Report on the

State Of The Union

about the policies, practices and research in Europe on the applications of Information and Communication Technology to tangible Cultural Heritage

2005.[11] These reports address a very broadly defined cultural sector, also including more or less detailed documentation on the state of play with respect to cultural heritage.

COMPENDIUM also provides comparative information, such as tables presenting data on selected topics across countries, and charts that show changes in policy priorities or public cultural expenditure (new monitoring tables, introduced in 2005, also offer a longitudinal perspective). The CUPIX Index offers an overview of changes in consumer prices for cultural goods and services. For example, a "time capsule" compares the prices of popular cultural goods and services, e.g., the 2003/2004 edition for 14 European countries provides the regular price of the latest "Harry Potter" book, the entrance fee to an exhibition of a main national museum or gallery of modern art, or similar information in the areas of film, theatre/opera and arts education.

Unfortunately, the COMPENDIUM does not at the moment provide any comparable information on digital cultural (heritage) products or services. Surprisingly, as one could conclude from the online accessible ERICarts documents on "Compendium Experiments" (end of April 2005, three documents dating from March 2003, second half of 2004, and January 2005), there also seems to be no intention to include indicators on the development of the digital cultural (heritage) sphere.[12] For example, nowhere is the word "digital" mentioned. And, "Heritage" is only mentioned in a suggestion from 2003 to monitor "specific legislation for different sectors such as heritage, theatre and music", and in a quote from UNESCO's definition of cultural diversity in the Draft International Convention on the Protection of the Diversity of Cultural Contents and Artistic Expressions (2004).

In order to extend the European-wide cultural policy research and, thereby, the information made available for well informed political and institutional decision making, it would be beneficial to include in the "Compendium Experiments" specific indicators on digital culture. From EPOCH's perspective, such an indicator could be the price of a CD-ROM/DVD featuring a collection or exhibition of a regional museum or an archaeological site. This would include to identify whether such "local" digital products are available in museum shops (also maybe on the Internet), a comparison of their price with "international" products (i.e. from major internationally active museums) and, based on the available information on the products, whether or not funding from a public body or major private sponsorship made the production possible.

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[11] Albania, Austria, Azerbaijan, Belgium, Bulgaria, Canada, Croatia, Estonia, Finland, France, Germany, Greece, Holy See, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, FYR Macedonia, Malta, Moldova, The Netherlands, Poland, Portugal, Romania, Russia, San Marino, Serbia and Montenegro, Slovenia, Sweden, Switzerland, Ukraine, United Kingdom. Preliminary profiles: Monaco, Spain; announced for 2005: Denmark, Norway, Slovak Republic.

[12] Cf. the following documents available from the section Compendium Experiments - Developing Indicators for Emerging Policy Issues: "First Proposals for the Development of Monitoring Activities. Discussion Paper", prepared by ERICarts/Council of Europe, March 2003; "Intercultural Dialogue, Cultural Policies and the Compendium. A Proposal for Discussion", ERICarts, 2004; "Indicators for Monitoring Cultural Diversity, Social Cohesion and Inter-Cultural Dialogue within the Compendium of Cultural Policies and Trends in Europe" (ERICarts and Council of Europe), Draft for Discussion", prepared by: John Foote (Canada), January 31, 2005), http://www.culturalpolicies.net/countryprofiles.htm (see: comparisons).

3.2 European Heritage Network

The European Heritage Network (HEREIN)[13] is a permanent information system of the Council of Europe linking European governmental departments responsible for cultural heritage, in particular, departments concentrating on issues in the preservation and conservation of tangible heritage. The Network, launched in 1999, has been developed as an instrument for implementing and monitoring the European conventions on the architectural and archaeological heritage and the UNESCO World Heritage Convention in Europe.

Of the Web-based information provided by HEREIN, the most relevant for the purposes of EPOCH is the database on national heritage policies. This database is updated by a network of national correspondents. It reports on the status of, and interesting developments in, the national heritage policies. This includes aspects such as changes in the perspectives that inform strategies concerning cultural heritage, public bodies and other organisations active in the field, legal frameworks and regulations for the protection and management of cultural heritage, and financial policies.

From this major source of country specific information, only the information on "Digitisation" is considered here. In fact, this is one of the top-level themes of the HEREIN database. The theme is subdivided into the sections "Policy on digitisation" and "Information systems and databases". The first section concentrates on CH specific policies including special funding programmes. The second provides information on existing CH information systems and databases as well as relevant research and development efforts.

Yet half of the countries covered in the database provide no information on this top-level theme.[14] For the countries Belgium (Flemish Region), Bulgaria, Finland, France, Georgia, Germany, Latvia, Poland, Portugal Romania, Spain and the Former Yugoslav Republic of Macedonia information is available in one or both sections, in some cases extensively, in other more concisely, sometimes limiting to state that no policy is in force.

The lack of detailed information on "digitisation" in the HEREIN database is a further proof of the additional effort required in covering this theme, as started by the present EPOCH's survey. Due to the partial coverage of the theme "digitisation" we will not attempt to summarise the results at an European level. Rather, we have taken some snapshots from individual surveys, which are, in our opinion, exemplary, because they express common situations thoughout Europe. The information relevant for our scope is contained in parts 7.1 (Policy on digitisation) and 7.2 (Information systems and databases). Further details on digital inventories are sometimes contained in 4.1 (Inventories and documentation).

3.3 MINERVA / MINERVA Plus

MINERVA (Ministerial Network for Valorising Activities in Digitisation) is a network of ministries of culture, public bodies and organisations from member states of the European Union and other states that was established in order to facilitate the adoption of the Lund Principles and the implementation of the Lund Action Plan.[15]

In response to the invitation by the former Cultural Heritage Applications Unit of the European Commission's Information Society Technologies Directorate, national representatives of the member states' ministries of culture and experts from the cultural heritage sector met on April 4, 2001 in Lund, Sweden, to

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[13] http://www.european-heritage.net

[14] The countries for which according to the pull-down menu information on "digitisation" should be accessible are: Andorra, Armenia. Belgium (Brussels capital region, Flemish region), Bulgaria, Croatia, Cyprus, Estonia, Finland, France, Georgia, Germany, Hungary, Ireland, Latria, Lithuania, Luxemburg, Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, United Kingdom.

[15] MINERVA website, http://www.minervaeurope.org

discuss a common and coordinated approach to digitisation. The meeting resulted in the adoption of the Lund Principles and Lund Action Plan, which lay out the agenda for a harmonisation of national measures and activities in heritage digitisation as well as the promotion of best practice. The Action Plan covers the period from 2001-2005. A follow-up New Dynamic Action Plan (2006-2012) is currently under discussion, and will be adopted under the UK presidency, in fall 2005.

In order to support this work, a consortium of ministries - from Belgium (French Community), France, Italy, Spain - and cultural heritage organisations defined and proposed to carry out the MINERVA project, and received funding of 1.4 million Euro from the 5th Framework Programme over a duration of 36 month (03/2002-02/2005). Furthermore, under the 6th Framework Programme the MINERVA Plus project, a Co-ordination Action that started in February 2004, has considerably extended the network and included ministries or institutions from other EU member states, and the countries Israel and Russia. This project has a funding of 840.000 Euro, and has run until the end of July 2005. Both projects have been coordinated by the Italian Ministero per i Beni e le Attività Culturali.

MINERVA and MINERVA Plus have been running an extensive programme of coordination activities, cooperative research, publications and events. In particular, they have also supported the activities of a growing National Representatives Group (NRG) that reports on the progress of a coordinated approach to digitisation policies and programmes, and achievements on the national level. It also formulated the "Charter of Parma" (19 November 2003) which further describes and confirms the NRG's commitment to the Lund Principles.

The following overview can only briefly present and discuss some of MINERVA's resources which may be of interest to EPOCH's goals and areas of research.

3.3.1 Excellence in the digitisation of heritage resources

Of general interest are the publications that specify technical guidelines and quality criteria for digital cultural content programmes, and identify good practices and competence centres in this field of activities. These include the "Technical Guidelines for Digital Cultural Content Creation Programmes", developed on behalf of the Minerva Project by UKOLN/University of Bath, in association with MLA, the Council for Museums, Libraries & Archives. This document builds on the guidelines developed by these organisations for the UK NOF-digitiseprogramme, and includes information from many other authoritative resources. [16]

In addition, there is the "Good Practice Handbook", which provides advice on how to develop digital collections. It is structured according to ten categories of activities in the digitisation, management, and publication of cultural heritage content, provides links to useful information sources for such activities, and lists projects that are managed in accordance to these quality principles.[17]

MINERVA's current list of good practices identifies 59 projects.[18] They are grouped according to the ten categories mentioned above. Listed good practices projects were asked to fill out a questionnaire which describes the practices and lessons learned. Approval by the National Representatives Group for the larger part of the good practice projects was in May 2002, but more examples were added and approved in 2003 and 2004 for Belgium and Italy. In fact, these countries were most active in proposing good practice projects, together 33 of the 59 projects. Most of the 59 projects concentrate on digitisation activities related to library and archival resources. However, MINERVA's list also includes some projects in the domains of museums, monuments, archaeological and other heritage sites, which are of particular interest to EPOCH's purposes (a selection of such projects is added below).

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[16] Technical Guidelines for Digital Cultural Content Creation Programmes (2004-04-08, v1.0), http://www.minervaeurope.org/structure/workinggroups/servprov/documents/techguid1_0.pdf

[17] Good Practice Handbook, edited by the MINERVA Working Group 6, final version, November 2003, http://www.minervaeurope.org/structure/workinggroups/goodpract/document/bestpracticehandbook1_2.pdf

[18] MINERVA online list of "Good practices in digitisation" (status: 21 April 2005), http://www.minervaeurope.org/listgoodpract.htm#managi

Furthermore, MINERVA representatives have established a list of competence centres that excel in the digitisation of certain types of cultural heritage content (e.g. film, audio recordings, photographs, maps, manuscripts, etc.).[19] As of April 2004, this list mentions 78 institutions that are active in the digitisation of CH resources as well as other organisations that show excellence in areas such as research or consulting. Again, EPOCH's survey team has selected from this list competence centres that may be of particular interest to EPOCH's purposes (see below).

3.3.2 MINERVA activities in Web-based access to heritage resources

The available MINERVA activities and publications go far beyond "digitisation", also covering essential matters of Web-based access to cultural heritage resources. A notable source of information and advice is MINERVA's Handbook on Quality Principles for Cultural Websites, edited by the Working Group 5.[20] These principles should help in building websites that can be said to have the following attributes: transparent, effective, maintained, accessible, user-centred, responsive, multi-lingual, interoperable, managed, and preserved. The handbook details these attributes and provides helpful checklists. In addition, the MINERVA website provides an extensive overview on European and national rules on Web applications.[21] A further valuable step is that the WG5 has developed, and actively promotes, criteria and a prototype for small and medium-size museums who wish to set up and maintain a high quality website.[22]

Also promoted by the WG5 are the World Wide Web Consortium's Semantic Web recommendations and the use of ontologies such as the International Committee for Documentation's Conceptual Reference Model (CIDOC CRM).[23]

A decisive move towards the Semantic Web in "a follow up on Lund-Minerva work packages" was strongly advocated at the end of 2003 in a "Position Paper on EU Added Value and post-Lund Strategy".[24] This position paper, among other statements on this issue, suggests:

> Emerging semantic web technologies at various stages of sophistication might add the rich texture of semantic metalayers through which agents and other intelligent technologies might perform the tedious and laborious task of harvesting knowledge and information that is tailored to the needs of individuals, or groups. Radical semantic interoperability is a precondition to achieve this level of refinement of meaning. Interoperability of content lies beyond the present horizon, but not too far. Research in the field of ontologies and semantic modelling languages is a prerequisite. This research is being conducted on a sufficient scale, but a coordinated international approach to the ontological universe of cultural heritage is needed to guide it in the right direction. Semantic modelling and ontological metatagging should be built into authoring environments and authoring tools. Therefore, industry and the private, or public

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[19] MINERVA online list of "Competence centres for digitisation" (status: 21 April 2005), http://www.minervaeurope.org/competencentre.htm

[20] Quality Principles for Cultural Websites: a Handbook. Final version (March 2005), http://www.minervaeurope.org/publications/qualitycommentary/qualitycommentary050314final.pdf

[21] Directory of European and national rules on Web Applications, edited by Chiara De Vecchis (provides extensive coverage of such rules and guidelines), http://www.minervaeurope.org/publications/qualitycriteria1_2draft/appendix4.htm

[22] See for example, "Seminario di presentazione del progetto MINERVA di un sito web di qualità per un museo medio-piccolo" organised by the Ministero per i Beni e le Attività Culturali, Rome, 16 December 2004, http://www.minervaeurope.org/structure/workinggroups/userneeds/events/semwp5_041216.htm

[23] CIDOC CRM, http://cidoc.ics.forth.gr; see the programme, abstracts and presentations of the MINERVA – W3C workshop "Rappresentazione della conoscenza nel semantic web culturale", held in Rome on July 6, 2004, http://www.w3c.it/events/minerva20040706/index.html; a summary of the workshop in English is available at http://www.minervaeurope.org/structure/workinggroups/userneeds/ documents/seminariowp504_07_06.htm

[24] Position Paper on EU Added Value and post-Lund Strategy, v.1, 15 November 2003, prepared by Eelco Bruinsma (Digital Heritage Benchmark, Netherlands), http://www.minervaeurope.org/structure/nrg/documents/positionpaper031115.htm

> sector research institutes should become important contributors to bringing about any successor to the current Lund Action Programme.

The position paper also hints at the issue that the Lund Action Plan, while having the target to establish a European Area of digitised cultural resources, may have focused too strongly on the "institutional" perspective in digitising and making accessible resources. It states:

> The Lund perspective still is institutional, rather than user centred and network-oriented. This institutional perspective may well be one of the main impediments to the objective of a European Area of digitised cultural heritage. A larger (or different) vision is needed. The semantic web might be a phase in the evolution towards a network of heritage resources in which the only portal is the workspace of the user. This requires some form of embedded 'intelligence' or 'image of the whole', but it also requires for institutions and other cultural agents to become a part of an infrastructure of content and play a much more discrete and subdued role.

While a coordinated approach towards a European cultural heritage Semantic Web may be a bit further down the road, the MINERVA Working Group 3 has prepared the ground for improvements in the interoperability of European cultural heritage information. There exists an extensive documentation and discussion of the use of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) in the cultural heritage sector, edited by Muriel Foulonneau from MINERVA partner Relais Culture Europe (France).[25] The OAI-PMH provides an application-independent interoperability framework based on metadata harvesting. The document states that the NRG "has demonstrated a clear interest for the OAI-PMH technology and the Minerva project (…) examines the way interoperability is handled in various countries and disseminates common standards for a European Information Environment, with notably a clear recognition of the major interest of the OAI-PMH practices of cultural heritage actors". The intention to build on the OAI-PMH was also manifest in the MINERVA Working Group 3's "Feasibility survey of the common platform" which was issued at the same time.[26]

Consequently, the "MINERVA spin-off project" MICHAEL (Multilingual Inventory of Cultural Heritage in Europe) was launched which receives funding from the eTEN programme.[27] A core goal of the project is to "deliver interoperability of national cultural portal initiatives and a high-quality end-user service, which will facilitate the exploitation of European cultural content resources". The project consortium is made up of the ministries of culture of France, Italy and United Kingdom, supported by the private organisations Dedale, AJLSM and Amitié for the technological and administrative aspects. The technology partners build on SDX, an open-source platform which is fully OAI-PMH compliant (i.e. for data expose and harvesting).[28] The SDX platform already was used in the technical set-up of the portal Aquitaine patrimoines and of the French national inventory project.[29] The MICHAEL project started in June 2004 and will run until May 2007.

