partners will take on this responsibility? How will it be paid for? To address this problem, the UK project partners chose to enter into a long (25 year) agreement with JSTOR over the care and delivery of the collection. JSTOR is an established provider offering a not-for-profit service for scholars, researchers, and students to discover, use, and build upon a wide range of content in a digital archive of over one thousand academic journals and other scholarly content.

Placed with JSTOR, the Pamphlets collection benefits from exposure alongside JSTOR's other content and marketing activities. It also benefits from the linking arrangements JSTOR has with other organisations. The project benefited particularly from JSTOR's search and retrieval interface, marketing activities, linking arrangements, and preservation services.

The outline of the business model was agreed before the commencement of the project and has now been underpinned by a series of legal agreements. JSTOR stores a copy of the archival digital dataset created by BOPCRIS from the library collections and undertakes all the activities required to preserve this dataset, including backing-up, data checking, and migration to other formats. Contributing libraries can request copies covering their own collections, while RLUK, the JISC or HEFCE can request a copy of the entire dataset. JSTOR derives a delivery dataset, which it makes freely available to UK secondary schools, FE, HE and some other institutions. The costs of archiving and delivering the collection for UK users are borne entirely by JSTOR and funded through income it is able to generate within other markets.

Integrating the different interests of JISC, HEFCE, JSTOR, RLUK, the libraries supplying content, the library undertaking the digitisation, and the owners of the material deposited, was a complex undertaking, especially as the agreement was designed to run for 25 years. While legal negotiations about licensing arrangements continued, the project proceeded on the basis of a standard consortium agreement setting out roles, responsibilities, procedures and practices, and expectations for the RLUK partners. This was a pragmatic solution to the dilemma presented by the lengthy legal processes which could have left the consortium without a statement of collective responsibility and practice.

The project found that there were some advantages in the length of time taken to complete the legal agreements in the sense that issues arose during the project implementation stage which

might not have been covered had the agreements all been concluded in advance. These included agreements on how much material could be hosted locally by a library in addition to the whole collection being delivered by JSTOR, requirements for long-term preservation and access, the balance of benefits between exclusivity and non-exclusivity, ownership of IPR, restrictions on accidental copyright infringement, and indemnities. The fundamental goal for the project was to achieve the balance required to deliver the content as freely as possible, whilst providing sufficient legal protection for partners and protecting the business interests of JSTOR, which would ensure the sustainability of the collection.

The project was also to develop a very good relationship with JSTOR, which it hopes will lead to further work with UK libraries.

### **Sustainable Website Development – Historical Boundaries of Britain**

Historical Boundaries of Britain was planned as an extension to the Great Britain Historical GIS (GBH GIS), a major digital resource assembled over almost two decades. The website 'A Vision of Britain through Time' already attracts around 80,000 unique users per month and this project was designed to increase the usefulness of this website by adding political units, maps and statistics to the existing system.

Over 1000 historical maps relating to five Boundary Commission Reports and administrative area maps have been scanned and had metadata added to the images. By locating them geographically (geo-referencing) it has been possible to mosaic these together, allowing them to be incorporated into a continuous viewing gallery on the Vision of Britain website known as the map library. The website also provides an aggregated resource of smaller datasets enabling researchers to track equivalent data from different dates in printed census reports, compile a time series and deal with comparability issues. Online tutorials and guides focusing on background themes offer insights into how to maximise the usefulness of the digitised resources for research.

Following a period of protracted negotiations with potential hosting services, resources developed by the Historical Boundaries project for the Vision of Britain website will be hosted on a server supported by the lead institution, the University of Portsmouth. Growing world-wide interest in genealogy and toponymy demonstrates the commercial potential of the site. The project team is considering adding functionality to the website to enable users to add their own information for particular localities. The team is concerned to maintain the perceived 'authoritativeness' of the information about administrative units, which includes statistics and legal changes, but is confident that information about less formally defined 'places' can be less tightly controlled without damaging the overall reputation of the site. The longer term vision for the site also includes geospatial contextualisation through the use of mobile technologies to access resources when and where appropriate.

## **6 Resource Discovery, Personalisation and Contextualisation**

### **6.1 Background and Context**

The importance of according primacy to the needs of users in the digitisation process has long been identified and emphasised in JISC digitisation strategies and implementation plans. The JISC Digitisation in the UK Report of 2005 included a clear recommendation for future developments in digitisation to investigate users' needs and respond more directly to user demand rather than supply.<sup>21</sup> The JISC Digitisation Conference in 2007 highlighted the need to

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<sup>21</sup> Digitisation in the UK – the case for a UK framework, JISC 2005, [www.jisc.ac.uk/media/documents/publications/digiuk.pdf](http://www.jisc.ac.uk/media/documents/publications/digiuk.pdf)

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address the needs of the end user as a key issue, recommending a renewed user focus in creating digital collections.<sup>22</sup>

The context for the enhanced focus on user engagement in JISC developments also included the parallel Capital-funded JISC Programme on Users and Innovation: Personalising Technologies<sup>23</sup>. The background documentation for this Programme included reference to the Chaos report of the Standish Group in 1994 which identified user involvement as the single highest factor in software projects that deliver on time and within budget<sup>24</sup>. The overarching aim was to ensure the effective and efficient use of technology in the support of user and institutional goals through exploring the use of a structured approach to engaging users at all stages in the development process. Fundamentally, the Users and Innovation Programme anticipated that an informed and enhanced approach to user engagement would lead to the development of tools and resources for the educational community that are useful, usable and used.

The Phase Two Digitisation Programme was conceived against a background of a growing awareness of the need not just to create digitised content, but to ensure the ongoing relevance of the content for a range of stakeholders. As such, the programme has been at the forefront of user involvement in large-scale digitisation initiatives in the UK. Each of the projects in its own way has taken seriously the need that was identified in previous initiatives (and articulated in the JISC Digitisation Strategy) to consult users with regard to the selection, presentation and contextualisation of the digitised resources. Some explicitly sought views and input from groups and individuals that were likely to be harshly critical, thus embarking on a brave public relations exercise which, through the ultimate public success of the digitisation initiatives, has had positive benefits for the resource and for the JISC Digitisation Programme as a whole.

User engagement was therefore identified from the outset as an important aspect of the Phase Two Digitisation Programme, and the value attached to user engagement at programme level was emphasised in the inclusion of resource discovery, personalisation and contextualisation of the digitised resources as a principal evaluation focus. The programme evaluation was tasked with exploring the ways in which the projects engaged with users when creating the new resources. The extent to which the new resources provide an appropriate user environment was also evaluated, in terms of the effectiveness of the projects' approaches to resource discovery, contextualisation, user involvement, and the degree of innovation adopted by projects in the personalisation of the digitised resources.

Evaluation workshops and ongoing discussions with project leaders throughout the programme consistently highlighted the importance of user engagement, and encouraged teams to review and reflect on the activities they were undertaking to involve users at all stages of the digitisation process.

## **6.2 Techniques for Engaging Users**

A number of different techniques and approaches for user engagement were implemented across the programme. The projects mostly took a pragmatic approach to engaging users in the development of the resources. Feedback was requested in fairly standard ways, including focus groups of students testing usability and functionality, feedback forms on websites, and consultation with experts. Where appropriate, feedback from users was acted upon in the selection of materials for digitisation and the enhancement of the digitised resources, the

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<sup>22</sup> [http://www.jisc.ac.uk/whatwedo/programmes/programme\\_digitisation/conference\\_2007.aspx](http://www.jisc.ac.uk/whatwedo/programmes/programme_digitisation/conference_2007.aspx)

<sup>23</sup> <http://www.jisc.ac.uk/whatwedo/programmes/usersandinnovation>

<sup>24</sup> [http://www.standishgroup.com/sample\\_research/chaos\\_1994\\_1.php](http://www.standishgroup.com/sample_research/chaos_1994_1.php)

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provision of guidance and educational materials, and the development of amended and improved structures for access.

Each project developed a public-facing website. Several included a project blog with opportunities for users to contribute their views. Some projects consulted user groups on the format and functionality of the website and/or undertook a user requirements analysis before instigating the development or redevelopment of the site. User feedback and usage statistics often informed the iterative development of the websites during the projects. Several projects had initially intended to have a public section to their websites but realised that they could not commit to sustaining this as a public resource and preserving the content that this might generate. Others have developed generalisable processes and workflows for user-generated content.

All but one of the projects established an advisory board or steering group, mostly comprising external experts as well as internal organisational representatives. These bodies provided a vehicle for user feedback to inform ongoing project developments as well as strategic advice and guidance on the digitised resources and their role in the sector. Several projects engaged with specific groups or cohorts of students through liaison with academic staff in the host institutions. Use was made of both relatively informal focus groups and structured user feedback in controlled programmes of user testing.

