



Information Society  
Technologies

# erpastudies

**national library  
of wales**

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Further information on ERPANET and access to its other products is available at <http://www.erpanet.org>.

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server (<http://europa.eu.int>).

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## **Executive Summary**

The National Library is one of Wales' leading cultural heritage institutions and is both a legal deposit library and a designated place of deposit for archival records. Established in 1907, the Library is a public body now sponsored by the recently formed Welsh Assembly, which is located in the south coast city and capital of Wales, Cardiff. The Library is located many miles away, in the geographically isolated town of Aberystwyth on the west coast of Wales. The arrival of electronic services has thus been seized upon as an ideal way to increase public access to the collection and is a prime motivator for developing and preserving objects in digital form.

The Library collects a variety of digital objects and as its collection continues to grow, it is developing a broad-ranging strategy to ensure preservation of the objects over time. This is achieved first and foremost by integrating digital preservation into the organisations overall strategic policy framework through a series of policy documents. The Library's dual mandate of both Archive and Library adds a further level of complexity to their challenge, for archival and library objects have different preservation and authenticity requirements. Different approaches for library and archive objects are therefore being developed that account for these differences both before and after deposit and that utilise (and add to) the experiences and knowledge of a diverse group of staff. The Library is actively researching the preservation of websites in conjunction with the UK Web Archiving Consortium and is engaged in a pilot programme archiving websites of Welsh interest. It is also digitising much of its analogue collection and, unlike many other organisations ERPANET has encountered in these case studies, digitises with explicit consideration for long-term preservation. This has been the case since the digitisation programme began in 2001 and, besides the integrated policy framework, this is the most advanced aspect of the Library's digital collection and preservation efforts. Metadata for digital still images is particularly well developed, not only compared to the other object types in the collection but also in the complex arrangement of internationally developed standards employed. Co-operation and learning from similar groups at national and international levels has proved a key aspect of the Library's overall approach

Supported by a favourable political environment that encourages sustainability, social inclusion and e-learning, the Library is committed both in paper and people to capturing, describing, preserving, and making accessible both present and future digital resources of Welsh cultural heritage. Preservation activity is internally supported and coordinated by a member of senior management, providing credence and a regular presence in the upper echelons of the organisation. This reflects the importance attributed to the digital collection, rightly so as it is a growing part of the Library's core business. Not all aspects of the approach are yet fully developed for all object types; however, planning is rigorous and comprehensive, accounts for future changes and relies on recognised standards wherever possible. This is vital for the strategy and the objects to persist through time.

## **Chapter 1: The ERPANET Project**

The European Commission and Swiss Confederation funded ERPANET Project<sup>1</sup> (Electronic Resource Preservation and Access Network) works to enhance the preservation of cultural and scientific digital objects through raising awareness, providing access to experience, sharing policies and strategies, and improving practices. To achieve these goals ERPANET is building an active community of members and actors, bringing together memory organisations (museums, libraries and archives), ICT and software industry, research institutions, government organisations, entertainment and creative industries, and commercial sectors. ERPANET constructs authoritative information resources on state-of-the-art developments in digital preservation, promotes training, and provides advice and tools.

ERPANET consists of four partners and is directed by a management committee, namely Seamus Ross (HATII, University of Glasgow; principal director), Niklaus Bütikofer (Schweizerisches Bundesarchiv), Hans Hofman (Nationaal Archief/National Archives of the Netherlands), and Maria Guercio (ISTBAL, University of Urbino). At each of these nodes a content editor supports their work, and Peter McKinney serves as a co-coordinator to the project. An Advisory Committee with experts from various organisations, institutions, and companies from all over Europe give advice and support to ERPANET.

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<sup>1</sup> ERPANET is a European Commission funded project (IST-2001-32706). See [www.erpanet.org](http://www.erpanet.org) for more details and available products.

## **Chapter 2: Scope of the Case Studies**

While theoretical discussions on best practice call for urgent action to ensure the survival of digital information, it is organisations and institutions that are leading the drive to establish effective digital preservation strategies. In order to understand the processes these organisations are undertaking, ERPANET is conducting a series of case studies in the area of digital preservation. In total, sixty case studies, each of varying size, will investigate awareness, strategies, and technologies used in an array of organisations. The resulting corpus should make a substantial contribution to our knowledge of practice in digital preservation, and form the foundation for theory building and the development of methodological tools. The value of these case studies will come not only from the breadth of companies and institutions included, but also through the depth at which they will explore the issues.

ERPANET is deliberately and systematically approaching disparate companies and institutions from industry and business to facilitate discussion in areas that have traditionally been unconnected. With these case studies ERPANET will broaden the scope and understanding of digital preservation through research and discussion. The case studies will be published to improve the approaches and solutions being developed and to reduce the redundancy of effort. The interviews are identifying current practice not only in-depth within specific sectors, but also cross-sectorally: what can the publishing sector learn from the aeronautical sector? Eventually we aim to use this comparative data to produce intra-sectoral overviews.

This cross-sectoral fertilisation is a main focus of ERPANET as laid out in its Digital Preservation Charter.<sup>2</sup> It is of primary importance that disparate groups are given a mechanism through which to come together as best practices for digital preservation are established in each sector.

### *Aims*

The principal aims of the study are to:

- build a picture of methods and match against context to produce best practices;
- accumulate and make accessible information about practices;
- identify issues for further research;
- enable cross-sectoral practice comparisons;
- enable the development of assessment tools;
- create material for training seminars and workshops; and,
- develop contacts.

Potential sectors have been selected to represent a wide scope of information production and digital preservation activity. Each sector may present a unique perspective on digital preservation. Organisational and sectoral requirements, awareness of digital preservation, resources available, and the nature of the digital object created place unique and specific demands on organisations. Each of the case studies is being balanced to ensure a range of institutional types, sizes, and locations.

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<sup>2</sup> The Charter is ERPANET's statement on the principles of digital preservation. It has been drafted in order to achieve a concerted and co-ordinated effort in the area of digital preservation by all organisations and individuals that have an interest and share these concerns.  
<http://www.erpanet.org/charter.php>.

The main areas of investigation included:

- perception and awareness of risk associated with information loss;
- understanding how digital preservation affects the organisation;
- identifying what actions have been taken to prevent data loss;
- the process of monitoring actions; and,
- mechanisms for determining future requirements.