3.3.3 A selection from MINERVA's list of "Good practices in digitisation"

URL: http://www.minervaeurope.org/listgoodpract.htm#managi (status: 21 April 2005)

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[25] M. Foulonneau (ed.): Open Archives Initiative – Protocol for Metadata Harvesting. Practices of cultural heritage actors, September 2003, quotation from pp. 43-44, http://www.oaforum.org/otherfiles/ oaf_d48_cser3_foullonneau.pdf

[26] cf. M. Foulonneau. (ed.): Feasibility survey of the common platform. MINERVA, Deliverable D3.2, final version, September 2003, chapter 7 "The European collaboration", http://www.minervaeurope.org/ intranet/reports/D3_2.pdf

[27] MICHAEL, http://www.michael-culture.org

[28] SDX, http://adnx.org/sdx/

[29] Cf. Rasik Pandey (AJLSM): Aquitaine Patrimoines & Cyberdocs. 4th Open Archives Forum Workshop, Sept. 5, 2003, http://www.oaforum.org/otherfiles/bath_pandey.ppt; Aquitaine patrimoines, http://demo.ajlsm.com/sdx-bnsa/pa-portail/index.html; Catalogue des fonds culturels numérisés, http://www.culture.gouv.fr/culture/mrt/numerisation/fr/f_02.htm.

Legenda: <nominated for good practice in…>; [yymmdd]: date of approval by the National Representatives Group.

Museum domain:

Belgium: Accès Informatisé des Collections des Institutions Muséales (AICIM), <online publication>, [040707], http://www.msw.be/aicim/

Belgium: ID-doc / The museum for the Old Techniques, Grimbergen, <online publication> [031105], http://www.mot.be

Portugal: MatrizNet / Instituto Português de Museus (IPM) <several categories> [020516], http://www.matriznet.ipmuseus.pt

UK: The British Museum COMPASS project, <several categories>, [020516], http://www.thebritishmuseum.ac.uk/compass

Monuments & archaeological sites:

Italy: S.I.T.I.A - Sistema Informativo Territoriale Integrato per l'Archeologia / responsible body: Direzione Generale per i Beni Archeologici, <managing digitisation projects>, [020516], http://www.archeologia.beniculturali.it

Italy: Virtual Archaeological Tours around the Lost Cities / responsible body: Direzione Generale per I Beni Archeologici), <digitisation process>, [020516], description by EPOCH survey team: digitisation of historic drawings and other imaginary depictions of Pompeii and Herculaneum stimulated by visits to, or reports on, excavations at these sites, http://www.archeologia.beniculturali.it

Portugal: Endovellicus System / Portuguese Institute of Archaeology, <several categories>, [020516], http://www.ipa.min-cultura.pt

Several domains:

Belgium: IRPA / Royal Institute for the Study and Conservation of Belgium's Artistic Heritage, <managing digitisation projects>, [031105], http://www.kikirpa.be/www2/Site_irpa/En /IndexEN.htm

Italy: SIGEC: Information system for the cataloguing of National Cultural Heritage ICCD / Istituto Centrale per il Catalogo e la Documentazione, <IPR and copyright, managing digitisation projects>, [040218], http://www.iccd.beniculturali.it

3.3.4 A selection from MINERVA's online list of "Competence centres for digitisation"

URL: http://www.minervaeurope.org/competencentre.htm (status: 21 April 2005)

Legenda: <specific competence in …>; no mechanism of approval by the National Representatives Group is mentioned.

Museum domain:

Austria: Technisches Museum, <virtual exhibitions, 3D-environment>, http://www.tmw.ac.at

Denmark: The National Museum, <virtual museum>, http://www.natmus.dk

Italy: I-MUSEUM ONLUS, http://www.i-museum.it, <virtual exhibitions, web applications>

Netherlands: Netherlands Institute for Cultural Heritage (ICN), <digitisation of museum collections>, http://www.icn.nl

Monuments & archaeological site:

Austria: Akademie der bildenden Künste Wien, Kupferstichkabinett, <digitisation of maps and building plans>, http://www.akbild.ac.at/kuka/

France: C2RMF for databases and tools for processing images for the conservation or restoration of heritage, <3D objects and 2D very high quality digitisation, multilingualism>, http://www.c2rmf.fr/

France: Modelling, simulations for architecture, urbanism and landscapes (MAP), <research centre, 3D modelling for monuments and natural sites>, http://www.map.archi.fr/

NL: National Service for Archaeological Research – ROB, <digitisation of information on built & archaeological monuments>, http://www.archis.nl

NL: Netherlands Department for Conservation – RdMz, <digitisation of information on built & archaeological monuments>, http://www.monumentenzorg.nl

Sweden: Lantmäteriet (Swedish Land Survey Authority), <digitisation and preservation of maps on the Web>, http://www.lantmateriet.se/index_eng.htm

UK: Archaeology Data Service, <metadata, implementation of interoperability>, http://ads.ahds.ac.uk

Several domains:

Belgium: Maerlant Center <digitisation of various CH resources including museum collections, multimedia, virtual exhibitions, e-learning>, http://www.maerlant.be

Denmark: National Cultural Heritage Agency <Databases and cultural heritage inventories>, http://www.kuas.dk

Estonia: Conservation Centre Kanut < digitisation of various CH resources including museum collections, consulting, collection management, metadata/ontology>, http://www.kanut.ee

Finland: National Board of Antiquities, Knowledge Management Centre, <databases and cultural heritage inventories>, http://www.nba.fi/Home.htm

NL: Netherlands Association for Digital Heritage – DEN, <integrated access to heritage information, e.g. http://www.cultuurwijzer.nl>, http://www.den.nl

Sweden: Riksantikvarieämbetet (National Heritage Board), <cultural heritage databases>, http://www.raa.se

UK: Arts & Humanities Data Service, <data archiving and presentation>, http://ahds.ac.uk

UK: University of Glasgow, Humanities Advanced Technology and Information Institute (HATII), <humanities informatics teaching, management of digitisation projects, digital preservation>, http://www.hatii.arts.gla.ac.uk/

3.4 DigiCULT Forum

The DigiCULT Forum project was a support measure within the Information Society Technologies (IST) priority of the European Union's Fifth Framework Programme for Research and Technological Development. The project consortium consisted of Salzburg Research (co-ordinator) and the University of Glasgow's Humanities Advanced Technology and Information Institute (HATII).

DigiCULT Forum built on the results of the strategic study "Technological Landscapes for Tomorrow's Cultural Economy – DigiCULT", that was commissioned by the European Commission, DG Information Society (Unit D2: Cultural Heritage Applications) and carried out by Salzburg Research in 2001.[30] The study addressed key issues in national policies & initiatives, organisational change, exploitation, and existing and emerging technologies. In particular, it provided a roadmap of how cultural heritage technologies will or could develop in the near future (until 2006), and formulated a series of recommendations.

[30] The DigiCULT Report. Technological Landscapes for tomorrow's cultural economy – Unlocking the value of cultural heritage. Authors: G. Geser and A. Mulrenin. Luxembourg: European Commission, DG Information Society, 2002; available for download at: http://www.digicult.info/pages/report.php

Drawing on these results, DigiCULT Forum from March 2002 to December 2004 provided a technology watch mechanism for the cultural and scientific heritage sector in Europe and beyond. Backed by a network of peer experts, it monitored, discussed and analysed existing and emerging technologies likely to benefit the sector.

To promote the results and encourage early take-up of relevant technologies, DigiCULT Forum has published seven Thematic Issues, three in-depth Technology Watch Reports, as well as presented the DigiCULT.Info e-journal to a growing database of interested persons and organisations. All these products can be downloaded from the project website.[31]

In its 34 months life cycle, DigiCULT Forum has produced 21 major products (one every six weeks, with a total of about 644,000 words), organised six Expert Fora and an Online Consultation Forum (one every 5 months, with a total of 137 participants), developed a highly dynamic and information rich website, carried out an extensive user survey, and developed a large contact database. The DigiCULT core network consists of approx. 3,000 organisations from 58 Countries, with 78% of the organisations from the EU 25 member states. The network showed a steady growth with less than 1% drop out rate.

Hence, the following sections can only provide a short overview of the DigiCULT information resources. In addition, a summary of the final publication "The Future Digital Heritage Space"[32] is provided as its results may be of particular interest to the EPOCH Network of Excellence's research agenda, and offer some guidance in ensuring its impact on the cultural heritage sector.[33]

What distinguishes the DigiCULT approach from the surveys and studies described above is that its research did not concentrate on developments in individual countries, or differences in the national situations in which digital cultural heritage application and content are developed. However, the publications "The DigiCULT Report" (January 2002) and "The Future Digital Heritage Space" (December 2004) may be used as tools for discussing and preparing the places of cultural heritage organisations in the future digital landscape. There is no guarantee for a thriving and inclusive future digital heritage space, this space must be developed in a conscious and planned way through activities on the European, national and regional/local levels.

3.4.1 Overview of DigiCULT resources

DigiCULT Technology Watch Reports

The Technology Watch Reports (TWRs) are major annual volumes, covering six technologies expected to have a substantial impact on the future of cultural heritage projects, professionals working in the sector, and approaches to cultural materials.

The available three reports cover the following topics:

- TWR 1 (February 2003): Customer Relationship Management; Digital Asset Management Systems; Smart Labels and Smart Tags; Virtual Reality and Display Technologies; Human Interfaces; Games Technologies.
- TWR 2 (February 2004): The Application Service Model; The XML Family of Technologies; Cultural Agents and Avatars, Electronic Programming Guides and Personalisation; Mobile Access to Cultural Information Resources; Rights Management and Payment Technologies; Collaborative Mechanisms and Technologies.
- TWR 3 (December 2004): Open Source Software and Standards; Natural Language Processing; Information Retrieval; Location-Based Systems; Visualisation of Data; Telepresence, Haptics, Robotics.

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[31] http://www.digicult.info

[32] DigiCULT Thematic Issue 7, edited by G. Geser & J. Pereira, December 2004, available for download at: http://www.digicult.info/pages/themiss.php

[33] An overview of the results, and specific recommendations for EPOCH research agenda, already have been provided by the author at an EPOCH Workshop on 17./18.02.2005 in Leuven, Belgium.

For each technology topic, the TWRs offer an introduction to the nature and capabilities of the technology; explain in more detail how it works; provide case studies and additional scenarios on how the technology may be applied to the heritage sector; point out what the obstacles are to deploying the technology; provide advice for the implementation process; and assess the benefits and risks the technology may pose (e.g. financial, staffing, management, training). Furthermore, the chapters provide appendices that inform on standards, products, technology developers and suppliers.

DigiCULT Thematic Issues

The Thematic Issues build on the results of an expert round table on a selected topic, and provide additional information and opinions in the form of invited articles, interviews, and case studies. Other elements may include short descriptions of related projects, a selection of relevant resources or a glossary.

The seven Thematic Issues cover the following topics:

- Issue 1: Integrity and Authenticity of Digital Cultural Heritage Objects (August 2002);
- Issue 2: Digital Asset Management Systems for the Cultural and Scientific Heritage Sector (December 2002);
- Issue 3: Towards a Semantic Web for Heritage Resources (May 2003);
- Issue 4: Learning Objects from Cultural and Scientific Heritage Resources (October 2003);
- Issue 5: Virtual Communities and Collaboration (January 2004) Issue 6: Resource Discovery Technologies for the Heritage Sector (June 2004);
- Issue 7: The Future Digital Heritage Space: An Expedition Report (December 2004).

A summary of the results of Issue 7 is provided in a separate section below.

DigiCULT.Info e-journal

DigiCULT.Info is a quarterly electronic journal presenting current news, high quality articles and interviews on various issues related to cultural heritage and the information society. Its aim is to bring developing projects and initiatives to a wider audience, to demonstrate the use of technologies and standards, and to provide greater access to the expertise and experiences of fellow cultural heritage professionals. The journal covers a wide range of heritage information topics such as 3D representation, preservation, digitisation, access technologies, user evaluation studies. Nine issues have been published so far, and an additional two are in preparation. Most notably, the journal has established a European network of regional correspondents who report on developments in the application of ICT in the heritage sector of the European Union's member states.

DigiCULT Online Resources

Also a notable source of information is the DigiCULT website's section "Resources", thematically grouped short descriptions of projects, technologies, products, standards, etc. plus URL. This includes over 120 gateways to cultural heritage resources, online journals, newsletters and magazines. The DigiCULT "themes" cover 22 technologies with a total of over 570 links. Particularly strong represented are the themes Resource Discovery & Information Retrieval; XML, Interoperability, Semantic Web; Natural language processing; Collaboration and Virtual Communities; Learning Objects; Digitisation and Electronic Preservation.

3.4.2 Towards the Future Digital Heritage Space

The DigiCULT Thematic Issue 7, "The Future Digital Heritage Space" (December 2004) summarises the results of an expedition into the possible future of digital heritage in the next 10-15 years. It builds on contributions of 62 researchers and professionals from or related to the cultural and scientific heritage sector as well as additional research results.

The target of the expedition was to bring home a research and technological development (RTD) roadmap that outlines what may be expected in a future digital heritage space. Routes should be found for different RTD endeavours, the results of which may fall into place to create such a space. The report outlines a roadmap which covers the major current research themes:

- Intelligent heritage [MEANING]
- Contextual cultural information [CONTEXT]
- Natural and enjoyable interaction [EXPERIENCES]
- Create/recreate [3D/VR/AR]
- Large-scale & distribution systems [AUTOMATION]
- Persistent and perpetual access [PRESERVATION]

For each of these themes, the report provides a summary of the expert input, and a RTD "navigator" for the time spans: 2004 (current limitations/barriers), 2005-2009, 2010-2014, and 2015 and beyond.

Most interestingly, the report relates the cultural heritage RTD to the IST Advisory Group's concept of Ambient Intelligence which informs the IST priority of the European Union's Framework Programmes for RTD.[34] It provides a radar on current developments in ambient intelligence technologies, from micro-level physical (e.g. systems-on-chip, smart sensors, etc.) up to Semantic Web technologies. The overview includes local and wider-area information and communication systems, devices and applications visitors of heritage buildings or archaeological sites may carry with them, as well as new interfaces and modes of interaction they would expect when they come to (or pass by) a museum, gallery, archive, library, historic city centre or other larger heritage area.

In particular, the report highlights the importance to involve heritage experts in eCulture "experience prototyping", a new way of developing ICT systems and applications which has been strongly suggested by the IST Advisory Group.[35] The report foresees that ever more massive distributed and embedded computing and communications, smart devices, novel interfaces, positioning and context-awareness technologies, etc. will be provided by the ICT industries. This may well pave the way towards a digital heritage space capable of handling increasingly complex information environments, applications and resources - within a wider landscape of ambient intelligence infrastructures.

However, when it comes to prototyping novel cultural experiences in ambient intelligence environments, new forms of collaboration and true interdisciplinary efforts will be needed. A digital heritage space within an ambient intelligence landscape cannot be created by technological research and development alone. Experts and practitioners from – and clients of – cultural, artistic and scientific heritage organisations (e.g. curators, archivists, librarians, educational programme managers), Arts & Humanities scholars and students, and experts from cultural hotspots such as historic city centres or archaeological parks need to be involved in a more qualitative and effective way. Too often purely technology-driven projects, proof of concept with little cultural heritage basis and other shortcomings, have hampered the creation and dissemination of RTD results that would need to find their way into the heritage sector.

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[34] IST Advisory Group, http://www.cordis.lu/ist/istag.htm; cf. the first major ISTAG report "Scenarios for ambient intelligence in 2010", published in 2001, and subsequent reports, http://www.cordis.lu/ist/istag-reports.htm

[35] See ISTAG: Ambient Intelligence: from vision to reality (September 2003), pp. 27-29. http://www.cordis.lu/ist/istag-reports.htm; ISTAG Working Group: Experience and application research. Involving Users in the Development of Ambient Intelligence (Final Report, 22 June 2004). ftp://ftp.cordis.lu/pub/ist/docs/istag-earc_wg_final_report_v1.pdf

The report also accompanies the core perspective on RTD with a view on the requirements, likelihood and time horizon of heritage organisations of different sizes adopting the future information and communication technologies (ICT), systems and applications that may stem from the ongoing RTD efforts.[36] This dimension of the roadmap will be of greater interest to stakeholders in the heritage sector, but may also be useful for RTD planners and funding bodies.

The report is intended as a navigation tool for boards and directors of heritage organisations and research centres, IT project managers, and curators of digital collections, virtual exhibitions and environments. It cautions that the next waves of innovative ICT systems and applications may significantly shape and re-shape the digital landscape in which heritage organisations reside. This tool may help them to discuss and prepare their places in this landscape in order to become part of it in a conscious and planned way. This could include opportunities to participate in projects that develop ambient intelligence services and applications, ensuring the creation of a thriving and inclusive future digital heritage space.