Some projects identified the importance of engaging in dialogue with the users of the digitised resource. In this context, the timing and planning of user engagement was seen to be crucial. Particular emphasis was placed on the need to engage with users as early in the project as possible, and where possible on building processes for engaging users into the project plan from the outset.

Projects engaged with users to inform their activities and developments at various stages. This included discussions around the selection of the resources to be digitised, how to present the resources to maximise their usefulness for a variety of user groups, to sort recognised problems and correct user-identified errors, to make recommendations for the expansion of digitised collections. Most projects established some kind of internal user panel with staff and student members. Programmes of public events such as conference presentations, roadshows and workshops allowed direct feedback from a wider constituency of potential users, and in some cases led to the recruitment or augmentation of user panels to test resources and their online environments in development. At the delivery end, publishers have been gathering usage information to inform delivery and packaging.

However, a small number of the projects persisted in a somewhat narrow interpretation of user engagement, with activities less geared towards an iterative and dialogic approach, and more in terms of 'pushing' information and resources at the users and potential users. Such an approach was more concerned with informing potential users and stakeholder groups about the project scope and the resources being made available, and disseminating the digitised resources when the process was complete. There was less emphasis in engaging in any consultative discussion about what was being selected for digitised, how the digitised resources would be presented and accessed, and possible contexts for use.

Others wrestled with the dilemma of the extent to which it was practicable to let users decide what was important for them, or whether users needed to be provided with documentation to enable them to make decisions about the relevance of the resources. This dilemma touches on the extent to which project teams consider that the best and most effective use of the digitised resources can be supported by structured guidance and support, or by leaving users to make sense of the resources for themselves. This in turn gives rise to questions about the importance

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of perceived scholarly value and academic authority both for the project teams and responsible owners/keepers of the resources, and for some users.

### **6.3 Contextualisation and Personalisation for Resource Discovery**

The projects employed a number of techniques and processes to enable users to contextualise the digitised resources to suit a variety of purposes. Some of the projects demonstrated particular innovation in the extent to which the digitised resources and their environment could be personalised to the context and requirement of individual users. Examples of the innovative use of web-based functionality include facilities for users to provide comments, manipulate images on screen, create their own personal archives, and annotated paths through the archive for others to follow. Use has been made of social networking sites such as the Twitter<sup>25</sup> microblogging service to inform a community of interested 'followers' about the staged release of digitised outputs.

The development of flexible educational materials for use in a range of learning contexts was a principal feature of the Programme. These include series of contextual essays, learning resource sets and online tutorials, video guides and podcasts, and accompanying teachers' guides.

Many of the original project proposals included plans to use emerging social networking platforms and processes to engage users not just in discussions informing the development and presentation of the digitised resources, but also in the generation of content to augment and enhance the digitised collections. There was early interest in using web 2.0 technologies for user engagement and building a sustainable community of users of the resources. In practice, however, most of the Phase Two projects scaled back their original proposals for user-generated content and devolved responsibility. While reasons for this scaling back included technical issues and/or security concerns, some of the projects explored the role of social networking and individual contributions to digital collections in some depth. A need was identified for careful balance between the potential depth, breadth and resonance of public contribution with the perceived authority of the institutional stamp and expertise. One of the wider issues relating to resource discovery explored by the projects was the need to address the sustainability of contextualised material, which may require special measures over and beyond the maintenance of the digitised resources in order to maintain their relevance and currency. It was noted that this challenge may lessen over time if functionality and processes in support of user-generated content are enhanced, and users take on more responsibility for ongoing contextualisation and the provision of additional resources.

Issues were identified with managing expectations, balancing what the sector and the wider public are increasingly demanding in terms of the quality and quantity of digitised resources and attendant contextualised materials, and what projects, organisations, institutions and funders are able to deliver. Projects have identified challenges with integrating the continuing requirements for change from the iterative user testing being carried out, and the needs of the organisation, the flexibility of the system that the site was being developed in, the timeframe available for making changes, the available budget and the change management processes. There is a recognised need to consider – before embarking on testing – at what point a line should be drawn under the user testing and how good is 'good enough' for the users.

Projects have noted that users are increasingly well informed about what they expect to find and how they wish to interact with the digitised resources. A core motivation for host institutions is therefore assembling resources and signposting their digitised collections. This requires

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<sup>25</sup> <http://www.twitter.com/>

institutional investment not just in digitisation but also in online infrastructure, environments and platforms, and in provision for responding to enquiries and updating the resource.

The active engagement of networks of users and contributors in the resource development process has highlighted issues of curatorship and the responsibilities attendant on making resources available to a community of users. Projects, programmes and JISC have an assumed responsibility for archiving, quality assurance and curation of the resources for the community of contributors and user-stakeholders. This presents issues of ownership, quality and authority. There may be a need for a framework for addressing the shifting boundaries of authority and responsibility that arise with the sort of user-involved approach to developing and maintaining a digital resource that was championed in this programme.

### ***Summary of Key Points for Resource Discovery, Personalisation and Contextualisation***

*Most projects took a pragmatic approach to engaging users in the development of the resources. Information on user views and requirements was mainly sought through focus groups of students testing usability and functionality, feedback forms on websites, and consultation with experts.*

*Some of the projects demonstrated particular innovation in the extent to which the digitised resources and their environment could be personalised to the context and requirement of individual users, including innovative use of web-based functionality, the development of education materials, and engaging in dialogue with users.*

*Feedback from users was acted upon in the selection of materials for digitisation and the enhancement of the digitised resources, the provision of guidance and educational materials, and the development of amended and improved structures for access.*

*Particular emphasis was placed on the need to engage with users as early in the project as possible, and on building processes for engaging users into the project plan from the outset.*

*A small number of the projects adopted a narrow interpretation of user engagement, with activities less geared towards an iterative and dialogic approach, and more in terms of 'pushing' information and resources at users.*

*The programme highlighted the dilemma of letting users decide what is important for them, or providing documentation to facilitate decision-making about relevance and appropriateness.*

*Most projects scaled back on original plans to use emerging social networking platforms and processes to engage users, mostly because of technical issues or security concerns. However, some explored issues relating to user-generated content and devolved responsibility for the ongoing maintenance of digitised collections.*

*Several projects have articulated plans to include provision for further user involvement in the ongoing development of the resources.*

*Developments in support of resource discovery have added to the conceptual accessibility of the digitised collections. The need for particular measures to address the sustainability of contextualised materials for resource discovery was identified.*

*Users are increasingly well informed about what they expect to find and how they wish to interact with the digitised resources. Meeting these expectations requires institutional investment not just in digitisation but also in online infrastructure, environments and platforms, and in provision for responding to enquiries and updating the resource.*

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## Case Studies in Resource Discovery

### Understanding User Needs for the Pre-Raphaelite Resource

Birmingham Museums and Art Gallery (BMAG) has a large and important holding of Pre-Raphaelite drawings which had never before been comprehensively documented and accessed as a collection. With the digitisation of these works, the project has created a unique research source for the study of the Pre-Raphaelites and British 19th-century art, available on an open access basis via the BMAG website.

One of the most important lessons to come from this project is the importance of undertaking audience research to find out what users want. The project team was concerned to develop the resource and make it available not just to meet the needs of the further and higher education community, but also to reflect the importance of the resource for the general public, historians, artists and researchers.

A detailed audience research study was commissioned, not just to shape the work of this project, but with the bolder and more visionary intention to inform BMAG's understanding of the wider development of effective, user-centred online resources for Arts and Heritage and Education communities. The research explored audience use and perceptions of online archives in both further and higher education and the broader public space. It also looked at the use of social software by learners, teachers, image librarians and academic professionals.

The research indicated that care must be taken with positioning for the resource to be truly useful as a research tool; students and lecturers need to know that it has been created for them and has scholarly merit. Their main concern is to access reliable, relevant content and information. In common with a theme that emerged from a number of projects in the Digitisation Programme, the research recommended that the digitised resource should enable users to form their own pathways and connections within the resource.

Whilst there are clear benefits to be achieved from providing teachers and students with the opportunity to share ideas in the context of stimulus artefacts, many hold reservations about 'giving away' their intellectual property. A status-conscious, competitive academic environment is unlikely to encourage users to share their ideas with others online, but it was suggested that providing different levels of publishing privileges will help cater for the varying acceptance within the audience base for sharing their ideas publicly.

