



Our Cultural Heritage: Building the Gateway

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Cultural Heritage Panel

List of Members

Donal Tinney, County Librarian, Sligo
Representing the Library Association of Ireland

Catherine Fahy, Assistant Keeper, National Library of Ireland
Representing the Department of Arts, Sport and Tourism

Jerome Morrissey, Director/**Anne White**, National Co-ordinator, National Centre for Technology in Education
Representing the Department of Education and Science

Betty Moriarty/Orlagh O'Sullivan, Assistant Principal, Department of the Environment, Heritage and Local Government
Representing the Department of the Environment, Heritage and Local Government

Liam Ronayne, City Librarian, Cork City

Annette Kelly, Assistant Director, An Chomhairle Leabharlanna
Chair

Project Funding Agency

The Cultural Heritage Project, Phase Two was funded by

The Department of the Environment, Heritage and Local Government
with support from the Information Society Fund
Custom House
Dublin 1
Ireland

Tel +353 1 888 2000
Fax +353 1 888 2888
Email: press-office@environ.ie
Website: www.environ.ie

The Project Team

Project Team – An Chomhairle Leabharlanna

Project Manager

Annette Kelly

Assistant Director

Address

An Chomhairle Leabharlanna
53-54 Upper Mount Street
Dublin 2

Phone

01-6761167

Email

akelly@librarycouncil.ie

Project Team

Joan Ward

Email

jward@librarycouncil.ie

Eugene Farrelly

Email

efarrelly@librarycouncil.ie

Claire Comiskey**Rachel Kavanagh****Niamh McNamara**

Email

info@librarycouncil.ie

Address

An Chomhairle Leabharlanna
53-54 Upper Mount Street
Dublin 2

Phone

01-6761167

Technical Partners

Ciarán Clissmann

Technical Partner

Address

Pintail Ltd
77 Springhill Avenue
Blackrock, Co. Dublin

Web address

www.pintailservices.com

Email

ciaran@pintailservices.com

Technical Partners

Charlie Pritchard**Evin McCarthy**

Address

Digital Media Centre
Dublin Institute of Technology
Aungier Street
Dublin 2

Website

www.dmc.dit.ie

Email:

info@dmc.dit.ie

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In particular, the project team thanks

- The Department of the Environment, Heritage and Local Government
- The *Branching Out* Steering Committee
- The Cultural Heritage Panel
- The Digital Media Centre, Dublin Institute of Technology
- The National Museum of Ireland
- The Irish Architectural Archive
- Professor Robert Clark, Faculty of Law, University College Dublin.

The project team wishes to record its appreciation of the contribution made to the project by the County and City Librarians and in particular the staff of their Local Studies Departments.

Foreword

At a time when some of the world's leading cultural institutions are reporting more visitors to their exhibits through the Internet than in person, the Ask About Ireland gateway is a timely and exciting project for Ireland.

Ask about Ireland reaches across the country to embrace the local library service, local authority archives, local newspapers and other historical sources and includes key national institutions such as the National Museum. It makes national treasures available online from Malin Head to Mizen Head (and around the world indeed!). But more than that, it makes local treasures available to those who would not otherwise have the time or opportunity to access those treasures. These "treasures" include those elements of our history locked up in 19th century Poor Law Union records, or in almost 2 centuries of local press in Ireland, or indeed in the beautifully artistic posters which were the pop art of the 1920s and 30s in Ireland.

This report builds on *Our Cultural Heritage: a strategy for action for public libraries* launched in 2003. This strategy, which is being funded by my Department, provided for the digitisation and online publication of the significant store of history and culture in Irish public libraries. The report documents the development of the www.askaboutireland.ie gateway and its findings encourage the view that the Irish cultural sector can be a significant player in the emerging eContent industry. It is also a major initiative, supported by the Information Society Fund, of the Government's eInclusion agenda.

I welcome the involvement of the Department of Education and Science through the National Council for Curriculum and Assessment. This is in recognition of the unique and authentic resource available from the collections of libraries, museums and archives which can now be made accessible in every school throughout the country thanks to the Internet.

I look forward to the continued roll out and development of this excellent initiative.



Dick Roche T.D.,
Minister for the Environment, Heritage and Local Government



Executive Summary

Introduction

In Phase One of the Cultural Heritage Project, the portal website www.askaboutireland.ie was developed to showcase the potential for users to access the cultural history of Ireland, based on the local studies collections of public libraries, local museums and archives. This work was presented in the report *Our Cultural Heritage: a strategy for action for public libraries*, published in September 2003.

In Phase Two of the project, the portal website was enhanced to provide online access to a broad range of content from Irish libraries, museums and archives. The project was established by the *Branching Out* Steering Committee, through its Cultural Heritage Panel and was carried out in 2002/2003 under the management of An Chomhairle Leabharlanna, with the support of the Department of the Environment, Heritage and Local Government and of the Information Society Fund.

This report outlines the process of enhancement of the portal website and also details the work carried out in the area of copyright, automated indexing of newspapers and three-dimensional imaging.



Above | Photograph of a group of eighteen workers with their Clerk of Works taken at the Great Southern and Western Railway Station in Athlone in 1927. © Westmeath Library Service



Left | Cover of an 1848 edition of *Orlandino* by Maria Edgeworth
Courtesy of Longford County Library

The project involved local libraries, museums and archives in the digitisation and online publication of their local studies materials, creating a national Internet resource for culture at www.askaboutireland.ie.

The project focused on meeting the requirements of the Information Society, addressing issues such as inclusion, attracting users to the Internet and emphasising the relevance of the Internet to all. It did so by creating a resource of interesting, relevant content with a uniquely local focus, on the basis that local news and local material is attractive and interesting in its own right and will attract members of the community who feel that the Internet has nothing of relevance to them.

Aims and Objectives

The objectives of Phase Two of the Cultural Heritage Project were:

- To create a new, more comprehensive source of historical material which would be exciting and engaging for the general user, aligned with the needs of the student and invaluable to the researcher

- To carry out research in a number of areas of critical importance to cultural projects in Ireland:
 - Copyright
 - Newspaper digitisation, indexing and online publication
 - Three-dimensional (3D) object digitisation and publication
 - Interoperability and cross-institution service provision
- To build further partnerships and relationships with major national cultural players such as the National Museum of Ireland, the National Archives, the Irish Architectural Archive and the National Library of Ireland. Co-operation with such bodies and the creation of integrated strategies for online culture will be of increasing importance into the future and
- To improve the services provided to the public through the website www.askaboutireland.ie, by enhancing it visually and functionally, while making it easier to use and navigate.

Project Results

- The project created a greatly enhanced online resource of local material in the www.askaboutireland.ie website.



Left | Photograph of a painting of author and poet Thomas MacGreevy painted by Sarah Purser in the early 1920s

Courtesy of Kerry County Library



Left | Photograph of the warehouse at Mill Lane, Birr Courtesy of Offaly County Library

- Public libraries, museums, archives and the National Museum of Ireland were involved in the project.
- The project supported the implementation of the national digitisation strategy funded by the Department of the Environment, Heritage & Local Government in 2004.
- The National Council for Curriculum and Assessment (NCCA) has formally recognised the www.askaboutireland.ie website as a resource which is closely aligned with the new syllabus in a number of subjects and in the primary, Junior Certificate and Leaving Certificate cycles.
- Important research results were achieved. The most important of these were achieved in the areas of:
 - Copyright
 - Newspaper digitisation, indexing and online publication
 - 3D object digitisation and publication and
 - Interoperability and cross-institution service provision.
- The www.askaboutireland.ie website has a new look, new content, new games and features, greater ease of use and significantly more impact.



| Above | Photograph of a Hedgehog swimming. Hedgehogs are thought to have been introduced to Ireland in medieval times.
Courtesy of Wexford County Library

Background



I Above I The Ask About Ireland Website

The *Branching Out* Report (1998), set out a strategic plan for the libraries' sector in Ireland, and a clear agenda in relation to developing the library as a centre of culture. The report recommended a *programme of digitisation of local studies materials, beginning with unique/rare resources, but with the long term aim of making the holdings of all local studies sections available in digitised form.*

The *Branching Out* Steering Committee established a panel, the Cultural Heritage Panel, to develop a strategy whereby the digitisation of cultural holdings could be progressed.

The Cultural Heritage Project Phase One was an initiative of The Cultural Heritage Panel, supported by the Department of the Environment, Heritage and Local Government with funding from the Information Society Fund. It took place over six months in 2002/2003 and established a national network of digitisation projects, an important cultural resource, guidelines and best practice

indicators, pilot projects and a central portal including databases of cultural material from across the country. This phase was documented in the report *Our Cultural Heritage: a strategy for action for public libraries* which was launched by the Minister of State at the Department of the Environment, Heritage and Local Government in the Custom House, Dublin, in September 2003.

The response to the Cultural Heritage Project, Phase One was universally favourable, with the value of the work done and the potential for further work widely recognised. This led to a proposal to the Information Society Fund that a further development of the project be carried out, with a broader range of topics and more research into legal and technical issues.

This project, the Cultural Heritage Project, Phase Two, commenced in September 2003.

Aims and Objectives

The objectives of this second phase of the Cultural Heritage Project were as follows

- To supplement the existing www.askaboutireland.ie website resource with **significant amounts of new cultural and historical material**, contributed by libraries, museums and archives across Ireland. This would help to establish a **critical mass** of online material, which in turn would increase the uptake and popularity of the project and the resources it provides. This material would include written, graphical and audio/visual material
- To structure the new material into integrated, accessible, **user-centred presentations**, adding value for the educational and recreational users
- To extend the existing online tools and presentations, adding **new user functionality** and ways to navigate and exploit the rich content resources
- To encourage **end user participation** in the website by providing quality content online which is of interest to a wide audience and presenting this content in a more visually and functionally enhanced manner
- To stimulate learning by the provision of **interactive** games and a 3D VRML presentation on the website, based on the cultural content presented on the site
- To align the work carried out and the material created and published online with the **second level school curriculum**, in co-operation with the National Council for Technology in Education (NCTE), the NCCA and the Department of Education and Science
- To build upon the results of the Cultural Heritage Project, Phase One in establishing a **national infrastructure for digitisation**, by furthering partnerships and relationships with **national cultural players**, such as the National Museum of Ireland, the National Library of Ireland, the National Archives and the Irish Architectural Archive.



I Above I Lords and Ladies berries, a common plant of Irish woods and hedgerows. Photograph supplied by Dún Laoghaire - Rathdown County Library. *Courtesy of Paula O'Regan.*

SGÉALTA NA nOILEÁN



Right | Cover of 'Sgéalta na nOileán' (Stories of the Islands) by Peadar Ó Direáin, published in 1929. Courtesy of Galway County Library

Δομ

Peadar Ó Direáin

- To formulate, with expert legal assistance, an appropriate treatment of copyright for cultural heritage material published online by projects such as this and the national digitisation strategy projects
- To carry out research in a number of areas of critical importance to cultural projects in Ireland, establishing knowledge and understanding in the areas of:
 - Newspaper digitisation, indexing and online publication
 - 3D object digitisation and publication
 - Interoperability and cross-institution service provision and
- To **promote** the website at a **local** level across the country, as well as through a **national** marketing effort, including a high-profile launch and a national media programme.



| Above | Image of the lighthouse on Scatterry Island, Co. Clare. *Photograph by Tim Redfern*

Implementing the Project

Approach

The project consisted of six co-operating strands. The strands ran in parallel, reflecting the tight timescale of the project and were as follows:

Creation of New Content

The creation of content in terms of digitised material and narrative involved public libraries, museums and archives and the National Museum of Ireland. Personnel were trained in the acquisition and installation of equipment, the selection of material to be digitised and the digitisation and submission of the new digital material to the project website.

Integration of Content

The project engaged experts to create contextual narratives to act as an information background for each topic. These narratives were then combined with selections of the new digital material to create new integrated presentations or 'features'.

Technical Development

The website was redesigned and re-implemented during the project. It was designed to comply with the internationally recognised standard for usability for people with disabilities, Web Content Accessibility Guidelines 1.0 created by the World Wide Web Consortium (W3C). The functionality

for submitting new digital content was given top priority, so that local libraries could input images and content easily and databases of content could be built up. This was followed by the functionality which presented the content to the end user in response to his particular requirements. A number of other technical developments also took place – database upgrade, interoperability pilot and the creation of a 'Storyboard' tool.

Interactive Facilities

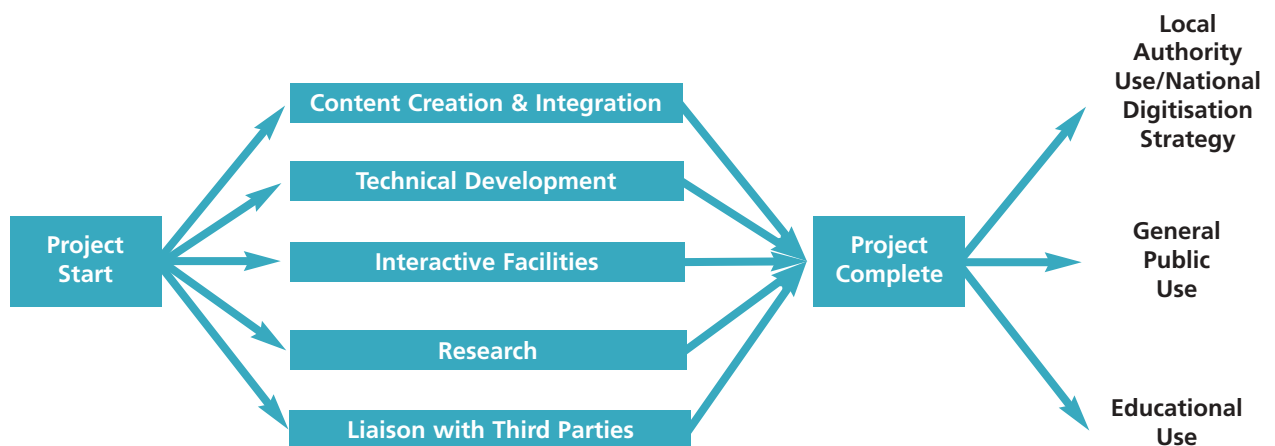
Three new games were created for the website. These used source material from the participant libraries and expert narratives. The games were designed to be both entertaining and educational.

Research

A number of research activities took place. These covered the areas of copyright, interoperability, newspaper digitisation, 3D object digitisation and publication.

Liaison with Third Parties

To add value to the project outcomes, the project team liaised with the NCCA and the Department of Education and Science in order to examine the potential for alignment of the content with the schools' curriculum. The National Museum of Ireland also joined in Phase Two as a full participant.



| Above | Project Life Cycle

Project Participants

The participants in the project included a significant number of libraries, museums and archives from around the country, several national bodies, a group of sectoral experts and two technical organisations. The participants can be categorised according to their roles in the project, as follows:

- Content creators
- Technical services and
- Sectoral experts.

Content Creators

The project involved local authority public libraries, as well as a selection of museums and archives, both local and national. All of the libraries and memory institutions digitised and contributed new cultural content for the project website. The degree of involvement of each individual library or museum reflected the availability of resources to work on the project during the brief project lifetime.

A full list of participants is provided in Appendix Six (page 61).

Technical Services

The project involved a significant number of technical tasks, including the provision of the project website, the creation of integrated online presentations building upon the contributions of the content creators, Web tools, online interactive features and games. The technical services were largely the domain of the Digital Media Centre, Dublin Institute of Technology. Additional technical services and project management support were provided by Pintail Ltd.



Left Photograph of LUAS tram approaching the Kingswood stop during testing on 3rd December 2003. Courtesy of Kieran Swords, South Dublin County Library



Above The Ask About Ireland Homepage

Sectoral Experts

The project focused its online content into a number of topics, in order to provide a coherent, integrated offering to the general public, to students and to other users. The project engaged sectoral experts to provide an introduction to and overview of each topic.