Within each section, the questions were designed to bring organisational perceptions and practices into focus. Questions were aimed at understanding impressions held on digital preservation and the impact that it has had on the respective organisation, exploring the awareness in the sector of the issues and the importance that it was accorded, and how it affected organisational thinking. The participants were asked to describe, what in their views, were the main problems associated with digital preservation and what value information actually had in the sector. Through this the reasons for preserving information as well as the risks associated with not preserving it became clear.

The core of the questionnaire focused on the actions taken at corporate level and sectoral levels in order to uncover policies, strategies, and standards currently employed to tackle digital preservation concerns, including selection, preservation techniques, storage, access, and costs. Questions allowed participants to explore the future commitment from their organisation and sector to digital preservation activities, and where possible to relate their existing or planned activities to those being conducted in other organisations with which they might be familiar.

Three people within each organisation are targeted for each study. In reality this proved to be problematic. Even when organisations are identified and interviews timetabled, targets often withdrew just before we began the interview process. Some withdrew after seeing the data collection instrument, due in part to the time/effort involved, and others (we suspect) dropped out because they realised that the expertise was not available within their organisation to answer the questions. The perception of risks that might arise through contributing to these studies worried some organisations, particularly those from sectors where competitive advantage is imperative, or liability and litigation issues especially worrying. Non-disclosure agreements that stipulated that we would neither name an organisation nor disclose any information that would enable readers to identify them were used to reduce risks associated with contributing to this study. In some cases the risk was still deemed too great and organisations withdrew.

### **Chapter 3: Method of Working**

Initial desk-based sectoral analysis provides ERPANET researchers with essential background knowledge. They then conduct the primary research by interview. In developing the interview instrument, the project directors and editors reviewed other projects that had used interviews to accumulate evidence on issues related to digital preservation. Among these the methodologies used in the Pittsburgh Project and InterPARES I for target selection and data collection were given special attention. The Pittsburgh approach was considered too narrow a focus and provided insufficient breadth to enable full sectoral comparisons. On the other hand, the InterPARES I data collection methodology proved much too detailed and lengthy, which we felt might become an obstacle at the point of interpretation of the data. Moreover, it focused closely on recordkeeping systems within organisations.

The ERPANET interview instrument takes account of the strengths and weaknesses from both, developing a more focused questionnaire designed to be targeted at a range of strategic points in the organisations under examination. The instrument<sup>3</sup> was created to explore three main areas of enquiry within an organisation: awareness of digital preservation and the issues surrounding it; digital preservation strategies (both in planning and in practice); and future requirements within the organisation for this field. Within these three themes, distinct layers of questions elicit a detailed discovery of the state of the entire digital preservation process within participants' institutions. Drawing on the experience that the partners of ERPANET have in this method of research, another important detail has been introduced. Within organisations, three categories of employee were identified for interview: an Information Systems or Technology Manager, Business Manager, and Archivist / Records Manager. In practice, this usually involved two members of staff with knowledge of the organisation's digital preservation activities, and a high level manager who provided an overview of business and organisational issues. This methodology has allowed us to discover the extent of knowledge and practice in organisations, to understand the roles of responsibility and problem ownership, and to appreciate where the drive towards digital preservation is initiated within organisations.

The task of selecting the sectors for the case studies and of identifying the respective companies to be studied is incumbent upon the management board. They compiled a first list of sectors at the very beginning of the project. But sector and company selection is an ongoing process, and the list is regularly updated and complemented. The Directors are assisted in this task by an advisory committee.<sup>4</sup>

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<sup>3</sup> See <http://www.erpanet.org/studies/index.php>. We have posted the questionnaire to encourage comment and in the hope that other groups conducting similar research can use the ideas contained within it to foster comparability between different studies.

<sup>4</sup> See [www.erpanet.org](http://www.erpanet.org) for the composition of this committee.

## **Chapter 4: The National Library of Wales**

<http://www.llgc.org.uk/>



The National Library is one of Wales' leading cultural heritage and memory institutions. Following a long campaign in the late 1800's by the Welsh for the establishment of a National Library in Wales, the UK government in London finally approved funding in 1905 and the Library was granted its charter in 1907. Since then the political landscape of the United Kingdom has changed. Wales continued to be administered by a branch of the UK government until 1999, when the Welsh National Assembly<sup>5</sup> was established under the process of devolution. This transferred the administrative powers of the previous UK government 'Welsh Office', run by a Secretary of State, to a democratically elected body in the newly formed National Assembly for Wales located in Cardiff. This body has responsibility for many areas of public life such as education and the arts, where the Welsh language is an important issue, and the Library is now an Assembly-sponsored public body collecting both library and archival deposits.

The Welsh Assembly emphasises the promotion of social inclusion and the importance of education and learning, issues that the Library embraces also. The Library is located in the University town of Aberystwyth, on the West coast and in the heart of Welsh-speaking Wales, but the town is geographically isolated and difficult to get to because of Aberystwyth's out-dated transport links. The arrival of electronic services has therefore been seized upon as an ideal method of making the contents of the Library's collection more widely and easily available for the long term through remote access. The Library established its digitisation strategy in 2001 and is now working explicitly towards the preservation of a range of digital objects both digitised and born-digital, including archival records from public and private bodies, digital still images, and publications. All of these object types are covered in this study, as are the Library's collaborative efforts towards preserving websites. Audio-visual materials are handled by the National Screen and Sound Archive of Wales<sup>6</sup> and are not a focus of this case study, nor are the Library's active corporate records.

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<sup>5</sup> National Assembly for Wales website: <http://www.wales.gov.uk/index.htm>.

<sup>6</sup> The National Screen and Sound Archive of Wales was established by the National Library and Sgrîn: Media Agency for Wales in April 2001; see: <http://screenandsound.llgc.org.uk/>.

After a radical organisational restructuring based on functions in 2001, there are now just three main Departments in the Library, namely Collection Services, Corporate Services, and Public Services, and a small 'Librarians department' that includes a functional directorate and a Research and Development officer. The department of Collection Services is responsible for all aspects of the Library's collections, including acquisition, description, preservation, and digitisation. Staff involved with digital preservation activities are currently spread throughout different sections in the Collection Services and Corporate Services departments.