Social networking features were perceived by both students and lecturers as primarily for pleasure rather than for work so must be used sparingly in a resource of this nature. For younger students, however, the boundaries between work and life are increasingly blurred and the ability to contact experts and to personalise or control the space would be welcomed.

### Cabinet Papers 1915 – 1978 and Stakeholder Requirements

The National Archives have developed an online resource aimed at schools, FE and HE students. Many of the topics included are key parts of the A-level examinations syllabus and university programmes.

The project benefited from early and continuing iterative user testing to create the site around a user centred design principle. Early informal discussions with primary user groups were critical in ensuring that comments and views were incorporated at an early high level design stages. An initial scoping carried out was to assess the needs of the intended audiences identified in the bid. One to one interviews were carried out with key providers in further and higher education and the schools sector. These were used to concept shape the potential structure and shape of the study packages to be provided.

A user-centred design approach with iterative user testing throughout the project was taken, to ensure that user needs remained central to the work of the project and its outputs. This included classroom testing in schools, one to one interviews, trials of the content and expert reviews. An external company carried out the usability testing and formal evaluation of the website, and the results were fed back into the development of both the website and the content. The contextual content being created was peer reviewed by key academic contacts who were able to ensure that a balanced approach was taken both in creating the content and ensuring that the resource was consistent with current approaches to teaching and lecturing. This was important in meeting user needs, both from the point of view of the user group represented by the peer reviewers and from the point of view of usefulness to students.

The website was also reviewed and approved by examination boards to ensure that the content supports the National Curriculum, and meets the needs of A-level teachers and students. The National Archives already had systems in place for receiving feedback from users on web services after they have been launched, either online or through our contact centre, or through the reading room user forum and online user panels.

Other features of interest on the website include a tool that allows users to pan around world maps and see the changes in geopolitical boundaries over time. This has been developed with world-view and zoom perspectives, and with information 'hotspots' which provide additional information about key events or decisions discussed within the Cabinet Papers. Some of these information points are classed as resource links with access to visual extracts, such as maps, photos, and statistics, from the original documents. The writing frame is the other key application on the site, which aims to support students in their understanding of writing essays based around primary historical sources, such as the Cabinet Papers.

### **Community Engagement with the First World War Poetry Digital Archive**

Building on the success of the University of Oxford's Wilfred Owen archive, this multimedia digital archive contains images, text, audio and video of primary material from five other major British poets of the First World War.

To ensure a usable and popular resource, engagement with users was at the heart of the project. The project team maintained close relations with a range of stakeholders and users, including academic staff, school teachers, literary estates and the wider public. The first steps to building a set of requirements was to understand how First World War Poetry is currently researched, taught, and studied, the challenges that are faced, and the part that technology and digitised resources can play to enhance this area. A series of requirements gathering exercises and tests with users were carried out prior to launching the website to check usability and accessibility, and further refinement were carried out in response to ongoing user feedback when the site was live.

The project formed a steering group consisting of key experts in the field of First World War Poetry. These experts were also researchers and teachers of the subject, and in many cases had worked extensively with the manuscripts that the project sought to digitise. Their experiences in this area were key in deciding exactly what should be digitised, the type of metadata that should be captured, and for generating the requirements of the end delivery system.

The importance of liaison with the wider academic community was also recognised. In collaboration with the Higher Education Academy Subject Centre for English, the project ran a workshop entitled 'Teaching WW1 Literature'. The aim of this workshop was to identify some core themes within the teaching of First World War Literature and in doing so be able to respond to needs, gather requirements, alleviate fears, and illuminate the benefits of using ICT in

teaching and learning. The workshop did not focus on the technology that was available, but instead facilitated discussion on what constituted the effective teaching and study of this area and how technology could respond.

The project successfully redeveloped a simple tool based on Vannevar Bush's original concept of trails and trailblazers that allows users to create annotated paths through the archive for others to follow. Selected paths were recreated in the new version, and additional ones were added based on the expanded content. The tool is available for users to create their own paths for others to follow as well as following the previously written ones.

Perhaps the most innovative and exciting aspect of this project was the Great War Archive, which provides opportunities for the public submission of resources and artefacts as contributions to the digitised collection. Originally conceived as a relatively small part of the project scope, the Great War Archive captured the imagination of a wide range of users and contributors. It has developed into a powerful resource and communicates a clear message to resource owners and responsible curators about the strength of public interest in the value of public contribution.

## **7 Capacity Building**

### **7.1 Background and Context**

The importance of ensuring that any digitisation project is compatible with the host organisation's wider mission and will attract high level support within the organisation has long been recognised as a critical success factor for the projects. Through its initiatives, JISC's role in supporting the development of a body of expertise in the sector in all aspects of the digitisation process is also recognised. The Programme Definition Document for Digitisation has a specific intended outcome the increased capacity of UK institutions to develop staff, skills and infrastructure for future digitisation projects.

In this context, the Phase Two evaluation reviewed on the extent to which the programme has been successful in developing institutional capacity within the funded institution, with a specific focus on changes to institutional infrastructure to support the digitised resources, and any changes to institutional strategies. It also focused on the enhancement of staff skills and the provision of training through the programme. A third evaluation focus under the broad heading of capacity building related to the development of appropriate management models in different institutions and the extent to which these models are durable and transferable to future digitisation initiatives.

### **7.2 Skills and Capacity Development**

In the course of the programme, evaluation activities with the project teams identified a range of management, technical and specialist skills that are collectively required by successful digitisation project teams. Requisite management skills include generic project management and information management skills, including skills of communication and negotiation, coordination and logistics, evaluation and outreach. Managers of digitisation projects also need to have specific expertise in understanding institutional cultures within higher education. There are particular financial skills requirements for identifying funding opportunities and securing resources from both public and private sources, understanding the workings of public/private partnerships, and developing robust, commercially driven sustainability models. Project teams in this programme also identified a particular skills set required for engaging with a range of users and stakeholders, and understanding and analysing user needs and experiences.

The range of technical and specialist skills identified by the teams included a good grasp of computer science and technical development, programming and data handling, complex

scanning and optical character recognition (OCR). They require skills in academic research, cataloguing and quality assurance. Digitisation project teams also need skills in conservation and handling collections. They need legal expertise to address intellectual property rights (IPR) and copyright issues, and pedagogical skills in contextualising materials for a range of users.

The project teams also identified some gaps in the skills sets that they had at their disposal. Managers need skills in motivation, time-management and developing imaginative strategies to help staff required to carry out repetitive tasks on a long term basis (specifically data input). Identified skills gaps also included generic skills in financial management, legal expertise to deal with copyright legislation and contractual negotiations) and community building with academics. In the spirit of positive affirmation, the digitisation project teams also reflected that across the Digitisation Programme there is representation of outstanding organisations with world-class reputations and that team leaders have developed skills in setting up diverse centres of excellence representing various aspects of digitisation. Collectively the projects have secured several millions of pounds of funding for their institutions.

Several projects have highlighted that equipment purchased for the specific purpose of digitisation activities undertaken in this Programme are being used to support additional activities that contribute to the overall capacity for digitisation, the quality of the work and the reputation of the lead organisations and departments.

### 7.3 Project Management Models

Most of the projects adopted or adapted a recognised project management methodology and were relatively tightly managed on the basis of targets, outcomes, dependencies, personnel, costs and timescales. Overruns in terms of timescale and budget virements were generally clearly documented at project management level and referred where appropriate to the programme managers. Arrangements for project management in this programme highlight the need for clarity and consistency between the arrangements put in place by the projects, and the project management requirements stipulated by JISC as a condition of funding<sup>26</sup>.

The projects were all run from existing units or departments within the host institutions and organisations. Three basic models were deployed:

- Internal staff were appointed or seconded to manage the project
- Temporary staff were employed to support internal staff
- The project was managed in partnership between the academic institution and an external agency

In practice, most projects seconded internal staff to manage the projects, and recruited temporary staff for specific tasks. However, some of the projects recruited external project managers on time-defined contracts for the duration. In most instances, technical tasks were outsourced to specialist units, or temporary staff recruited to undertake specific technical tasks. Some projects also commissioned special studies and project-related tasks from external bodies on an ad hoc basis. The third model applies to one project in particular which, while managed from within the academic institution, operated on a collaborative basis of mutual responsibility with the external partner which is not adequately reflected in a simple contractor/contracted relationship.

The range of approaches to project management in this programme serves to highlight the importance of a properly constituted project board, with clear lines of reporting and responsibility into organisational committee structures. It is also important from a project and programme management perspective that key decisions taken in project boards are adhered to, and any

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<sup>26</sup> [http://www.jisc.ac.uk/proj\\_manguide.html](http://www.jisc.ac.uk/proj_manguide.html)

deviance from agreed actions is formally noted and revised actions agreed. Where key decisions have been taken outside of project boards, this has caused some difficulties in terms of project accountability as well as some vexation for programme managers.