The following sectoral experts were involved in the project:

Architecture: **Professor Alistair Rowan**

Professor Rowan became the first professor in the History of Art in University College Dublin in 1977. He is a founder member of the Ulster Architectural Heritage Society and was Chairman of the Irish Architectural Archive from 1982 to 1986. He served on the Historic Buildings Council for Scotland from 1986 to 1994 and has been President of the Society of Architectural Historians of Great Britain and of the Architectural Heritage Society of Scotland. He is an authority on the architecture of Robert Adam and is an author and editor of the Yale University Press *Buildings of Ireland* series.

Flora & Fauna: **Michael Viney**

Michael Viney is the author of *Ireland: A Smithsonian Natural History*, published in Belfast by the Blackstaff Press. He lives in west Mayo and writes the column *Another Life*, on ecology and natural history, for the Weekend Review of The Irish Times.

Irish Language & Legends:

Dr. Bríona NicDhiarmada

Dr. Bríona NicDhiarmada lectures in Irish in the Department of Languages and Cultural Studies, University of Limerick. She was educated at Trinity College, Dublin and University College Dublin. Among her publications are *Téacs agus Comhthéacs* (with Máire Ní Annracháin), Cork University Press 1998, as well as various articles on aspects of Irish language literature. She was a contributing editor to *The Field Day Anthology of Irish Writing Volumes IV & V*. She has previously worked as a scriptwriter and as a producer/director in television.

Irish Writers: **Dr. Derek Hand**

Dr. Derek Hand teaches in the English Department in St. Patrick's College, Drumcondra. He is interested in Irish writing in general and has published articles on W.B. Yeats, Elizabeth Bowen and on contemporary Irish fiction. His book *John Banville: Exploring Fictions* was published in 2002 by The Liffey Press. He is a frequent reviewer of Irish fiction for The Irish Times.

Poor Law Union Records: **Dr. Raymond Gillespie**

Dr. Raymond Gillespie is currently a senior lecturer in the Department of Modern History, National University of Ireland, Maynooth. His principal research interests are in the seventeenth century and he has written widely on social and economic change in seventeenth century Ireland.

Sport: **Dr. Joss Lynam**

Dr. Joss Lynam was a founder member of the Irish Mountaineering Club, the first mountaineering club in Ireland, in 1948. He was a founder and the first Honorary Secretary of the Association for Adventure Sports in 1969. Concentrating on mountaineering, he has been on fourteen expeditions to the Himalaya and other great ranges, and was the founder and editor for 14 years of the magazine *Irish Mountain Log*. He has also produced a series of guidebooks on walking in Ireland.



Above | Waterford Boat Club - group of oarsmen and members in 1952. © Waterford Boat Club. Courtesy of Waterford City Library

Transport: **Bernard Share**

Bernard Share contributed the material on inland transport to the new *Encyclopedia of Ireland* and is consultant to the Heritage Office of Iarnród Éireann. He is a former editor of *Cara*, the in-flight magazine of Aer Lingus and was founder editor of *Books Ireland*.

His books include a history of Aer Lingus - *Shannon Departures: a study of regional initiatives* and *The Emergency* - a social history of Ireland in World War II, as well as three novels and a number of books for children.

Project Initiation

The project commenced on approval by the Information Society Fund Evaluation Committee, on 8th October, 2003. A project team was established, comprising of personnel from An Chomhairle Leabharlanna and an external consultancy organisation. A project plan and quality plan were produced and agreed by the project team.

A briefing meeting was held with all county and city librarians, or their representatives, on 25 September, 2003. At the meeting, the new topics for content were discussed and an outline of the proposed contribution was provided subsequently by each participating library service.

Training

Further training was provided to library and memory institution personnel as required. Training in the new content management technologies used on the project website was also provided.

Content Creation

New content, reflecting material of local and national significance was created by the participant libraries. This includes some 3,000 new images, several hundred pages of narrative text, audio, video and other material. The website is now a major online resource for anybody interested in the history and culture of their local area.

The new content has been integrated into a clearly-structured, easy-to-use new website, indexed both by location and by topic.

I Right I
The Ask
About
Ireland Flora
and Fauna
Feature



Content Integration

Ten topics were explored. For each topic, a unique interactive presentation (or 'feature') was created by the Digital Media Centre. Each feature presents the material relevant to that topic in a manner most appropriate to the material. This means that each feature has its own identity including its own layout and its own colour scheme. These features and the individual topic treatments make the new website a model for the presentation of this sort of material.

Each feature includes a contextual narrative provided by a national expert in the topic, as well as images and other content (text, audio, video, etc.) provided by the participant libraries.

The topics selected are as follows:

- Architecture – containing considerable content on local architecture from a variety of library authorities, together with a comprehensive guide to the *Architecture in Ireland* feature with narrative composed by Professor Alistair Rowan.
- Flora & Fauna – which is comprised of a wide selection of material from many library authorities, and the *Ireland's Natural World* feature on the story of plant and animal life in Ireland by Michael Viney.
- Irish Language & Legends: *Teanga agus Finscéal na hÉireann*: dréachta d'ábhair maidir le oidhreacht saibhir na hÉireann i gcás teanga, litríocht, miotaseolaíocht agus béaloideas, curtha i gcomhthéacs ag an Dr. Bríona Nic Dhiarmada sa phíosa *Teanga, Litríocht agus Finscéal na hÉireann*.

Contributions of material in relation to Ireland's rich heritage of language, literature, mythology and folklore, placed in context by the *Irish, Language, Literature and Legends* feature by Dr. Bríona Nic Dhiarmada.
- Irish Writers – is a rich source of content on Ireland's many writers from local library authorities, set in context by Dr. Derek Hand's *Irish Authors* feature tracing the development of modern Irish writing.
- Island Life – the story of Scatterry Island, a small uninhabited island at the mouth of the River Shannon with a rich and unusual history.



I Above I The Ask About Ireland Race Around Ireland Game

- Pages in History – an overview of significant events in Irish and world history in the 20th century, compiled by Dublin City Public Libraries. Pages in History is complete with newspaper coverage and features a snapshot of social history in 1904, and 2004, which commemorates the centenary of Bloomsday (16th June 1904), the day in which the events in James Joyce's *Ulysses* were set.
- Poor Law Union – details of the records and daily operation of a sample of workhouses in Ireland from the public library collections, with explanatory setting provided in the *Poor Law Unions and their Records* feature by Dr. Raymond Gillespie.
- Sport – a range of content on a variety of sports from a number of library authorities, with the *Adventure Sports in Ireland* feature guide written by Dr. Joss Lynam.
- The Virtual Museum – a 3D presentation of a selection of artifacts from the National Museum of Ireland ranging from pre-history to medieval times and in addition incorporating a number of natural history artifacts.
- Transport – a wide selection of local content from many public library authorities across the country, together with the *Transport* feature on the development of public transport in Ireland by Bernard Share.



Above | Postcard of a couple driving their three pigs to market in Enniskerry, County Wicklow. Courtesy of Wicklow County Library

The Virtual Museum

The National Museum of Ireland played an important role in Phase Two of the project. The Museum focused on the digitisation and subsequent publication of 3D museum artifacts. The results are hosted on the project website and provide a valuable indicator of what can be achieved using current technologies and a limited budget. The results are of interest and relevance to all holders of 3D cultural items which they wish to place on the Internet. From the end-user point of view, this material provides a unique opportunity to manipulate and explore museum exhibits with a great deal more freedom than would be possible with the original items. Core research results of this work are presented in Appendix Two (page 30).

Interoperability Investigation

The project carried out a technical feasibility study to identify the most appropriate approach to enabling a single point of access for the user to library catalogues and websites. A user can now search all library websites and catalogues through a single interface. Using the results, the user can request an inter-library loan from his local library service. It is proposed to investigate the development of a delivery service for the end user based on the searching facility.

The core finding was that a non-intrusive approach based on existing Web technologies was the most appropriate, feasible and effective. This result was then followed up by the creation of a search facility based on this approach, which enables parallel real-time cross-searching of library catalogues and websites nationwide. The research aspects of this work are presented in more detail in Appendix Four (page 51).

Interactive Facilities

The extended project website includes interactive features and games to engage the end user. The initial focus is on second level (Junior Certificate cycle) students, but the appeal is general. Three games have been created which feature the topics Irish Writers, Transport and Irish Language and Legends.

I Right | Bare Limestone
pavement at Poll Salach,
The Burren, Co. Clare.
© by Carsten Krieger
www.thecapturedlight.com



Copyright

The project engaged a legal expert, Professor Robert Clark of University College Dublin and Arthur Cox and Company, to provide legal information on copyright issues. Professor Clark was briefed to provide legal advice and models which could be applied both in this project and in subsequent projects where cultural bodies are publishing historical and cultural material online. These included strategies for determining copyright, copyright notices for cultural websites and checklists to be followed before deciding whether or not to publish material online. A detailed guide to copyright for cultural digitisation projects is included in Appendix One (page 27).

Promotion and Marketing

An important aspect of the project is the marketing and promotion of the project outcomes to the end users. The Cultural Heritage Project, Phase Two included detailed planning and preparation for a marketing strategy. The implementation of the marketing plan is taking place in parallel with the production of this report.

The project engaged a professional marketing organisation, Mahon O'Neill to prepare a marketing plan. This supplemented the work of the project team in this area.



Left | Poster advertising the victory celebration dance for Seamus Mc Cabe on winning the All-Ireland Softball Senior Handball Championship in 1966.

Courtesy of Monaghan County Library

The marketing strategy suggests a two-pronged approach, with both national and local marketing for the project. Some key points are listed here:



Left | Poor Law Union document - numbers admitted, discharged and that died. *Courtesy of Meath County Library*

National Marketing

- The addition of new interactive and user-generated content functions for the site. As was noted by Mahon O'Neill, much Web promotion and marketing includes user polls, small competitions, email bulletins, newsletters, and quizzes
- The addition of a new topic on a regular basis, which would generate ongoing interest in regular visits to the website, and
- Media interaction at national level, including press releases, working with features journalists (e.g. Arminta Wallace, who interviewed the project team at the end of Phase One for The Irish Times) and targeting cultural and contemporary programmes on radio and television.

Local Marketing

- A staged approach, with a number of local events to provide sustained and repeated media coverage rather than a one-off event
- The delivery of local events, hosted in the local libraries, where target groups within the community are treated to a demonstration of the site and what it has to offer them in particular, and are invited to participate in local initiatives such as contributing their memories to the site, themed around a particular location, event, building or artifact
- Media work at local level, including contacts with local newspapers and radio and

- Meetings with teachers to explore the resource.

The delivery of the marketing strategy is planned for Spring 2005.

Technical Development

The project incorporated a number of technical developments. These include the following:

- **Redesign of website:** The project website at www.askaboutireland.ie was comprehensively redesigned. The Digital Media Centre, Dublin Institute of Technology was engaged to carry out this work, in co-operation with the project team. The redesign of structure and presentation aspects of the site has resulted in a more coherent, 'branded' project website, with enhanced user friendliness and navigation and compliance with W3C's Web Content Accessibility Guidelines 1.0.
- **Database upgrade:** the existing database system was upgraded to simplify searching across all fields using simulated free-text searching. This enables easier finding of material in the databases for the user
- **Interoperability:** a facility was created which allows the end user to search across online catalogues and databases of public and national libraries in parallel. This makes finding material which satisfies a particular research requirement a great deal simpler and
- **Storyboard tool:** the project created a tool for the building of integrated, coherent Web presentations, made up of multiple Web pages. This provides the potential for participants to create artifacts similar in nature to the 'Features' found on the new project website and the existing 'Big House Experience' feature.

Newspaper Digitisation

This research, undertaken by Dublin City Public Libraries, consisted of a cost-benefit analysis of various digitisation options, with a particular focus on local newspaper digitisation, Optical Character Recognition (OCR) and automated indexing.

Holdings of historical newspapers are an important and widely-used part of local studies collections in the

majority of public libraries. Any approach which achieves, in a simple and economical manner, the digitisation, indexing and presentation of historical newspapers would have an important impact on the public libraries and their end users, as well as on researchers, students and the general public.



Above | Photograph of champion Greyhound, Master McGrath with trainer Mr. Walsh. *Courtesy of Waterford County Library*

The project found that while the optimum results were achieved by outsourcing the digitisation and indexing of historical newspapers to international bureaus which specialise in this work, the cost was prohibitive. In-house approaches based around manual indexing and presentation using Portable Document Format (PDF) files were found to be feasible, and more economical, at least for smaller projects (if labour-intensive). The results of this research are presented in Appendix Three (page 37).

Poor Law Union Records

Most library authorities hold significant amounts of early local government material in their local studies collections. These include minutes of the Board of Governors meetings, Poor Law Union records, Record of Deaths, etc. These are a major source of original material for those with an interest in Irish history of the eighteenth and nineteenth century in particular. Material covering the management of the Famine by local authorities and committees is particularly popular.

The objective of this research was to ascertain how best to digitise and publish online excerpts from the Poor Law Union records. Two local authorities, Meath County Library and Donegal County Archives Service, undertook to investigate a best practice for the treatment of the records. The results of this research are presented in Appendix Five (page 58).



| Above | Sketch depicting mythical Irish heroes Cúchulainn and Ferdia in battle.
Courtesy of Louth County Museum

Project Results

Overview

The website www.askaboutireland.ie now provides access to a rich collection of online digitised local material. Users can browse or search for content about Ireland, both national and local. To find out further information, users can follow links to contact their local studies librarian.

Public libraries, museums, archives and the National Museum of Ireland were involved in the project. Many hundreds of items of great local, historical and cultural interest were digitised and published online. The majority of local authorities now have a



! Above ! Image portraying the sport of road bowling.
Courtesy of Cork City Library

significant amount of local studies material online, providing a unique and exciting resource for local people, for students and researchers, for the Irish diaspora and for the general public.

The online nature of the project results means that this showcase of local studies and special collections from around the country can now be accessed at any time, from anywhere on the Internet.

The NCCA has formally recognised the www.askaboutireland.ie website as a resource which is closely aligned with the new syllabus in a number of subjects and in the primary, Junior Certificate and Leaving Certificate cycles.

Important research results were achieved. The most important results were achieved in the areas of:

- Copyright
- Newspaper digitisation, indexing and online publication

- 3D object digitisation and publication and
- Interoperability and cross-institution service provision.

The www.askaboutireland.ie website was radically re-engineered, overhauled and revamped, with a new look, new content, new games and features, greater ease of use and significantly more impact.

Project Findings

Great **enthusiasm and interest** in technology projects such as this one exists in the Irish cultural sector. This suggests that the cultural sector will contribute to the creation of a real eContent industry in Ireland.

Public libraries used this project to prepare for the national digitisation strategy which was recommended in the report of the Cultural Heritage Project Phase One, *Our Cultural Heritage: a strategy for action for public libraries*. In June 2004, the Department of the Environment, Heritage and Local Government announced the availability of grant aid for the development of significant online content and digitisation expertise in each library authority in line with the report's recommendations. New content developed under the national digitisation strategy will be made available on public library websites or through the project website at: www.askaboutireland.ie



! Left !
Signed photograph of William Butler Yeats.
© Sligo County Library

| Right |

Brownshill dolmen,
Kernanstown,
County Carlow,
a portal tomb
dating from
c.3300 – 2900 B.C.
Courtesy of Carlow
County Library



| Below | Photograph taken in Castlebar by Wynne Photographers c. 1900 of group of people with penny-farthing bicycles.