## **Chapter 5: Details and circumstances of the Interviews**

ERPANET initially approached the Director of Collection Services, Mr. Gwyn Jenkins, in March 2004. The Library was keen to become involved and interviews were scheduled for May 25<sup>th</sup> 2004 at the National Library premises. The following people were interviewed:

- Director of Collection Services, Mr. Gwyn Jenkins.
- Head of Systems Section, Ms. Kathy Hughes. The Systems section is located within the Department of Collection Services and acts as the interface between the curatorial and computing sections.
- Systems Manager, Ms. Mared Owen.
- Head of Acquisitions Section, Ms. Non Jenkins. Acquisitions is also located within Collection Services.
- Metadata manager, Mr. Lyn Lewis Dafis. Mr Dafis is primarily involved with the Library's digitisation programme but also manages metadata responsibilities.
- Head of Computing, Ms. Avril Jones. Computing is part of the Corporate Services department.

We are grateful for the involvement of such a broad range of personnel and functions.

## **Chapter 6: Analysis**

This section presents an analysis of the data collected during the case study. It is organised to mirror the sequence of topics in the questionnaire.

- Perception and Awareness of Digital Preservation
- Preservation Activity
- Compliance Monitoring
- Digital Preservation Costs
- Future Outlook

The Library's digital preservation activities are still under development and certain aspects of its programme are more advanced than others. Digital still images currently form the bulk of the Library's digital collection, and thus preservation work on images is more advanced than for other object types. Digital publications are not yet a great component of the Digital Archive due to pending legal deposit legislation; similarly, digital archival records are not yet a great component as most depositing organisations still submit in paper. Preservation activities regarding these two types of objects are therefore not yet as advanced as that for images but preparation for their deposit is ongoing.

### **Perception and Awareness of Digital Preservation**

The Library embarked on its first digitisation programme in 2001 with explicit consideration for the preservation of those resources and a 'scan once for many purposes' policy. Since then it has extended its reach to focus more explicitly on digital preservation and has embarked on several unique or collaborative ventures to further its digital preservation knowledge and activities. This has been built into the Library's organisation at policy and strategic levels, and educating and training staff at the Library is considered very important. Staff responsible for digital preservation displayed high levels of awareness of multiple facets of digital preservation, ranging from technical and metadata issues, to organisational development and required changes in legal deposit legislation. This is not necessarily the case for their depositing bodies; however, sustainability is an important issue for the Welsh National Assembly and the Library is drawing on this to further knowledge of digital preservation issues outside of its walls.

The Library is involved with or aware of several collaborative digital preservation efforts. It is a member of the UK Digital Preservation Coalition<sup>7</sup> and regularly participates in their activities and reports. It also participates in the UK Web Archiving Consortium<sup>8</sup> and an email preservation working-group, both organised by the British Library.<sup>9</sup> Staff monitor the activities of other institutions and projects active in digital preservation, such as the UK National Archives,<sup>10</sup> RLG,<sup>11</sup> CURL,<sup>12</sup> OCLC,<sup>13</sup>

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<sup>7</sup> For more information about the UK Digital Preservation Coalition, see their website: <http://www.dpconline.org/graphics/>.

<sup>8</sup> The UK Web Archiving Consortium is a two-year project involving six partners – the British Library (lead), the National Libraries of Scotland and Wales, the UK National Archives, JISC, and the Wellcome Library. The National Libraries of Scotland and Wales are concentrating on sites of Scottish and Welsh interest respectively, and the National Archives upon government sites in their remit. See: <http://www.webarchive.org.uk/>.

<sup>9</sup> See the British Library website: <http://www.bl.uk/>.

<sup>10</sup> See the digital preservation pages of the National Archives website: <http://www.pro.gov.uk/about/preservation/digital/default.htm>.

DigiCULT,<sup>14</sup> ERPANET, TASI,<sup>15</sup> CAMiLEON,<sup>16</sup> and CEDARS.<sup>17</sup> They also cited standards and approaches by the US Library of Congress<sup>18</sup> and Digital Library Federation,<sup>19</sup> the National Libraries of Australia,<sup>20</sup> Canada,<sup>21</sup> and New Zealand,<sup>22</sup> and the OAIS<sup>23</sup> and Trusted Digital Repositories models.<sup>24</sup> This research and knowledge is drawn on as appropriate.

### *The Main Problems*

One of the main challenges for the Library is the range of different digital objects with which they must deal. Different types of digital objects have different preservation requirements, a fact of which the Library is well aware. Therefore, although the Library is developing a preservation strategy to cater for *all* digital object types, the specific details must be tailored for each type of object when necessary. This is made more complex by the Library's dual mandate as both a library and an archive, and requires co-ordination from a central point to ensure that transferable work is not duplicated and that different approaches are compatible wherever possible. To tackle this, the Library has employed a very 'hands on' approach, in which generic aspects of the strategy, such as storage, are dealt with centrally, and the particular details of approaches for different objects are worked out separately.

Staff showed appreciation of preservation problems across the whole life-cycle of their range of assets. From a pre-deposit perspective, they indicated that one of the biggest challenges facing their preservation of archival records was the necessary cultural change within depositing organisations. Many depositing bodies are unaware of the challenges involved in maintaining *authentic* electronic records, which poses a risk to the records' survival before they are even due for deposit at the Library. Authenticity is more a contentious issue for archival records than for publications and this is one of the areas where two distinct approaches are required for the different objects. It is not the same case with electronic publications, where staff cited the main problem at this moment as legal deposit legislation in the UK, which does not yet include electronic publications. As an increasing amount of publications are disseminated in electronic format only, there is a risk that the Library's collection will be incomplete if the legal deposit issue is not rectified. The Library must therefore rely on a voluntary agreement until the legislation is passed, which still involves an element of risk, and staff are involved in national efforts to ensure the appropriate legal changes take place.

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<sup>11</sup> Research Libraries Group (RLG) website: <http://www.rlg.org/>.

<sup>12</sup> Consortium of University Research Libraries (CURL) website: <http://www.curl.ac.uk/>.

<sup>13</sup> Online Computer Library Centre (OCLC) website: <http://www.oclc.org/>.

<sup>14</sup> DigiCULT website: <http://www.digicult.info/pages/index.php>.

<sup>15</sup> TASI – Technical Advisory Service for Images – website: <http://www.tasi.ac.uk/>.

<sup>16</sup> CAMiLEON - Creative Archiving at Michigan & Leeds: Emulating the Old on the New – website: <http://www.si.umich.edu/CAMiLEON/about/aboutcam.html>.

<sup>17</sup> CEDARS – Curl Exemplars in Digital Archives – website: <http://www.leeds.ac.uk/cedars/>.

<sup>18</sup> Library of Congress' national digital preservation programme website: <http://www.digitalpreservation.gov/>.