However, overall the report cautions that it seems likely that their digital surroundings may develop much faster than most heritage organisations can adopt and employ. For many organisations this could result in becoming "blind spots" in an emerging ambient intelligence environment. In particular for smaller and also medium-sized institutions the benefits of most current and future technologies will need to be realised within national and larger regional initiatives. In such initiatives, a leading role will require to be played by digital heritage networks, innovative and inspiring examples of which already exist in the European Union's member states. Furthermore, there will over the coming years be an increasing demand for supportive digital services centres and ICT training programmes for technical and non-technical staff on how to handle new technologies. Such funded mechanisms should enable smaller institutions to keep the costs and risks of digital heritage resources and services manageable while not being excluded from new technological developments.

3.5 Summary

This chapter provided an overview on different European-level efforts in establishing extensive information sources on cultural policies (COMPENDIUM, HEREIN), strategies of digitising and making accessible cultural heritage content (MINERVA/MINERVA Plus), and developments in relevant technologies for the cultural heritage sector (DigiCULT Forum). The description and analysis of these resources can be summarised as follows:

The information provided by the correspondents of the European ministries and other responsible bodies to the HEREIN database on national heritage policies is in-depth with respect to the institutional frameworks (i.e. regulations, responsible bodies, administrative issues), but, most of the correspondents found it difficult to provide detailed information on the theme "Digitisation" ("Policy on digitisation" and "Information systems and databases").

COMPENDIUM provides "Cultural Policy Profiles" and interesting comparative information. As the "Profiles" are created by dedicated organisations and documentation centres, they are rich in current information on a broad range of issues in cultural policies in culture and arts. They also contain valuable information on important developments in the heritage sector. Yet, COMPENDIUM, like HEREIN, does not provide a good coverage of developments in the area of digital cultural heritage. This is particularly evident in the "Compendium Experiments" which do not consider including any indicators in the area of digital culture (which EPOCH would strongly suggest).

MINERVA concentrates on European coordination in the digitisation of, and web-based access to, cultural heritage resources. Hence, the project addresses two issues that are of interest to EPOCH's survey: First,

[36] See also G. Geser: Assessing the readiness of small heritage institutions for e-culture technologies. In: DigiCULT.Info e-Journal, Issue 9, November 2004, pp. 8-13, http://www.digicult.info/pages/newsletter.php

through the National Representatives Group (NRG) the project has an impact on the level of institutional frameworks, for example, by stimulating and reinforcing national strategies and funding programmes. Second, through the progress reports of the NRG a rich information source is available on the state of play in Europe in the digitisation of cultural heritage information and objects. Furthermore, the description of MINERVA's work should have made it clear, that several publications of MINERVA Working Groups form a valuable resource with respect to issues in the provision of Web-based access to digital heritage content.

DigiCULT Forum's focus is on the monitoring and assessment of existing and emerging technologies likely to benefit the cultural heritage sector. Many European experts have been involved in discussing and analysing the development and implementation of these technologies in the sector. DigiCULT Forum did not concentrate on providing information on the conditions that foster or hinder the uptake of the technologies in individual countries (e.g. different institutional frameworks, strategies, funding mechanism, etc.) Because, in-depth information and recommendations regarding key issues in national policies & initiatives, organisational change, exploitation, and technologies were established in "The DigiCULT Report" published in 2002. Furthermore, parts of the recent publication "The Future Digital Heritage Space" address important issues in digital cultural heritage policies and strategies, on the European and national/regional level.

For EPOCH's survey on the state of the European Union in the application of ICT to tangible cultural heritage this overview suggests that the survey

(1) does not need to reproduce general information on institutional frameworks; rather, it may direct interested users to the information provided by COMPENDIUM and the relevant sections in the HEREIN's database;

(2) however, it should strive to provide information on specific aspects of the institutional frameworks that are likely to foster or hinder the development and broad uptake of digital applications in the area of tangible cultural heritage;

(3) issues in the digitisation of, and Web-based access to, cultural heritage resources are well covered by MINERVA; here EPOCH may highlight the relevance of particular resources of libraries, archives and museums that are directly important in the documentation, conservation and (virtual) reconstruction and presentation of monuments and cultural heritage sites;

(4) for the assessment of many technologies that are of core interest, the EPOCH survey and other publications can build on the results of the DigiCULT Forum project; in fact, for example, its inventory of IT tools that are in development or already used in the cultural heritage sector EPOCH already build on the DigiCULT results;

(5) finally, following the recommendations of the DigiCULT Forum, EPOCH may also consider to give special emphasis to, and monitor national developments in, the following two areas: (i) establishment of digital service centres (IT-support, training, etc.) for small to medium-size institutions, (ii) use of "experience prototyping" methods and involvement of heritage experts in the development of IT-applications (e.g. for visitor attractions such as archaeological parks).

4 The State Of The Union: an overview

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4.1 Goals, background, and contexts

The goal of the SOTU survey and the publication of the report form an important part of EPOCH's activities. EPOCH is not a traditional EU-funded project. As a Network of Excellence, its most important deliverable is … networking. This includes a series of reports on different aspects of ICT applications to Cultural Heritage. The first one is the Stakeholders' Needs report. This survey analyses the needs arising from the scientific community addressed by EPOCH's activity and mainly consisting of culture professionals, as those involved in museums, sites, monuments and landscape. Representatives of this community have been interviewed and their opinion collected to define a demand-side contribution to the definition of the Research Agenda. In a similar way, market watch provides an offer-side contribution to it. Here generic technologies are monitored and potential application to Cultural Heritage outlined. Finally, current training opportunities are surveyed and an yearly report on Training Offerings and Needs in Europe (TONE) is produced. These surveys and reports, together with the Network's jointly executed research, and dissemination and training, form EPOCH's contribution. The ultimate goal consists in achieving a high degree of integration among partners, an in stimulating aggregation, fostering adoption of innovative technologies, and reducing the "digital divide" in the heritage community beyond the network borders.

We are aware that our work must have an impact on policies and policy makers to be durable. It is expected that the SOTU report will contribute to this goal, directly or through national stakeholders.

4.2 Cultural Heritage ICT applications and content

As stated in the EPOCH plan of activity, the overall objective of the network is to provide a clear organisational and disciplinary framework for increasing the effectiveness of work at the interface between technology and the cultural heritage of human experience represented in monuments, sites and museums. This framework will necessarily encompass all the various work processes and flows of information from archaeological discovery to education and dissemination. The existence of a framework will allow proposers of new topics for research to be very specific about where the topics will fit into the research spectrum and how they contribute to an integrated vision of the purposes of the research. It will allow identification of where the bottlenecks in the end-to-end process are currently located and this in turn will allow prioritisation of where the research priorities should lie. Plans towards the sustainability of developments will have to be an integral part of proposals.

There have been a substantial number of projects funded to address specific aspects in the application of technology to cultural heritage. In general these have concentrated on techniques with specific application in one area. A major strand in the development of the network has been to define a program of activities which will deliver an integrated infrastructure to support the production of applications to communicate aspects of cultural heritage to different end-user markets (e.g education or tourism). This will require a mixture of integrating existing technologies and plugging some gaps, via a program of jointly executed research. This will bring together the localised results in individual steps of the cultural production pipeline and harmonise those solutions across progressively wider groupings of such steps.

A clear thread through all activities in the network is the requirement to recognise different disciplinary perspectives and the value of cross-disciplinary fertilisation of ideas, skills and understanding. This is reflected in the network's membership, in the structure of its organisation and in the mechanisms for defining priorities within the Joint Program of Activities.

By bringing the disciplines and constituencies into a closer working relationship, the NoE will effect a fundamental, positive change in the state of the art. This will be accomplished through enhanced communication, thereby avoiding situations either in which technologists work on problems for the public cultural sphere that have little practical applicability — or in which cultural heritage specialists re-invent technologies that have been tried and tested elsewhere, and perhaps even found wanting. The network's primary goal will be to encourage all groups to work on problems which have potentially sustainable practical applications in achieving technical objectives, underpinning sustainable businesses and effectively communicating cultural heritage.

Technology has a part in delivering the potential benefits of increased understanding of the forces that have shaped our society, but the way the message is communicated is likely to determine whether the effects are positive or negative. As reported by UNESCO in 2001 "In recent years tourism has become a complex phenomenon of unprecedented proportions, which can be either an opportunity or a threat with regard to culture, depending on how tourism is managed. UNESCO's objective is to help Member States to devise strategies for the long-term preservation of the cultural heritage, for better promotion and knowledge of the cultural heritage among national and international tourists and for constructive intercultural exchanges between the local population and travellers, thereby contributing to economic, social and cultural development." This recognises a clear inter-disciplinary and cross-cultural motivation which is founded in a belief that heritage and cultural tourism has the potential to add to quality of life - a motivation well beyond a simplistic economic return of individual visitor centres.

A part of the sector assessment concerns the measure of the levels of activity of various aspects as part of the market-watch activity. The intention is to identify key factors and pre-conditions in determining the competitiveness and economic efficiency of commercial ventures in the cultural heritage/tourism sector. This includes:

- Gauging the rate of production of new technologically-based exhibits and visitor centres and their success in attracting visitors.
- Measuring the levels of SME and other commercial involvement in cultural heritage and monitoring progress in those measures.
- Modelling the economic impact of cultural heritage tourism and the contribution of technology to that impact.
- Studying market take up trends in similar markets and estimating the current positioning of the sector and likely timescales for achieving sustainable economic impact.

The SOTU report contributes to the definition of the future scenarios:

- By describing the current policies at state or regional level in EU member countries, and analyzing their impact on the evolution and development of ICT applications to CH.
- By describing present practices in different countries, evidencing success (and failure) stories and trying to extrapolate a lesson for similar or comparable situations.
- By pointing out strengths and weaknesses of current approaches, and opportunities and threats to success in this sector, trying to suggest corrections and improvements at a national/regional level.
- By explicitly addressing policy makers on their field, policies and practices, with arguments based on previous experience and verifiable evidence.

4.3 ICT applications to CH and EU funding

EPOCH has collected publicly available information on EU-funded research concerning ICT applications to tangible Cultural Heritage[37]. Such data have been processed to produce statistics and compared with other information obtained from Eurostat[38], UNESCO[39] and other sources, in order to analyze patterns possibly explaining the different participation of member states in EU programmes in the relevant area. The funding EU programmes considered for the statistics are: FP5, FP6, Culture 2000 and EuroMed/Eumedis. The participation statistics gives the following table[40]:

Country	As Leader			As Partner			Total		
	No.	%	% on EU	No.	%	% on EU	No.	%	% on EU
Austria	5	11.4%	11.4%	11	4.0%	4.9%	16	5,1%	6,2%
Belgium	1	2.3%	2.3%	11	4.0%	4.9%	12	3,8%	4,6%
Cyprus	0			3	1.1%	1.3%	3	1,0%	1,2%
Czech Rep	0			4	1.4%	1.8%	4	1,3%	1,5%
Denmark	2	4.5%	4.5%	5	1.8%	2.2%	7	2,2%	2,7%
Estonia	0			3	1.1%	1.3%	3	1,0%	1,2%
Finland	0			4	1.4%	1.8%	4	1,3%	1,5%
France	5	11.4%	11.4%	20	7.2%	8.9%	25	8,0%	9,6%
Germany	5	11.4%	11.4%	24	8.7%	10.7%	29	9,3%	11,2%
Greece	4	9.1%	9.1%	16	5.8%	7.1%	20	6,4%	7,7%
Hungary	0			5	1.8%	2.2%	5	1,6%	1,9%
Ireland	1	2.3%	2.3%	8	2.9%	3.6%	9	2,9%	3,5%
Italy	4	9.1%	9.1%	30	10.9%	13.4%	34	10,9%	13,1%
Latvia	1	2.3%	2.3%	3	1.1%	1.3%	4	1,3%	1,5%
Lithuania	0			3	1.1%	1.3%	3	1,0%	1,2%
Luxembourg	0			1	0.4%	0.4%	1	0,3%	0,4%
Malta	1	2.3%	2.3%	4	1.4%	1.8%	5	1,6%	1,9%
Netherlands	1	2.3%	2.3%	5	1.8%	2.2%	6	1,9%	2,3%
Poland	0			7	2.5%	3.1%	7	2,2%	2,7%
Portugal	1	2.3%	2.3%	4	1.4%	1.8%	5	1,6%	1,9%
Slovakia	0			2	0.7%	0.9%	2	0,6%	0,8%
Slovenia	0			4	1.4%	1.8%	4	1,3%	1,5%
Spain	1	2.3%	2.3%	14	5.1%	6.3%	15	4,8%	5,8%
Sweden	1	2.3%	2.3%	7	2.5%	3.1%	8	2,6%	3,1%
UK	11	25.0%	25.0%	26	9.4%	11.6%	37	11,9%	14,2%
Total EU25	44	100%	100%	219	81.2%	100%	263	83,3%	100%
Bulgaria	0			2	0.7%		2	0,6%	
Croatia	0			2	0.7%		2	0,6%	
Iceland	0			2	0.7%		2	0,6%	
Israel	0			1	0.4%		1	0,3%	
Norway	0			6	2.2%		6	1,9%	
Romania	0			3	1.1%		3	1,0%	
Russia	0			3	1.1%		3	1,0%	
Switzerland	0			8	2.9%		8	2,6%	
Turkey	0			3	1.1%		3	1,0%	
Total Associated	0			30	11.1%		30	9,6%	
Others	0			22	8.0%		22	7.0%	
Total	44			271	100%		315	100%	

Table 1 – Number of partners leading or participating in an EU-funded project, by country

[37] The EU project database may be accessed from the EPOCH web site.

[38] http:// europa.eu.int/comm/eurostat/

[39] http:// www.unesco.org/

[40] The EPOCH project has not been considered in the analysis, because of the very large number of partners that makes it rather unusual and different from other projects with similar scope.

From the above table, it is clear that a relatively small number of countries plays a major role: Italy, UK, Germany, France, Greece, Spain, Belgium and Austria are those which are present with the largest number of partners and which lead most consortia. Countries associated to Framework Programmes play a minor role, with the possible exception of Switzerland and Norway, while no new Member State is the leader of a project – with the exception of Malta that leads the restoration and training Euromed Heritage project IKONOS. Poland and Hungary are the most involved as partners among the New Member States. The Others item comes mainly from Euro-Mediterranean activity or from partners belonging to countries as USA, Japan, etc. sporadically involved in research projects.

Arranging the countries according to the importance of their role gives the following table.

Country	Leader	Country	Partner	Country	Total
	No.		No.		
UK	11	Italy	30	UK	37
France	5	UK	26	Italy	34
Austria	5	Germany	24	Germany	29
Germany	5	France	20	France	25
Greece	4	Greece	16	Greece	20
Italy	4	Spain	14	Austria	16
Denmark	2	Belgium	11	Spain	15
Belgium	1	Austria	11	Belgium	12
Ireland	1	Ireland	8	Ireland	9
Latvia	1	Poland	7	Sweden	8
Malta	1	Sweden	7	Denmark	7
Netherlands	1	Denmark	5	Poland	7
Portugal	1	Hungary	5	Hungary	5
Spain	1	Netherlands	5	Netherlands	6
Sweden	1	Finland	4	Malta	5
Cyprus	0	Malta	4	Finland	4
Czech Rep	0	Portugal	4	Portugal	4
Estonia	0	Slovenia	4	Slovenia	4
Finland	0	Cyprus	3	Cyprus	3
Hungary	0	Czech Rep	3	Czech Rep	3
Lithuania	0	Estonia	3	Estonia	3
Luxembourg	0	Latvia	3	Latvia	3
Poland	0	Lithuania	3	Lithuania	3
Slovakia	0	Slovakia	2	Slovakia	2
Slovenia	0	Luxembourg	1	Luxembourg	1

Table 2 – Ranking of countries according of the number of projects led, or partners involved in EU projects

Table 2 shows that UK largely outnumbers others, leading at least twice as much as any other country. Other large countries[41] as Italy, France, Germany are reasonably represented at the top of the ranking (but Italy benefits of the double count of Minerva and Minerva+), while Spain is significantly below and Austria and Greece, much smaller than the latter, are included in the top group. Also Belgium is in a similar, though less important, position.