Mayo County Library - Wynne collection, courtesy of Gary Wynne

The **value of a single point of access (or 'portal')** to multiple distributed collections was further reinforced by the project. A gateway to this content through a national cultural portal would benefit the user.

Public interest in the local cultural material placed online remains high.

The project's interactions with the NCCA and the Department of Education and Science were beneficial to all concerned.

Technical and project **research findings** covering copyright, 3D digitisation, newspaper digitisation, interoperability and common service provision are presented in the appendices.

The website www.culturenorthernireland.org provides a portal website for cultural content in Northern Ireland. The project team held discussions with the creators of the Culture Northern Ireland website - the Linen Hall Library, Belfast and the Nerve Centre for multimedia arts, Derry. These discussions identified synergies with the Ask About Ireland website which will continue to be delivered in the future.

Appendix One: Copyright

Objective

The project investigated the issue of copyright, particularly in the context of historic materials, with a view to establishing legally valid opinions and direction. This would enable organisations involved in digitisation projects to be more assured of their legal footing. It would consequently encourage the online publication of exciting and valuable content, as well as protecting the cultural organisations from any risk of legal action due to inadvertent breach of copyright.

A simple, clear guide to tackling common issues such as how to ascertain whether or not items are in copyright, how to deal with items where the copyright holder is unknown, what to do when copyright holders fail to respond to requests for use, was required.

Approach

Professor Robert Clark of University College Dublin and Arthur Cox and Company was engaged as a consultant. Professor Clark is Ireland's foremost expert on copyright, particularly in the areas of European and international copyright, online rights and digital copyright.

All participants in the project submitted queries in relation to copyright issues. These were included in a formal briefing document or specification and presented to Professor Clark. As further questions arose, the specification was refined and extended and at the end of the process, Professor Clark submitted his report and findings.

Below | Photograph of an Orange Tip Butterfly feeding on a Dandelion flower. *Courtesy of Wexford County Library*



Above | 1890 Lawrence Photograph of Upper Flower Terrace in Woodstock Estate. *Courtesy of Kilkenny County Library*

Results: A Brief Guide to Copyright

Professor Clark's legal report covers the areas listed in the specification in great depth and detail. A summary of the most important points is presented here. The full text is available on the website www.askaboutireland.ie

Introduction

This section is intended to provide summary advice on the copyright and database rights issues that arise out of the Cultural Heritage Project. It is to be understood that specific rights attach to individual works and that statements contained in this document are for general purposes only and cannot provide a basis for individual rights clearance or the assertion of copyright or database rights.

What is Copyright?

Copyright is a statutory right to prevent others from copying a work, making the work available to the public, or adapting a work into another format. Copyright is automatic – as soon as a work is created it is subject to copyright unless copyright is explicitly released.

Major Types of Copyright

The following are the most commonly encountered forms of copyright:

Books and other **literary** texts such as letters and correspondence, original newspaper articles, as well as **artistic** works such as drawings, prints and photographs are subject to copyright.

Collections of works are subject to a **collection-level or database copyright**. While the items in the collection may be in the public domain, the work of collecting, arranging and presenting them is protected by a database copyright. This applies, for example, to websites of non-copyright and copyright-cleared material such as the *Ask About Ireland* website.

Newspapers, magazines and other publications have a copyright over the **layout or typographical arrangement** of their publications. This can be breached, for example, by scanning or photographing the work. This copyright is in addition to any other copyright which may apply to the work.

How do I know if a Work is in Copyright?

Copyright generally depends on time – when a certain period of time has elapsed since the item was created or first published, or the creator died, copyright lapses. The timeframe varies according to the nature of the item. The following rules cover most items which will be encountered by the Irish cultural sector:

- Literary works are not likely to be in copyright if the author died before 1935
- Photographs taken prior to 1912 are not copyright
- Photographs taken before the 1st of October, 1964 are in copyright for 50 years following the taking of the photographs
- Paintings, drawings and other artistic works are not likely to be in copyright if the author died before 1935 or the work was sold before 1912
- In relation to newspapers printed before the 1st of October, 1964, these can be scanned onto the database without infringing a typographical arrangement copyright, as can newspaper articles printed before 1975
- It will often be difficult, if not impossible, to identify the author/right holder. The governing legislation, the Copyright and Related Rights



Left | Picture shows Thomas Rowan and family from Stackallen, County Meath, during tobacco harvesting on his farm. *Courtesy of Meath County Library*

Act, 2000, decrees that if a work is anonymous, copyright is not to subsist if it is reasonable to presume the author has been dead for 70 years or more. It is also not an infringement to make use of a work where the author cannot be identified by reasonable inquiry, and it is reasonable to assume copyright has expired and

- In the case of collections created before the 27th of March, 1996, copyright in the collection as an original database lasts for the life of the author of the database and 70 years thereafter. The database right in respect of databases created after the 1st of January, 1983 subsists for 15 years from the 1st of January, 1999.

If a work is not in copyright, or not the subject of a database right, it can be freely used.

Moral Rights

Moral rights entitle the author of a work to be identified as the author of the work and to object to derogatory treatment harmful to the reputation of the author. These rights are independent of ownership of copyright. These rights can be relinquished by the author, for example by a contract agreement.

Physical Ownership and Copyright

Physical ownership does not confer copyright on the owner. This is particularly relevant to libraries or archives who receive donations of papers, letters, photographs, etc. As a minimum, the donor should be encouraged to sign over any copyright which he holds to the library or archive.

If an individual has transferred ownership of a document or image, by way of a gift, it is

reasonable to infer that the donor is by implication consenting to re-utilisation by the recipient of the work, insofar as the donor is in a position to give permission to use the work or item in question.

Ownership of Copyright

Ownership of copyright is normally vested in the author, subject to the statutory exceptions. For pre-1964 photographs, for example, works commissioned from photographers are the copyright of the commissioner. All works created in the course of employment are owned by the employer. In the case of an original database, the maker of the database is the copyright owner.

Ownership can be transferred by contract, by assignment of copyright, by will or by operation of law (e.g. via bankruptcy). For companies that cease trading, for example, ownership of works may be transferred by the sale of assets by a receiver or liquidator.

Defences against possible breaches of copyright by cultural institutions

As mentioned above, old materials that cannot be identified as being the work of an individual – anonymous works or works published under a pseudonym, or where the author is not known – will not be protected by copyright if it is reasonable to believe the author has been dead for 70 years.

The motives for publication or other breaches of copyright are not important – copyright is still breached even if materials are placed on a website only to facilitate research or private study by other people. Such a worthy intention does not of itself attract a defence to copyright infringement.

Where a work is clearly in copyright (e.g. a recently published book quoted in text written for a website) a defence of reasonable quotation of extracts of the book may be used, but the quotations should be short and non-competing, to come within both this defence and some



Above | Photograph of The Liffey Swim 1999: Female Swimmers.
By kind permission of Martin McCree, Dublin City Council

possible “fair dealing” defences. The source of the work must always be acknowledged, as should the owner of the copyright.

Future Value

The legal guidelines provide a general set of rules and procedures for projects and organisations embarking on cultural and historical digitisation projects. They allow such initiatives to avoid the most important pitfalls in such projects, such as inadvertently publishing material which is still in copyright, failing to publish exciting material due to uncertainty as to whether it is in copyright or not and inappropriate use of quotations. Further, they empower the new initiative to protect its own legal rights, both as owners of new compilations and databases of content and as publishers of material never published before. A ‘fair use’ text is provided, which (when agreed with by the end user) provides a level of protection against free-for-all commercial exploitation, as well as against litigation due to inadvertent publication.

Having these legal guidelines means that digitisation projects are freer to choose the best material to use on their websites. This in turn ensures that the public have access to the most exciting and interesting material possible and that copyright holders do not have their copyright unexpectedly and inadvertently breached by memory institutions embarking on new ventures.

Appendix Two: Digitisation in Depth - 3D Objects (National Museum of Ireland)

Introduction

Increasingly sophisticated 3D technologies have the capacity to enrich and broaden the means and extent of access to our cultural heritage.

The Irish Antiquities and Natural History Divisions of the National Museum of Ireland were involved in the Cultural Heritage Project, Phase Two commencing in October 2003.

This involved the laser scanning and 3D imaging of a selected group of objects from the Museum's collections, primarily for use on the *Ask About Ireland* website. However, other possible uses of the resulting data, particularly for curatorial purposes, were also factored into the project plan in an effort to yield the best possible return from the project.

This was the National Museum of Ireland's first direct experience of the implementation of advanced 3D technology and laser scanning for any collections-related or public access purpose.

Background: National Museum of Ireland Collections

The National Museum of Ireland was established under the terms of the Science and Art Museums Act, 1877 and opened its doors for the first time in 1890. It inherited significant collections, across a range of disciplines, from earlier collecting bodies such as the Royal Irish Academy and the Royal Dublin Society. It consists of four curatorial Divisions, Irish Antiquities, Art and Industry, Natural History and Folklife, covering a very broad range of cultural heritage disciplines.

The National Museum has developed apace, particularly during the past decade, which has seen the opening of two new branches of the Museum at Collins Barracks in Dublin (now the Museum's headquarters) and at Turlough Park in County Mayo.

Education and knowledge dissemination has always been regarded as one of the most



Below | Image of Dodo Skeleton exhibit at the Natural History Collection of the National Museum. © National Museum of Ireland

fundamental roles of the National Museum. Given this expansion and the demands of meeting the requirements of a wider and more varied audience, it is very timely to address the potential of virtual media to complement the Museum's outstanding collections of original artifacts. The use of 3D is seen as a complementary tool alongside the primary experience of viewing the original artifact before, during, or after the virtual experience. It is important also, in the context of the present emphasis on the development of e-government in Ireland, for the Museum to be able to offer the opportunity of a virtual museum experience to those geographically far removed from a National Museum location. Likewise, there are other sections of the population who may not be able, or willing, to avail of normal museum opening hours.

Virtual access encourages virtual users to make more actual museum visits in order to complete their experience of the collections.

3D technology also allows us the option to place a chosen object in many different 3D contexts. In the case of archeological objects, a sort of 'end to end' experience can be envisaged from the time of discovery on an archeological site, to recording in 3D, through the various processes – recording in situ, conservation, documentation, interpretation and display.



I Left I

Image of St. Senan's Bell Shrine exhibit at the Archaeology & History Collection of the National Museum.
© National Museum of Ireland

What has been learnt in the course of Phase Two of the Cultural Heritage Project has provided a sound foundation for further development across a very broad range of museum applications. These range from the most direct forms of public access in museum galleries and on websites, to more specialised curatorial functions. Many of these activities can be tedious and unnecessarily time consuming in the standard 2D and text only formats, which have been widespread and unchallenged throughout the twentieth century.

Museums have a unique relationship with 3D objects. They provide the perfect forum in which to explore the diverse world of 3D recording and interpretation, along with the constantly developing technologies required to support this research.

The Essential Resources – Dependable 3D Scanning Technology, Expert Advice and Curatorial Participation

An initial 3D project for any museum must take account of the fact that this complex area of digitisation is at an early stage of development. The matching of the appropriate technical tools to the specific requirements of a particular museum in a 'fitness for purpose' research design, is likely to take time, effort and a considerable level of experimentation. Any museum setting out on this

path needs to temper its ambitions with a reasonable level of expectation and must also accept the need for substantial research and development in their project plan. Goals and timescales must be realistic.

The participation of the National Museum in the **Cultural Heritage Project, Phase Two** involved very tight time schedules, some of which ultimately needed to be stretched because of the ambitious programme which was chosen and the unpredictability of complex technical equipment.

Two important issues needed to be addressed before the project could get underway:

Firstly, it was necessary to find a suitably **equipped and experienced company** to undertake the project in a very short time scale and in an easily accessible geographic location. Because of the short-term nature of the Museum's involvement in the project and the ever pressing deadlines which it necessarily involved, there was little time to deliberate over the choice of contractor.

Given the practical considerations in relation to the need to transport valuable museum objects and the decision to choose versatile high resolution laser scanning, the choice proved easy and the selection of Kestrel 3D Ltd., Belfast, turned out to be an excellent one from every point of view.

Secondly, it was essential to enlist **independent, expert advice** from the academic sector. The ongoing advice and technical commentary provided by Associate Professor Luis Salgado of el Grupo de Tratamiento de Imágenes of Universidad Politécnica de Madrid has proven invaluable. It has greatly enhanced the learning aspect of the project. The presence of an additional technical input from a different perspective to that of the scanning company has also improved the likely interoperability applications of the scanning data.

It is essential to have independent non-commercial advice as an intrinsic part of a project of this kind. It is especially important as a guide to a museum's initial untutored ventures into this field.

How Does 3d Technology Scanning Work?

The scanning system used by the National Museum is based on **non-contact colour 3D laser scanning**. It is possible to capture geometric and colour data about objects that permits their surface characteristics to be uniquely identified and quantified. The technology consists of a laser camera and a motion control system for moving the camera. The laser scanning mechanism characterises each point on the scanned object according to its colour and location in a three-dimensional space. It does this by scanning the surface of an object with three different laser wavelengths (red, green and blue), in one focused beam and recording the reflected light. These points are then processed by specialist 3D modelling software to produce a master version of the 3D scan. From this, delivery versions using technologies such as QuickTime Virtual Reality (QTVR) and Audio Video Interface (AVI) can be produced, as well as museum-specific versions using object file formats such as OBJ.

The overall process then consists of scanning time, which varies commensurate with the complexity of the object and the level of accuracy required, and post-processing time to create the various output formats.

Project Focus and Priorities

The National Museum's initial priority was to deliver to the requirements of the Cultural Heritage Project, Phase Two. This essentially required the delivery of QTVRs of twelve objects from the Museum's collections along with corresponding descriptive texts, an introductory piece and this report to describe the Museum's experience of the project.

The project allowed the National Museum to address aspects of 3D which were beyond the remit of the immediate website based project and which would also address the priorities of the Museum.

In the first instance and perhaps most obviously, are the 3D models and QTVR's that can be used on the Museum's own website www.museum.ie.

Beyond that, in conjunction with the technical advice from Associate Professor Salgado, the Museum has prioritised the inclusion of other formats – OBJ's (Object files), Voxels (Volume Pixel) and PSI's (Psion) for example. This will at least provide the scanning geometry and raw materials to test other uses of 3D within the Museum.

It is hoped that this work will contribute to the development of an ongoing strategy for the imaginative development of 3D applications in the National Museum of Ireland.



The position at present is that existing technical solutions for 3D in museums do not yet match the needs and requirements of widespread and intense use for routine museum documentation purposes. However, the potential for this type of usage is very great, not least of all for reasons of quality, economy and efficiency.

With the benefit of just one and a half year's theoretical and practical experience of the world of 3D, the

Left | Image of the prehistoric Keenoge Food Vessel exhibit at the Archaeology & History Collection of the National Museum.
© National Museum of Ireland

Museum's present priority is to progress further research and trial of the use of 3D for a variety of public access and curatorial purposes.

Choice of Objects

The choice of objects was informed by a desire to select objects of a variety of different types and from a number of different periods. Objects were chosen from the Archeological and Natural History Divisions of the Museum.

The current second level school curriculum was a factor in the choice of archeological objects, as was the wish to enable re-use of the results by the designated regional museums.

In terms of period and subject matter, the selection of objects fell into five broad categories :

- **Prehistoric period**
- **Early Medieval period**
- **Viking period**
- **Medieval period and**
- **Natural history.**

From a scanning point of view, it was necessary to choose objects that were not too dark or shiny which would have presented difficulties for the use of the laser scanner. Some objects were automatically excluded because of their size, fragility and security considerations given the need to transport the objects from Dublin to the scanning centre in Belfast.