<sup>19</sup> Digital Library Federation website: <http://www.diglib.org/>.

<sup>20</sup> National Library of Australia website: <http://www.nla.gov.au/>.

<sup>21</sup> National Library and Archives of Canada website: <http://www.collectionscanada.ca/>.

<sup>22</sup> National Library of New Zealand website: <http://www.natlib.govt.nz/>.

<sup>23</sup> OAIS – *Open Archival Information System. Reference model* available from the CCSDS website at: <http://www.ccsds.org/documents/650x0b1.pdf>.

<sup>24</sup> *Trusted Digital Repositories: Attributes and Responsibilities*. Available from the RLG/OCLC at <http://www.rlg.org/longterm/repositories.pdf>.

From a curatorial perspective, technical obsolescence, funding, emerging standards, and a rapidly changing field were all identified as further challenges that the Library must deal with. These are challenges of a more general nature and are faced by all organisations wishing to preserve digital information for the long term.

### *Asset Value and Risk Exposure*

As one of the most important cultural heritage and memory institutions in Wales, the Library has a strong sense of responsibility towards the Welsh culture. As such, it seeks to thoroughly document Welsh culture and make access available to as many people as possible. Its collection is broad, incorporating both digitised and born digital materials such as digital publications on CD-ROMs, e-journals and e-books, online publications (received via email or actively collected), disks that form part of archival collections, electronic archival records deposited by institutions, digitised images, and audio-visual materials.<sup>25</sup> The collection is educational, valuable for research, and holds great historical value. It also has commercial aspects, for the Library makes revenue through some of the services it offers to users and aims to increase its revenue generation activities.

It is the Library's core business objective to obtain and preserve this collection in whatever forms it takes. The Library's digital assets include a growing amount of born-digital material, and staff are aware that the future will bring much more, many of which available in digital form only. The business and legal risks it should run should it fail to preserve would be severe, as without its collection the organisation would cease to exist. Financial risks also exist, for the Library makes some revenue from its growing digital collection. Furthermore, there is the historical and cultural risk of losing the national memory, which would affect the whole country, not just the organisation. The Library is aware of these risks and maintains a risk register that notes the risks involved in each new project. It is also involved in a national workgroup on extending legal deposit legislation to electronic publications, hereby addressing the risk of gaps in its publications collection caused by the absence of such legislation.

### *Regulatory Environment*

The National Library of Wales is both a legal deposit (or 'copyright') library and a designated place of deposit for public archival records (ie. archival records originating from public bodies such as the Welsh Assembly). As such, it must accord to public regulations for both types of objects. It also collects and maintains archives from private organisations or individuals with relevance to Wales; however these records do not fall into the same legal context and are often covered instead by voluntary archival deposit agreements.

The UK Copyright Act of 1911 gives the Library the right to claim, for free, a copy of every printed work published in the UK and in Ireland. In 2003 this was supplanted by the Legal Deposit Libraries Act;<sup>26</sup> however, as this does not yet cover electronic records, electronic publications are deposited only under a voluntary agreement.<sup>27</sup> As part of the Library's collaborative efforts to resolve this, the Head of Acquisitions

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<sup>25</sup> All of these record types are identified in the Library's *Digital Preservation Policy and Strategy*, discussed in a later section.

<sup>26</sup> *Copyright Act 1911*; see: <http://www.legislation.hmso.gov.uk/acts/acts2003/20030028.htm>.

<sup>27</sup> *Code of Practice for the Voluntary Deposit of Non-Print Publications*, which the legal deposit libraries agreed with the publishing industry and the UK Department for Culture, Media and Sport (DCMS) in January 2000. See: <http://www.bl.uk/about/policies/codeprac.html>.

attends meetings of the Joint Committee on Legal Deposit (JCLD)<sup>28</sup> to discuss preparations for the extension of legal deposit legislation to include electronic publications via Regulations. The extension was expected when the 2003 Act was passed and so the Act already contains provisions for adding such regulations on electronic legal deposit at a later date.

The Library is designated a suitable 'place of deposit'<sup>29</sup> for public records under the terms of the UK Public Records Act of 1958,<sup>30</sup> allowing it to accept and preserve the public records of Welsh origin in Wales instead of transferring them to the National Archives in England.<sup>31</sup> It has a significant collection of paper archival material originating from Welsh public bodies and expects forthcoming deposits to soon start arriving in electronic form. The National Archives in London provides extensive guidance on electronic records management and preservation, which staff at the Library can use to develop advice for depositing public agencies, and to develop their overall approach to preserving archival records.

Although the Library also collects and preserves archival records from private bodies, it does not have a legal right to preserve them, nor to enforce good record-keeping practices in the organisations or individuals supplying them. It therefore relies on a collaborative approach to ensure the creation and deposit of authentic and accessible records originally created and deposited by appropriate private parties. The Library has voluntary agreements for archival deposit with the Church of Wales and the Presbyterian Church of Wales and accepts archival deposits from other groups such as the Welsh Arts Council and the National Eisteddfod Organisation.

As with other UK organisations, the Library must also accord with the Freedom of Information and Data Protection Acts.<sup>32</sup>

### **Preservation Activity**

The Library is active in a range of digital preservation activities and uses information developed inside its sector as well as externally to develop its approach. In addition to the numerous groups and institutions focusing and working on digital preservation that have already been mentioned in this report, staff at the Library draw upon information provided by the National Computing Centre,<sup>33</sup> government agencies, and higher education organisations such as JISC<sup>34</sup> and the AHDS,<sup>35</sup> as well DigiCULT and other more general library and archives organisations. This broad range of resources reflects the diverse functions of the staff working on digital preservation activities and the different areas into which their digital preservation activities penetrate.

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<sup>28</sup> The Joint Committee on Legal Deposit comprises representatives of all six legal deposit libraries in the UK and Ireland and of the publishing industry; see <http://www.bl.uk/about/policies/legaldepositterms.html>, and <http://www.bl.uk/news/webcase.html> for details.

<sup>29</sup> There are over 230 archives, libraries, museums, galleries and government agencies in the UK that have been inspected by the National Archives and appointed to hold specified classes of public record.

<sup>30</sup> *Public Records Act 1958*; see: <http://www.pro.gov.uk/about/act/default.htm>.

<sup>31</sup> The National Archives in London is actually the National Archives of England, Wales, and the United Kingdom. Northern Ireland and Scotland have their own National Archives.