Where project managers were appointed or seconded internally, the expertise that has been gained both in terms of understanding digitisation and generic project management skills are retained within the institution and constitute a secondary asset for the sector from the investment in the programme. Where project managers were external appointments, the expertise gained may be lost to the JISC community (this also applies to temporary staff hired to undertake particular tasks in the digitisation process). This highlights the growing need for recognition of the value of engagement with innovation in terms of professional capacity development. Individuals and teams learn a huge amount when they are engaged in JISC innovation work, increasing their technical and specialist skills and generic management skills, and extending their network of contacts and spheres of expertise. There should be some means of recording and accrediting this experience as professional development to enhance recognition of the value of innovation work for individuals and institutions, and facilitate the development of a critical mass of expertise in the sector.

### **Summary of Key Points for Capacity Building**

*Phase Two projects which were building on Phase 1 demonstrated their developing expertise and capacity in the refinement of technical processes, arrangements for project management processes, and in particular in the development and use of standards and protocols.*

*Investments in hardware have enhanced the organisational infrastructure for future digitisation initiatives.*

*Project teams require generic management and information management expertise, financial and business awareness. They need to have a range of technical and specialists skills, legal expertise, an understanding of academic research and quality management processes, and an understanding of the pedagogical potential of the digitised resources.*

*The Digitisation Programme represents organisations with world-class reputations and project leaders have established diverse centres of excellence representing various aspects of digitisation.*

*Three basic models of project management were deployed: the appointment or secondment of internal staff, temporary employment of external staff, and partnership between the academic institution and an external agency.*

## **Case Studies in Innovative Approaches to Capacity Building**

### **Partnership Working with the East London Theatre Archive**

The East London Theatre Archive project (ELTA) has created an online database with almost 15,000 images and related metadata sourced from nearly 4,000 archive items, as well as a range of illustrative contextual essays. It preserves unique endangered theatre archive collections through digitisation and allows academic audiences to explore East London's unique contribution to the development of theatre. The archive presents researchers and students with an opportunity to focus on developments in theatre and the insights these provide on social, cultural and political themes from 1827 to the present day.

One of the great assets and benefits of ELTA has been the establishment and development of a strong partnership between higher education, the heritage sector, local theatres and community organisations. Led by the University of East London, working in collaboration with the V&A museum in London, the team has brought together the owners and keepers of unique

collections, a wide and deep understanding of cultural heritage, academic excellence, and technical expertise in the field of digitisation. Working together in discovering and selecting the materials, overseeing the digitisation process and organising dissemination events and conferences has established a solid platform, not just for the preservation of this resource but for future collaborative initiatives. The project team experienced a number of challenges and setbacks along the way, including the early loss of a key partner and delays with the development of the user interface for the online resource, and has emerged with a stronger sense of shared purpose, mutual respect and the value of partnership working.

### **Institutional Impact of the British Cartoon Archive Database**

The Centre for the Study of Cartoons and Caricature at University of Kent holds the national collection of British social and political cartoons, including the archive of Carl Giles (1916-1995). With original cartoons, sketches, letters and documents, this key resource for British political and social history was not previously available to the public.

The project illustrates two particular aspects of capacity development for the host institution – the development of in-house skills and expertise in the digitisation process, and the formation of internal links and shared systems for the further development of technology in support of the core business of the institution. This has provided the institution with both the hardware and the internal communication systems to support further digitisation activities.

The team was concerned to use open source options wherever possible to support the archival process, searching and content delivery. This strategy was developed with the intention of generating interest and leveraging the expertise of open source communities for the digitisation of the archive. The project team also hoped to make a contribution to the development of innovative, low-cost, flexible and transferable systems for the sector.

Requirements for the new website were developed and an evaluation process was carried out to select appropriate software. Recognising that this evaluation and selection might be of interest to other departments in the University, the project team opened the process to representatives from other parts of the institution. This proved to be useful because it:

- Publicised the project across the university
- Allowed staff who might be doing similar things to network
- Created buy-in by staff who would be supporting the products
- Exposed staff to products and ideas which they may have been aware of but did not know specific details
- Provided the project with additional expertise

The initial plan was to outsource the digitisation to external agencies. However, in practice it was found that the demands of the material being digitised, particularly the colour artwork, was unexpectedly complex. Furthermore, some of the pieces of artwork were warped due to the way Giles had stored them. The best results seemed to be via scanner technology (rather than via camera work) and in the end it was decided to purchase a suitable scanner and perform almost all the digitisation in-house to ensure greater control over the quality of the images.

Furthermore, the team developed expertise not just in defining and recognising the levels of quality that they wanted to achieve, but also in doing their own testing. They developed a methodology based on rapid prototyping and iteration. Following this project, the institution now has the hardware infrastructure (including scanners, PCs and other hardware) which can be used to support additional activities and further digitisation projects.

The high profile of the project has raised awareness of the BCA both internally and externally and has resulted in a number of new projects within the University which will help support the

sustainability of the outcomes and outputs of this project. For example, there is a new JISC-funded project, the VERsatile DIgitisation framework project (VERDI), which will allow the BCAD infrastructure to be used to support digital collections across the University and Drupal has been selected as the new content management system for the entire University of Kent website.

The project has highlighted the value of internal awareness raising about development activities and innovations. As a result of discussions instigated by the project in the institution, disparate departments have already joined together to secure funding which will not only make additional resources available for learning and teaching but is ensuring sustainability of the architecture. In addition, the project has raised the internal profile of the BCA. Its press coverage is now being tracked and quantified by the University as a factor in recruiting students and attracting staff. Members of the University are approaching the BCA for advice regarding digitisation standards, how to organise and hang exhibitions and asking for contributions of material for inclusion in exhibitions and conference presentations.

New ways of working together have been highlighted and explored. Various methodologies including collaborative working via Web 2.0 technologies, rapid prototyping and agile programming development were used during the project and their success has encouraged the methodologies to be rolled out more widely across the institution.

The work of the BCAD project has effectively set a precedent for copyright holders to extend permission for learning and teaching re-use. Copyright holders of other material in the archive have been, and will continue to be approached with new agreements which will allow their material to be used under similar terms as the Carl Giles Archive.

Furthermore, important contacts and linkages with associated programmes and organisations have been established. Not only have the JISC programme events created important and useful contacts but the staff brought in as part of the team have shared their knowledge and experiences.

Buy-in from senior management with ownership of the project helped to secure critical mass which in turn meant that the project was more visible throughout the University – from purchasing to systems to academics and the more exposure the project gets the better. In fact the resource has generated interest from finance officers to use cartoons in conferences with other HE finance officers.

### **Welsh Journals Online Impact on Policy and Practice at the National Library for Wales**

Welsh Journals Online was the most challenging digitisation project ever undertaken by the National Library of Wales. It aimed to create a website giving free searchable and browsable access to the contents of back-numbers of the major journals relating to Wales or the Welsh language. These journals form the core of the Library's collection of printed books and are its most-used resource. By June 2009, 52 titles and more than 400,000 pages had been digitised, representing the single largest web corpus of scholarly material relating to Wales, fully accessible and licensed for re-use.

In terms of capacity development, the project has coincided with major developments in the Library's approach to digital preservation arising from its recognition that curation of digital assets has become one of its core responsibilities. The Digital Preservation Plan for the project will inform future operational plans and help to ensure that all necessary resources are in place.

The digitisation project represented a steep learning curve for the Library and its staff. The project team recognised at an early stage that they had underestimated the time and resource required for metadata creation in an initiative of this scope. Following some initial delays, they carried out a review and scoping study, on the basis of which they then developed a realistic appraisal and forward plan for the initiative. The time, effort and negotiation skills required to

secure licensing rights for some of the material was also underestimated. The team developed and documented a detailed process and workflow for dealing with small publishers and rights. Addressing these challenges has not only ensured the delivery of the majority of the digitised content that was originally anticipated, it has established processes and expertise which will enable the Library to enhance the scope and scale of its future digitisation initiatives.

The Library has created a workflow that can be readily exploited in order to present further material on the web, if permission was granted and resources for cataloguing and scanning were available. It will continue to seek external funding in order to develop its journal coverage, alongside other digitisation proposals.

The need to consider project legacies at an early stage has become clear from the explicit programming of post-project activities, with resource and technical implications; the Library will seek in future to extend established procedures rather than custom project-specific methods. The project's adoption of a risk-management approach to rights has allowed it to present the overwhelming majority of the desired material without excessive labour and cost, and the Library's commitment to ensuring takedown where required in future has allowed it to proceed largely on the basis of the publishers' licence.