Ultimately, the objects represented a number of different periods, materials and levels of complexity in order to test the scanning and imaging across a range of different challenges. The selection included objects that are usually on display and some that were taken from storage and not normally accessible to the public.

The Museum undertook to provide twelve objects for the website, but seventeen objects in total were scanned. It is recommended, while scanning, to allow some wastage if quality is to be



| Left | Image of the Early Medieval Dooey Motif piece exhibit at the Archaeology & History Collection of the National Museum.
© National Museum of Ireland

maintained. A common agreement on quality between the museum and the contracting company is important.

In retrospect, a few objects were not especially well chosen but the scanning and imaging experience was necessary in order to discover this. In other words, the choice of a couple of unsuitable objects was ultimately worthwhile from a research point of view. There follows below a detailed consideration of the choices:

Prehistoric Period

The Knowth Macehead dates from the Neolithic period. It was found in the excavations at Knowth, Co. Meath, part of the world famous complex of megalithic tombs in the Boyne Valley. It was selected for its almost perfect 3D nature, decorated with superb artistry on all six faces. Its elegance and simplicity lent itself very well to the 3D imaging process. It was probably the most successful experience amongst all the objects scanned.

The Keenoge Food Vessel comes from a very interesting site context, being part of a large Bronze Age cemetery which yielded many different types of burials and their pottery, stone and bronze accompaniments. It was chosen



Above | The Virtual Museum: Prehistoric Web Page.

because it was an excellent example of its type, decorated on all surfaces including its base and therefore worthwhile for the viewer to turn around fully and to look underneath. Neither the food vessel nor the macehead can be viewed on all sides in display context.

Both of these objects were also chosen because of the prehistoric period content in the second level school curriculum.

Early Medieval Period

Trial or Motif pieces from Dooley, Co. Donegal and from Shandon, Dungarvan, Co. Waterford were chosen for the insight and detail that they provide on the complex metalworking processes of this period.

The Dooley example, originating from a sandhills metalworking and habitation site in the Donegal sandhills was a particular success. The deeply carved running spiral motifs presented little difficulty to the laser scanning technology. Like the previous objects, it proves worthwhile for the viewer to turn these objects over in a way not possible in museum exhibitions. The Shandon example bears animal and abstract ornament and was found in a cave site which produced extensive archeological evidence. Both of these objects have the potential also to be used by County Museums in Letterkenny, Co. Donegal and in Waterford City, thus increasing the scope of regional virtual access.

Brooches from Cormeen, Co. Meath and from Knockast, Co. Westmeath were chosen, in part to test the effectiveness of scanning brooches and quite minute detail in a variety of different metals and materials. It may be that sufficient consideration was not given to the fact that the backs of the brooches were plain and therefore, did not hold a great deal of interest. However, the decorated surfaces presented sufficient challenge and difficulty especially when it came to colour matching. The pins were also very problematic to reproduce. The amber studs on the Cormeen brooch were especially difficult to match in colour, as was the silver interlacing on the Knockast brooch.

Viking Period

Three decorated lead weights found at a Crannog or lake dwelling site at Coolure Demesne, Co. Westmeath are fascinating examples not only of the conduct of Viking period trade - probably with the native Irish - but also of the production of the decorative metalwork cut into pieces and used to adorn the weights.

The National Museum of Ireland is currently engaged in a research project on this Crannog site with University College Dublin, The Discovery Programme and the Underwater Unit of the Heritage Service of the Department of Environment, Heritage and Local Government. The 3D imagery will therefore find a home on a number of other websites in the context of this project.

The trial or motif piece from the Dublin Viking period excavations was chosen for similar reasons to the others above. It was also chosen because one of its decorative motifs matches almost exactly with a corresponding motif on **St. Senan's Bell Shrine** which is also featured on the site, thereby illustrating the link between design and production.

Medieval Period

Shrines of a number of different types were chosen largely because of their complexity, intense ornamentation and construction detail, which were considered to be well worth illustrating in 3D. The types chosen included a bell shrine, its casing and a bronze bell from elsewhere but of a type that might well have been enshrined within it.

The **bell shrine crest** from Killua Castle, Co. Westmeath features an interesting human face coupled with unusual animal ornament and other motifs.

Finally, the portion of a **crozier** from Durrow, Co. Offaly is one of a major shrine type of the medieval period used in some instances to enshrine the wooden staffs of bishops, abbots or other important clerics. The wooden core of the crozier is visible in the model and presented some problems in distinguishing between wood and metal textures.

Natural History

Two objects from the Natural History Division were chosen – a massive meteorite that fell in Co. Limerick in the early 19th century and a dodo assembled from bones of the extinct bird recovered from excavations on the island of Mauritius.

Both the **Brasky Meteorite** and the **Dodo** presented considerable technical difficulties from a scanning point of view and it took substantial time and effort to produce a usable model for each object. The difficulties can be identified in terms of dark colour and shininess in the case of the meteorite, and the challenge of enabling the laser to access all surfaces in the case of the Dodo skeleton. In both instances, considerably greater scanning time was expended than was originally estimated.

Some Contractual Issues

It is vital that the terms of any contract with technical delivery companies should be negotiated to allow the maximum flexibility to the museum client. A

reputable imaging company can be expected to be flexible in agreeing a contract which allows full control of the images produced to the commissioning museum.

It is important to consider the full range of image formats which might usefully be generated. For example, for website delivery it is a good idea to have high quality 2D images in Joint Photographic Experts Group (JPEG) format or Tagged Image File Format (TIFF) to display on the Web page while the QTVR's or AVI are downloading.

Effective archive OBJ formats gathering the object at the highest scanned resolution and also possible simplified versions of it will be necessary for the more complex in-house museum usages of 3D.



Figure 1 Above | The Virtual Museum: Early Medieval Web Page.

Companies involved in technical delivery, scanning etc. are likely to request some usage of material scanned, for example for marketing and training purposes. It is recommended that this should usually be possible, subject to the museum remaining in control of the nature and type of usage. Linkage of promotional and educational usage to the museum's website may also be desirable.

Use of images in commercial image banks and libraries needs to be given very careful consideration. It may be more beneficial in the long-term for the museum to maintain control over commercial exploitation of its images, rather than to pay significant percentages to an outside company, whether in 2D or 3D.

Resourcing the Project – the Practical Issues

It can be difficult to predict correctly the amount of time required for an innovative project of this sort. This project may have been over-ambitious in the number of objects that were chosen for a project of such short duration. The quantity increased the strain on all concerned at every stage. However, the overall project value is significantly greater because of the range of objects included.

When in doubt, it is valuable to factor in some extra time if at all possible. For example, the project lost some time due to machine failure at the Belfast scanning centre. However, when relying on sophisticated equipment of this sort, some breakdown or recalibration problems are almost inevitable.

It is also worthwhile to enlist as much assistance as possible from a variety of colleagues within the project museum. The time commitment to the actual scanning is quite considerable and it is necessary for a museum's curator or conservator to be present at all times in order to move objects to different positions on the scanning table.

Ideally, a dedicated project team should be provided for a museum's engagement with 3D projects. Realistically, this may not always be possible.



| Left |
The Virtual Museum:
Natural History Web
Page.

The Technical Experience – Some Further Matters

It has proven extremely worthwhile to have mid-term and post-project reviews with the laser scanning company, in the course of which each image produced was examined in detail and in each format provided. The resulting exchange of views and consensus has been invaluable and will certainly positively inform an approach to future projects. The scanning company concluded that it is vital to have high quality 2D images of all objects available to the imaging specialists at the post processing stage. Communication is important between all concerned, to ensure that equivalent software is used in each location to visualise the project deliverables.

In this case, the project participants and advisors were based in three venues: in Dublin as well as in Edinburgh and Madrid. It is important also that the museum's IT facilities are upgraded, if necessary, to cope with the demands of large graphic files and the need for increased RAM and graphics accelerators. The museum will also need to ensure that the appropriate software packages are available for viewing the images and models provided.

Appendix Three: Historic Newspapers

Objective

A large proportion of all local studies and special collections enquiries in public libraries relate to collections of old newspapers. Many library authorities have large collections of local and regional newspapers dating from the eighteenth, nineteenth and twentieth centuries, including coverage of major historic events such as the Famine, the War of Independence and Civil War, and the Land Question. These provide a great deal of insight into contemporary viewpoints on these issues, often with a tight local focus.

The digitisation and presentation of historic newspapers on the Internet is a theme which occurs in both phases of the project and one which concerns many of the participant libraries. The actual digitisation process is the least complex area – either flatbed scanning or digital photography (or digitisation of a film photograph) is required. However, there are two other important issues – how to index the newspaper content and how to present the newspapers online.

Indexing of newspaper content either involves a member of staff reading the newspaper and then typing in a précis, or else the automated reading of the text (using Optical Character Recognition – OCR – software) and the creation of an index. The issue is complicated by the usually bad quality of newspaper originals and by the fact that, in many cases, a microfilm is the source for digitisation.

Presentation of the content online is also difficult – a typical newspaper page is far too large to present in its entirety on-screen with any hope of legibility. Thus, there must be some facility for zooming and panning within the image, or else the newspaper page must be broken down into sections, each of which is presented as a separate image.

In Phase One, Waterford City Library investigated the automated indexing of newspapers using the original newspaper holdings, 'off the shelf' OCR software and the indexing system of the www.askaboutireland.ie website. The project wished to build on this and investigate further to

establish an economically and logistically feasible way to digitise, index and present historic newspapers online. To that end, a dedicated sub-project was established with Dublin City Public Libraries, which focused on examining each aspect of the process and identifying the most appropriate approach to take.

Contribution to the Overall Project

As noted previously, historic newspapers held on microfilm and on paper are among the most popular of all the special collections and local studies collections materials in public libraries. Any project which wishes to showcase the holdings of the libraries and make them accessible to a broader public must tackle the issue of newspapers.

A core objective of the project is to appeal to as many members of the general public as possible.



↑ Above ↓ Advertisement for Blackie's Children's Annual in *The Lady of the House* magazine, 1904.
© Dublin City Public Libraries

The nature of historic newspapers, which combine historical information with a leavening of advertisements, photographs and verbatim transcripts, makes them immediately appealing to the general user. The social history and changing customs which are communicated by the drawings and advertisements are particularly diverting, while the urgency and currency of contemporaneous news reporting adds a great deal to standard textbook coverage of major historic events.

Structure

This section examines the creation of online historic newspaper archives. This is a complex topic with a large number of possible variations and methodologies. The section has the following structure:

Firstly, the **overall** steps in the process are outlined. These are

1. Microfilming
2. Scanning
3. Optical Character Recognition (OCR)
4. Indexing
5. Online publication.

These steps are not always mandatory; depending on the individual project and the approach taken, one or more of these steps may be omitted.

Subsequently, four different **implementation** approaches to taking these steps to an online newspaper resource are explored. These are

1. Simple in-house system with no automated indexing
2. In-house microfilming, scanning, OCR, indexing and publication
3. Outsourced scanning, OCR, indexing and publication by iArchives
4. Outsourced scanning, OCR, indexing and publication by Olive Software



↑ Above ↑ Image of page seven of The Irish Times, dated 16th April 1912 covering the sinking of the RMS Titanic.

Courtesy Dublin City Public Libraries

Finally, the **results** experienced by the project team at Dublin City Public Libraries are outlined for each of the overall steps.

Overall Step 1: Microfilming

The usual original format for online newspaper projects is microfilm. This reflects the fact that most newspaper archives are held on microfilm and that the original paper documents may be fragile and will certainly be difficult to handle. While it is possible to avoid microfilming and to scan the paper originals, this is relatively unusual.

For microfilm to be suitable, it must be photographed with a low reduction ratio (ideally 10:1 or 12:1, preferably not more than 16:1, while reduction ratios in excess of 20:1 are not suitable for subsequent digitisation). The microfilm must itself be of high-quality stock, with minimal scratches, spots and discolourations.

The need for a high-quality microfilm is a major issue in the Irish libraries context. Large amounts of microfilmed newspapers exist, but the quality of the film is typically not high enough for online newspaper projects. This reflects the fact that the microfilm process was carried out in order to

provide alternative access to the original papers, rather than as a step towards digitisation and OCR.

If no high-quality microfilm exists, there are two possible options open:

- One option is to microfilm the original papers using a modern camera at the high standards outlined above. The new, top-quality microfilm is then suitable for use
- The second option is to scan or digitally photograph the original newspapers. This bypasses the requirement to scan any microfilm, by working directly from the originals. Computer-generated Output on Microfilm (COM) can then be produced as a by-product, in order to provide high-quality microfilm for other purposes, including archiving.

Overall Step 2: Scanning

Scanning, or the creation of a digital version of the originals, uses one of two technologies. Either the microfilm or paper is scanned, using a flatbed or a microfilm scanner, or else the paper is photographed with a digital camera. Both procedures result in the creation of large digital master files, typically in TIFF (Tagged Image File Format) format. These contain a great deal of detail, but are very large files.

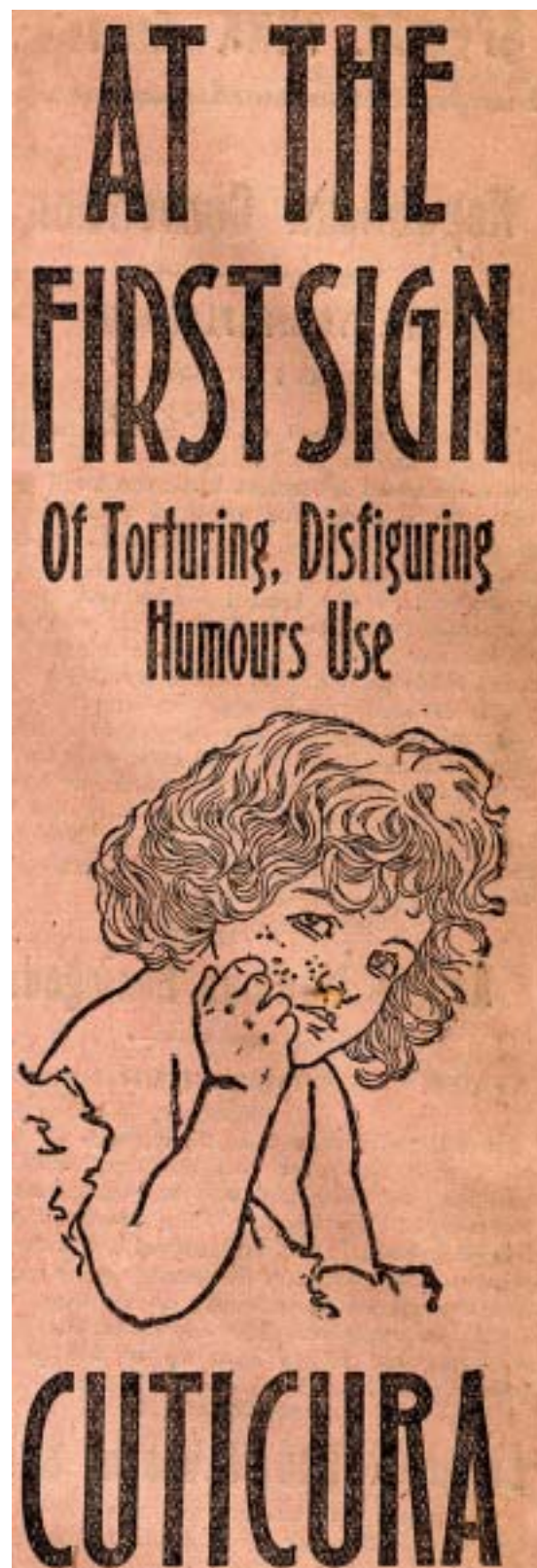
Microfilm Scanning

The scanning of microfilm requires a special microfilm scanner. These costs range from €3,000 to €40,000 currently, depending on whether or not the scanner is mechanised, the quality of the optics, the management software, etc.