<sup>32</sup> Information on both these Acts can be found at the UK Information Commissioner's website: <http://www.informationcommissioner.gov.uk/>.

<sup>33</sup> National Computing Centre website: <http://www.ncc.co.uk/>.

<sup>34</sup> JISC – Joint Information Systems Committee – website: <http://www.jisc.ac.uk/>.

<sup>35</sup> AHDS – Arts and Humanities Data Service – website: <http://ahds.ac.uk/>.

Although the Library originally focussed its interests on digitisation when it began its digitisation programme, the focus is now explicitly on preservation of a broader range of digital objects.

### *Policies and Strategies*

Several policies relating to the Library's activities emphasise the need to develop a learning country, a need to increase access to the nation's rich cultural heritage, and the promotion of ICT to help create a more prosperous, culturally rich, and less divided society. Perhaps as a result of this, as well as the recognised national and organisational risks faced should the Library fail to preserve, preservation of an array of digital objects has already gained an important position in the Library's policy framework.

There are three main policies and strategies in place that directly relate or explicitly refer to the preservation of digital information. The Library implemented the first of these, a *Digitisation Strategy*,<sup>36</sup> in 2001. This embraced an element of its Digital Library initiative that required the mounting of digital, online copies of items from the collections. It was not explicitly oriented on a particular type of digital object but was generally directed towards items from the collection considered worthy for digitisation, for example, 2D texts and images such as Welsh journals and manuscripts, cartoons, television stills, and photographs. The strategy established policies and procedures from several perspectives and made explicit references to preservation of both analogue and digital resources. It stated that digitisation was intended 'for the purpose of enhancing access for current and future users', but that it would also, 'where appropriate, use digitisation as a preservation tool'. This was the case for a particular photographic collection in which the negatives were deteriorating. The document committed the Library to operating on the principle of 'scan once for many purposes' to minimise the risk of damage to the analogue originals during the scanning process, and allowed for digitisation to be used as a preservation tool so that surrogate (i.e. digital) copies could be used in place of the analogue original, again as a protective measure against damage caused by excessive handling of analogue materials. Using digitisation as a preservation tool for analogue materials addresses preservation of the analogue resources, but comes with the consequence of shifting the preservation onus from the analogue to the digital object. To ensure that this was not overlooked, the document contained a general Statement of Policy that 'The Library will aim to produce, preserve, and present its digital collections to the highest recognised standards'. The digitisation programme thus considered preservation of its digitised resources from the outset.

The second document pertaining directly to preservation of electronic deposits is the *Policy on the Deposit and Storage of Electronic Archives of Welsh Interest in the NLW*,<sup>37</sup> oriented obviously on the preservation of archival records. This was produced in September 2001 and is currently under review. The policy is aimed at ensuring that the Library can preserve and make available electronic records created by public bodies in Wales. It covers the entire life-cycle of electronic records, although the focus is on encouraging maintenance of authentic records by depositing organisations. Potential problems arising from an uncontrolled electronic records management environment are clearly identified and record keeping systems are advocated to enable life-cycle management of the records in the care of depositing organisations. This policy directly addresses the problem of pre-deposit preservation, as discussed in the 'Main Problems' section, and it commits the Library to communicating these issues to

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<sup>36</sup> *Crossing the Threshold: The National Library of Wales's Digitisation Strategy, 2001 – 2004*. Available from the NLW website at [http://www.llgc.org.uk/drych/digido\\_s01.htm](http://www.llgc.org.uk/drych/digido_s01.htm).

<sup>37</sup> Internal document, not available online.

depositing organisations. Creating a specific policy for archival deposits recognises a crucial difference between the management of electronic archival records and the Library's other deposits: that the creation stage involves far more risk for archival records than for non-archival deposits. This is for a number of reasons, for example, a greater number of people with a varying skill base creating records than those creating publications, and the often-uncontrolled records management environment that gives many users a free reign over how they build an electronic record often causing records to be badly constructed in technical terms. Additionally, they may also be badly documented in archival terms and may not be accompanied by appropriate metadata required to ensure the guaranteed provenance of the objects over time. Communication with record creation bodies both public and private is recognised as crucial for these challenges to be overcome, and the Library is developing principles for deposit and accession for both types of organisations regardless of the policy restriction to public deposits. The pilot project concentrated on public bodies, but it is expected that the results of the pilot will inform decisions made about the management of all electronic records accessioned by the NLW. The policy outlines the importance of authenticity and a controlled records management environment, and provides a suitable context in which records can be transferred to and preserved at the NLW.

The Library's *Digital Preservation Policy and Strategy* followed in 2003.<sup>38</sup> This document, created by a task force under the leadership of the Director of Collection Services,<sup>39</sup> established a policy and outline strategy to facilitate the sustainability of all of the Library's present and future digital holdings. The strategy stresses this need for sustainability of digital holdings and commits to preserving and providing current and continued access to digital material, both born digital and digitised, whilst acknowledging the different archive and library domains of records and archives that it covers. It commits the Library to adopting relevant international standards and states that the Library will aim to become a trusted digital repository or equivalent recognised standard, conforming with the Open Archival Information System (OAIS) Reference Model, and applying metadata standards such as METS<sup>40</sup> and Dublin Core.<sup>41</sup> The policy also refers to technical preservation strategies and procedures, the digital archive facilities, research awareness and skills transfer training, and establishes a strategy plan for 2003-2006 that incorporates staffing, funding, equipment, and implementation.

Furthermore, the Digital Preservation Policy refers and links directly to the documents above and three more, related policies: the Library's first policy on preservation (that concentrated entirely on non-digital materials); the Information Systems Strategy; and the Library's overall Collection and Development Policy.<sup>42</sup> Digital Preservation is hereby integrated into the wider policy framework of the whole organisation, reflecting the increasing level of importance that is being attached to the sustainability of the Library's digital collections. All of the Library's policies and strategies have a three-year cycle for renewal and updating, plus an annual review.

Staff reported that the Library made use of its extensive research network in developing these policies, utilising external models and sources of information wherever relevant.

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<sup>38</sup> The Library's *Digital Preservation Policy and Strategy* is available from its website, see: [http://www.llgc.org.uk/adrodd/digital\\_preservation\\_policy\\_and\\_strategy.pdf](http://www.llgc.org.uk/adrodd/digital_preservation_policy_and_strategy.pdf).

<sup>39</sup> The task force included most of the people interviewed for this case study.

<sup>40</sup> METS - Metadata Encoding and Transmission Standard – website pages: <http://www.loc.gov/standards/mets/>.