The Library's intention is that the work of digitisation of the journals should not need to be repeated by itself or others in the foreseeable future, and it has therefore endeavoured to support the exploitation of the resource by current and new technologies.

### **Freeze Frame – Developing Digitisation Expertise at the Scott Polar Research Institute**

The Scott Polar Research Institute (SPRI) at the University of Cambridge holds a world-class collection of photographic negatives illustrating polar exploration from the nineteenth century onwards. The Institute's oldest photographs are daguerreotypes, a significant number are on glass plates, while other more modern negatives are, by their very nature, difficult to view. Due to the fragile nature of much of these photographic collections, therefore, access for teaching and research was severely limited.

The Freeze Frame project has produced 20,000 scanned images covering both famous and little known polar expeditions. The launch of the project website in March 2009 generated a great deal of press and public interest. Features include accompanying education packages, illustrated with relevant images taken from and linked back to the parent collections. News feeds are available, social networking tools are embedded on every page and users are encouraged to save their favourite images by creating and updating their own personal galleries.

Freeze Frame has shown that, within the context of a small academic institution (fewer than 25 permanent staff), a well-trained, dedicated team is capable of delivering a carefully planned set of project outputs on time and in budget. Much of the success can be attributed to the ability of the staff to work in close co-operation and to the detailed work plans devised by the project management team. However, the enthusiasm of team members to develop new skills and to be involved in improving and promoting the project also played an important part. These include skills in conservation and preservation, digital image capture, metadata standards and the development of educational packages for a range of levels including schools.

Through Freeze Frame, the SPRI team has also developed enhanced project management skills for large-scale digitisation initiatives. Indeed, the project may provide a model for other institutions of a similar size wishing to undertake digitisation of underused resources. Initial feedback confirms that there is a growing demand for visual resources of this nature, and from a far wider user community than was originally envisaged by the project team. One of the key

lessons learned by this team is the need to consider carefully the resource implications of a project of this size on the organisation as a whole.

A scanner purchased through this project continues to be used to support and enhance the work of the SPRI in digitising its existing photo collection. The quality of image provided by this piece of equipment also provides an impetus for attracting contributions from other sources to enhance the SPRI collection.

## 8 Programme Reflections

### 8.1 Benefits Realisation

Since the early 2000s, JISC has based its programme management methodology on the Managing Successful Programmes (MSP) framework that is promoted and supported by the Office of Government Commerce<sup>27</sup>. A key aspect of this approach is the focus on realising the measurable benefits of change which derive from embedding a new capability into business operations so that it becomes 'business as usual'.<sup>28</sup> While this is unlikely to happen within the timescale of the programme itself, potential benefits can be identified and nurtured, and plans to maximise the benefits of the initiative in the longer term can be implemented.

In this context, one of the immediate benefits of the Phase Two Digitisation Programme has been the development of a community of experts in large-scale digitisation projects for the academic sector. Some strong professional relationships have been forged, generating energy and synergies that are of potential lasting benefit to the sector. A particular aspect of the programme has been the interaction between relatively large and small organisations; ancient and new universities; libraries, academic departments and specialist units; commercial enterprise, publishers, schools and higher education; teachers, researchers, students and the wider public.

JISC has an opportunity to capture that expertise and use it not just to benefit future programmes, but also to support the development of digitisation processes as part of mainstream resource management practice in institutions. The Enriching Digital Resources programme strand provides some impetus for supporting institutions in enhancing the use of their digital collections. There is a wider opportunity to capitalise more generally on the expertise in the Digitisation Programme as a whole by supporting a digitisation 'expert forum'. A model for this development is the JISC Learning and Teaching Practice Experts Group<sup>29</sup>, which meets three times a year to receive updates from the Programme, to offer advice and feedback to JISC funded project teams, and to comment on the direction of future JISC work. Supporting the work of such a group would enable the Digitisation Programme both to realise the benefit of the community of expertise it has helped to engender, and to promote future benefits from digitisation activity in the sector.

An important element in the vision for the use of digitised resources is the use of the resources across a range of disciplines, beyond the obvious 'home' of the resources to other areas and academic levels. The programme points to potential benefits to scholarship that are to be realised in the opportunities that digitised resources present in prompting researchers to develop a wider perspective on their particular discipline, and for cross-disciplinary teaching and research. The digitised resources will not only transform academic disciplines but will be available to a wider international audience. These digitisation initiatives have sharpened focus on the role of the international community of users and contributors. Increased online access is

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<sup>27</sup> [http://www.ogc.gov.uk/guidance\\_managing\\_successful\\_projects.asp](http://www.ogc.gov.uk/guidance_managing_successful_projects.asp)

<sup>28</sup> Managing Successful Programmes, London: TSO (Office of Government Commerce) 2003

<sup>29</sup> <http://www.jisc.org.uk/whatwedo/programmes/elearningpedagogy/elearningexperts.aspx>

assumed to cope with the demands of a growing non-UK user base, which presents opportunities for wider scholarship as well as challenges in terms of managing resources, revenue and legal complexity.

Almost all of the projects have indicated in their final reports that further evaluation of the impact of the digitised resources is essential to gauge the longer-term value of the activities that were undertaken in this Programme. In the short term, while it may not be feasible for the organisations with responsibility for maintaining the resources to scope the potential scale and boundaries of their uses and usefulness, they should be able to monitor what is accessed, how and by whom it is accessed, and how it is used.

## **8.2 Programme Management**

Feedback from the project sponsors, managers, teams and other stakeholders indicates widespread and considered appreciation of the ways in which this programme was managed. The two programme managers adopted a consistent approach with clear and inclusive lines of communication, negotiation and discussion. There was regular communication with the project teams, both on a formal basis through the management structures and informally as a source of advice and support. Where intervention was necessary to address issues relating to timescale, budget or the achievement of core objectives, this was handled with sensitivity and professional care to protect the interests of all concerned.

The projects have also expressed their appreciation for the personalised support that was made available to address areas of particular concern or interest (particularly the support provided by the metadata consultant and for the development of project evaluation plans). Given the amount of time and effort that projects have invested in key areas such as metadata creation and IPR, there may be an argument for dedicated consultancy or support projects or consultancy running throughout the programme. Recommendations with regard to digital preservation would also indicate the need for specific support for the development of preservation plans.

With hindsight, the programme managers have suggested that more could have been done to involve JISC Communications and Marketing teams at an earlier stage in the programme. While some projects were adept at securing press coverage for their products at the launch stage, there was a lack of consistency across the programme which has led to an imbalance in the public perception and appreciation of the outputs as a whole. There is also some inconsistency in the extent to which the role of JISC on behalf of HEFCE in supporting the development of these resources is recognised in press coverage. Some questions also remain over the extent to which the academic community fully appreciates the resource that is now at its disposal.

One of the key management issues for JISC that has been highlighted by this programme is its relationship with external partners such as JSTOR and ProQuest, which have a contractual relationship with individual projects but not with JISC. The negotiating position of the programme managers on behalf of JISC and the UK HE sector is potentially weakened by the absence of any formal contractual link with the publishers.

## **8.3 Evaluation Process**

In developing an evaluation plan contextualised within the overarching Evaluation Framework for the JISC Capital Programme, the programme managers adopted a proactive and considered approach to the formative evaluation of the Digitisation Programme. Responses from the project teams to the evaluation approach proposed by the programme were quite varied. Some projects engaged with enthusiasm and interest in discussions about evaluation and were happy to refine their project evaluation plans to accommodate programme-level issues of interest. Others were less engaged with the formative, reflective approach to evaluation that was proposed, and seemed to expect a more judgmental evaluation process. In general, evidence from the final

reports indicates that the focus on the programme-level evaluation themes in interviews, workshops and programme meetings has helped to leverage project attention on the wider implications of their planned activity for content creation, standards, capacity development, resource discovery and sustainability.

#### 8.4 Philosophical Questions

Discussions with project and programme representatives in the course of the evaluation have touched on some philosophical questions which, although outside the scope of the programme evaluation, are nonetheless worthy of brief comment and may germinate interest in further consideration. These deeper issues include the role of digitisation in promoting *veracity* – several project representatives have indicated that an important intended outcome of their initiative is in helping researchers to get to the 'truth' of the matter in hand. This may be through providing access to previously hidden or inaccessible materials, or promoting comprehensiveness where before only selected elements were available, or simply opening up resources to a wider community of users to make their own judgements. Opportunities for dialogue and debate around online resources are also important factors in promoting 'veracity'. A further dilemma is *authenticity*. Projects have questioned the extent to which obvious textual errors should be corrected in the course of digitisation, or retained to protect the authenticity of the original document.