Paper Document Scanning

Original paper documents can, of course, be scanned using a large flatbed scanner or a digital camera. However, this approach is not recommended because of the likely detrimental impact on the originals.

| Right | Advertisement for Cuticura ointment in the Evening Telegraph, 1904.
© Dublin City Public Libraries



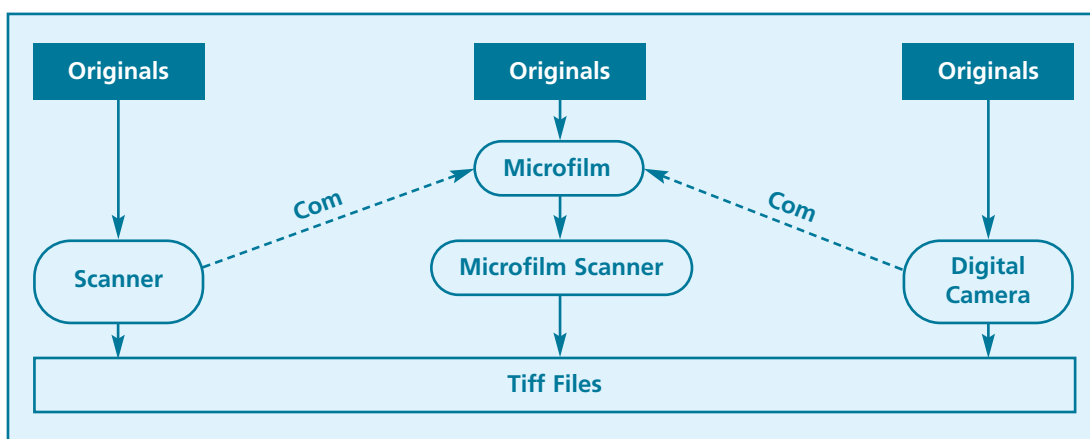
Scanning can be carried out in-house, or outsourced to a digitisation bureau. The cost of bureau digitisation is relatively low for large volumes of material, when compared to the hardware, staff and space costs of in-house scanning. However, smaller projects can usefully be tackled in-house, in order to maximise the learning opportunity for staff. For smaller projects, a microfilm scanner can be rented, or a relatively cheap one acquired.

The various options are shown below.

these words can then be used to create an index for searching the newspaper.

OCR is a software process, whereby TIFF or other image files are converted to text files. The text files are linked back to the original image, so that a search on the text file can bring the user back to the relevant part of the source image.

The success of OCR depends on the quality of the image. Characters must be reasonably clear if the words are to be made out. This is a reflection of the quality of the microfilm, if microfilm is used



Above | Outline of the options for the digitisation of paper documents.

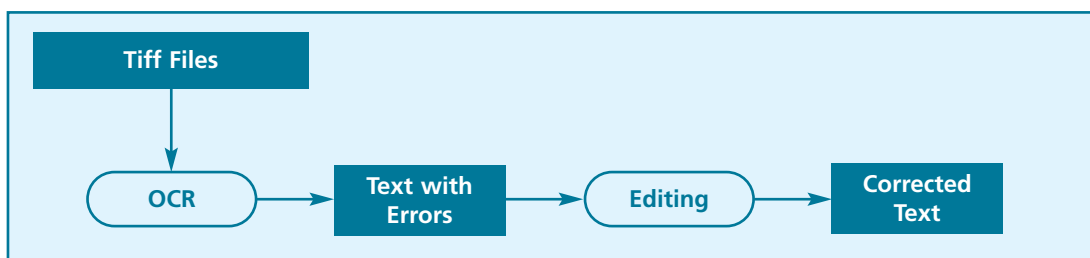
The final result of whichever scanning approach is taken is TIFF files.

Overall Step 3: OCR

The next step, after the creation of TIFF images of the source material, is to extract as much meaning as possible from the images. This essentially means that the letters (characters) within the images must be recognised and combined to form words, and

and consequently the reduction ratio used at microfilming time, the state of the film itself, the colour and any discolouration, etc.

Typically, OCR software will only achieve a certain percentage of successful recognition. OCRed material must be manually proof-read and corrected, in order to identify and correct the omissions or errors made by the software. The facilities provided by OCR software to simplify such editing are an important aspect of the software.



Above | Outline of the Optical Character Recognition process.



I Above I Programme for the Theatre Royal (front cover), January 1906.
© Dublin City Public Libraries

OCR software can be bought 'off the shelf', as well as often being bundled with scanner hardware. Alternatively, several companies carry out OCR (with or without scanning) as a service. Such 'OCR bureaus' include Olive Software, iArchives and (recently) Adobe.

Avoiding OCR

If the project is not aiming to index the newspapers automatically, then there is no requirement for OCR. Instead, the project can use manual indexing, as described below.

Overall Step 4: Indexing

Having created text representations of the images, the next step is to link the text back to the images,

in a process called **indexing**. An index is a data structure which links words and phrases back to particular images, much as a search engine links words to Web pages.

A number of different indexing approaches and technologies are available. Simple free-text searching, which indexes the text files and can then be linked back to the image files, can be implemented in-house.

More complex and complete indexing of OCR'd images is usually carried out by the OCR bureaus, such as Olive and iArchives.

Indexing is, however, only the first half of the process. A user interface and search tool must be provided which allows the user to enter his search terms, then searches the index and directs the user to the relevant images. Again, a simple approach can be implemented in-house, while more complex implementations would usually rely on a bureau.

Manual Indexing

If no automated indexing is planned (and no OCR was carried out), it will be necessary to index the new material manually. This involves members of staff reading the original documents and typing a summary. Of course, such an approach is not tenable for very large projects because of the prohibitive amount of time required.

However, for small projects, this approach may be appropriate.

Overall Step 5: Online Publication

The remaining task is that of making the digital material available on the Internet. If the material was OCR'd and indexed, then the indexes and a search facility must also be made available.

Online publication is in many ways similar to any other online project – Web server space is required, the search tool and index must be accessible over the Internet and the images and other results must

be of such a size and nature that they can easily be delivered to the user using a Web browser.

Overall Steps: Conclusion

This sub-section presented the various steps that must be completed in any online newspaper project. There are, however, various different options for each step of the process. These typically reflect the core choice of carrying out work in-house or having it carried out by a professional services provider or 'bureau'.

These options are explored next in the Implementation Section.

Implementation 1: In-house System with No Automated Indexing

This is a relatively simple approach to the newspapers project. By deciding not to carry out automated indexing, the project can avoid the issues surrounding OCR (the need for high quality microfilm, the need to scan microfilm, the

requirement to use OCR software or engage a bureau, etc.). However, the results of such a project are relatively modest; the ease of use of the results will depend to a large extent on the time invested in manual indexing.

Microfilming

Existing microfilm resources can be used for scanning purposes, unless the resulting images are of such bad quality that they cannot be read with the human eye. In these cases, re-microfilming is needed. In the event of re-microfilming, there are good reasons to use the high standards of microfilm outlined above, in the interests of future re-use.

As an alternative to microfilm, paper originals can be scanned or digitally photographed.

Scanning

The microfilm or newspaper is scanned using a microfilm scanner or a flatbed scanner. The net result is a TIFF file. There are no particularly high standards of quality needed.

OCR

No OCR takes place.

Indexing

Only manual indexing is possible.

Publication

The original image files, as created by the scanning process, are in TIFF format. These are very large files and are in no way suitable for publishing on the Internet, due to their consequently slow download times. Instead, the images must be published as JPEG or GIF files. However, the large size and great detail of a newspaper page means that, if the page text is to be legible, a very large image is required. Also, panning and zooming tools are needed in order to navigate the image in a user-friendly manner.

An appropriate technology to allow a large, navigable image to be published on the Internet is Portable Document Format (PDF) files. These files are viewed in the ubiquitous browser plug-in, the Acrobat Reader, which includes tools for panning and zooming, among others. PDFs also include support for multi-page documents so that a



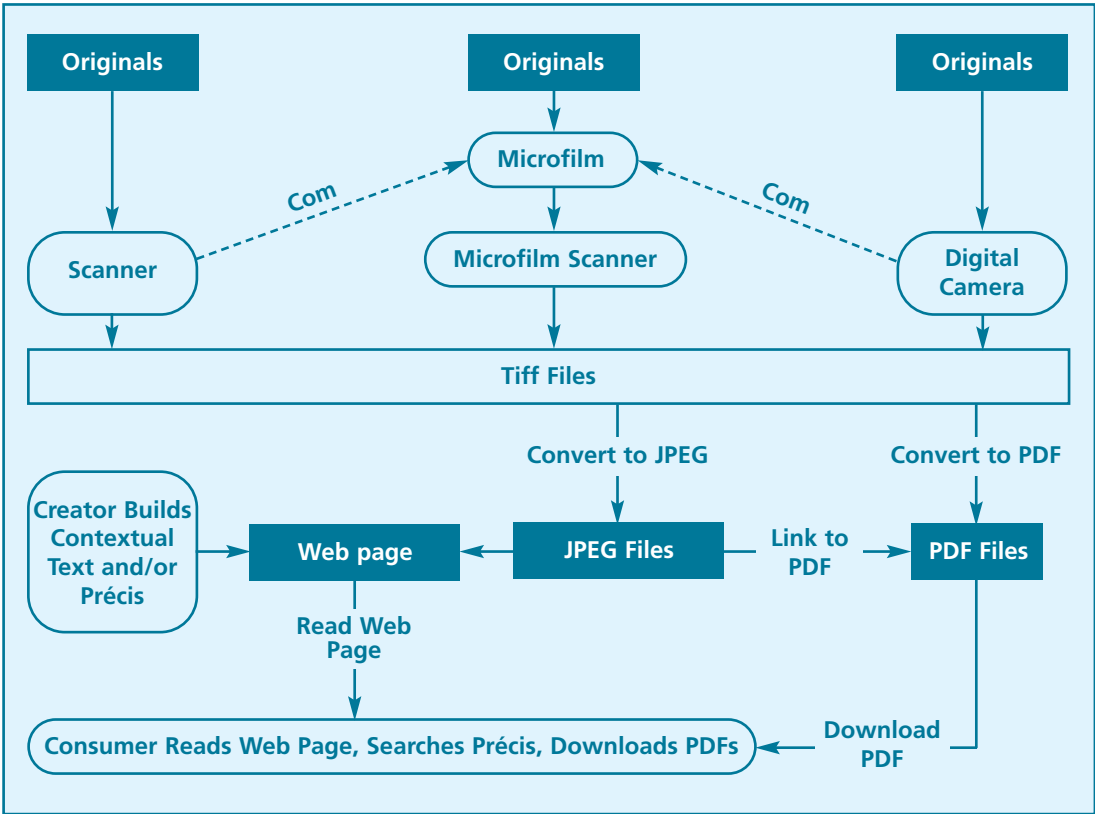
1 Above Image of title page of the Evening Telegraph, dated 10th September 1923. © Dublin City Public Libraries

newspaper issue of five pages, for example, can be published online as a single file.

However, PDF files cannot be integrated with the text and graphics of a Web page, such that they can be viewed in conjunction with them, in the same window. So a combined approach can be considered – a JPEG version of the newspaper image (created by copying the master TIFF file and converting it to JPEG, then resizing it appropriately) can be used to illustrate any descriptive text and to give an overview of how the newspaper page is laid out. In parallel, a link can be provided to the PDF file, so that it can be downloaded and displayed in an Acrobat Reader.

It is the remit of the publishing library or other institution to provide explanatory text, or an outline of what is covered by the newspaper page, so that this text can be searched by the end user. The inclusion of text (metadata), describing what is shown on each newspaper page, allows the user searching the website using a tool such as Google, to identify which newspaper page may interest him. He can then download the PDF of the newspaper page and read it manually.

The full process is illustrated below.



I Above | Outline of the full process for the publication of digitised newspaper files.

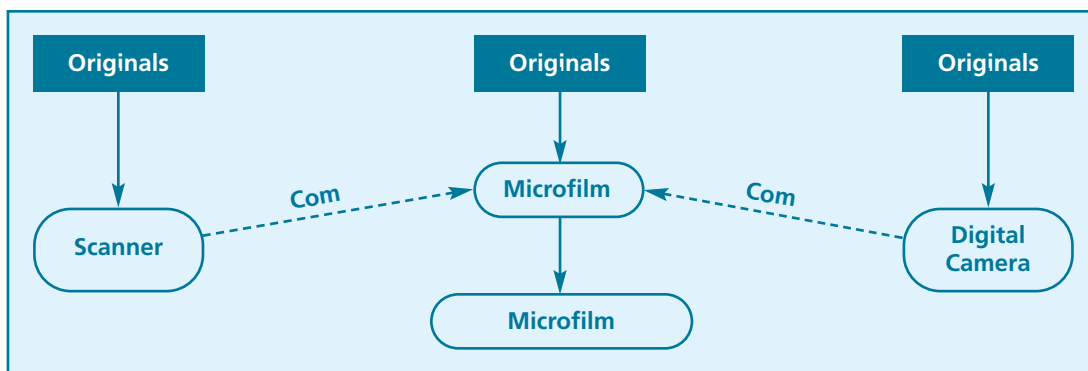
Implementation 2: In-House OCR and Automated Indexing

In this second approach, the library aims to create a fully functional automated index, by carrying out each step of the process in-house.

Microfilming

Since there will be a requirement for OCR in this instance, the microfilm must be of a high standard. If high-quality microfilm is not available, then the originals must be re-filmed. Alternatively, the originals may be scanned or digitally photographed rather than microfilmed and COM (computer output on microfilm) can then be produced as a side-effect.

The process is illustrated here:



I Above I Outline of the microfilming process.

Scanning

If no COM is available, the microfilm is now scanned in-house. A microfilm scanner is used for the purpose. These are relatively simple to use and extremely quick. However, as noted previously, the associated costs are significant. The leasing of a microfilm scanner may be appropriate. Alternatively, this stage could be outsourced to a bureau.

OCR

In-house OCR requires the use of 'off the shelf' software such as ABBY or Adobe Capture. In any case, significant time will be needed to edit and proofread the results. **This makes in-house OCR suitable only for small-to-medium projects.**

The time costs associated with in-house OCR are perhaps the greatest obstacle to major in-house projects.

Indexing

In-house indexing requires the installation of search technology on the website of the library and the indexing of the OCR results. Search tools of sufficient power are available without cost online; however, **sufficient resources must be set aside for integration, customisation and testing.**

Publication

The in-house project must reach its own conclusions on how best to publish its results online. For many projects, a variation of the PDF-driven approach outlined for Implementation

Option 1 previously, may be suitable, with the indexing tool pointing to the Web pages hosting the JPEG image and the link to the PDF.

Implementation 3: iArchives

The iArchives company (www.iArchives.com) is a bureau which specialises in the digitisation, indexing and online publication of paper documents, including historic newspapers.

The iArchives services include scanning of microfilm, OCR, indexing and (optional) publication. This means that, having created sufficiently high-quality microfilm, the work of the library is done, unless publication is taken in-house.



I Above I Black and white illustration of champion dancers of the San Francisco Gaelic Dancing Club in *The Gael* magazine October 1904. © Dublin City Public Libraries

Microfilming

iArchives require high-quality microfilm (see Overall Step 1 (page 38)). This will typically mean that the library must have its newspapers re-microfilmed at a local bureau.

Scanning

iArchives scan the microfilm at 600 dots per inch (dpi) to create large, high-quality TIFF files.

OCR

iArchives use a combination of proprietary technology and human input to OCR the TIFF files.

Indexing

iArchives index the OCR results and produce an Extensible Markup Language (XML) data structure which links the index terms to a collection of document images. These document images are in PDF format. Thus, an iArchives search leads the user to a PDF file, which is viewed in Acrobat reader.