Analysing the typology of the lead partner, it results that for UK there are 5 Universities, 2 companies and 4 heritage institutions; Greece has 3 research institutions (mainly FORTH) and one (large) company; German institutions are equally distributed among the types; Austrian ones are half Universities and research centres (Salzburg Research) and half heritage institutions; the Belgian case is a university.

[41] Large here refers to the population: UK, Italy and France have about 60 million inhabitants, Germany more than 80 millions, Spain about 43 millions, while Austria has little more than 8 millions and Greece about 11 millions.

On the contrary, lead partners from Latin countries mainly belong to the "others" category, i.e. consortia, agencies etc. possibly created to circumvent the bureaucracy of public institutions, which however account for two leaders (a University and a heritage institution) in France. In the projects considered for this analysis, no Italian University has dared – or deserved – leading a consortium.

The picture becomes clearer if compared with the results of the Report on Training Offerings and Needs in Europe[42] which shows that the relevant subject is well-considered in UK, hence the vitality of academic institutions as lead proposers and winners. On the other hand, the activity of strong Research Centres as Fraunhofer (DE), Forth (GR) and Salzburg Research (AT) is capable of providing support in the respective countries.

The absence of heritage institutions as leaders in Greece and Italy must be noted as well, opposed to the 4 similar institutions leading winning projects in UK. This perhaps denotes in the two Mediterranean countries a lesser capability of such institutions of keeping the pace with technological advancement.

The situation changes if one considers the partnership. In this case – considering only the 8 countries involved in most of the projects – the distribution is more similar, with a few notable points: in Spain most partners come from the academy, possibly denoting that universities have more international contacts than other institutions, facilitating their involvement in project consortia; German commercial companies are more keen to participate in EU funded research; Italy's and France's mammoth national research institutions (CNR and CNRS, respectively) are as shy as their country-fellow university departments in leading projects, such timidity disappearing when they have to be just partners.

The impact of language – EU projects must be written in English, in practice –is not irrelevant. Since good knowledge of English is of course standard in UK and Ireland, but also in Malta, well spread in Germanic countries (and perhaps in Greece, where many researchers in this field have completed their training in UK) and often a serious concern in Latin countries, grouping accordingly the leading partners gives the following result.

Language group	No. of projects led
English	13
Germanic/Nordic	14
Latin	12
Total	39
Greece	4
Others (Latvia)	1
Total	44

Table 3. Number of projects led, by linguistic group of coordinator

Of course, language is not the only factor, but as shown above it has some influence, as the group of native English speakers gets about 1/3 of the total, good English speakers get another third, and Latin countries get the remainder. This is clearer if compared with population: native English speakers are about 65 million people, German/Nordic ones are about 127 millions and Latin speakers are 178 millions (with Belgium split half and half between the latter two).

As yet, comparisons have been made on the number of institutions involved in projects. However, it is clear that projects have different sizes so it has been attempted to estimate the amount funded in this area per country. Since individual partners' budgets are not available, while it is often available the amount funded for each project, an estimate of individual budgets has been computed assuming that partners have equal budgets with the exception of the coordinator, getting 20% more. We are aware of the fact that this is not true in general, but it keeps into some account the difference between projects worth 100.000 or 2.000.000 Euro.

The result is shown in the following table 4.

[42] EPOCH Report on Training Offerings and Needs in Europe, Budapest, Archaeolingua, 2005.

Country	Estimated value		
	K€	%	% on EU
Austria	3.628	7,7%	8,6%
Belgium	1.718	3,6%	4,1%
Cyprus	170	0,4%	0,4%
Czech Rep	262	0,6%	0,6%
Denmark	628	1,3%	1,5%
Estonia	105	0,2%	0,3%
Finland	327	0,7%	0,8%
France	4.662	9,9%	11,1%
Germany	6.035	12,8%	14,3%
Greece	4.324	9,2%	10,3%
Hungary	300	0,6%	0,7%
Ireland	843	1,8%	2,0%
Italy	6.430	13,6%	15,3%
Latvia	168	0,4%	0,4%
Lithuania	78	0,2%	0,2%
Luxembourg	76	0,2%	0,2%
Malta	575	1,2%	1,4%
Netherlands	566	1,2%	1,3%
Poland	810	1,7%	1,9%
Portugal	660	1,4%	1,6%
Slovakia	121	0,3%	0,3%
Slovenia	203	0,4%	0,5%
Spain	2.078	4,4%	4,9%
Sweden	993	2,1%	2,4%
UK	6.373	13,5%	15,1%
Total EU	42.133	89,2%	100,0%
Bulgaria	54	0,1%	
Croatia	284	0,6%	
Iceland	52	0,1%	
Israel	121	0,3%	
Norway	495	1,0%	
Romania	103	0,2%	
Russia	150	0,3%	
Switzerland	1.237	2,6%	
Turkey	302	0,6%	
Total associated	2.798	5,9%	
Others	2.316	4,9%	
Total	47.246	100,0%	

Table 4 – Overall estimated budget of funded projects, by country

The weight of the countries associated to FP programmes and of the other countries is relatively small, around 10%. The same 8 countries have obviously the largest share, but Greece almost reaches France that has 5 times its population, and Austria has more than half the Germany budget with 1/10 of the population. Italy and UK tie at the top.

To have a better insight into possible explanations of the above distribution, we considered some socio-economic indicators for each country, that is Population, Internet diffusion (estimated number of users)[43], Government estimated expenditure in University research[44], and as index of cultural "importance", the number of World Heritage sites present in each country.

[43] Source: http://www.internetworldstats.com/

[44] Source: Eurostat

Country	Leader			Partner			Estimated value			WH sites			Population	Internet Users	Growth 2000-2005	%Users		Gov. Inv. M€	Value (€) per	
	No.	%	% on EU	No.	%	% on EU	€ x 1000	%	% on EU	No.	%	% on EU				on Pop.	on EU		inh.	site
Austria	5	11,4%	11,4%	11	4,0%	4,9%	3.628	7,7%	8,6%	8	2,5%	3,0%	8.163.782	4.630.000	120,5%	56,7%	2,1%	791	394	401.920
Belgium	1	2,3%	2,3%	11	4,0%	4,9%	1.718	3,6%	4,1%	8	2,5%	3,0%	10.443.012	5.100.000	155,0%	48,8%	2,4%	254	164	214.700
Cyprus	0			3	1,1%	1,3%	170	0,4%	0,4%	3	0,9%	1,1%	950.947	250.000	108,3%	26,3%	0,1%	…	179	56.627
Czech Rep	0			4	1,4%	1,8%	262	0,6%	0,6%	12	3,8%	4,5%	10.230.271	3.530.000	253,0%	34,5%	1,6%	175	15	12.650
Denmark	2	4,5%	4,5%	5	1,8%	2,2%	628	1,3%	1,5%	3	0,9%	1,1%	5.411.596	3.720.000	90,8%	68,7%	1,7%	351	116	209.403
Estonia	0			3	1,1%	1,3%	105	0,2%	0,3%	1	0,3%	0,4%	1.344.840	621.000	69,4%	46,2%	0,3%	…	78	105.453
Finland	0			4	1,4%	1,8%	327	0,7%	0,8%	5	1,6%	1,9%	5.246.920	3.260.000	69,2%	62,1%	1,5%	290	62	65.346
France	5	11,4%	11,4%	20	7,2%	8,9%	4.662	9,9%	11,1%	27	8,5%	10,1%	60.293.927	24.848.009	192,3%	41,2%	11,5%	2875	77	172.657
Germany	5	11,4%	11,4%	24	8,7%	10,7%	6.035	12,8%	14,3%	30	9,4%	11,2%	82.726.188	46.312.662	93,0%	56,0%	21,5%	5417	68	187.431
Greece	4	9,1%	9,1%	16	5,8%	7,1%	4.324	9,2%	10,3%	16	5,0%	6,0%	11.212.468	3.800.000	280,0%	33,9%	1,8%	220	386	270.242
Hungary	0	0,0%	0,0%	5	1,8%	2,2%	300	0,6%	0,7%	8	2,5%	3,0%	10.083.477	3.050.000	326,6%	30,2%	1,4%	…	30	37.473
Ireland	1	2,3%	2,3%	8	2,9%	3,6%	843	1,8%	2,0%	2	0,6%	0,7%	4.027.303	2.060.000	162,8%	51,2%	1,0%	65	209	421.596
Italy	4	9,1%	9,1%	30	10,9%	13,4%	6.430	13,6%	15,3%	34	10,7%	12,7%	58.608.565	28.610.000	116,7%	48,8%	13,3%	3642	107	183.598
Latvia	1	2,3%	2,3%	3	1,1%	1,3%	168	0,4%	0,4%	1	0,3%	0,4%	2.306.489	936.000	524,0%	40,6%	0,4%	…	73	167.749
Lithuania	0			3	1,1%	1,3%	78	0,2%	0,2%	3	0,9%	1,1%	3.430.836	695.000	208,9%	20,3%	0,3%	…	23	25.931
Luxembourg	0			1	0,4%	0,4%	76	0,2%	0,2%	1	0,3%	0,4%	455.581	170.000	70,0%	37,3%	0,1%	…	166	75.758
Malta	1	2,3%	2,3%	4	1,4%	1,8%	575	1,2%	1,4%	3	0,9%	1,1%	384.594	120.000	200%	31,2%	0,1%	…	1496	191.771
Netherlands	1	2,3%	2,3%	5	1,8%	2,2%	566	1,2%	1,3%	7	2,2%	2,6%	16.316.019	10.806.328	177,1%	66,2%	5,0%	1370	35	80.900
Poland	0			7	2,5%	3,1%	810	1,7%	1,9%	10	3,1%	3,7%	38.133.891	10.600.000	278,6%	27,8%	4,9%	…	21	80.953
Portugal	1	2,3%	2,3%	4	1,4%	1,8%	660	1,4%	1,6%	12	3,8%	4,5%	10.463.170	3.600.000	44,0%	34,4%	1,7%	318	63	54.988
Slovakia	0			2	0,7%	0,9%	121	0,3%	0,3%	4	1,3%	1,5%	5.379.455	1.820.000	180,0%	33,8%	0,8%	26	22	30.241
Slovenia	0			4	1,4%	1,8%	203	0,4%	0,5%	0			1.956.916	800.000	166,7%	40,9%	0,4%	6	104	NA
Spain	1	2,3%	2,3%	14	5,1%	6,3%	2.078	4,4%	4,9%	34	10,7%	12,7%	43.435.136	14.590.180	170,8%	33,6%	6,8%	1383	48	61.130
Sweden	1	2,3%	2,3%	7	2,5%	3,1%	993	2,1%	2,4%	11	3,4%	4,1%	9.043.990	6.656.716	64,4%	73,6%	3,1%	797	110	90.309
UK	11	25,0%	25,0%	26	9,4%	11,6%	6.373	13,5%	15,1%	24	7,5%	9,0%	59.889.407	35.179.141	128,4%	58,7%	16,3%	1935	106	265.560
Total EU	44	100%	100%	224	81,2%	100%	42.133	89,2%	100%	267	83,7%	100%	459.528.780	215.765.036	131,6%	46,9%	100%		89	153.597
Bulgaria	0			2	0,7%		54	0,1%		7	2,2%		7.521.066	1.545.100	259,3%	20,5%			7	7.657
Croatia	0			2	0,7%		284	0,6%		5	1,6%		4.459.137	2.318.240	1059,1%	52,0%			64	56.799
Iceland	0			2	0,7%		52	0,1%		0			294.947	195.000	16,1%	66,1%			176	NA
Israel	0			1	0,4%		121	0,3%		4	1,3%		6.986.639	3.040.000	139,4%	43,5%			17	30.190
Norway	0			6	2,2%		495	1,0%		5	1,6%		4.600.644	3.140.000	42,7%	68,3%			108	99.023
Romania	0			3	1,1%		103	0,2%		12	3,8%		21.377.426	4.000.000	400,0%	18,7%			5	8.597
Russia	0			3	1,1%		150	0,3%		6	1,9%		144.003.901	22.300.000	619,4%	15,5%			1	25.028
Switzerland	0			8	2,9%		1.237	2,6%		4	1,3%		7.452.101	4.688.775	119,7%	62,9%			166	309.220
Turkey	0			3	1,1%		302	0,6%		9	2,8%		73.598.181	6.000.000	200,0%	8,2%			4	33.552
Total assoc.	0	0,0%		30	10,9%		2.798	5,9%		52	16,3%		270.294.042	47.227.115		17,5%			10	53.798
Others	0			22	8,0%		2.316	4,9%												
Total	44	100%		276	100%		47.246	100%		319	100%									

Table 5. Values of some indicators in EU and FP6 countries

Rank	Country	As leader (No. of projects)	Country	As partner (No. of projects)	Country	Est. total project value € x 1000	Country	WH sites	Country	Population (millions)	Country	% Internet users on pop.	Country	Govmt. Invest. per 1000 inhab.	Country	EU Funding.per 1000 inhab.	Country	EU Funding per WH site
1	UK	11	IT	30	IT	6.430	IT	34	DE	83	SE	73,6%	AT	96 925	MT	1496	IE	421.596
2	FR	5	UK	26	UK	6.373	ES	34	FR	60	DK	68,7%	SE	88 084	AT	394	AU	401.920
3	AT	5	DE	24	DE	6.035	DE	30	UK	60	NL	66,2%	NL	83 992	GR	386	GR	270.242
4	DE	5	FR	20	FR	4.662	FR	27	IT	59	FI	62,1%	DE	65 487	IE	209	UK	265.560
5	GR	4	GR	16	GR	4.324	UK	24	ES	43	UK	58,7%	DK	64 786	CY	179	BE	214.700
6	IT	4	ES	14	AT	3.628	GR	16	PO	38	AU	56,7%	IT	62 147	LU	166	DK	209.403
7	DK	2	BE	11	ES	2.078	CZ	12	NL	16	DE	56,0%	FI	55 210	BE	164	MT	191.771
8	BE	1	AT	11	BE	1.718	PT	12	GR	11	IE	51,2%	FR	47 684	DK	116	DE	187.431
9	IE	1	IE	8	SE	993	SE	11	PT	10	BE	48,8%	UK	32 317	SE	110	IT	183.598
10	LV	1	PO	7	IE	843	PO	10	BE	10	IT	48,8%	ES	31 832	IT	107	FR	172.657
11	NL	1	SE	7	PO	810	AT	8	CZ	10	EE	46,2%	PT	30 377	UK	106	LV	167.749
12	PT	1	DK	5	PT	660	BE	8	HU	10	FR	41,2%	BE	24 295	SI	104	EE	105.453
13	ES	1	HU	5	DK	628	HU	8	SE	9	SI	40,9%	GR	19 586	EE	78	SE	90.309
14	MT	1	NL	5	MT	575	NL	7	AT	8	LV	40,6%	CZ	17 105	FR	77	PO	80.953
15	SE	1	FI	4	NL	566	FI	5	DK	5	LU	37,3%	IE	16 217	LV	73	NL	80.900
16	CY	0	MT	4	FI	327	SK	4	SK	5	CZ	34,5%	SK	4 845	DE	68	LU	75.758
17	CZ	0	PT	4	HU	300	CY	3	FI	5	PT	34,4%	SI	3 049	PT	63	FI	65.346
18	EE	0	SI	4	CZ	262	DK	3	IE	4	GR	33,9%	CY	…	FI	62	ES	61.130
19	FI	0	CZ	4	SI	203	LT	3	LT	3	SK	33,8%	EE	…	ES	48	CY	56.627
20	HU	0	CY	3	CY	170	MT	3	LV	2	ES	33,6%	HU	…	NL	35	PT	54.988
21	LT	0	EE	3	LV	168	IE	2	SI	2	MT	31,2%	LV	…	HU	30	HU	37.473
22	LU	0	LV	3	SK	121	EE	1	EE	1	HU	30,2%	LT	…	LT	23	SK	30.241
23	PO	0	LT	3	EE	105	LV	1	CY	1	PO	27,8%	LU	…	SK	22	LT	25.931
24	SK	0	SK	2	LT	78	LU	1	MT	<1	CY	26,3%	MT	…	PO	21	CZ	12.650
25	SI	0	LU	1	LU	76	SI	0	LU	<1	LT	20,3%	PO	…	CZ	15	SI	NA

Table 6. Ranking of EU countries according to different indicators (potential outliers in italics)

The coefficients used for ranking in table 6 are the following: number of projects where an institution of the country is the leader; number of projects where an institution of the country is a partner; number of UNESCO World Heritage sites; Internet penetration as percentage of the population with Internet access; EU funding, per 1000 inhabitants (Euro); and EU funding, per World Heritage site.