The focus on user-generated content and the use of social networks of user and contributor communities also touches on the issue of academic *authority*. The rise in importance of web 2.0 in parallel with the timescale of this programme represents a new way of thinking and working that has profound implications for traditional concepts of authority and value in teaching and scholarship.

A concern for *objectivity* has also informed key elements of the digitisation process, not least in the development of criteria for the selection of resources. Materials have been selected because they are representative of particular themes or areas of interest, or because they are deemed to be important. The responsibility for determining what is interesting or important places a significant burden on digitisation initiatives.

Projects have also raised the issue of *sufficiency* – making the decision that a digitised resource is 'good enough' in terms of quality, comprehensiveness, discoverability and usefulness.

### 9 Recommendations

Numbers in brackets refer to the sections in this report from which the recommendations are principally derived.

#### 9.1 Recommendations for JISC and Other Funders

- There is a need for ongoing discussion with relevant bodies to capitalise on the expertise developed in this programme in the development and maintenance of standards for planning, processing, presenting and preserving digital assets. Consideration should be given to bringing together key agencies including JISC CETIS and JISC Digital Media to review the use and development of standards and specifications for digitisation. (4.1, 4.2)
- There are opportunities for further liaison between JISC innovation teams with responsibility for strategic content development and resource discovery to maximise the potential benefits of digitised collections for learning, teaching and research. This is particularly important in the context of metadata creation to maximise the effectiveness of emerging technologies for teaching, learning and research. (6.3)

- There should be further exploration of the benefits and challenges of engaging a community of users in the development of digitised collections and their use. (6.4)
- Formal relationships between JISC and publishers need to be further developed. Building on the successes of this Programme, JISC has an enhanced opportunity to broker contractual negotiations on behalf of the sector. Future programmes could benefit from the early engagement of the expertise of JISC Collections in this regard. (8.2)
- Programmes of this size may merit a dedicated support strand to address the completion of the various stages of the HEFCE licence, with particular focus on addressing IPR and copyright. (4.3)
- Projects require further guidance on licensing terms, communication, marketing and public relations. There may be value in involving the JISC Communications and Marketing team in supporting projects from the outset. (7.2)
- The range of IPR issues that have been raised and addressed in this Programme merits further investigation and a dedicated study to inform future digitisation initiatives. (4.3)
- There is scope for the creation of services from the body of expertise that has been developed, consolidated and enhanced through this Programme to support future digitisation initiatives undertaken by JISC and others. (5.3)
- There is an opportunity to realise the benefit for the sector of the relationships and expertise developed through this Programme through the establishment of an expert forum or reference group to inform future initiatives. (8.2)

## 9.2 Recommendations for Institutions

- Institutions should ensure that they are deriving maximum value from their existing digital collections in terms of teaching, learning and research. Determining the real costs of selecting materials for digitisation needs to be set against the value of the material to the institution of digitising the material and making it available online. (8.1)
- Users are increasingly well informed about what they expect to find and how they wish to interact with the digitised resources. Meeting these expectations requires institutional investment not just in digitisation but also in infrastructure, environments and platforms, and in provision for responding to enquiries and updating the resource. (6.3, 7.3)
- Institutions should capitalise on existing staff skills and digitisation infrastructure, and develop a skills base for further digitisation initiatives, by enhancing their digital collections through in-house activity where possible. (5.2, 7.2)
- Institutions may be able to exploit their role as curators of nationally and internationally important collections by generating revenue to offset the continued investment required to maintain the resource. (7.3, 8.1)
- The value of engagement with innovation in terms of professional capacity development should be recognised in professional frameworks, institutional structures and processes for reward and recognition. (7.3)

## 9.3 Recommendations for Projects

- Projects need to establish a management board with clear internal lines of communication and responsibility, and opportunities for external dissemination and consultation. It is important to maintain a formal record of key decisions and actions. (7.1)

- Clear and robust workflow processes should be established at an early stage. These need to take account of the interfaces and dependencies between project elements, institutional processes for quality management, and the role of other agencies and resources. (4.2)
- Projects should consider adopting early and iterative processes for engaging with appropriate user groups and other stakeholders to maximise the ongoing relevance of the resources. (6.3, 6.4)
- Arrangements for the sustainability of the digitised resources should be confirmed at the outset, with due consideration to the role of JISC as the investor in the digitised resource on behalf of the sector. (5.3, 5.4, 5.5)

## Appendix A: Programme Evaluation Plan

Evaluation Questions	Indicators of change	Baseline	Source of information	Collection method
<i>What do you want to know?</i>	<i>How will you know?</i>	<i>What is the situation prior to any activity?</i>	<i>How will the data be gathered?</i>	<i>How will the data be gathered?</i>
<b>1. Content creation</b>				
1.1 Has content been created as planned? <sup>30</sup> 1.2 Have projects added value to e-resources at least through one of the following: - creation of critical mass in particular subject area - aggregating previously dispersed material - provision of access to hidden material	<ul style="list-style-type: none"> <li>• Inventory of digitised materials</li> <li>• Location of digitised materials</li> <li>• Number of items digitised</li> <li>• Increased use of re-sources</li> <li>• Access to new resources</li> </ul>	<ul style="list-style-type: none"> <li>• Anecdotal evidence from projects on current patterns and figures for access to material previous to digitisation</li> <li>• Any relevant literature/reports on users' needs analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Projects bids</li> <li>• Progress reports</li> <li>• Existing reports to be identified</li> <li>• Any additional research by consultants</li> </ul>	<ul style="list-style-type: none"> <li>• Existing projects documentation</li> <li>• Interviews with projects</li> <li>• Relevant literature re-view</li> </ul>
<b>2. Adoption of standards – technical and processes</b>				
2.1 have projects contributed to technical standards development? 2.2 have projects contributed to best practice in processes (eg procurement or workflow)? 2.3 has the programme/projects provided leadership and dissemination of innovation, best practice and standards?	<ul style="list-style-type: none"> <li>• Technical standards used</li> <li>• Degree of compliance with standards, issues addressed</li> <li>• Contributions made to standards development</li> <li>• Evidence of good practice and consistent approach to key processes</li> </ul>	<ul style="list-style-type: none"> <li>• Current practice at wider level</li> <li>• Standards used in Phase 1 Projects</li> <li>• Key processes identified in Phase 1</li> </ul>	<ul style="list-style-type: none"> <li>• Projects bids</li> <li>• Progress reports</li> <li>• Metadata consultant</li> <li>• JISC Comms and Marketing plan/activities</li> <li>• Relevant SCA reports</li> </ul>	<ul style="list-style-type: none"> <li>• Existing projects documentation</li> <li>• Projects interviews</li> <li>• Metadata consultant</li> </ul>
<b>3. Innovation in sustainability and business models</b>				

## Appendix A: Programme Evaluation Plan

Evaluation Questions	Indicators of change	Baseline	Source of information	Collection method
<p>3.1 Are there innovative examples in the effective use of business models that address projects' sustainability and digital preservation issues, through:</p> <ul style="list-style-type: none"> <li>- private/public partnership</li> <li>- use of existing services/ infrastructures</li> <li>- approaches to preservation</li> </ul>	<ul style="list-style-type: none"> <li>• Number and type of business models used, issues addressed</li> <li>• Evidence of common practice between projects in the use of business models</li> <li>• Evidence of innovative or novel approaches to access through increased uptake</li> <li>• Terms, limitations and timeframe for access</li> <li>• Quality assurance methods used and degree of conformance</li> </ul>	<ul style="list-style-type: none"> <li>• Existing business and sustainability models in non-profit and commercial sector</li> <li>• Overview data from existing documentation and case studies</li> <li>• Adapted models from Phase 1</li> </ul>	<ul style="list-style-type: none"> <li>• Projects bids</li> <li>• Progress reports</li> <li>• Consultation with selected experts (Also links to SCA work and their vision/blueprint for the future)</li> </ul>	<ul style="list-style-type: none"> <li>• Existing projects documentation</li> <li>• Focus groups with projects including partners</li> <li>• Interviews with selected experts</li> </ul>
<b>4. Resource discovery, personalisation and contextualisation for the use and re-use of the new e-resources</b>				
<p>4.1 Have projects engaged with users when creating the new resources? 4.2 Do the new resources provide an appropriate user environment, through:</p> <ul style="list-style-type: none"> <li>- effectiveness of resource discovery</li> <li>- resource contextualisation</li> <li>- degree of innovation in personalisation of resources and user involvement</li> </ul>	<ul style="list-style-type: none"> <li>• Type and extent of user engagement</li> <li>• Extent to which resources can be considered authoritative</li> <li>• Arrangement for review of materials</li> <li>• Ease of access to resources</li> <li>• Arrangements for personalisation and localisation of resources</li> <li>• Increased user satisfaction with resources</li> </ul>	<ul style="list-style-type: none"> <li>• Anecdotal evidence from users on their use of material previous to its digitisation</li> <li>• Current practice in the education community (teachers, researchers, learners) in the use and re-use this type of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Project reports</li> <li>• Projects' own usability testing and users consultation</li> </ul>	<ul style="list-style-type: none"> <li>• Existing projects documentation</li> <li>• Projects' own usability testing</li> <li>• Focus groups/case studies</li> <li>• Web logs</li> <li>• Possible separate impact study at later stage</li> </ul>

<sup>30</sup> If not, have alternative plans been agreed with JISC?