Costs for scanning, OCR and indexing are currently in the region of €2 per page.

Publication

iArchives are prepared to offer hosting of the results on their website. Typical costs at present

for 50,000 pages of newspaper are: approximately \$6,000 per month if the hardware is purchased by the library, and \$1,750 per month if the hardware is rented from iArchives.

However, the bureau's preferred approach is to provide the customer (the library) with XML index file, the PDF files and the technical information needed to integrate this information with the library's existing Web server software. Where necessary, iArchives offer a turnkey solution (hardware, Web server, systems software, management system, search system, XML and PDF files), which they ship to the customer or host themselves. iArchives use the GreenStone open-source digital library system as the basis for their management system. In this case, the costs are at present approximately \$5,500 for the hardware and the software setup, plus shipping costs for the server from the United States. The library must then also pay Internet connection costs and must have the capability to provide the necessary in-house support.

Sample iArchive results can be seen at http://www.iarchives.com/demos_clients/public.jsp

Implementation 4: Olive

Olive Software services (www.olivesoftware.com) include scanning of microfilm, OCR, indexing and (optional) publication. This means that, having created sufficiently high-quality microfilm, the work of the library is done, unless publication is taken in-house. In-house publication must use Olive's Active Paper Archive software, however.

Microfilming

Olive require high-quality microfilm (see Overall Step 1 page 38). This will typically mean that the library must have its newspapers re-microfilmed at a local bureau.

Scanning

Olive insist on scanning the microfilm themselves to their own standard.

OCR

Olive use their own software and process to OCR the TIFF files.

Indexing

Olive create the index. The index is in a proprietary format that can only be used by Olive's Active Paper Archive software.

Publication

Olive offer to host the results, but their usual approach is to sell a copy of the Active Paper Archive software to their customers. While detailed pricing depends on the project, a 'typical' site with 200,000 images costs at present in the region of \$250,000 all-in (scanning, OCR, indexing and the software). The Active Paper Archive software must be integrated with the library's existing Web server.

Results

This section presents the results and experience of the Dublin City Public Libraries' project team.

Microfilm Results

Microfilm is a viable medium from which to create online newspaper collections. If OCR processing of the newspapers with searchable indexing is planned, the microfilm must be of high quality, with the lowest possible reduction ratio (ideally 14:1 or less). This means that the **microfilm must, in general, be freshly created** for the purposes of the project and that **existing stocks of archival microfilm are not suitable**.

Existing stocks of microfilm were scanned with a microfilm scanner. The results were acceptable for the human eye, but not for subsequent OCR.

New microfilm was shot using modern cameras. This produced higher quality microfilm, which was then scanned with a microfilm scanner. However, the large size of the newspaper originals made the reduction ratio quite high (17:1 to 19:1). This meant that the resulting images were borderline in terms of usability for OCR. However, the end results were acceptable in some cases.

If a project is planning to create new microfilm, it may consider digital photography or scanning, followed by computer generated output to microfilm (COM), as an alternative to classic microfilming followed by scanning.

Various bureaus in Ireland offer microfilm services. For any project other than small ones, the use of such bureaus could be considered.



! Above | "The Pages in History feature on www.askaboutireland.ie"

Scanning Results

Scanning of originals using a flatbed scanner was to be avoided, due to potential damage to the original papers.

Microfilm scanners are straightforward to use. However, while basic models cost in the region of €3,000, mechanised advanced models are expensive (€20,000-€50,000 currently) and require dedicated microfilm scanner software (costing several thousand euro). Scanning from microfilm with a motorised microfilm scanner is hundreds of times faster than scanning original newspapers with a flatbed scanner or a digital camera. Various bureaux offer microfilm scanning as a service – given the cost of the hardware, this makes sense for any but the largest projects.

If OCR is planned, scanning at 600 dots per inch (dpi) is ideal. An absolute minimum is 300 dpi, while 400 dpi gives appreciably better results when OCRing.

If the original newspapers have to be scanned, consider the use of a book cradle for bound newspapers and/or the use of a digital camera rather than a contact scanner.

Scanning produces large image files. Ensure that a powerful PC with a large hard drive is available.

Scanning can be carried out in-house or outsourced. For very large volumes, the efficiencies of external bureaux bear serious consideration. On the other hand, smaller to medium scale projects provide an opportunity for the development of staff expertise and experience.

OCR Results

The project investigated both the use of in-house, off-the-shelf OCR software (from AABBY and ADEST) and external bureaux (Olive, iArchives and Adobe). The results were as follows:

In-house OCR Results

The project examined various in-house OCR packages. AABBY's FinePage 7 was the OCR package of choice – easy both to install and to use, with good results in terms of accuracy.

From **old microfilm, the in-house** results were of such low quality as to be unusable. Error rates of up to 50% meant that typing in the source



Above | Image of page seven of the Irish Independent, dated 13th April 1928. © Dublin City Public Libraries

material from scratch would be faster.

From **new microfilm, the in-house** results were usable but disappointing. Error rates of about 10% meant that significant editing effort was needed. For large volumes of material, such as several weeks' editions of a newspaper, the amount of staff time needed is prohibitive.

From **newly-printed text originals, the in-house** results were acceptable. Error rates were lower than 5%, with whole paragraphs letter-perfect. Unfortunately, such high-quality paper originals are rare in the historic newspaper realm.

No 'off the shelf' OCR package available to date was found to be sufficiently powerful to achieve acceptable levels of accuracy when converting microfilmed historic newspapers to text. There remains a possibility that a very low reduction ratio (of the order of 10:1) with a modern camera might produce results with acceptable accuracy levels, but the indicators are not positive.

For all but the most high-quality original material, in-house OCR is limited in its feasibility at present. For small projects which focus on a particular small topic or area, the staff investments required to edit OCR output may be acceptable. For large volumes, such as significant newspaper digitisation projects, 'off the shelf' OCR products are not a success at this point. For such projects, the use of external organisations such as iArchive or Olive must be evaluated.

At present, there is little to recommend in-house OCR of historical newspapers, particularly from microfilm. This may change with the emergence of better OCR software and/or higher-quality microfilm.

Outsourced OCR Results

In contrast with the in-house results, both of the external OCR bureaus (Olive and iArchives) achieved 100% OCR success. This suggests that a significant amount of human, as well as software, resources were deployed. The results for each bureau are presented here.

(It should be noted that while Adobe provide an online OCR service, it produced results of similar standard to the 'off the shelf' products.)

iArchives

The project sent three rolls of new microfilm to iArchives in Utah, U.S.A. They scanned the microfilm at 600 dpi and used their proprietary OCR solution to create text indexes in XML format of the newspapers. The OCR results were impressive, with every word being found when searching.

Olive

In a related effort, both Dublin City and Waterford County separately sent microfilm to Olive software, also in the U.S.A. Again, OCR success was 100%, with impressive search facilities. The presentation technologies provided by Olive on their website are very user-friendly. As outlined previously, the Olive service includes the presentation technology (Active Paper Archive) as well as digitisation of microfilm, OCR and indexing.



Above | Black and white illustration of Dublin slum dwellers in *The Lady of the House* magazine, 1901. © Dublin City Public Libraries

Costs

Given the large size of many newspaper holdings, the cost of external OCR and indexing is substantial and likely to be prohibitive. It should be noted that the exercise carried out in this project used new microfilm, created according to the international best practice standards. This is not typical of library microfilm holdings, so the cost of re-microfilming must be taken into account. Scanning of the microfilm must also be taken into account.

Indexing Results

Manual indexing was used in the first phase of the Cultural Heritage Project, in the pilot study carried out at Waterford City Library and documented in *Our Cultural Heritage: a strategy for action for public libraries*. This was successful in terms of service delivery, but was labour-intensive. It demonstrates the viability of the approach; however, again there is an issue in relation to the amount of staff time needed to create metadata and index data manually. The development or integration of search tools and indexes for OCR results was not carried out as part of the pilot study. This is a significant task; the pilot focused on other aspects of the historic newspapers process.

Publication Results

In-house Publication

The original image files as created by the scanning process are in TIFF format. These are very large files and are unsuitable for publishing on the Internet, due to consequent slow download times. Instead, the images must be published as JPEG or GIF files. However, the large size and great detail of a newspaper page means that, if the page text is to be legible, a very large image is required. Also, panning and zooming tools are needed in order to navigate the image in a user-friendly manner.



I Above | iArchives search tool user interface

An appropriate technology to allow a large, navigable image to be published on the Internet is PDF files. These files are viewed in the ubiquitous browser plug-in, the Acrobat Reader, which includes tools for panning and zooming, among others. PDFs also include support for multi-page documents, so that a newspaper issue of five pages, for example, can be published online as a single file.

However, PDF files cannot be integrated with the text and graphics of a Web page. So a combined approach can be considered – a JPEG version of the newspaper image (created by copying the master TIFF file and converting it to JPEG, then resizing it appropriately) - can be used to illustrate any descriptive text and to give an overview of how the newspaper page is laid out. In parallel,

a link can be provided to the PDF file, so that it can be downloaded and displayed in an Acrobat Reader. Such an approach is used for the Poor Law Union Records section of the project website, described in Appendix Five (page 58).

In-house publication of externally OCR'd material must also include in-house support for a search engine such as those provided on the websites of the OCR bureaus. The text files created by the bureaus must be installed on the Web server of the library and a suitable search engine provided. The details of this process will vary from one bureau to another, because the manner in which they link page or article images, PDF files, etc. to their text indexes will vary.

However, **in many cases, in-house publication will follow in-house digitisation**, possibly without any successful full-scale OCR effort. In this case, it is the remit of publishing library or other institution to provide explanatory text, or a summary of what is covered in the newspaper page, so that this text can be searched by the end user. The inclusion of text (metadata) describing what is shown on each newspaper page, at least allows the user searching the website using a tool such as Google, to identify which newspaper page may interest him. He can then download the PDF of the newspaper page and read it manually.

The full publication process is illustrated over.

Outsourced Publication

The project has demonstration material on the websites of both iArchives and Olive. Due to cost and time constraints, no index engine or search tool was set up to use the indexing output from iArchives or Olive. See the relevant sections (*Implementation 3: iArchives page 44 and Implementation 4: Olive page 46*) for details.

The screenshot above shows the search tool on the iArchives website, with one of the search results shown in a popup window.

The illustration over shows the Olive software user interface. This is clearly superior to the iArchives website – the whole page is shown, and any article can then be clicked up.

For the publication of **indexed, OCRed** newspapers in the present, there is a strong case to be made for **outsourcing** the hosting. This reflects the finding that only outsourced OCR actually generated results of acceptable quality. If costs or other factors prohibit the use of an outsourced publication and hosting arrangement, the project should be prepared for a certain amount of integration effort, to establish searchable indexes on the project website, based on the data structures used by the OCR bureau.

Future Value

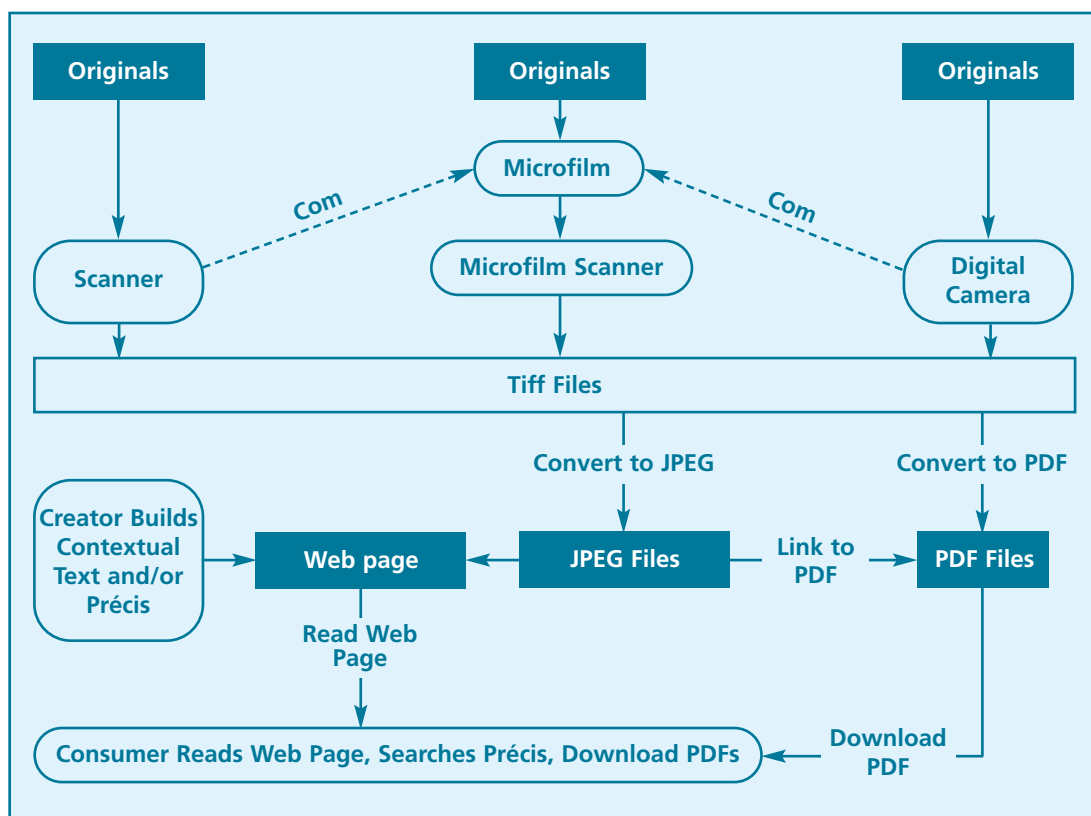
Most library authorities have local historic newspaper collections. Their appeal is general, the copyright issues are quite clear-cut, they combine historic value with entertainment and social insight and their popularity with the public is already well established.

Unfortunately, the technical issues surrounding the viable presentation and indexing of historic newspapers are significant. By investigating these

issues further, the project makes an important contribution to ongoing and future digitisation initiatives. The results of the project will make it easier for libraries and memory institutions across the country to make informed decisions as to the feasibility and methodology of digitising and publishing newspaper material online at this point in time.



! Above ! The Olive software user interface.



! Above ! Outline of the full process for the publication of digitised newspaper files.

Appendix Four: Interoperability and Common Services

Objective

The project investigated the most appropriate and feasible manner in which common search services could be provided across multiple independent cultural websites and library catalogues. This research will be of particular value as the number of online cultural projects increases in Ireland and as existing cultural organisations increase their presence on the Internet.

The core objective was to investigate and pilot an approach to allow the user, through a single point of access, to search online catalogues' databases and websites which belong to public libraries around the country, as well as the National Library of Ireland and its photographic archives.

Contribution to Overall Project

The project has been a co-operative effort involving almost thirty independent cultural organisations across Ireland. While the majority of participants were public libraries, there was also participation from local museums and archives and the National Museum of Ireland.

The project website highlights the local studies holdings of public libraries. A facility whereby the catalogues of the libraries could be searched would extend the reach and value of the project beyond that which was digitised and contributed to the project website, into the catalogues of the libraries themselves. This both adds extra value for the end user and raises the profile of the participant libraries.

A facility for providing services across a number of websites is of great importance for a portal or single point of access. There is a need for such portals in the Irish cultural sector. The creation and demonstration of a cross-searching facility is expected to be of benefit in the enhancement of such a portal and to other websites.

Approach

The first step in the investigation was to establish what online catalogues were available at present.



Above | Bust of George Bernard Shaw sculpted by Sava Botzaris (1894-1965). *Courtesy of Carlow County Library.*

The State of the Art

The following websites were identified:

- Public Libraries:
 - All public library services with online catalogues
- National Library of Ireland
 - Catalogue
 - Photographic Archive
- National Archives of Ireland and
- The Ask About Ireland website.