<sup>41</sup> Dublin Core metadata element set. See website of the Dublin Core Initiative for more information: <http://dublincore.org/documents/1998/09/dces/#>.

<sup>42</sup> The Library's *Collection and Development Policy* is available online at: [http://www.llgc.org.uk/adrodd/collection\\_dev\\_policy2003.pdf](http://www.llgc.org.uk/adrodd/collection_dev_policy2003.pdf).

Consultants are infrequently used, though staff expect to employ them during development of a new Information Systems Strategy (currently up for its three year review). Implementation of the strategy is gradual, with digital still images, metadata, and web archiving the main areas of progress so far. Awareness training is planned at an organisational level, and departments will receive further training as appropriate.

### *Selection*

Selection is based on the priorities set out in the Library's *Collection Development Policy*. This policy covers all materials, including electronic objects. Research into specific selection criteria for new types of collection objects in digital form is in progress. For example, selection criteria for websites, a digital object type unparalleled in the paper world, are under development in conjunction with the UK Web Archiving Consortium. Selection criteria for digital still images are considered in the *Digitisation Policy* and form the basis of criteria for selecting items for digitisation. These criteria must be followed for each item in each digitisation project the Library undertakes. Regarding selection of electronic publications, the Library holds the National Publishing Archive and aims to develop a comprehensive collection of works published in or relating to Wales. This is indicated in the Collections policy and specialist staff received further guidance on selective acquisition of other, related publications. The specific arrangements regarding selection and collection of electronic publications will be clarified after the forthcoming changes to the legal deposit act.

As different aspects of the collection are at different stages of preservation activity and research, a Library-wide selection and classification schedule is not yet in operation for digital materials. Retention schedules for cultural heritage material information are not considered necessary as it is being preserved *ad infinitum* once ingested; however, retention periods can be stipulated in the Library's software if necessary.

### *Preservation*

The Library's preservation policy and strategy is intended to cover all digital record types. These can potentially be in a very broad range of file formats. In keeping with the terms of the Digital Preservation Policy, staff have undertaken a survey of text, image, multi-media, spreadsheet, and general-purpose file formats and hardware already in the Library. The range of file formats the Library will accept for electronic archival record deposits is restricted and appropriate transfer formats are identified in the Library's policy on the deposit of electronic archives, which is currently being revised. From the 2001 policy, preferred file formats were TIFF, TXT, RTF, PDF, HTML, XML and Postscript, submitted on CD-ROM, Zip drives, 3.5 floppy discs from PCs or via FTP. The Library could also support MS Word files and MS Works for Windows, but had no support for Amstrad or Apricot formats. Further file types and media, such as MS Excel and Access, and memory sticks, flash cards, or USB hard disks, will be considered in the revised policy due later this year.

Implementation is at various stages for different elements of the strategy. One of the most advanced areas is web archiving. In June 2003 the Library, in conjunction with the UK Web Archiving Consortium, began a pilot project called Web Archiving Wales. This project aimed to 'select and capture a representative sample of 100 Web sites, and develop procedures for future selection, capture, description, preservation and access'.<sup>43</sup> Licensed copies of software developed by the National Library of Australia<sup>44</sup>

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<sup>43</sup> See the National Library of Wales website for further information:  
[http://www.llgc.org.uk/drych/drych\\_s059.htm](http://www.llgc.org.uk/drych/drych_s059.htm).

are being used to collect and manage websites according to pre-defined selection criteria (in development, see section above). This software, named PANDAS, is designed to be a complete digital archiving system: in addition to selecting and collecting sites by using a selective harvesting robot, PANDAS is also used to store management metadata and archiving schedules, manage access restrictions, and to process and display the files. The findings of the pilot project will be integrated into the Library's web-archiving procedures in the future.

For digitised images, the Library's digitisation policy defines a default image resolution and requires a master uncompressed image. Appendix 5 to the policy contains guidelines for digitised image file specifications, which vary depending on the nature of the original artefact (e.g. published or illustrated texts, colour or greyscale, archival documents in different inks on different papers, maps or graphs). According to the nature of the artefact, a series of guidelines are given regarding the end resolution, bit depth, compression, archival file format, and web-access format.<sup>45</sup> For all types of images, TIFF is the proposed archival format.

Preservation of other types of digital objects is in preparation. The Library's Preservation policy commits them to preserve the original bitstream of digital objects according to the collection retention decisions.<sup>46</sup> It also states that an archival master copy will be kept in the Digital Archive and that an access copy or copies will be available for access and use.<sup>47</sup> As part of the survey of file formats, suitable formats for access and archiving are being identified. So far, access and archival formats have been identified for electronic records received in the Adobe Portable Document Format (\*.pdf) and MS Word format (\*.doc). Both formats will be archived in the Portable Document Format and the original MS Word files will also be retained as an authenticity measure. Publications received through voluntary deposit will likewise be preserved in .pdf. Research into suitable formats for other text files (such as \*.rtf and \*.html) and born-digital image, spreadsheet, multimedia, and general-purpose files, are under research.

The systems manager is particularly concerned about the preservation of archival email messages, which are not yet part of the collection and for which an archival file format has not yet been identified. Several analogue items in the Library's collection consist of correspondence between crucial Welsh figures of literary, social, and political importance. The traditional method of correspondence using paper letters is today largely sidestepped by electronic mail. If these messages are not preserved, this valuable correspondence and record of Welsh history will be lost. As a result, the Library has embarked upon an email preservation working group with the British Library, the activities of which will be integral in developing the Library's preservation approach for archival email records.

The importance of good metadata is appreciated in all the policy documents pertaining to digital resources. Metadata for electronic records and websites is under research, in conjunction with a proposed Electronic Document Records Management System (EDRMS) project to manage the Library's own administrative records and the Web Archiving Consortium. Metadata for digital still images is particularly advanced and

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<sup>44</sup> For further information on this software and the NLA approach, see the NLA website: <http://www.nla.gov.au/dsp/>. PANDAS stands for the 'PANDORA Digital Archiving System'. To access the NLA PANDORA archive and read more about PANDORA, see <http://pandora.nla.gov.au/index.html/>.

<sup>45</sup> For a full list of specifications, see the *Digitisation Strategy 2001 – 2004*, available online (op cit).

<sup>46</sup> NLW *Digital Preservation Policy and Strategy*, article 4.5.