## Appendix A: Programme Evaluation Plan

Evaluation Questions	Indicators of change	Baseline	Source of information	Collection method
<b>5. Capacity building</b>				
<p>5.1 Has the programme been successful in developing institutional capacity within the funded institution?</p> <p>5.2 Has the programme been successful in developing staff and skills within the institutions it funded?</p> <p>5.3 Has a range of appropriate management models in different institutions been developed?</p>	<ul style="list-style-type: none"> <li>• Changes to institutional infrastructure to support resources</li> <li>• Revisions to institutional strategies</li> <li>• Enhancement of staff skills</li> <li>• Training programmes accessed or provided</li> <li>• Institutional overheads for projects</li> </ul>	<ul style="list-style-type: none"> <li>• Existing institutional infrastructure</li> <li>• Current staff skills and knowledge of digitisation</li> </ul>	<ul style="list-style-type: none"> <li>• Project institutions and staff</li> <li>• Project reports (sec 11, 12, 13 on Project Resources)</li> <li>• Projects feedback to JISC on guidance support needed and gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Existing projects documentation</li> <li>• Interviews</li> </ul>

## Appendix B: JISC Digitisation Programme Phase 2 Evaluation Coding Frame

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<b>Topic</b>	<b>Code</b>	<b>Description</b>
Content creation	content	Content created as planned
	access	overcome physical problems or hidden materials
	aggregation	bringing disparate collections together
	critical mass	creating large-scale significant collections
	selection	choosing materials for digitisation
Adoption of standards	adoption	Use of standards as intended (or not)
	technical	Relating to technical standards
	processes	Relating to process standards
	standards	Print, audio, moving image, photo, artefacts
Resource discovery	effectiveness	How easy it is to find and access resources
	personalisation	Degree of innovation in
	contextualisation	resources packaged into a context for use
Capacity building	user engagement	project engagement with users when creating resources
	infrastructure	Existing institutional
	staff	Individual professional development
Sustainability and Business Models	business models	Effective use of business models
	sustainability	Where a business model has helped
	partnership	public/private
	preservation	Reference to Digital Preservation Study

## Appendix C: Digitised Content Planned and Created

Digitised Content Planned	Digitised Content Created
<i>19<sup>th</sup> Century Pamphlets: University of Southampton</i>	
<p>This project will provide online access to some of the most significant collections of 19<sup>th</sup> century pamphlets held in UK research libraries. The digitisation of around 23,000 paper copy pamphlets, which focus on the political, economic and social issues that fuelled the great Parliamentary debates and controversies of the 19<sup>th</sup> century, will provide researchers, students and teachers with an immensely rich and coherent corpus of primary sources with which to study the socio-political and economic landscape of 19<sup>th</sup> century Britain.</p>	<p>Over the course of two years the project succeeded in scanning 26,041 unique pamphlets (1,000,732 pages) and ensuring their effective online delivery and discovery. The pamphlets are available within JSTOR and will be freely accessible to UK users for at least 25 years. <a href="http://www.britishpamphlets.org.uk/">http://www.britishpamphlets.org.uk/</a></p>
<i>A Digital Library of Core e-Resources on Ireland: Queen's University Belfast</i>	
<p>The digitisation of 100 key journals, 205 monographs and 2,500 manuscript pages from core Irish Studies collections makes this comprehensive, multi-disciplinary digital library the first point of contact for scholars and students seeking a convenient and comprehensive one stop shop for e-resources relating to Ireland.</p>	<p><a href="http://www.jstor.org/action/showJournals?browseType=collectionInfoPage&amp;selectCollection=ireland&amp;cookieSet=1">600,000 pages by Autumn 2009 anticipated</a> <a href="http://www.jstor.org/action/showJournals?browseType=collectionInfoPage&amp;selectCollection=ireland&amp;cookieSet=1">http://www.jstor.org/action/showJournals?browseType=collectionInfoPage&amp;selectCollection=ireland&amp;cookieSet=1</a></p>
<i>Archival Sound Recordings: British Library</i>	
<p>Building on the British Library's ground-breaking work in creating the first online fully-searchable digital library of sound recordings from one of the world's treasure houses of audio heritage, these nine new digital collections will make available around 4,200 hours of audio content. The recordings, which range from canonical classical repertoire to interviews with Holocaust survivors, will be supported by images and added value features to enhance the existing service and transform teaching, learning and research.</p>	<p>The project has exceeded its targets including the creation of 50% more digital content, additional documentation to match, and an enhanced website which will engage users in a more direct way. <a href="http://sounds.bl.uk/">http://sounds.bl.uk/</a></p>
<i>British Cartoon Archive Digitisation Project: University of Kent</i>	
<p>The project will digitise the Carl Giles collection, including 15,000 cartoon images, mostly published in the Express newspapers, and 5,000 related images of contextual material, including Giles' own image archive, as well as selections from his professional and fan correspondence. This will add to the current digital images database comprising 120,000 images of cartoons.</p>	<p>Website at <a href="http://www.cartoons.ac.uk">http://www.cartoons.ac.uk</a> includes 20,000 images of Giles original artwork and a selection of correspondence, reference information, and fan mail from the Giles' personal archive as well as 124,000 cartoons which were on the old database</p>

## Appendix C: Digitised Content Planned and Created

Digitised Content Planned	Digitised Content Created
<i>Cabinet Papers 1914 – 1975: The National Archives</i>	
<p>About 500,000 images of full text Cabinet papers, including Minutes and Memoranda, covering key events spanning the period 1914 – 75. Images will be digitised from microfilm and OCR'd and available as a freely accessible searchable database. Contextual learning packages will be developed for schools and Higher Education.</p>	<p>Over half a million searchable digitised images from the Cabinet papers held at The National Archives made available to all through The National Archives website: <a href="http://www.nationalarchives.gov.uk/cabinetpapers/">http://www.nationalarchives.gov.uk/cabinetpapers/</a></p>
<i>British Newspapers 1620 – 1900: British Library</i>	
<p>1.1 million pages are being digitised from 18<sup>th</sup> and 19<sup>th</sup> century newspapers, building on previous projects to enable access to a virtual library containing some 4 million digitised pages of important national, regional and local newspapers.</p>	<p>The BL has achieved its goal with the additional 1 million pages of this project intended to be uploaded to the website currently established in partnership with Gale Cengage. <a href="http://newspapers.bl.uk/blcs/">http://newspapers.bl.uk/blcs/</a></p>
<i>Electronic Ephemera: Bodleian Library, Oxford University</i>	
<p>65,000 items (up to 150,000 images) drawn from the John Johnson collection of ephemera spanning 1508-1939. The collection covers five broad themes, including: Entertainment; Booktrade; Popular prints; Crime, murders, and executions; and Advertising. The project is conducted as a partnership between the Bodleian Library and ProQuest.</p>	<p>By the end of February 2009, approximately 120,000 digital surrogates had been produced with a projected total of 170,000 images. Catalogue records created for some 54,500 project items (84% of the project total). <a href="http://johnjohnson.chadwyck.co.uk/marketing/index.jsp">http://johnjohnson.chadwyck.co.uk/marketing/index.jsp</a></p>
<i>First World War Poetry Digital Archive: University of Oxford</i>	
<p>Approximately 2000 items of primary source material (manuscripts and letters) relating to World War 1 poetry and focusing on Edward Thomas, Isaac Rosenberg, Robert Graves, and a selection of Women poets. The project will also digitise contextual material such as images, videos and audio files from other institutions such as the Imperial War Museum. The final web site will also include a Community section, whereby users can submit their own material relating to WW1 poetry.</p>	<p>The main output of the project was a large web site presenting the user with facilities to search, browse, view, and download over 11,000 items, in a context conducive to teaching and research. The scope of the archive has widened to include manuscripts of other poets including Vera Brittain and Roland Leighton. The web site also contains 'The Great War Archive', holding over 6,500 items originating from the War submitted by the general public. <a href="http://www.oucs.ox.ac.uk/ww1lit/">http://www.oucs.ox.ac.uk/ww1lit/</a></p>
<i>Freeze Frame: Historic Polar Images: Scott Polar Research Institute, University of Cambridge</i>	
<p>The archival collections held by the Scott Polar Research Institute are among the richest in the world for the study of polar environments. The photographic negatives recording historic polar expeditions are a unique resource but also an extremely fragile one.</p>	<p>In February 2009, the project reached its target of 20,000 scanned images covering both famous and little known polar expeditions. The project web site <a href="http://www.freezeframe.ac.uk">http://www.freezeframe.ac.uk</a> provides access to the digital images and related resources.</p>