The websites of each of these targets were examined, with the focus on establishing what online search, catalogue and database systems and services they provide to the public.

Public Libraries

Most public libraries in Ireland have websites with a variety of information resources available freely over the Internet. Generally, the most significant resource is the online catalogue, which lists all of the material held in the library service. Other resources include community information and local history and culture.

National Library of Ireland: Main Catalogue

The National Library of Ireland provides an online service available at <http://hip.nli.ie>.

National Library of Ireland: Photographic Archives and Others

The National Library currently has three databases for photographic collections online. These can be accessed at <http://www.nli.ie/onlinedatabases/default.htm>.

The collections are:

- The Clonbrock Collection
- The O’Dea Collection and
- The Lawrence Collection.

In addition, the Library’s main catalogues include a catalogue of photographs, where in many instances, a database entry is accompanied by an image. The National Library also hosts catalogue or search information for a collection of lists of manuscripts, at <http://www.nli.ie/manuscriptlist/advancedsearch.asp>

National Archives of Ireland

The National Archives of Ireland host a large amount of online material at <http://www.nationalarchives.ie>, much of it modern and created by central government. However, the National Archives also have important holdings of historical material.

Ask About Ireland

The Ask About Ireland website contains database holdings of the digitised images of local studies collections of public libraries, museums and archives, together with information on special collections of cultural material held by public libraries and details of Irish digitisation initiatives.



Above | Photograph of the flower Lesser celandine (*Ranunculus ficaria*). Photograph supplied by Dún Laoghaire-Rathdown County Library. *Courtesy of Paula O’Regan*

Summary of State of the Art

Many Irish cultural bodies provide online access to catalogue searches or other online services related to their holdings. There are several different systems from different suppliers in use in Ireland.

The situation is quite fluid – some organisations plan online catalogues (e.g. the National Museum and the Heritage Service of the Department of the Environment, Heritage and Local Government) – while the ongoing national digitisation strategy can be expected to result in new online collections, potentially with catalogues and databases in some cases.

Architecture

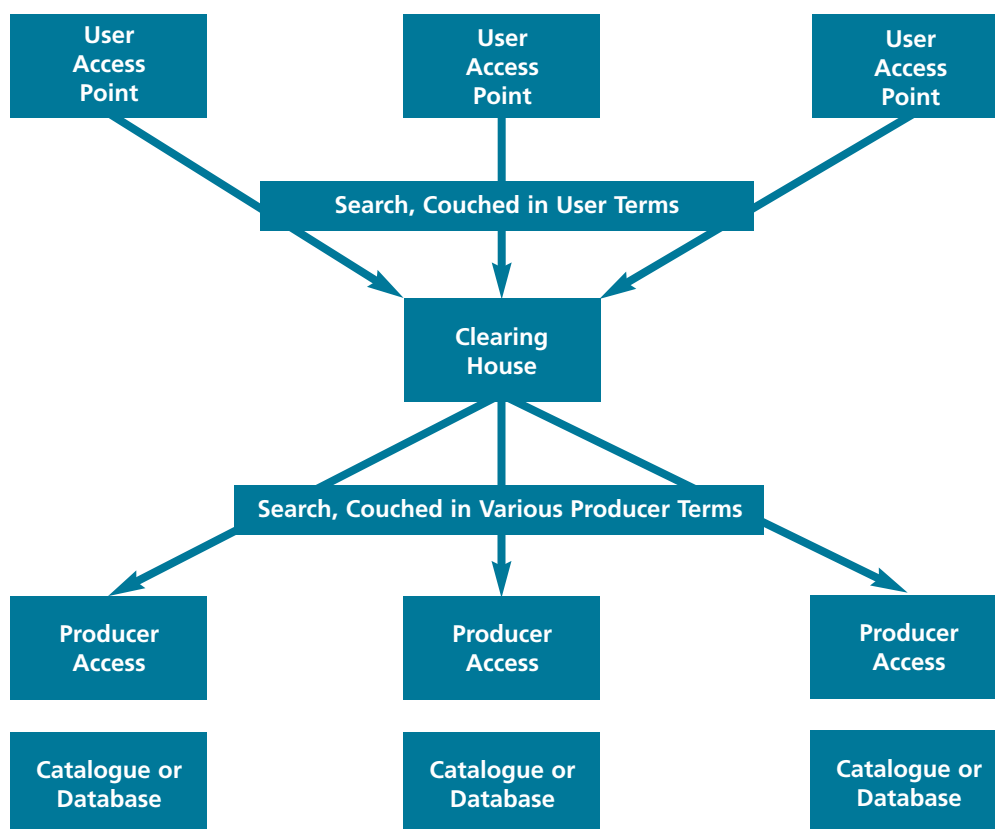
The provision of a cross-searching tool which allows easy access to multiple online databases and catalogues has the following logical or schematic architecture:

1. One or more **user access points**, where the end user enters his search criteria and receives the results
2. One or more **producers** (the memory institutions), where the search is received, the database or catalogue consulted and the results generated
3. A central **clearing house** where the search is 'translated' into service requests which can be understood and acted upon by the producers
4. Ideally, the clearing house will search multiple producers in parallel and indicate to the user which producer has material which fits the user's information requirement.

Each **producer** already provides Web access to the end user, via a Web interface, shown in the diagram below as 'producer access'. Each of these producer access points is different from the others, with a different set of search options, services, etc. Each producer access point is, of course, accessed at a different Web address (URL).

The **user access point** is typically a search form. The search form is part of the website which the user is accessing. Copies of the search form may be available at the websites of each participant, or at a single 'portal' website, or in other locations. In any of the cases, the user access point passes on a search request to the clearing house.

This is illustrated here:



I Above I Illustration of the function of the clearing house in the user search process.

The **clearing house** is the core of the system. It receives search requests from the user access point, and returns search results to the user. It **converts** the user request into a search request which the relevant producers can comprehend, based on what is expected at the producer Web interface. It receives the results from the producers, and passes them back to the user access point.

Implementation: A Web-Based Approach

This section looks at how the architecture outlined above can be implemented. It focuses on the provision of cross-searching tools.

Each producer has its own **legacy systems** in place and these legacy systems need to be taken into account. Each system has the following characteristics that need to be considered:

- The way in which a search is passed into the system
- The layout in which search results are returned and
- The additional services which are made available to the user of the legacy system (e.g. search refinement, various search types).

Passing a Search into a Legacy System

Each catalogue or library system expects to receive a search in a particular layout. Typically, it consists of a command (e.g. 'do a search') and some parameters (the search type, the query value, the number of results to return, etc.). The precise layout of the search request varies from system to system.

What all the legacy systems have in common, however, is a **Web interface**. This means that they all accept searches in the form of URL strings which describe the search and its parameters. These URL strings are created by the Web page that provides the online search facility to the end user, and are passed into the 'engine' of the system, for searching. The results are then presented on a Web page to the end user.

Any clearing house which wishes to send searches to the legacy systems therefore, can do so by

crafting URL strings in a format that the legacy system will understand. The precise detail of how such a URL string can be created varies from one legacy system to another. This is reflected in the cross-searching tool implemented during the Cultural Heritage Project, Phase Two. Typically, the URL can be constructed following analysis of the HTML code which makes up the search and search results pages provided by the legacy system.

Thus, while somewhat complex, a search can be passed from the clearing house to the legacy systems.



! Above ! Photograph of Mr Edmund F. Dease, nephew of Mr Gerald Dease, Master of the Hunt from 1861-1868 with Patrick Keelan.
© Westmeath County Library



↑ Above ↓ Photograph of the Winter Garden, Woodstock House, Inistioge, County Kilkenny looking north-east.
Courtesy of Kilkenny County Library

The pilot also has the advantage that all additional options and services which are provided by the producers remain available and fully functional.

Results

The key findings of this research are as follows:

The provision of cross-institution common services from a single point of access is feasible. The pilot system can be maintained and updated with only moderate programming resources; a low-expertise version can be envisaged.

The pilot system is user-friendly and a major improvement on the state of the art. Instead of users having to access each library site in turn and re-enter their search parameters, the tool displays which libraries have results matching their query and then allows them to access the catalogue by a single click.

Leveraging existing Web interfaces is a sensible and viable approach to providing services across websites. While more powerful technologies (e.g., Web services, Enterprise Application Integration (EAI)) do exist, they are expensive both to establish and maintain in an environment such as this one. The key advantage is the lack of intrusion for the provider websites; the pilot uses the existing Web

interface and the presentation model of the provider systems, so that the end user gains the maximum functionality.

While the pilot system does not mask from the user the fact that he is accessing multiple websites, it does make the transition from site to site as easy as possible. The investment that would be required to integrate search services, so that the user is completely shielded from the fact that there are multiple institutions being searched, might be disproportionate to the benefit. It would also need to be maintained, with significant extra effort, each time a provider changed his internal systems and/or their external interfaces.

Future Value

The availability of cross-system search tools will be critical to the success of future digitisation portals and general cultural portals.

Providing the facility to allow the user to identify, quickly and easily, the material required is an important step. Some of this material can be browsed and downloaded as required. Developing a service to deliver items such as books or DVDs to the user will require further research. At present, the user can request that material through the inter-library loan service of their local library.

Appendix Five: Poor Law Union Records and Early Local Government

Objective

Most library authorities hold significant amounts of early local government material in their local studies collections. These include, for example, minutes of the Board of Governors meetings, Poor Law Union records, Record of Deaths. These are a major source of original material for those with an interest in Irish history of the eighteenth and nineteenth century in particular. Material covering the management of the Famine by local authorities and committees is particularly popular.

The objective of this research was to ascertain how best to digitise and publish online excerpts from the Poor Law Union records. In general, the sheer volume of these records prohibits the digitisation and display of the full collection (for example Meath, not the county with the largest collection, has some 550 volumes of records, each several inches in thickness).

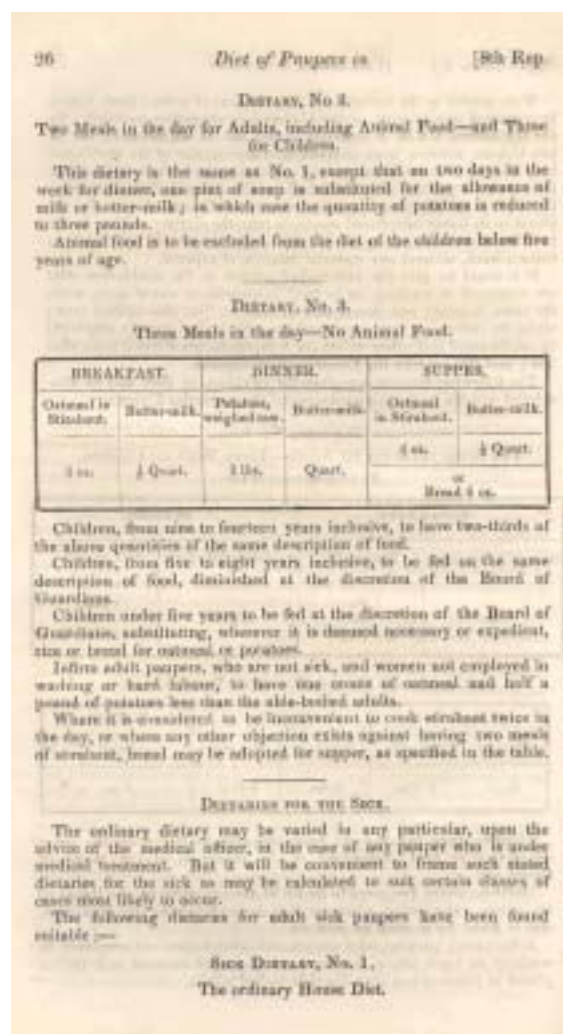
Contribution to the Overall Project

The Poor Law Union records are among the most important sources of original historical information held by public libraries in Ireland. While the large volume of records means that the project is only sampling the total resource, it is intended that the procedures and technologies used for digitisation and publication will be applicable for other projects in the future.

Approach

The treatment of Poor Law Union records was addressed by two authorities – Meath County Library and Donegal County Archives Service. The core objective was to pilot the digitisation and publication of Poor Law Union material, so that appropriate techniques and technologies could be identified and deployed in the future. The aim was research, rather than large-scale digitisation.

Each county selected a number of records to digitise and publish. Typically, the material is in large bound volumes, some inches in thickness



I Above I Poor Law Union Document - diet guidelines.
Courtesy of Donegal County Archives Service

and a little larger than foolscap size. The paper is often not of the best quality and usually pink or other off-white colour. The records were kept in longhand (copperplate), using inks which have often faded to a rusty colour. As a result, the contrast between ink and paper colour is often not very good.

The age of the records means that many records are discoloured or are in poor condition. Creating a legible and useful digital version of the material was a challenge. Optical Character Recognition (OCR) was simply infeasible – OCR does not support hand-written material, even in perfect condition. The longhand, discoloured and low-

contrast Poor Law Union records are simply not suitable for OCR.

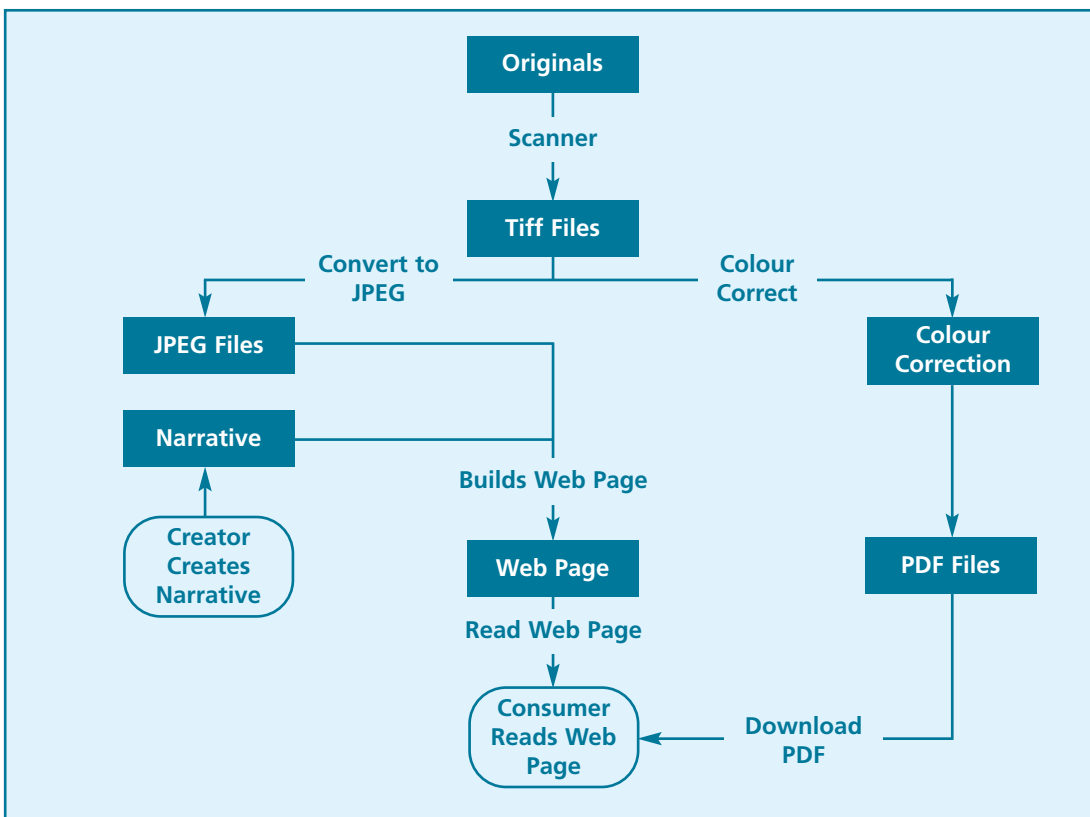
The records were scanned at top quality (300-600 dpi, depending on the scanner used) by the libraries involved. A book cradle was found to be a useful accessory. While the page size was greater than A4, many pages could have all their written content kept within an A4 area. However, a significant number of the pages were totally full, which meant that an A3 scanner was essential.