Although some coefficients are a very rough indicator due to lack of more detailed data, table 6 is interesting to try matching activity in EU funded research with other socio-economic or cultural conditions.

It is immediate that recent membership is a disadvantage in securing funds. All New Member States rank very low. This may be due to little familiarity with the mechanism of funding or, more likely, to the lack of policies and the gaps in research in these countries.

There is an apparent correlation between the share of EU funding in terms of number of partnerships going to individual countries and their "cultural" ranking as measured by the WH indicator, with two exceptions, one in the negative (Spain) and one in the positive (UK). This is no more true if the value of such projects is considered: site-rich countries, as Italy, France or Germany, rank closer to the average value of 160.000 Euro than other countries with a more limited presence of such sites. To complete the analysis, other factors should be included, as museums, collections, visitors, and so on, an extension perhaps to be considered for future SOTU reports.

Another result of the comparison is that the diffusion of digital culture – expressed here by the percentage of penetration, i.e. the percentage of Internet users over the population – appears in some cases to positively correlate with leadership, or in general to compensate other success factors. A possible explanation may be that Internet use is the ultimate result of governmental policies, awareness of the population, acceptance of technology, advancement in technological development, and so on, all features that create favourable conditions for pushing the adoption of technologies even in a traditional field as Cultural Heritage.

Apart from possible outliers as Malta, Luxembourg and Cyprus – and perhaps also Ireland – where the small figure for population may amplify the effect of errors in the estimate of the project budgets, there appears to be a small group of EU countries formed by Austria and Greece at top and then Belgium, Sweden and Denmark, gathering more funding than others compared to their size. A similar grouping is formed when referring to EU funding compared with the presence of Heritage (measured, as above, by the number of WH sites): Austria and Greece (with Ireland, which could be an outlier also in this case for the small number of WH sites) again rank at top. The lesson following from this interpretation is that "Small is good" and "You do not need to have too many ruins to exploit them well."

Figures for government investment in university research are given here just for reference because disaggregated data are unavailable and there is no indication of the part of funding allocated to ICT applications to Cultural Heritage (rather small, probably). Although investment policies in research, i.e. where money goes, should be roughly similar in EU countries, previous analysis has shown that this could be false as far as ICT applications to Cultural Heritage are concerned. It would be strange, indeed, that a country invests in research in a field which receives little attention for training. Since the survey on training in this field has shown substantial differences among European countries, it might be expected that similar differences exist also in research: in other words, where ICT applications to CH are appreciated and taught, one would imagine that the same happens for research in the same field, and where such applications are almost ignored in teaching, research in the field should suffer from a similar lack of interest. Validating such reasonable conjecture is probably beyond the scope of the present report, and certainly beyond the goals of its first issue. Understanding the allocation of funding to different disciplinary area could perhaps explain the success of Greece and Belgium, where pro-capita investment is lower than the average EU25 value of 43,3 Euro/inhabitant, and the apparent failure of some Northern countries, whose investment Is high but perhaps interest in CH low. It could also explain why UK and Spain that have similar values show so different results. In conclusion, the existence of any positive correlation between national investment

policies in research and success in securing EU funding is an hypothesis that needs more detailed data to be validated or rejected.

It is difficult to draw overall conclusions from such a preliminary analysis without incurring in oversimplification. Categorizing by country may lead to incorrect generalization. With this proviso, a grouping of countries may be attempted according to the above data, to be compared with the subjective description of the situation of each country as it derives from the national reports that follow.

1. UK is the undisputed leader in this area. UK institutions lead most projects, have the highest presence in consortia (37) and collect the highest amount of funds, here tying with Italy. The ratio leadership to partnership is 1 to 3,4. This, though they have less WH sites than other countries (but perhaps a more global indicator accounting also for museums and "cultural activity" would change the ranking) and their universities receive less support from the government then elsewhere. Numbers do not offer an explanation, but apart from trivial considerations about the language, there is something in the UK report that hints to a possible reason. Better, it is something missing: the respondent could not describe practices in the field "for the huge number of projects, products and related info." It seems that a strong national background is the key to success also to an European level.
2. Italy ranks first as number of presences at partner level in consortia, and collects the highest amount of funds, but ranks rather low, as already noted, when leadership is considered with a ratio very close to 1 to 9. Italian institutions seem to prefer piggybacks on projects led by others. Problems with English? Timidity? Mediterranean laziness? Lack of ideas? Limited expertise to offer in projects? All these reasons may have some influence. A likely explanation is that the partnership count results from a mix of followers, sometimes just sherpas of cultural content, and innovators, as shown by the number of institutions that are partner in more than one project, about 60% of the academic, heritage and institutional ones. Possibly the latter have little confidence in their talent as leaders and in the capability of their administrative structure to manage the reporting and accounting tasks. This lack of self-confidence, or limited leadership capability, is a likely consequence of the discomforting picture outlined by the Italian respondent and confirmed by other sources. Nonetheless, the contrast between such representation and the above quoted results concerning EU-funded research is astonishin,g and will push towards a more detailed analysis of the Italian situation.
3. The situation of France and Germany is similar, but more equilibrated than the Italian one, as their ratio leadership to partnership is 1 to 5 or 1 to 6. France collects much less in terms of budget, but she is "smaller" than Germany. This is also reflected by the partnership composition: a prevalence of heritage institutions in France (1/3 of the total) while in Germany more commercial companies are involved. French partners receive an average of 186.000 Euro while German ones receive 208.000 in the average, a possible confirmation that they bring in more technology, while French partners belong in larger part to the content provider category, and enter into smaller projects.
4. Two smaller countries, Austria and Greece rank better than one would expect. Their leadership to partnership ratio is respectively 1 to 3.1 (close to the UK value) for Austria and 1 to 5 for Greece. Also the average budget is high. There may be different reasons for success in these two countries but in both cases according to respondents there have been agencies and funded programmes for technology that have supported projects in the relevant field with dedicated calls (as is the case of Greece) and the eFit Austria initiative. These cases show that in eCulture investment pays back well.
5. Belgium ranks well with regard to her size, but is more on the "passive" side with a leadership ratio of 1 to 12, even worse than Italy. A case to be further investigated, since the report presented here is barely essential.
6. Nordic countries and the Netherlands have a poor score compared to their technological level. The average budget of their partners is well below the average. Compared to Austria, the population of the Netherlands is twice as much, government expenditure is comparable, the number of WH sites is similar, but funding is one seventh. From the two reports

published in this issue, concerning Finland and the Netherlands, it seems that there is a lack of public interest in these applications that are left to individual initiative. Lack of competence among heritage professionals and consequent outsourcing of ICT in heritage institutions is denounced by the Dutch respondent as a serious weakness factor. Here "for the very large programmes, Cultural Heritage has to compete with other sectors", we can imagine how successfully. In Finland, de-centralization of initiatives perhaps causes a similar lack of momentum. Notwithstanding the favourable technological framework and the high level of government investment for research, this group looks as the negative of Austria and Greece.

7. Spain and Portugal share a same destiny, proportionate to their size. Although Spain has indicators similar to Italian ones with regard to number of WH sites and population, and Portugal equals or beats Austria, Spain gets 1/3 of Italy and Portugal 1/3 of Austria in terms of number of presences, a value that collapses to less than 1/5 in terms of funding. Concerning the cause, the comment of the Portuguese respondent are illuminating: "[In Portugal] there does not seem to be a policy for actually increasing the use of new technologies in disseminating information and access to cultural assets. Where this is happening it is mostly due to the actions of a few enlightened institutional directors." It is very likely that the survey on Spain, due for the next issue of SOTU, will report a similar situation.
8. New member states, and candidate countries. The involvement is nominal and with very low budget (never more than 60.000 Euro per partner, in the average, and sometimes much less) for Eastern European countries. Possibly here there are more urgent priorities postponing national policies for ICT applications to CH, but Europe should take appropriate measures to avoid that the gap widens. The impact may be substantial, as pointed out by the Romanian respondent: "A Romanian museum involved in a European co-operation will never be the same". The report from Poland shows the presence of some embryonic policy for digitization of cultural assets that deserves support as well. Malta and Cyprus somehow differ from this pattern: Malta is rather active when compared to her small dimension. Cyprus has a peculiar situation (see the box in the Cyprus report) making her unique in the European framework.
9. Associate countries. The situation here is what one would expect, with Norway in the average Nordic condition and Switzerland in a position similar to Belgium. Small and remote Iceland has a nominal presence, and probably does not complain too much. The position of Israel is much poorer than her technological level and rich cultural heritage would suggest. It is very likely that this is due to political factors. Israel does not participate in Culture2000 and is in practice excluded from EuroMediterranean projects, where the presence of an Israeli partner undermines the creation of a consortium for the adverse reaction of many Arab countries. Whether the practical absence from FP5 and FP6 projects is the result of discrimination, is something that numbers don't tell and is difficult to prove. In any case, it goes beyond the scope of this survey.

4.4 Results of the EPOCH 2004/2005 survey

The following sections provide summaries on important issues addressed by the national correspondents of the countries covered by the 2004/2005 survey. Concentrating on several key requirements in the application of ICT to tangible heritage, they include, for example, missing or inconsistent frameworks, funding mechanisms that are seen to be not effective enough, necessary improvements in professional training and other issues in the achieving a higher level of uptake and use of ICT in the cultural heritage domains of monuments, archaeological sites, and museums.

4.4.1 Policies / institutional frameworks

There are national policies and funding programmes stimulated by the eEurope Action Plan, some of which also include an "e-culture" branch (e.g. the eFit Austria programme and the ePolska Polish programme; both include provisions for cultural assets). However, overall operational programmes of activities targeted to culture are missing in most cases, or, where present, lack implementation or fail for other reasons (see the Portugal report). It seems that awareness of the national implications of the eEurope Action Plan seldom includes eCulture.

Long-term sustainability is a major concern. Even when funding programs exist, they limit their action to short-term results (even in best conditions: see the report on UK). Long-term planning is in general lacking. Many respondents complain that products are abandoned to their destiny when projects end.

Sometimes, management of resources is decentralized. In most of these cases, there is a diffused lack of coordination and little or no re-use of results achieved elsewhere in the same country or in contiguous – and often very similar – regions (this is the case of Italy, for instance).

With respect to the area of digitisation, the Minerva project has been instrumental to further stimulate activities related to digital cultural heritage, particularly through starting benchmarking activities and results, spreading best practice guidelines, etc. While Minerva's focus has been on digitisation in the sense of creating digital collections of heritage resources (i.e. digital surrogates), also the Minerva activities concerning Web-based access have been considerable. Similar results for steps following digitisation, as management, enrichment and communication of cultural content, are in general lacking, or not endorsed by policy makers at the same level as Minerva.

All respondents advocate an improvement of training, especially as far as professionals are concerned (vocational/recurrent training).

The relationship with industry is often absent from national policies, which in most cases concern mainly the public sector. SMEs support is advocated from the Greek respondent, while deployment of industrial products from funded prototypes is a concern for the French one.

The difficulty of cross-fertilization and the issue of the "two cultures" is generally acknowledged as a problem by most reports, among others by the Finnish respondent. Sometimes this is extended to new generations, seen as the privileged beneficiary of the introduction of technology in the cultural context. The Dutch respondent stresses the importance of archival resources to secure interpretability of objects. Fostering collaboration with archivists.

Specific issues concerning individual countries sound very critical:

"The budget on programmes and projects was more a desire than a reality. Until now there were no transparent criteria for projects selection, no independent commission and no guarantee

that the officially selected projects will be financed in the end, or not. The new [Romanian] Minister of Culture want to increase [competition and transparency]. We have to wait and see."

"The current poor state of the Portuguese economy is reflected by the fact that projects that have been approved are often in financial difficulties due to the late payment of instalments: a situation which is, however, not unknown as far as European projects are concerned. Also it is not uncommon for approved projects submitted under competitive terms to be financed at less than the level of funding that has been indicated in the information for applicants."

This is also very well represented by the UK respondent.

William Kilbride, ADS

Perceived needs

The pressing need for Intelligent Heritage in the United Kingdom is sustainability. This multi-facetted problem surfaces in a variety of different ways, and strains our technical, organisational and managerial competence. It touches on all aspects of policy, funding, technology, research and training.

Most heritage work in the UK is undertaken with project funding. Such funding is inherently unstable. Few projects are able to attract the additional long term funding necessary to turn them into services, and many are wound up just at the point where the resource created is at its optimum.

This is bad news for the staff that cycle between projects in order to ensure their careers. Staff are not encouraged to develop detailed expertise since the next project may require a different set of skills, and there is little incentive in seeking specialist training. It can mean disruption to personal lives, problems buying houses, and difficulties acquiring pensions. There is no identifiable career structure, no identifiable progression along it and no job security.

From the perspective of the employers this means that there is little incentive in developing staff since the skills they learn are not likely to be required in future work and that they are likely to move on before that point. Indeed, many projects suffer from problems recruiting short-term staff, and staff leaving before the end of a project in order that they can ensure their medium term employment. Other expensive resources are similarly under-exploited: equipment and software may be essential for one project but be redundant thereafter.

From the perspective of the technology this also means that very large numbers of heritage projects become obsolete within weeks of their completion. There is little incentive for agencies to identify long-term benefits or to plan for the curation of the digital objects they create. In the short term this leads to replication of investment, as we repeatedly digitise the same objects over and over, having failed to look after the original. This has the consequence of reducing the impact of investment and prevents us from progressing beyond familiar favourites. This lack of long term planning creates a compelling long-term case against investment in intelligent heritage. Digital heritage should be seen as part of the culture heritage being protected and presented.

4.4.2 Best practices: Lack of critical analysis and knowledge transfer

Lack of critical analysis, important e.g. for defining and communicating best practice, is one of the weaknesses described among others by the UK and Italian reports.

A first step in such analysis is knowledge. Poor dissemination of national projects and their results is a common complaint, from which neither better situations (e.g. Austria) are free. All respondents have met difficulties in collecting the data to answer to the survey. With few exceptions, no one-stop source is available on these topics – and often there is no source at all.

4.4.3 Professional training in CH ICT

In the reports there are many statements on training needs.

Several respondents comment negatively on the situation of university training in their home country. They suggest that future archaeologists, and heritage professionals in general, will need better computer skills, and specialization in the ICT area may open new scenarios and job opportunities.

All respondents agree that present training is insufficient and in particular they point out the need of updating the skills of heritage professionals and personnel of heritage institutions. The Dutch respondent states: "It is often seen that the skills of the professionals are less developed than that of the users (non-professionals) from "outside"." He also points out another aspect related to the lack of computer skills among culture professionals: "A serious problem is the management of ICT-facilities. Daily management is mostly "sourced out". ICT is usually not seen as belonging to the core business of the heritage sector."

4.4.4 CH Competence Centres / the situation of smaller institutions

Some respondents suggest to establish regional service centres in CH ICT to serve the needs of smaller institutions that cannot afford costly consultants, for instance the Austrian and the Dutch one. The latter points out the dependence on external providers created by outsourcing It services: "[In public Dutch cultural institutions] daily ICT management is mostly outsourced […] this leads to a total dependence on the whims of the private company that is interested, besides to making a sound profit, in keeping the burden of the management as stable and consequently as low key as possible. […] It would be ridiculous to suggest to […laboratory…] scientists to send their laboratory personnel home, and hire fresh "greenhorns" from somewhere outside the institute. But this is exactly what has happened in the heritage sector…"

5 Country Reports

5.1 AUSTRIA

Guntram Geser, Salzburg Research - eCulture Group

POLICIES

Institutional framework

In Austria, the responsibility for defining the supportive framework for the application of information and communication technology (ICT) to tangible cultural heritage is divided between the Austrian federal government and the regional authorities of the Bundesländer (that have cultural sovereignty); and between the different ministries and national agencies.[1] Furthermore, in the last few years the large cultural heritage institutions formerly under direct responsibility of the Federal Ministry for Education, Science and Culture have been accorded far-reaching autonomy. In particular, the federal museums with the passing of the Federal Museums Act of 1998/2002 were recognised as scientific institutions under public law that have full legal capacity (also the Austrian National Library attained this legal status in 2002). However, the federal museums are still under the authority of, and receive basic grants from, the Federal Ministry for Education, Science and Culture.