<sup>47</sup> *ibid*, article 4.11.

incorporates a range of internationally developed metadata standards for Libraries.<sup>48</sup> Image metadata files currently use the Metadata Encoding and Transmission Standard METS, a schema for encoding descriptive, administrative, and structural metadata regarding objects within a digital library, as an outer layer.<sup>49</sup> The METS files incorporate elements from the Metadata Object Description Schema (MODS<sup>50</sup> – essentially MARC 21 in an XML framework), and Dublin Core (metadata for resource discovery) elements in XML. Preservation metadata follows the template suggested by the RLG Preservation Metadata working group<sup>51</sup> (May 1998) and is encoded in MARC and/or Dublin Core. Staff are actively monitoring development of the NISO MIX<sup>52</sup> standard, an XML schema for a set of technical data elements to manage digital image collections and anticipate migrating the preservation metadata in MARC format to the new NISO standard when ready.

Metadata for digital still images has until recently been entered manually but the Library is in the process of automating this. It is being undertaken first in conjunction with an external company, but staff afterwards will be able to apply the lessons they have learnt to cater for a broader range of objects in the Library. Staff aim to automate creation of approximately 80% of metadata and to lead the rest by easy-to-use means including drop down menus.

The Library aims to become a trusted digital repository, with a mission to provide reliable and long-term access to its managed digital resources for the designated community now and in the future. The Systems Manager and the Systems Archivist carry out most of the practical work regarding implementation of the preservation systems, in conjunction with staff from other departments or sections (such as computing). The staff member currently responsible for identifying information for long-term storage is the Metadata Manager. This is an informal arrangement arising from the fact that digital still images are the primary record type in the Library's collection and, in his capacity as Metadata Manager in the digitisation section, he is the last contact with the images before long-term storage. This is thus a logical arrangement, but the responsibility has yet to be properly and formally defined. The metadata manager forwards the appropriate files to the Computing section, which take responsibility for transferring the information into long-term storage from there. The Computing section organises the digital archive in an ADIC<sup>53</sup> tape library that was implemented in 2001.

The Metadata Manager provides METS and general metadata training for staff, but most of the remaining training and advice comes from external sources<sup>54</sup> or is passed on informally. It is expected that this will change in the future with the possible growth of a dedicated department.

### Access

Copies of the image files are hosted onto a digital image server for public access over the Internet. Documentary images are presented as PDF files, many of which have an embedded text processed with optical character recognition (OCR), and other images

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<sup>48</sup> Staff kindly provided examples of practical metadata implementation.

<sup>49</sup> See the METS webpages, op cit.

<sup>50</sup> See the MODS webpages: <http://www.loc.gov/standards/mods/>.

<sup>51</sup> *RLG Working Group on Preservation Issues of Metadata - Final Report*:  
<http://www.rlg.org/preserv/presmeta.html>.

<sup>52</sup> See the MIX webpages: <http://www.loc.gov/standards/mix/>.

<sup>53</sup> See the ADIC website for further information:

<http://www.adic.com/ibeCCTpSctDspRte.jsp?section=10023>.

<sup>54</sup> For example, DPC and ERPANET events.

are presented in either JPEG or Graphic Image Format (GIF). The access format for electronic records and electronic publications will be PDF and possibly also other formats in order to broaden accessibility. Not all of the Library's images can be hosted on the website due to copyright restrictions, and users must visit the Library in order to view some items in the collection; however, this is another issue which is covered by policy and the majority of the collection is available online.<sup>55</sup> Revenue covering costs and an element of profit are gained from some reprographic services, such as scanning on request.<sup>56</sup> Permissions for archiving websites are collected under the UK Web Archiving Consortium project and the Consortium makes the website available through an external service provider.

Further access provisions for electronic documents and publications have yet to be defined, although work is progressing on both counts. Data Protection in archival analogue records is currently addressed on an individual basis but staff are aware that this procedure will change with implementation of the automated EDRMS.

### **Compliance Monitoring**

The preservation process outlined above is still in the process of implementation and it has not yet been considered necessary to begin auditing. However, compliance to policies and strategies is measured in the annual policy and strategy review, including the Digital Preservation policy. This internal assessment measures achievements against targets for each year. Verification checks on the preserved material are made regularly and specific audits can be requested if deemed necessary. External auditors audit compliance to Freedom of Information and the Data Protection acts.

### **Digital Preservation Costs**

Overall strategic cost analyses were undertaken as part of the organisational restructuring in 2001-2002, but not specifically regarding digital preservation investments. Likewise, funding is provided by the Assembly to fulfil their role as a National Library and is not specifically for digital preservation. Most of their funds for digital preservation activities have originated from the Library itself and not from the Welsh Assembly. The tape archive purchase and upgrades to the tape archive come from the Library's own pocket, specifically the Digitisation budget which takes this sustainability issue into account. However, as further preservation activities are spread out across the organisation, to a range of people engaged on more than one activity, progress in completing projects can be slow and costs are distributed. This makes it difficult to gauge an accurate figure.

The Library contributed to the consultation exercise that preceded the passage of the Legal Deposit Libraries Act 2003. This included a Regulatory Impact Assessment that incorporated the findings of a study commissioned by the Joint Committee on Voluntary Deposit (JCVD)<sup>57</sup> on the quantifiable impacts of extending legal deposit to non-print publications.

### **Future Outlook**

Staff are confident that their preservation policy will stand firm in the near future, but appreciate that the situation depends on the forthcoming changes to the legal deposit

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<sup>55</sup> For examples of the online image collection, visit:  
[http://www.llgc.org.uk/drych/drych\\_s003.htm](http://www.llgc.org.uk/drych/drych_s003.htm).

<sup>56</sup> See [http://www.llgc.org.uk/gwas/index\\_s.htm](http://www.llgc.org.uk/gwas/index_s.htm) for examples of revenue services.

<sup>57</sup> For further information about the JCVD see <http://www.bl.uk/news/webcase.html>.

legislation. The policy will undergo annual reviews and regular revisions to ensure that it remains up-to-date. Their emphasis will remain on defining a strategy for preservation and the strategy is expected to develop as more experience is gained.

Although preservation efforts are currently deemed satisfactory by all interviewees, there was a perceived need for an even more organised approach and increased staff resources. These will come as the strategy is further developed and a team established with staff time dedicated solely to digital preservation. However, they are pleased with the results of their collaborative efforts and are keen to increase collaboration and the sharing of information and experience, specifically with other Welsh organisations.<sup>58</sup> Staff wish to see increased investment in digital preservation efforts and believe that this will become more necessary as the strategy is further developed and implemented. Additional funds are required specifically to expand and improve the Library's technical infrastructure and to engage more staff on curation and systems administration monitoring and verification. Preservation efforts in the near future will extend to incorporate the preservation of further data types and the specification of technological solutions.