The resulting TIFF images were copied. One copy was colour-corrected, in order to produce as 'black-and-white' an image as possible. This aids legibility. The monochrome image was then converted to PDF. Multi-page and single-page PDFs were created. While the multi-page files

reflected more accurately the structure of the records themselves, their large size and long download time meant that the shorter one-page PDFs were more immediately useful.

From the non-colour-corrected TIFF files, a small JPEG image was created. This image was used to illustrate the narrative text written by the participants, to describe the content of the Poor Law Union records. Links were provided within the narrative text which allowed the end user to download a PDF version (colour-corrected) of the relevant pages. This could then be examined, zoomed into and panned across using Acrobat Reader.

The full process of treatment of the Poor Law Union records is shown below



I Above I Outline of the treatment for Poor Law Union records.

No. of Case	NAME	OFFENCE	Date of Offence	Punishment imposed by Magistrate or other Officer
74	Lizzy Genthew	Using abusive language to the Magistrate, & persisting in doing so, after being cautioned.	15th July	3 hours in the Refractory Ward, by the Magistrate.
75	William Rodden	Going to Milford without leave.	18th July	2 hours in Refractory Ward.
76	Neil O'Donnell	Using filthy and abusive language to the Magistrate.	18th July	2 hours in Refractory Ward.
77	Petrol Sweeney, Jun	Going over the wall & leaving the Workhouse premises.	18th July	Caston with a rod on the hands, by the Schoolmistress.
78	John Rodgers	Refused to comply with an order of the Magistrate.	26 July	2 hours in Refractory Ward.

Left
Extract from Milford Poor Law Union Punishment Book. Courtesy of Donegal County Archives Service

Results

A viable and feasible methodology and technical approach for the digitisation and publication of Poor Law Union records was established and demonstrated. The methodology has the advantage of being feasible in-house – there is no part of the procedure that requires outside assistance. It has the disadvantage of being relatively labour-intensive; while the scanning is quite straightforward, there is the potential to spend a great deal of time creating a narrative which is informative and valuable from a searching point of view.

OCR is not feasible on Poor Law Union records. This has a major impact on their value for genealogical and place name search purposes. This can be overcome, to a certain degree, by including lists of names and places within the narrative text.

The massive volume of Poor Law Union and Local Government records means that it is unlikely that all available records will ever be digitised and placed online. However, their widespread appeal,

local focus and inherent comprehensiveness means that their coverage of important historical events such as the Famine cannot be equalled. A subset of the records, addressing major events, is certainly worth digitising and publishing online. These would be a valuable resource for the general public, for school and university students, for researchers, for members of the Irish diaspora.

Future Value

The Poor Law Union records exercise within the Cultural Heritage Project, Phase Two was a pilot exercise. It focused on the development and demonstration of an appropriate, feasible and economically viable process for the digitisation and online publication of this important source material.

Having achieved this objective, the results are important for any subsequent library project which wishes to derive value from and open access to, their own Poor Law Union records.

Appendix Six: List of Participant Institutions and Teams

- Carlow County Library : Thomas King, Carmel Flahavan
- Clare County Library: Noel Crowley, Maureen Comber, Anthony Edwards
- Cork City Library: Éamonn Kirwan, Kieran Burke
- Donegal County Library: Liam Ronayne, Berni Campbell, Niamh McMahon
- Donegal County Archives Service: Niamh Brennan, Arlene Crampsie
- Dublin City Public Libraries: Deirdre Ellis-King, Bernadette Cogan, Caroline Clery, Helen O'Donnell, Máire Kennedy, Alistair Smeaton, Eithne Massey
- Dún Laoghaire-Rathdown Public Libraries: Muiris Ó'Raghaill, Nigel Curtin, Pat Walsh
- Fingal County Library: Paul Harris, Lilian Whelan
- Galway County Library: Pat McMahon, Robert Warren, John Fitzgibbon
- Kerry County Library: Kathleen Brown, Michael Costello, Tommy O'Connor, Seán Cahill
- Kilkenny County Library: James Fogarty, Declan Macauley, Damien Brett, Alicia Dunphy
- Laois/Offaly Archives Service: Mary Fitzpatrick
- Longford County Library: Mary Carleton Reynolds, Willie O'Dowd
- Louth County Library: Ann Ward, Isabell Murphy, Dermot Foley
- Louth County Museum: Brian Walsh
- Mayo County Library: Austin Vaughan, Richie Hickey, Eleanor O'Toole
- Meath County Library: Ciarán Mangan, Frances Tallon, Carmel Doggett
- Monaghan County Library: Joseph McElvaney, Karen McKenna, Catherine Elliott
- National Museum of Ireland: Nessa O'Connor
- Offaly County Library: Anne Coughlan, Órla Dooley, Catherine Feighery
- Sligo County Library: Donal Tinney, Eimear Sullivan
- South Dublin County Library: Teresa Walsh, Kieran Swords, Síle Coleman
- Waterford City Library: Jane Cantwell, Sinéad O'Higgins, Donal Quigley
- Waterford County Library: Donald Brady, Eddie Byrne, Ger Croughan
- Westmeath County Library: Mary Farrell, Mary Stuart
- Wexford County Library: Fionnuala Hanrahan, Susan Kelly, Anne Griffin
- Wicklow County Library: Brendan Martin, Fiona Scannell, Robert Butler



I Above I Places page of the website containing links to the content of the participant institutions and to their websites and catalogues.

Appendix Seven: National Digitisation Profile Update

Cultural content has been identified as a driver for Internet take-up in Ireland by the Information Society Commission (<http://www.isc.ie>). Some 40% of the Irish population now have access to and use the Internet (Commissioner for Communications Regulation, December 2002). This reflects the wide availability of the Internet in the workplace and its popularity in the residential market. While new delivery mechanisms such as ADSL and Wireless Broadband have become considerably more economical, take-up to date has been slower than anticipated. This indicates that the number of Irish users of the Internet is stabilising and that the large majority of those who are interested in the Internet for its own sake are now online. Content that is local in nature and of specific interest to the inhabitants of a particular region, acts as an important stimulus to attract new users to the online medium. The digitisation of large amounts of local content in all parts of the country will have a nationally significant impact on the take-up of the Information Society. This impact would not be restricted to adding value to library or museum collections, but would have wider ramifications for the use of the Internet as a whole, once late adopters were attracted to the Internet using local material.

Irish Initiatives

In addition to the work of the Cultural Heritage Project in relation to local cultural initiatives, national cultural institutions continue towards developing their digitisation programmes. Details on their current positions are as follows:

The National Library

The National Library of Ireland continues its digitisation work on the visual collections – photographs and prints. Over 8,000 digital images are now available through the website <http://www.nli.ie>. A project is underway to digitise approximately 40,000 photographs from the Library's photographic collections. The aim is to have a significant number of these images

accessible through the Library's website by the end of 2005.

The National Archives

The National Archives will continue to develop its website <http://www.nationalarchives.ie> as the first point of contact for those seeking to access their archival heritage. Informational content will continue to be augmented and remain the core of the service. However, a new focus will be applied to the development of the site as a vehicle for interactive, experiential and transactional services to the public.

The National Museum of Ireland

The National Museum of Ireland (<http://www.museum.ie>) was a participant in the EU Information Society Technology (IST) funded, fifth framework ORION project (<http://www.orion-net.org>). The project addressed the application of 3D technology across a diverse range of applications in European archeological museums.



Left | Portrait of author Maria Edgeworth
Courtesy of Longford County Library

This project ended in July 2003 and the final deliverable was a Research Roadmap which addressed a broad variety of 3D research areas, according to the results of user requirement surveys within the ORION consortium and beyond. The project's internal partners in Ireland were a particularly significant element in the success of the project. Regional museums were the largest constituency amongst the internal partners. The ORION experience has been of great use to the National Museum in helping to establish new contacts and potential partnerships with both museum and technical partners, with the aim of producing innovative 3D results for collections management, Web applications and display as well as other specialised applications. The National Museum of Ireland has also developed a partnership relationship with An Chomhairle Leabharlanna/The Library Council in relation to digitisation projects and is considering a number of other partnerships and project possibilities as a direct result of the experience gained in the course of the ORION project.

The National Gallery

The National Gallery of Ireland houses the National Collection of Irish Art, the Yeats Collection and the National Portrait Collection, together with a major collection of European master paintings, drawings and prints. The National Gallery website is available at <http://www.nationalgallery.ie>, providing an easy way of accessing information on the National Gallery.

A review of the National Gallery website is currently in progress with a view to expansion and development in the future. The National Gallery's digitisation project has concentrated on high resolution imaging and transferring images on to the collection management system. A wider development of the National Gallery's digitisation programme is currently in progress.



Above | Image of Waterford City Bridge. *Courtesy of Waterford County Library*

Heritage Service of the Department of the Environment, Heritage and Local Government

(formally Dúchas, the Heritage Service)

The website <http://www.heritagedata.ie> offers major heritage data sets and information is available in digital format. This site provides a simple way of accessing the heritage information relating to the following:

- Sites and Monuments Record
- Recorded Monuments Record
- Monuments in State Care
- Natural Heritage Areas
- Special Areas of Conservation
- Special Protection Areas (Birds' Directive) and
- Nature Reserves and National Parks.

As of November 2003, a contract has been agreed with ESRI Ireland to implement an Internet browser to provide widespread access to the datasets listed above. Phase One of this project is due for completion in 2004. Additionally First Edition (1830s) 6 Inch mapping for the island of Ireland has been scanned and this will be made available through this browser. Phase Two of this project will see all core datasets transferred to an Oracle spatial database, which will facilitate full public access to the data.



I Above I Aran Island Children from the book *Home Life in Ireland*, Lynd R., Millis and Boon Ltd., London, 1909.

Co-operation developments

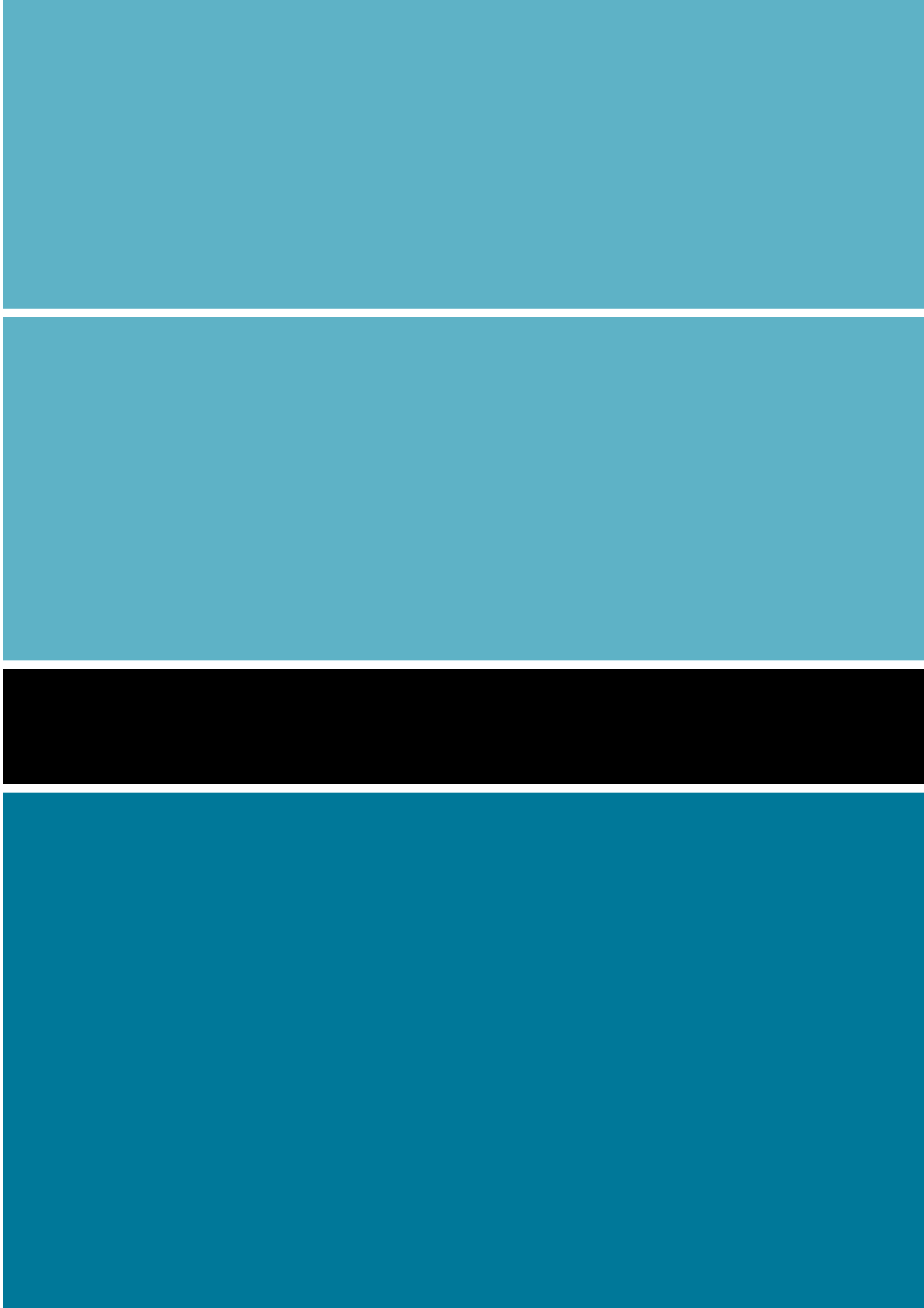
As a contribution to the Irish presidency of the EU, Ireland has co-operated with Italy on a mid-term assessment of the *Coordinating Digitisation in Europe* report of the MINERVA and MINERVA Plus EU project for the co-ordination of digitisation in European cultural institutions. The assessment is managed by an assessment steering group, comprised of representatives of the recent Italian and Irish presidencies and the current Netherlands presidency and the European Commission. The focus of the assessment and analysis has been on concrete results, which have a demonstrable impact on the cultural landscape and which underline the effect of the work of the initiative on the development of eContent and the contribution of cultural heritage to eEurope. The digitisation initiatives are offering great scope for further co-operation development amongst libraries, museums and archives at local and national level. Small institutions have also been involved. They have acquired the skills and equipment to allow them to include digitisation as a standard element of their housekeeping procedures.

Use of NRG/MINERVA results and impact

Ireland continues to participate fully in the National Representatives Group of the European Union cultural institutions and in the MINERVA Plus project. The Irish presidency was offered the opportunity to demonstrate the initiatives to date in the International Conference on Digitisation, with the specific theme of portals and access to European culture, which took place in Dublin Castle in June 2004.



I Above I Castle Street Distillery on banks of River Camcor, Birr, County Offaly. *Courtesy of Offaly County Library.*



An Chomhairle Leabharlanna
The Library Council
53-54 Upper Mount Street
Dublin 2
Ireland

Tel +353 1 6761167 – 6761963
Fax +353 1 6766721

Email: info@librarycouncil.ie
Website: www.librarycouncil.ie

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Custom House
Dublin 1
Ireland

Tel +353 1 888 2000
Fax +353 1 888 2888

Email: press-office@environ.ie
Website: www.environ.ie



AN CHOMHAIRLE LEABHARLANNA
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