The main institution responsible for monuments, historic ensembles and archaeological sites is the Austrian Federal Office for the Care of Monuments (Bundesdenkmalamt), which is also under the authority of the Federal Ministry for Education, Science and Culture. Based on an amendment to the Monument Preservation Act (§2a Denkmalschutzgesetz, DMSG-Novelle 1999, BGBl. I Nr 170/1999), the Office is charged with the responsibility by the end of 2009 to identify and document all relevant objects fully or mainly owned by the Republic of Austria, its member states (Bundesländer), public administrative bodies, institutions or foundations as well as churches or religious communities recognised by law. If a monument or other cultural heritage object is regarded to be of public interest, the Office will issue a decree on its (provisional) protection by law. The information gathered in this project is being aggregated in a central database which is planned to become publicly accessible in 2009.

The main body in charge of digital cultural heritage policies is the Federal Ministry for Education, Science and Culture. A core political reference point of, and framework for, the activities of the ministry (and other Austrian ministries) is the eEurope Action Plan. To realize the goals set by the eEurope Action Plan towards 2010, the ministry has established the eFit Austria programme which specifies focus areas and targets, and provides funding opportunities for projects in eEducation and eTraining, eScience and eCulture (for further information on the area eCulture see the section on funding below).

Furthermore, following the ministry's commitment to participate in the realisation of the Lund Principles and Action Plan, it launched the Austrian Initiative for Digital Cultural Heritage in November 2003. The role of this project, which was coordinated by Salzburg Research, was to carry out on the national level many of the activities recommended by the Lund Principles and

[1] For a detailed description of this division of responsibility see the Austrian „Cultural Policy Profile" in the "Compendium of Cultural Policies and Trends in Europe, 6th Edition", Council of Europe/ERICarts, 2005, http://www.culturalpolicies.net (section: Download).

Action Plan (detailed information on this project is available from the website http://www.digital-heritage.at, or see the short description provided in the section on projects below).

In response to a recommendation of the Austrian Council for Research and Technology Development, in autumn 2004 the Federal Ministry for Education, Science and Culture also commissioned a feasibility study on the systematic registration and preservation of Austria's scientific and cultural heritage. The primary objective of this study is to provide recommendations concerning a thematic, organisational and financial (medium to long-term) strategy to secure the accessibility of cultural and scientific heritage resources. The study is conducted by the private company UMA technologies (Vienna) and will mainly be based on interviews with a broad sample of stakeholders. The results should become available in autumn 2005.

URLs:

Austrian Council for Research and Technology Development, http://www.rat-fte.at/en.php
Austrian Digital Cultural Heritage Initiative, http://www.digital-heritage.at
Austrian Federal Ministry for Education, Science and Culture, http://www.bmbwk.gv.at
Austrian Federal Office for the Care of Monuments (Bundesdenkmalamt), http://www.bda.at
eEurope Action Plan, http://europa.eu.int/information_society/eeurope/2005/index_en.htm
eFit Austria / eCulture: http://www.efit.at/english/eculture
Lund Principles and Action Plan, http://www.cordis.lu/ist/directorate_e/digicult/lund-principles.htm
Salzburg Research, http://www.salzburgresearch.at
UMA technologies, http://www.uma.at/kulturerbe/

Statistical information on monuments, archaeological sites, and museums

According to the cultural statistics of the STATISTIK AUSTRIA as of end 2003, of an estimated number of 60,000 objects that fall under the Monument Preservation Act 1999, 15,348 objects were protected by decree (257 more than in 2002). Of which, 11,287 were secular buildings such as castles, town houses, farmhouses, mills, etc. 1,257 were ecclesiastic buildings and other objects (e.g. chapels, presbyteries, monasteries, etc.), and 2,257 were archaeological areas and objects. Of the latter, most were situated in Lower Austria (1,096) and Styria (451). The statistics also show that in recent years only few archaeological objects have been added to the record of protected cultural heritage objects. While in the five years 1996-2000 485 objects joined the list of protected objects, in the three years 2001-2003 only 34 objects were added.

A survey conducted by STATISTIK AUSTRIA in the second half of 2004 provides in-depth information on museums and other institutions that exhibit cultural heritage objects. For the year 2003, the survey (starting with about 1,800 addresses) identified 389 organisations that according to UNESCO and ICOM criteria can be classified as museums. These 189 public and 200 private organisations had 478 venues and sites for exhibition and other museum related activities. Another 474 organisations were classified as related institutions including zoological and botanical gardens, castles and palaces, ecclesiastic buildings, mines, etc. In the category historical and archaeological museum and related institutions 97 organisations were identified.

The survey also provides detailed comparative information on numbers of visitors (incl. a list of the most visited public and private institutions), opening period (all year, seasonal/days), income, staff and publications. Of particular interest to EPOCH will be the information on available computers in, and websites of, historical and archaeological museums. Of the 49 museums in this category (figures for "related institutions" are not provided) 11 did not have a computer. 37 museums had one or more computers, which were used for administrative purposes (26 museums), internet access (25), and collection management (19). 23 museums also had computers in place for visitor information. 44 of the 49 museums had a web presence through their own website (32) or/and on another website (13).

URLs:
Statistik Austria - Kulturstatistik 2003:
Tabellen-Übersicht: http://www.statistik.at/fachbereich_03/kultur_txt0_03.shtml
Baukulturelles Erbe, http://www.statistik.at/fachbereich_03/03_02_Baukulterbe.pdf
Museen und Ausstellungen, http://www.statistik.at/fachbereich_03/03_01_Museen.pdf

FUNDING

European funding programmes

Over the last years, European programmes have been a significant source of funding in the development of digital heritage applications and content in Austria.

5th and 6th Framework Programmes of Research and Technological Development (FP5, FP6)

In FP5, IST priority/strategic objective: Cultural heritage applications, Austrian research centres and heritage organisations participated in 21 of the total 92 research and other projects carried out in the period 1998-2002. The projects with Austrian participation concentrated on thematic areas such as technology monitoring (DIGICULT FORUM), cultural e-business services (OPENHERITAGE, REGNET), 3D modelling and visualisation, mixed reality, advanced real-time systems (3D-MURALE, ART-E-FACT, ARTIST), preservation and restoration of audio-visual material (AMICITIA, PRESTO), distributed virtual archives (COVAX), authority files (LEAF), automatic meta-data generation (META-E), interoperability of large heterogeneous databases (I-MASS). Undoubtedly, cultural heritage was one of the focal points for Austrian participation in FP5.

In FP6, IST priority/strategic objective: Access to and preservation of cultural and scientific resources, due to the change in funding mechanisms and instruments (which now favour fewer, but large-scale and longer-term projects), participation of Austrian organisations has somewhat dropped. As of April 2005, Austrian research centres and heritage institutions partake in the integrated projects BRICKS and PRESTOSPACE, the networks of excellence DELOS and EPOCH as well as in the co-ordination actions CALIMERA and MINERVA-PLUS. Some further participation may result from the 5th call for project proposals in this strategic objective which will be issued in June 2005.

Other European funding programmes

Other European funding programmes that played a role in promoting the use of digital technologies, provided opportunities for ICT training, and allowed for the creation of some digital content have been:

LEADER+: http://www.leader-austria.at/network/projects; several projects in the area of local museums, cultural landscapes & pathways, and world heritage sites;

INTERREG IIIA-C: http://www.interreg.at; e.g. the reconstruction of a Celtic settlement at the archaeological site Uttendorf/Pinzgau, http://www.uttendorf.at (see section: Archäologie).

Culture 2000: e.g. the project Cathedral.IT, http://www.dombauwien.at/cit/

National funding programmes

Funding of digitisation projects: Federal Ministry for Education, Science and Culture

In response to the eEurope Action Plan, the Ministry has established the eFit Austria initiative which alongside supporting ICT projects in the areas of science, education and training also funds e-culture projects. Actually, for the area of digital cultural and scientific heritage eFit Austria currently constitutes the only formally established funding programme.

The major e-culture projects funded thus far under eFit Austria concentrate on the digitisation of selected collections of the large national institutions: Albertina, Kunsthistorisches Museum, Österreichische Galerie Belvedere and Österreichische Nationalbibliothek, all located in Vienna. In addition, there are some projects concentrating on digital archives of other renowned institutions such as the Wiener Secession and the Wiener Konzerthausgesellschaft as well as a couple of smaller projects in various areas such as monasterial records, folk music or the literary estate of Thomas Bernhard. Yet, to date the list of projects funded under the eFit/eCulture programme does not include a project with direct relevance to the cultural heritage domains monuments, archaeological or other cultural heritage sites.

URL: eFit Austria/eCulture, http://www.efit.at/english/eculture/

FIT-IT: Federal Ministry of Transport, Innovation and Technology

The Federal Ministry of Transport, Innovation and Technology funds industry-related research, technology development and innovation measures. In particular, it is responsible for defining priority areas of national research programmes. For example, the ministry has initiated the national programme FIT-IT for some of the strategic objectives defined within the IST priority of the EU Framework Programmes of RTD, thus setting off national counterparts in areas such as embedded systems and semantic systems. Yet, so far no such counterpart has been established for digital heritage technologies.

However, in recognition of the successful participation of Austrian research organisations in FP5 and the first phase of FP6 in the area of digital heritage, the ministry (Unit RTD for Information Technology), has sponsored the International Workshop “eCulture - European Cultural Heritage: RTD Challenges Ahead” that was held on 28 May 2004 in Graz, Austria (the presentations of this workshop are available at http://www.joanneum.at/eculture/).

URL: FIT-IT programme, http://www.fit-it.at

Competence Centres in RTD: Federal Ministry of Transport, Innovation and Technology / Federal Ministry of Economics and Labour

The two ministries support research competence centres involving private companies and public organisations. The Federal Ministry of Transport, Innovation and Technology has a funding programme for centres that concentrate on basic research (Kplus), which is managed by the Austrian Research Promotion Agency. Competence centres in applied research (Kind) or networks of such centres (Knet) are funded by the Federal Ministry of Economics and Labour. While unlikely to be a source of funding for specific digital cultural heritage systems and tools, some of the research results of these centres may be of relevance for creating such applications. For example, results from the Kplus centres Advanced Computer Vision (ACV) and Virtual Reality and Visualisation (VRVis) may be of interest. An illustrative example for such “bottom-up” developments may be that the EPOCH partner Imagination Computer Services participates in the Kplus centre VRVis.

URLs:
Competence Centres:
Kind and Knet, http://www.kompetenzzentren.biz
Kplus, http://www.tig.or.at/en/fundingprogramms/Kplus/

Advanced Computer Vision (ACV), http://www.acv.ac.at/
Virtual Reality and Visualisation (VRVis), http://www.vrvis.at

Fund for the Promotion of Scientific Research

A major source of funding of basic and applied research is also the Fund for the Promotion of Scientific Research. This fund supports individual projects as well as longer-term programmes of focused research that are jointly proposed by several university-based and other research groups. For example, it funded the Austrian Joint Research Program on "Theory and Applications of Digital Image Processing and Pattern Recognition". This five year programme (1994-2000) involved eleven Austrian labs, and has considerably strengthened Austrian research in this area. The two Kplus Competence Centres mentioned above may be regarded as "spring-offs" of this targeted funding.[2]

An example of an individual project is "Computer Aided Classification of Ceramics" that was carried out from May 1999 to April 2002 by the Pattern Recognition & Image Processing Group of the Vienna University of Technology's Institute of Computer Aided Automation, in cooperation with the Institute of Classical Archaeology of the University of Vienna. Based on the results of this project, participation in the Austrian Joint Research Program mentioned above, and further work in the framework of the EU-funded project 3D-MURALE (11/2000-10/2003), the research group developed the "ArcheoProfiler" system. This system supports the documentation, archiving, automated classification and 3D reconstruction of archaeological fragments (e.g. pottery reconstruction). For example, in summer 2004 this system was tested in the documentation and analysis of excavated sherds in Tel Dor, Israel.

In order to capitalise on the results of this and other related projects, the Vienna University of Technology is reported to currently prepare an Audio-Visual Laboratory that will focus on applications in cultural heritage (cf. Mara, Sablatnig 2005).

URLs:
3D-MURALE, http://dea.brunel.ac.uk/project/murale/
Fund for the Promotion of Scientific Research, http://www.fwf.ac.at
Joint Research Program - Digital Image Processing and Pattern Recognition (FWF-funded project S-70, 1994-2000), http://www.prip.tuwien.ac.at/Research/FSP/
Mara, Hubert and Sablatnig, Robert: 3D-vision applied in archaeology. In: Forum Archaeologiae, 24/III/2005, http://farch.net/

Mixed funding model:

Many areas of research and development that are of interest to EPOCH, in particular, archaeological sites will follow a model of mixed funding. In this model, the different activities such as excavations, documentation, virtual and physical reconstruction, presentation, development of an archaeological park, etc. are funded by different (mainly) public bodies, and under different schemes of funding. A typical example may be the prehistoric fortified settlement "Burg" (near Schwarzenbach, Lower Austria) where since 1996 the work of the involved research and other groups has been funded by the municipality of Schwarzenbach, the Country of Lower Austria (Cultural Department; Eco Plus regional development fund), the Oesterreichische Nationalbank, and the Ministry of Transport, Innovation and Technology. For further information on this archaeological work see the section on projects below.

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[2] Since October 2004 another programme funded by the Fund for the Promotion of Scientific Research is active in the area of Industrial Geometry. Among the research groups from four universities is the Geometric Modelling and Industrial Geometry unit of the Vienna University of Technology. In the area of applied research this unit in particular concentrates on 3D technology. See the Innovative Project 3D Technology, http://www.geometrie.tuwien.ac.at/3dtechnik/.

Private funding sources:

In Austria, only an estimated 1.8 per cent of the overall cultural funding is supplied by the private sector, although, since 1987 there has been a "Sponsors' Ordinance" regulation in place that grants a tax break on expenses for sponsoring cultural events. In 1997, through an amendment to the Federal Arts Promotion Act (1988), certain public subsidies are tax exempt, in particular, income and assistance (i.e. compensation for expenditure or expenses) from public funds or from the funds of public or private foundations. Furthermore, a new legal incentive was introduced in October 2002 that allows for donations made to federal as well as private museums to be tax deductible. Yet, these and a couple of other regulations do not particularly stimulate private funding of digital cultural heritage.

However, one might expect that private funding of projects that have some digital component to it (e.g. development of a specific application) is most likely in the areas of monuments and archaeological sites where larger construction companies, banks, insurance companies and also to some degree IT companies have a vital interest in new investments. Other candidates for private sponsorships are exhibitions or other events of major institutions (e.g. museums), that may involve the development of some virtual presentation (e.g. CD-ROM/DVD, virtual tour on the internet or on-site displays). However, the right combination of a culturally inspired company and an innovative ICT organisation may also lead to a unique project such as The Crystal Web, http://www.thecrystalweb.org.

RESEARCH CENTRES AND INSTITUTIONS ACTIVE IN THE DEVELOPMENT OF DIGITAL CULTURAL HERITAGE

As with other parts of this report, this section can only provide a first, and in this case highly selective, overview of relevant organisations.

Digitisation of heritage resources

The funding of some larger digitisation projects in major cultural heritage institutions has turned their responsible departments into competence centres for particular kinds of digital heritage resources. Such centres are, for example:

- Photographs and other 2D images: Österreichische Nationalbibliothek, Image Archive, http://www.bildarchiv.at
- Historic maps and building plans: Akademie der bildenden Künste, Kupferstichkabinett, http://www.akbild.ac.at/ kuka
- Historic sound recodings: Österreichische Mediathek, http://www.mediathek.ac.at
- Paintings, drawings and other objects of art: Albertina, http://www.albertina.at; Kunsthistorisches Museum Wien, http://www.khm.at; Österreichische Galerie Belvedere, http://www.belvedere.at
- Digitisation of books and manuscripts: Library of the University of Graz, http://www.kfunigraz.ac.at/ub/sosa/; Library of the University of Innsbruck, http://www2.uibk.ac.at/ub/dea (the latter also excels in automated metadata creation and management, partly based on the library's involvement in EU-funded research projects in this area).