## Appendix C: Digitised Content Planned and Created

Digitised Content Planned	Digitised Content Created
<i>Independent Radio News Archive : Bournemouth University</i>	
<p>About 4000 hours of radio programmes on tape from the Independent Radio News/London Broadcasting Corporation (IRN/LBC) archive spanning the period 1973-1990s. The LBC and its sister organisation IRN constitute the first commercial radios in Britain and their archives form an important part of the history of radio broadcasting, providing an alternative perspective from the BBC radio archive collections. The digitise material includes news programmes, phone-ins, children's programme and some drama.</p>	<p>Outputs achieved include selecting relevant material from the archive of 7,000 tapes and placing the audio along with information on the web for HE and FE at <a href="http://radio.bufvc.ac.uk/lbc/">http://radio.bufvc.ac.uk/lbc/</a> The collection runs from 1973 to 1996 and is considered the most important commercial radio archive in the UK. It includes exceptional examples of radio news and is a unique audio history of the period.</p>
<i>InView: Moving Images in the Public Sphere: British Film Institute</i>	
<p>600 hours of moving image material taken from films and videos from the collections of the British Film Institute and other partners organisations. The resources will span the last 70 years of public debate on issues such as economy, citizenry, health, education, immigration and society.</p>	<p>Efficient and economic resource consumption throughout the course of the project resulted in a significant underspending. This enabled the BFI to extend the range of moving image material that could be made available and an agreement with Fremantle Media allowed the project to serve up to 200 hours of television current affairs material, thus extending the range and type of moving image material made available through InView. The total volume of moving image material amounts to approximately 1,000 hours of digitised video, documents and associated resources for the enhancement of learning, teaching and research within the areas of the arts and humanities. <a href="http://radio.bufvc.ac.uk/lbc/">http://radio.bufvc.ac.uk/lbc/</a></p>
<i>Modern Welsh Journals Online: National Library of Wales</i>	
<p>600,000 pages of journals both in Welsh and English from 90 titles, covering the humanities, social sciences and science and technology. The project will give free access to such material in line with the National Library of Wales's digital content policy.</p>	<p>The scale was reduced to approximately 50 titles and 400,000 pages because it was found that processing of the content was much more labour-intensive than had been estimated. 52 titles and more than 400,000 pages are now available. This represents the single largest web corpus of scholarly material relating to Wales, fully accessible and licensed for re-use. <a href="http://welshjournals.llgc.org.uk/">http://welshjournals.llgc.org.uk/</a></p>

## Appendix C: Digitised Content Planned and Created

Digitised Content Planned	Digitised Content Created
<i>Historic boundaries of Britain: Portsmouth University</i>	
<p>Administrative boundaries provide a framework for many of the activities of the state, from welfare provision via poor law unions in the past to elections held in constituencies today. This project will create a comprehensive digital library of historic administrative boundaries for Britain through a combination of scanning historical maps and creating vector boundaries for selected geographies</p>	<p>Over 1000 historical maps relating to five Boundary Commission Reports (1832, 1868, 1885, 1917 and 1954) and administrative area maps have been scanned and had meta-data added to the images. By locating them geographically (geo-referencing) it has been possible to mosaic them together, thereby allowing them to be incorporated into a continuous viewing gallery on the Vision of Britain website known as the map library.</p> <p>The contents of Cheffins' authoritative book on Parliamentary constituencies and their registers since 1832 has been transformed into digital content and added to the existing database.</p> <p><a href="http://www.visionofbritain.org.uk/index.jsp">http://www.visionofbritain.org.uk/index.jsp</a></p>
<i>Pre-Raphaelite Resource Site: Birmingham Museums and Art Gallery</i>	
<p>about 2000 images of works relating to Pre-Raphaelite paintings, drawings and glass plates from artists Edward-Burne Jones, Ford Madox Brown, John Everett Millais, Dante Gabriel Rossetti, William Holman Hunt, Arthur Hughes, Frederick Sandys and Simeon Solomon . The resource will be freely available on the internet and will include learning packages as well as give users the option to self tag items of interest.</p>	<p>The project has created 2432 files with metadata, 3000 high quality TIFF images with related jpg images for website and back up image files.</p> <p><a href="http://www.preraphaelites.org/">http://www.preraphaelites.org/</a></p>
<i>The East London Theatre Archive: University of East London</i>	
<p>The East London Theatre Archive will create an invaluable database of performing arts resources, from playbills and programmes to press cuttings and photographs. By creating around 15,000 digital objects, taken from East London theatres, the project will preserve unique endangered collections and make them accessible to an academic audience.</p>	<p>The project digitised over 14,900 images and related metadata, sourced from 3,368 archive items, as well as 17 contextual essays.</p> <p><a href="http://www.elta-project.org/home.html">http://www.elta-project.org/home.html</a></p>
<i>UK Theses Digitisation Project: British Library</i>	
<p>Digitising at least 5335 paper-borne UK theses will 'kick start' the EthOS service, which will allow open access to theses in electronic form. The project will deliver a fully operational, easily scaleable and financially viable prototype of an UK e-theses online service that will enable users, via one single web interface, to access the full text of electronically stored theses after selection from a database of UK theses</p>	<p>The project delivered 9522 digitised theses (11,300 volumes) nearly twice the number originally quoted in the bid.</p> <p><a href="http://ethos.bl.uk/Home.do">http://ethos.bl.uk/Home.do</a></p>

## **Appendix D: Metadata Standards used in JISC Digitisation Programme Phase 2**

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DCMES – Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description.

<http://dublincore.org/>

METS – Metadata Encoding and Transmission Standard schema is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library.

<http://www.loc.gov/standards/mets/>

MIX – Technical Metadata for Digital Still Images is an XML schema for a set of technical data elements required to manage digital image collections.

<http://www.loc.gov/standards/mix/>

PREMIS – Preservation Metadata Implementation Strategies is a data dictionary and supporting XML schemas for core preservation metadata needed to support the long-term preservation of digital materials.

<http://www.loc.gov/standards/premis/>

MODS – Metadata Object Description Schema is a bibliographic element set that may be used for a variety of purposes, and particularly for library applications. As an XML schema it is intended to be able to carry selected data from existing MARC 21 records as well as to enable the creation of original resource description records.

<http://www.loc.gov/standards/mods/>

MARC 21 – MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began nearly forty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogues used today. MARC became USMARC in the 1980s and MARC 21 in the late 1990s.

<http://www.loc.gov/marc/>

EAD – Encoded Archival Description is designed for encoding finding aids such as inventories, registers, indexes, and other documents created by archives, libraries, museums, and manuscript repositories to support the use of their holdings.

<http://www.loc.gov/ead/>

*SPECTRUM* is recognised both nationally and internationally as the industry standard for Collections Management.

<http://www.collectionstrust.org.uk/stand>

ISAD(G) – General International Standard Archival Description is a standard which provides general guidance for the preparation of archival descriptions.

<http://www.ica.org/en/node/30000>

TEI – The Text Encoding Initiative is a consortium which collectively develops and maintains a standard for the representation of texts in digital form.

<http://www.tei-c.org/Guidelines/P5/>

UKETD – Electronic Theses and Dissertation Metadata Schema

In order to use uketd\_dc for OAI harvesting – and other methods of metadata transfer – it is necessary to implement it using an XML schema that defines the uketd\_dc records format.

[http://ethostoolkit.cranfield.ac.uk/tiki-index.php?page\\_ref\\_id=47](http://ethostoolkit.cranfield.ac.uk/tiki-index.php?page_ref_id=47)

OAI – The Open Archives Initiative develops and promotes interoperability standards that aim to facilitate the efficient dissemination of content.

<http://www.openarchives.org/>