Some of these developments are already in the pipeline. The Library wishes to implement FEDORA<sup>59</sup> as its Digital Asset Management System, providing both access and management to resources through one centralised system. It also wishes to connect to other legal deposit libraries to form a secure network and has begun investigations into how this can be achieved. From a user-perspective, the Library plans to extend the range of resources available to remote users by implementing web-based subscription services. This will utilise an asset management system with patron authentication<sup>60</sup> and provide opportunity for the Library to increase web-based revenue.

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<sup>58</sup> The recent founding of CyMAL, the Welsh Museums, Archives and Libraries association, has been met with great enthusiasm. The Library will work closely with CyMAL to raise awareness of digital preservation issues amongst the Welsh community. For further information on CyMAL, see: <http://www.cymal.wales.gov.uk/content/template.asp?ID=/index.asp>.

<sup>59</sup> FEDORA – Flexible Extensible Digital Object and Repository Architecture – see website: <http://www.fedora.info/>.

<sup>60</sup> The computing section has selected ATHENS authentication software for this, see the ATHENS website: <http://www.athens.ac.uk/>.

## **Chapter 7: Conclusions**

The National Library of Wales has made a strong and committed start to implementing successful digital preservation. Their solid policy framework and building blocks approach is resulting in gradual strategic development and implementation in a comprehensive and constructive manner. Intent upon furthering knowledge of digital preservation issues to the wider community, the Library is making strenuous efforts to ensure that Welsh cultural heritage and archival material is available for current and future preservation and remains accessible; backed by upper level management and a favourable political landscape, this goal is well on its way to being met.

In addition to the strong management presence and a solid preservation policy framework, its approach has several more laudable aspects. Preservation has been built into the Library's agenda from the outset of their first digitisation strategy in 2001. This is in direct contrast to many other organisations interviewed during ERPANET case studies, where preservation and sustainability of digitised/digital objects has been overlooked because of too tight a project focus.<sup>61</sup> The Library's primary mission to preserve has no doubt played a role in this, unlike other organisations where preservation is a by-product of their core activities. As a result of the Library's explicit consideration in several successive collection policy documents, preservation has become embedded in the organisations overall policy framework. This both reflects and strengthens the position and value attributed to the digital collection and should assist in attracting finances to sustain it.

Furthermore, the Library's strategy incorporates approaches for different types of objects and many activities at different stages of the object life-cycle. This means that their approach is complex, but it is also comprehensive. Diverse functions have been assigned to staff throughout the organisation who are subsequently becoming specialists in their respective fields. As the Library prefers to develop the expertise in-house rather than employ external consultants, these experiences remain in-house and can be transferred to similar projects, expanding implementation. Likewise, digital preservation awareness is more easily spread through the organisation than if the operations were outsourced. The benefits of international knowledge sharing and collaboration with organisations such as the Digital Preservation Coalition and the Web Archiving Consortium can clearly be detected in the range and depth of digital preservation activities the Library is engaged with, complemented by collaborative work on pre-deposit issues such as electronic legal deposit and the maintenance of authentic electronic records in depositing organisations. Geographical isolation may prove a problem for physical visitors, but it certainly hasn't proved a barrier in the formulation of the Library's digital preservation activities.

Some technical elements of the strategy still require attention. Regarding the challenge of email preservation, staff were particularly interested to hear about software developed by the Digital Preservation Testbed project in the Netherlands that produces and stores copies of sent and received email messages in XML. Likewise, work is continuing on the selection of appropriate archival file formats for spreadsheet files, multimedia objects, and born-digital images. Migration pathways, i.e. the procedures through which to convert records to different file formats, have yet to be fully defined; however, this is all future work that the Library is aware of and for which provisions are being made. The Library's approach is strategically forward-looking: the policy and organisational framework bears provisions for regular policy updates and target reviews; standard and open source file formats are selected for archival longevity;

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<sup>61</sup> For example, focussing solely on access or on records management.

metadata is considered for longevity and interoperability; and the Library is already planning further developments in broadening data types and access, and sharing data.

The Library's dual mandate as both a deposit library for publications *and* a designated place of deposit for archival public records, and their approach to this in terms of preserving their assets, also merits further discussion. As is obvious from this study, work on the preservation of digital archival records is not yet as advanced as in those parts of the collection with a Library-focussed content. This may be for a number of reasons; for example, that electronic records do not enter the Library's collection until many years after they are created, whereas library objects have a much shorter transfer delay schedule. The point, however, is that Library and Archive objects originate from different contexts, and as such, demand different preservation approaches to secure them. The range of creation mechanisms available to record creators of varying computing competency, and the time delay between creation and deposit of archival records, means that the Library must work closely together with archives-depositing organisations to ensure records are created and maintained in a manner conducive to preservation whilst the records are still in the organisations' custody; contrary to this, the Library can have no direct influence on the way publications are created by publishing houses and is not required by Library standards to acquire the same degree of contextual metadata as Archives. Also, publications tend to adhere to widely accepted standards so that they are consistently accessible to a range of people with different computing systems; archival records often have a much smaller circulation and are likely to utilise a broader range of file formats. Unpublished items are, for this and other reasons, generally at far greater risk than those that have been published. Furthermore, not only must the Library's communications activities differ between different types of depositors, so also must the metadata they collect from different organisations. It is widely accepted that authenticity of archival records must be approached in a different way to that of publications. Archival requirements are much stricter and demand greater proof of provenance than that of libraries; as such, the NLW must allocate different metadata to archival objects than library ones so that authenticity and provenance can be ensured. Staff at the Library are aware of these issues, which make their challenge more complex and the need for central coordination ever more important.

Implementing digital preservation is a lengthy process, but as long as staff at the NLW continue in the direction they are currently taking, coordinating, planning, and properly researching each step, their strategy is highly promising. Committed to current and continued preservation and access, the Library has successfully embedded digital preservation into the policy heart of the organisation. Digital cultural heritage of Welsh origins stands a stronger chance of survival as a result.

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Staff were also kind enough to provide documentary examples of practical metadata implementation.

Map of Wales obtained from <http://www.met-office.gov.uk/weather/europe/uk/wales.html> copyright acknowledged.

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