Note that with the exception of the two university libraries all other institutions are located in Vienna.

Development of digital cultural heritage systems, tools, and applications

The university departments, research organisations, heritage institutions and companies mentioned below either concentrate on applied research or otherwise participate in the development or further improvement of specific digital cultural heritage applications (examples of this work are described in more detail in the section on projects below). As with other sections, this overview must be understood to be far from comprehensive:

- Photogrammetry: Institut für Photogrammetrie und Fernerkundung, TU Wien, http://www.ipf.tuwien.ac.at
- Photogrammetry and 3D scanning solutions (commercial): Linsinger ZT-GmbH, St. Johann/Pongau, Salzburg, http://www.linsinger.at
- 3D and other laser scanning solutions (commercial): RIEGL Laser Measurement Systems GmbH, Horn, Upper Austria, http://www.riegl.com
- Interactive archaeological visualisation (Harris matrices): Institute for Computer Graphics and Algorithms, TU Vienna; product: ArchEd program, v1.4, 10-04-2003; http://www.ads.tuwien.ac.at/arched/
- Documentation, archiving, automated classification and 3D reconstruction of archaeological fragments (e.g. pottery reconstruction): Pattern Recognition & Image Processing Group of the TU Vienna (EPOCH partner); product: ArcheoProfiler; http://www.prip.tuwien.ac.at
- 3D GIS-based archaeological documentation: Vienna Institute for Archaeological Science (VIAS), http://www.univie.ac.at/vias/
- GIS-based cultural heritage information service: Department for Geographical Data Processing (MA14-ADV/GDV) of the City of Vienna; services: Vienna database and cadastre of cultural heritage, http://service.wien.gv.at/kulturkat/
- 3D GIS-based information management and presentation (commercial): MultimediaPLAN.at, Vienna, http://multimediaplan.at
- 3D reconstruction of large and small-scale urban sites: Stadtarchäologie Wien (e.g. Roman Vindobona), http://www.wien.gv.at/archaeologie/
- "All-in-one" documentation system for museums: Joanneum Research, Institute of Information Systems & Information Management; product: IMDAS-Pro (note: the Institute also excels in audio-visual technologies); http://www.joanneum.at/en/informatik/schwerpunkte_liste.php?p_iid=IIS
- Virtual exhibition space, interactive smart.card: Technisches Museum, Vienna, http://www.tmw.ac.at
- 3D virtual environments: Imagination Computer Services, Vienna (EPOCH partner), http://www.imagination.at
- Augmented reality applications: Interactive Media Systems Group, Vienna University of Technology (currently no specific CH RTD projects), http://www.ims.tuwien.ac.at
- Semantic and location-based services: NIWA WEB Solutions, Vienna, http://www.niwa.at
- Semantic web, ontology-based tools, contextualisation of cultural information: Salzburg Research, Salzburg (EPOCH partner), http://www.salzburgresearch.at

Institutions which in recent years have been involved in the development or further improvement of specific digital cultural heritage applications are, for example,

- Austrian Archaeological Institute, http://www.oeai.at

- Institut für Realienkunde des Mittelalters und der frühen Neuzeit, Austrian Academy of Sciences, e.g. archREAL database, http://www.imareal.oeaw.ac.at/archREAL/
- Institute for Classical Archaeology, University of Vienna, http://www.univie.ac.at/Klass-Archaeologie
- Institute for Prehistory and Protohistory (Aerial Photograph Archive), University of Vienna, http://www.univie.ac.at/urgeschichte; http://www.univie.ac.at/Luftbildarchiv/
- Museum of Fine Arts, Collection of Antiques, Vienna, http://www.khm.at
- Natural History Museum, Prehistoric Department, Vienna, http://www.nhm-wien.ac.at/NHM/Prehist/

Networks and associations supporting the development of digital heritage

Currently, national or regional networks and associations that concentrate on the development of digital heritage are rare. However, some relevant Austrian special interest and working groups include: The "Workshop Archäologie und Computer" is a co-operation of the Forschungsgesellschaft Wiener Stadtarchäologie, the Department of Urban Archaeology and the Computing Centre of the City of Vienna. Since 1996, the Workshop has been held annually and has attracted an increasing number of international presenters and participants. In 2003, the Workshop also organised the CAA2003 "Enter the past" congress.

Netzwerk Denkmalschutz Austria (NDA) is a central information and communication platform for private associations and initiatives interested in preserving monuments and historic ensembles on the regional and local level. It is a highly active initiative that provides opportunities to network, organise interest groups, promote ongoing activities, events, etc.

BAM is a working group of representatives from professional organisations of libraries, archives and museums as well as some major institutions from these domains. They seek to identify common positions and strategies, and also promote ongoing activities related to digital heritage resources. There is no formal membership, and participation in the bi-annual BAM meetings is driven by a common interest to share and exchange experiences with peers, independently of the domain.

In addition, m:o (Museum Online) merits to be mentioned as an important link between the educational and cultural heritage sectors. Funded by the Federal Ministry for Education, Science and Culture, since 1996 this initiative has encouraged students and teachers to develop interactive media projects together with museums, galleries and other cultural organisations. Also funded by the Ministry is www.austrianmuseums.net, which is the national access point to the museum portals maintained by the Austrian provincial governments.

Furthermore, with respect to new developments in digital heritage at the international level the established Austrian nodes of councils and committees such as, for example, ICOM, ICOMOS or TICCIH, distribute relevant information to Austrian members.

URLs:
Austrianmuseums.net, www.austrianmuseums.net
BAM – Arbeitsgruppe Bibliotheken, Archive, Museen, contact: harald.weigel@vlr.gv.at
CCA2003 "Enter the past" Congress, http://www.archaeologie-wien.at/caa2003/caa2003.htm
International Council of Museums (ICOM), Austrian committee, http://www.icom-oesterreich.at
International Council on Monuments and Sites (ICOMOS), Austrian committee, http://www.icomos.at
The International Committee for the Conservation of the Industrial Heritage (TICCIH), Austrian representative, see http://www.mnactec.com/TICCIH
m:o, http://www.museumonline.at
Netzwerk Denkmalschutz Austria, http://www.denkmalschutz.at, and http://www.nda.at
Workshop Archaeologie und Computer, http://www.archaeologie-wien.at/workshop/

PRACTICES: ON-GOING AND PAST PROJECTS

The following are some exemplary projects in the different areas of interest to EPOCH, i.e. museums with their objects and collections, historic monuments and archaeological and other cultural heritage sites.

Austrian Digital Heritage Initiative

On behalf of the Austrian Federal Ministry for Education, Science and Culture, the role of this project was to carry out on the national level the activities as defined by the Lund Principles and Action Plan. In recognition of its expertise in eCulture and management of national and international projects, the Ministry commissioned Salzburg Research to implement and run the Austrian Digital Heritage Initiative (November 2003 - February 2005). As the Lund Principles and Action Plan are supported by the EU-project Minerva (Ministerial Network for Valorising Activities in Digitisation), Salzburg Research also became a partner in the MinervaPlus consortium in order to collaborate in the execution of tasks on the European level.

One major objective of the national project was to create the operational infrastructure for collecting and making accessible information on ongoing or completed activities in the digitisation of cultural and scientific heritage in Austria. By end of February 2005, the project had identified and documented 53 digitisation projects and 134 organisations that are involved in digital projects either as initiators, active partners, content providers, technology suppliers, academic consultants, or funding bodies.

Besides access to this database, the website www.digital-heritage.at also offers for download the Minerva guidelines and other documents (which were translated into German) as well as links to valuable other resources. It is especially targeted at professionals and IT-managers of the Austrian cultural heritage institutions. Also worth mentioning is that the website is based on the Minerva good practice model for inventorying digital content, and offers all information in German and English.

Besides setting up this online information resource, the project also organised and participated in several events throughout Austria in order to make the cultural heritage community aware of the goals and results of the Austrian Digital Heritage Initiative. Furthermore, a one-day workshop was organised in the framework of the Salzburg Research e-Culture Symposium 2004 to spread information and promote a stronger networking between the institutions and practitioners

URLs:
Austrian Digital Heritage Initiative, http://www.digital-heritage.at
Minerva project, http://www.minervaeurope.org
Salzburg Research e-Culture Symposium (2003, 2004), http://eculture.salzburgresearch.at

The Cadastre of Cultural Heritage Objects (Kulturgüterkataster) of the Municipality of Vienna

In cooperation with the Vienna City Archaeology (MA7) and the Department for Architecture and Urban Design (MA19), the Department for Geographical Data Processing (MA14-ADV/GDV) of the City of Vienna has developed a GIS-based internet service that presents the city map with thematic layers and information about remarkable objects (buildings, archaeological findings, etc.), including the architecture guide “Vienna around 1900”. The system offers real-time cartography by accessing different geo-databases, a customized selection of topics, and direct access to original data. The integrated MA19 photographic archive and building directory holds information of about 50,000 buildings (e.g. age of building, architect, characteristic features, etc.). An address finder is used for orientation. Through

functions that overlay archaeological maps and the historical atlas “Franziszeischer Kataster” with the modern city map one can also examine the urban development through the centuries.

URL: http://service.magwien.gv.at/kulturkat/html/start.asp

Location Based Services for Cultural Organisations (LBSCult)

The LBSCult project established a competence network for the development of an electronic cultural heritage guide for the City of Vienna. Based on the data models of the Cadastre of Cultural Heritage Objects (see separate project description) and the photo archive of the Austrian National Library, the concept of an open system platform was developed and tested. This platform should connect cultural heritage databases, additional content provider databases as well as other GIS-based services, and process user queries based on semantic web technologies. Mobile users of the LBSCult Service would receive on their device (e.g. PDA or Smartphone) touristic and cultural information or maps & routes that are contextually connected to the user’s actual position and personal interests.

The project was initiated by NIWA Web Solutions and Kaya-Fill+Hilbrand+DeVlieghere OEG (Wanderman.net). Other partners in the project consortium were Austrian National Library, City of Vienna (MA14, MA19) and Tiscali. The project was carried out from November 2003 to May 2004, with funding from trans koop Wien (a funding programme for knowledge and technology transfer of the City of Vienna).

Selected URLs:
http://www.niwa.at/index.php/rnd/info/102/uk/main.html
http://www.wanderman.net

Cathedral.IT

The Cathedral.IT project developed and tested a digital infrastructure for the systematic monitoring, preservation and maintenance of historic buildings, based on the experiences of the work carried out at the cathedrals in Vienna, Regensburg and Urbino.

In particular, the project created a system for the recording, storage and evaluation of the increasing amount of data from the monitoring and detailed documentation of the condition of the historic fabric as well as the different measures used in the preservation and restoration of cathedrals. One of the main results of the project was the setup of a sophisticated database-system for the digital archive, which was also used in the follow-up project Digital European Cathedral Archives (DECA, 09/2002-08/2003). Led by the office of the mason‘s lodge (Dombauhütte) of St. Stephen‘s Cathedral (Vienna), Cathedral.IT was carried out from October 2000 to December 2001. It received funding from the Culture 2000 programme and the City of Vienna.

URLs:
Cathedral.IT, http://www.dombauwien.at/cit/ (a detailed project description in English is available under the section: “project”)
DECA, http://www.deca-forum.net

The prehistoric fortified settlement “Burg”: a GIS-based 3D documentation of interdisciplinary stratigraphic excavations

Since 1992 the prehistoric fortified settlement "Burg" near Schwarzenbach in Lower Austria has been a highly interesting site for archaeological investigations. Building on an earlier comprehensive geomagnetic survey, in 1998 and 1999 an area of 400 m² was explored surprisingly showing Bronze Age relics underneath the Late Iron Age settlement remnants. The stratigraphic excavations were carried out by an interdisciplinary team combining expertise in geophysics, archaeobotanics, geology, anthropology, archaeozoology, metallography, numismatics, geodesy and photogrammetry. In particular, a GIS-based 3D documentation

method was developed for recording the excavated surfaces of the deposits. Among the major institutions involved in this scientific research were the Central Institute for Meteorology and Geodynamics (Vienna), the Institute for Pre- and Protohistory of the Vienna University, and the Vienna Institute for Archaeological Science (VIAS).

Initiated by the archaeological excavations, the municipality of Schwarzenbach has developed an archaeological park that includes reconstructed parts of the fortification, several buildings, a cistern, a kiln, etc. For the reconstruction of the discovered settlement relics methods of experimental archaeology have been used. The park also has a (modern) watch tower which was opened in 1999, and since 2001 hosts a small museum.

URLs:
Abstract from the CCA 2003 conference "Enter the Past", Vienna, http://www.archaeologie-wien.at/caa2003/papers/77.htm
VIAS, http://www.univie.ac.at/vias/vias_d.html (project information until May 2002)

Carnuntum Virtual Tour

Carnuntum is Austria's largest archaeological site situated about 40 km east of Vienna. In 1996 the Archaeological Park Carnuntum Betriebsgesellschaft took over the management of the site and improved the open-air museum Petronell. In 1999 the private company MultimediaPLAN.at was commissioned to develop a multimedia representation of traditional life in and around the various buildings such as temples, commercial and private buildings, and public baths of the Roman settlement. The project was carried out in cooperation with the Department for Local Planning of the Vienna University of Technology, with archaeological guidance by the director of excavations in Carnuntum. A 3D representation of Carnuntum was created and the public areas as well as the private quarters of ancient Carnuntum were depicted as detailed as possible, using excavated objects, preserved interior decorations, etc. Since April 2000 visitors of the open-air museum via touch-screen displays can also take a virtual tour and visit a baker, a carpenter and a wine merchant. The virtual tour is also available on CD-ROM (within the EU, EUR 18,20). In the period 2001-2003, reconstructions of some settlement relicts were carried out, starting with a Roman building (255 square metres) and garden, which forms the centre of a larger ensemble (1,2000 square metres). In April 2005 work began on the reconstruction of another house using antique construction techniques.

URL:
Archaeological Park Carnuntum, http://www.carnuntum.co.at
MultimediaPLAN.at, http://www.multimediaplan.at/carnuntum/ (provides illustrative images of the virtual tour)

Limes project: "Vindobona – Österreichischer Limes, Teil 1", CD-ROM

The CD-Rom "Vindobona - Österreichischer Limes" (part 1, released October 2004) was produced in a collaboration of the City of Vienna's department Stadtarchälogie Wien (MA7), the Wien Museum and the multimedia companies digital-graphics & 7reasons. Videos, 3D objects, panoramic views, animations, and many interactive components provide access to much of the available knowledge and data on the large Roman settlement and legionary fortress Vindobona at the Limes. In particular, the CD-ROM priced at EUR 25.00 brings to life the settlement and the life of its inhabitants in a scientifically sound and educating fashion. The second part of "Vindobona" is planned for release in September 2005.

URLS:
http://www.limes.co.at (provides illustrative images, video clips, and detailed information, in German)
Klein M, Kronberger M, Mosser M: Die Reise in das antike Wien auf CD-ROM, Forum Archaeologiae, 33/XII/2004, http://farch.net (provides a good summary of the background and details of the production)

Vienna's Medieval Jewish Quarter

The combination of recent excavations, historic research and a 3D reconstruction of one building have allowed for a considerably extended understanding of the late medieval Jewish quarter of Vienna (e.g. size and architectural details of buildings and accompanying infrastructure). Of the known properties, one house from the second half of the thirteenth century was reconstructed in 3D, which besides some new insights stimulated many new research questions. Starting with the reconstruction of this individual house, surrounding properties were filled with the shapes of the buildings that once stood there. By placing the house in its urban context, a fresh picture emerged of the late medieval Jewish quarter.

URL:
Cf. M. Goriany (Stadtarchäologie Wien) and D. Schön (Independent Archaeologist and Buildings Researcher, Austria): Latest News from Vienna's medieval Jewish quarter, http://www.archaeologie-wien.at/caa2003/papers/237.htm

The Crystal Web

The Crystal Web is a large, purely digital cultural collection and virtual museum, themed around crystals and the crystalline in different cultural and scientific disciplines.

The collection contains about 5,000 digital exhibits from over 300 museums and archives worldwide. It is accessible at www.thecrystalweb.org via an innovative multidimensional navigation software called “Liquid”.

Sponsored by the renowned Tyrolean company Swarovski, the virtual museum was developed over the period March 2001 to September 2003 by the non-profit organisation Polygon with an interdisciplinary team of 30. Apart from the online presentation, The Crystal Web’s collection and Liquid software have also been used for multimedia exhibitions and installations (e.g. at the Kristallwelten, Wattens/Tyrol; Leopold Museum, Vienna).

URL:
http://www.thecrystalweb.org
http://www.polygon.at/
http://www.suite.at (see: Case Study – The Crystal Web)

NEEDS

With respect to issues that would require more attention by the public authorities and other stakeholders in digital heritage, here only one will be addressed[3]:

Regional service centres, in particular, for supporting smaller institutions

Currently, mainly the larger and better sourced heritage institutions are in a position to shift their processes towards digital workflows for the acquisition, documentation, management (incl.

[3] A broad overview of needs, critical issues, and recommendations on how to tackle them on the European and national/regional levels, is to be found in: The DigiCULT Report. Technological landscapes for tomorrow’s cultural economy - Unlocking the value of cultural heritage. Editor in chief: A. Mulrenin. Authors: G. Geser and A. Mulrenin. Luxembourg: Office for Official Publications of the European Commission 2002.

archiving/preservation) and communication of cultural heritage. Yet, most heritage institutions are small organisations that lack funds, dedicated IT personnel as well as know-how in how to benefit from implementing digital technologies.

The funding of some larger digitisation projects of major cultural heritage institutions has turned their responsible departments into competence centres for particular kinds of digital heritage resources. But, these “centres” mainly reside in Vienna, while most of the smaller heritage institutions are located in the regions. Therefore, a major need is to establish regional service centres that may enable smaller organisations to participate in digital culture heritage (which of course includes much more than only creating digital collections). Such service centres would provide smaller heritage institutions with various technical services, e.g., support in the creation of a virtual presence, digitisation of holdings, development and presentation of online exhibitions, content management and various other services (i.e. based on an Application Service Provision model). Certainly, also ICT training courses for the (non-technical) operators, staff and volunteers of the small cultural heritage organisations would be most welcome.

It may also be highly beneficial to involve regional multimedia companies in the service centres, and to link up with university institutes, research organisations and their business-oriented spin-offs that are active, for example, in 3D/VR, semantic web and location-based services.

While there may be a growing awareness within the regional authorities that smaller institutions need external support (and local companies could benefit from some innovative infusion), the issue of tight budgets remains a matter of fact. However, an encouraging example may be the Styrian government support of the Digitisation and Inventory Initiative for Regional Museums (DigIReg) for the provision of training courses for operators of smaller museums in the region. The objective of this initiative is to teach the basics of how to create a “digital museum” in a six day seminar. Through the creation of digital inventories, the museums would be able to 'dock' a part of their collections into the regional cultural network and present their institutions on the Internet.

Final comments

Ideally, ICT-based cultural heritage throughout Europe would build on an integrated chain of knowledge transfer that connects leading European research and development, national centres of excellence, major private companies, and large as well as small heritage institutions. However, there remain several critical gaps of which the situation of the smaller heritage organisations is but one (and certainly not only one in Austria).

Another example is that a national funding programme for the creation of cultural heritage ICT (i.e., systems, tools, and applications) which would act as a counterpart to the EU IST strategic objective in Cultural Heritage RTD is missing (as in many other member states).

Furthermore, research centres and cultural heritage institutions that are involved in European cooperative research projects and networks should function as vertical “linking pins” to connect people to, and channel research into, the national and regional activities in intelligent digital heritage. Such a linking does not happen automatically, but, requires a much stronger coordination of the various stakeholders.

Therefore, what may be hoped for is that EPOCH - for its main areas of interest - functions as a key enabler in closing some of the gaps in the chain of knowledge transfer which, however, must also receive appropriate attention and support on the national and regional level.

5.2 BELGIUM

Gentiane Vanden Noortgate, Chedi, Brussels

POLICIES

The role of cultural institutions

Belgium being a Federal State, besides some cultural institutions (the main National museums), cultural policies are decentralised according to the three language communities: Flemish, French speaking and German speaking.

Local authorities (Provinces and Municipalities) play an important role in cultural affairs.

ICT applications to CH are also taken in charge by both the Federal State and the Communities. In addition, the universities and some technology enterprises are also active in the field.

Specific regulations

The Federal Government has launched a 10 years plan for the digitization of the collections in the National museums and the Archives (under supervision of the Federal Service for Scientific Research).

The Communities also develop some projects, in connection with libraries and museums. However, their main efforts are being developed through European common projects.

Priorities for ICT applications to Cultural Heritage

Training is certainly a priority. Otherwise, there is the danger of having the whole technology development taken in charge by technology people, without enough participation of Cultural Heritage professionals.

Hardware availability is not the main problem. The point is rather to set up projects and programmes that are relevant and feasible. The hardware would come after.

There is a tendency to pay more attention to archaeological sites, where spectacular achievements seam to attract visitors and please to the public authorities.

Museums should receive more attention and become a priority.

Associations and networks

Service de la Culture, Conmunauté Française Wallonie Bruxelles

Dienst van de Cultuur, Vlaamse Gemeenschap

Musées et Société en Wallonie

Direction générale de l'Aménagement, du Territoire, du Logement et du Patrimoine, Région Wallonne

VCM, Contactforum voor Erfgoeverenigingen

Vlaamse Museum Verenigingen

Universities (Université Catholique de Louvain, Université Libre de Bruxelles, Université de Liège, Katholieke universiteit van Leuven)

Funding sources for IT projects

Public

Public funds come from the different levels: federal, communities and, at a lower level, provinces and municipalities.

Most of the time, they are allocated by direct contact. When the investment is important, there are competitive calls, according to the European regulations.

Private

There are private investments in research activities by relevant enterprises, but no reliable information is available.

The contribution of the private sector to the public projects is marginal.

PRACTICES

On going and past projects

Programmes:
Digitisation plan of the ten Federal establishments (Digitisation)
Multiannual Information Society Support Programme (Digitisation)
eFlanders (Digital Actieplan Vlaanderen) (Digitisation)
Projects (Type):
AICIM (Web + databases + ontologies + knowledge management + networking)
Balat (Web + databases)
Bornes multimédia (projet MSW) (Interactive terminal multimedia)
Deios (Development and Enhancement of Interferometric Optical Systems) (3D method of statements)
Ename Center (Kiosk + virtual reality + virtual reality tools + 3D)
Eole (Web + databases + knowledge management)
GNOSIS (Web + gateway GIS + common access system)
In Flanders Field Museum, Ieper (Multimedia + Interactive terminal multimedia + VR + web)
MARS (Web + digitisation + databases + networking)
Musée de Louvain-la-Neuve (Multimedia + Interactive terminal multimedia)
Portail des Musées en Wallonie (Web + databases + gateway)
Telematicart (Web + digitisation + databases + networking)

Approximate estimate of funded projects by size:

Project size	% on total
Small size (up to 100.000 Euro)	5, 6

Medium size (100.000 to 300.000 Euro)	4
Large size (300.000 to 600.000 Euro)	1, 3, 7
Very large size (over 600.000 Euro)	13, 14

Average duration of funded projects

Project duration	% on total
Short (up to 1 year)	9
Medium (1 to 2 years)	3, 5, 8
Long (more than 2 years)	1, 2, 4, 10, 13, 14

BELGIUM: DESCRIPTIONS OF PROGRAMMES AND PROJECTS

Information collected and edited by Teresa Varricchio (EPOCH survey team)

Editorial note

Only projects relevant for the report scope have been collected. Information concerning such projects was searched on-line, thus only projects that created and maintained Internet sites, or at least are quoted somewhere on the Internet, have been reviewed.

General Information

Belgian Science Policy

This is the web portal of policies, practices and research in Belgium, previously known as the 'Federal Office for Scientific, Technical and Cultural Affairs' (OSTC). This name change follows the Copernic reform of Belgium's federal administration. It contains databases about federal national and international project, scientific institutes and research programmes etc.

For more information see the website: http://www.belspo.be

Programmes

Digitisation plan of the ten Federal establishments

The programme of the new federal Government (July 2003) states that the Government will carefully examine the practical ways for implementing the recommendations of the White Book on the modernization of the ten federal scientific establishments (FSEs: National Library and State Archives; Museums of Fine Arts, Museums of Art and History and Institute of Artistic Heritage; Institute of Natural Sciences and Museum of Central Africa; Royal Observatory, Meteorological Institute and Institute of Space Aeronomy). Among the priorities of the White Book, the preservation and valorisation of the scientific, historical and artistic heritage held by the FSEs (and in particular the digitisation policy) have been identified as major issues at stake

Multiannual Information Society Support Programme

The Multiannual Information Society Support Programme (2001-2008) - a Research Action in the framework of Federal Research Action deployed by the Federal Science Policy - backs up the various initiatives taken elsewhere. Its aim is to stimulate the use of information technologies in target sectors through application projects that give priority to the calibration and mastery of the many applications that can be developed through the new technical tools.

Research projects funded: GNOSIS, MARS, Digital access to aerial and astronomical photographic archives

For more information see: http://www.belspo.be/belspo/fedra/prog.asp?l=en&COD=I2

eFlanders (Digital Actieplan Vlaanderen)

In 1998 the Ministry of the Flemish Community, department Visual Arts and Museums started with a co-ordinated computerisation project. The objective of the project is to promote not only the computerisation but also standardisation of collection registration. This way of working will make it possible for the 95 participating institutions to exchange collections with other museums and the public. And possibilities like offering information about "Flanders collection" via the internet are coming closer and closer.

Initiatives

On 9 February 2001, the "High Council for Museums in the French Community" was officially established. The aim of this council (composed by 25 members) has been to support the introduction of ICT in all the museums recognised by the French Community, with to goal by 2004 to bring all museums with their collections on the Internet.

URL: http://www.msw.be/fr/index.php

Projects promoted: AICIM, Portail des Musées en Wallonie

Projects

Accès Informatisé aux Collections des Institutions Muséales (AICIM)

AICIM Network is a service provided by Musées et Sociétés de Wallonie (MSW). Started in may 2001, the project has the objective to create a database of museums collection on line, to stimulate collaboration and to coordinate the sharing of information among partner.

URL: http://aicim.cfwb.be/html/index.php?index.php?action=objet&todo=view&id=838

Balat

Aim of the project is to exploite Belgian cultural heritage using on-line technology. The web site is conceived like a portal acting as meeting point for Belgian art starting from Medieval Age till contemporary age. Contents of the web site are: match different databases (on biographic and catalographic bases) and make an inventory of the History of the Art.

URL: http://balat.kikirpa.be/site/

Digital access to aerial and astronomical photographic archives

The aim of the project is to make the historic-scientific content of three photographic archives publicly accessible and scientifically usable by means of a high-resolution digitising technique. The historical aerial photographic collections of the National Geographical Institute (NGI-IGN) and the Royal Museum of Central Africa (KMMA-MRAC) along with the astrophotographic plate archive from the Royal Observatory of Belgium (KSB-ORB). In the first phase it will be produced digital and searchable inventories that will disclose the exact content and the state of each collection. Phase two will start with the operational scanning of and the electronic access to the digital images and the derived data.

No web site available at the moment

Development and Enhancement of Interferometric Optical Systems (DEIOS)

The so-called startup DEIOS (a spin-off company of the University of Liège) develops the scanning tools in the framework of the results of the OSIRIS project (Optical Systems for Interferometric Relief Investigation and Scanning). This project OSIRIS was a partnership between the European Centre for Archaeometry of the University of Liège and the Hololab Laboratory, wich have developed together a complete portable set-up (combining the whole optoelectronic acquisition and data processing) specifically dedicated to the quick and accurate numerical 3D recording of archaeological documents, in a reference to Ancient Egypt's heritage.

For an overwiev of the project see:
http://www.europhysicsnews.com/full/30/article9/article9.html

EOLE

The aim of EOLE is to provide access to databases with multimedia content (images and text) about the Belgian cultural patrimony. The database is a selection of documents from different domains: architecture, sculpture, painting, silversmith's, ceramics, prints, drawings.

URL: http://www.muse.ucl.ac.be/Eole/

Generalized Natural Sciences Online and Spatial Information System (GNOSIS)

GNOSIS is an initiative that brings together scientific partners from the Royal Belgian Institute of Natural Sciences (RBINS), Royal Museum for Central Africa (RMCA) and Royal Meteorological Institute of Belgium (RMI). Among other activities it builds a geoportal, via web GIS portal, which provide access information available at the Belgian federal scientific institutes. Various valuable datasets ranging from meteorological data, zoological collections, to geological datasets for Belgium and Central Africa, will be made available through the portal.

No web site available at the moment

In Flanders Field Museum, Ieper

Interactive web site providing a virtual tour of the First World War Museum and 4 databases of Military Casualties, 2 started and managed by the museum and 2 external.

URL: http://www.inflandersfields.be/default2.htm

Multimedia archaeological research system (MARS)

To bridge the division of archaeological and anthropological collections among various federal institutions (FSI´s) and also at Community, regional, communal or even private level, the Royal Museums of Art and History (RMAH), the Royal Belgian Institute of Natural Sciences (RBINS) and the Royal Museum of Central Africa (RMCA) promoted the digitisation of their archaeological collectionsand of the data associated with the objects (field recordings, geological and sedimentary contexts, chemical, biological, physical analyses, etc.).The objective of the MARS project is also to serve as a search tool while permitting the link between the databases of analyses, the bibliographic databases and the consultation of all multimedia supports compatible with an Internet access, via a rational management of the collections in terms of conservation, study or loans for exhibitions. The multimedia formats must make it possible to illustrate but also, as far as possible, to preserve the original items by replacing them with their virtual representation.

URL:
http://www.naturalsciences.be/MARS/login_form?came_from=http%3A//www.naturalsciences.be/MARS/index_html&retry=&disable_cookie_login__=1

Musée de Louvain-la-Neuve

The development of the information technology service in 1989, and the production of multimedia tools as from 1993, make the Museum of Louvain-la-Neuve a standard reference at the national and even the European level. The introduction of information and communication technology tools, produced entirely by the museum (its CD-Rom, multimedia consultation terminals, website), is also proof that the museum is recognized by the university itself. In addition, the EOLE project (remote access to a multimedia information system on the Belgian heritage) has been developed thanks to the skills acquired by the small museum team.

URL: http://www.muse.ucl.ac.be/

Portail des Musées en Wallonie

The web site gives virtual access to 400 museum and museal institutions of French Community in Wallonie-Bruxelles, presently dispersed on the area. of Wallonie region. This initiative start froma collaboration between the Minister of Museum, managed by French Community of Wallonie-Bruxelles, and the Minister of Tourism, managed by Wallon region. At the same time 34 museums of Wallonie are promoting a data processing system to make other Cultural Institution more sensitive towards digital approach.

URL: http://www.lesmuseesenwallonie.be/html/index.php

Telematicart (Telematic network for teaching art history in universities)

The aim of this project is to introduce and test a mechanism for exchanging digital images for university teaching of art history. The project concentrates on the development of image databases which will be realised in a partnership by: Royal Library of Belgium (co-ordinator); Université libre de Bruxelles; Service d'histoire de l'art et d'archéologie de la Grèce antique; Université catholique de Louvain (Département d'Achéologie et histoire de l'art); Royal Institute for the Study and Conservation of Belgium's Artistic Heritage; Facultés universitaires Notre-Dame de la Paix (Section d'histoire et de l'art et archéologie); Studiecentrum Vlaamse Miniaturisten. The project is part of the "Multiannual Information Society Support Programme, 2001-2008. First phase".

URL: http://www.kbr.be/telemat/reseau_eng.html

5.3 BULGARIA

Information from HEREIN database on national heritage policies: Theme 7: Digitisation:

HEREIN partner: Ministry of Culture, National Institute for Monuments of Culture, Bulgarian National Committee of ICOMOS

Policy on digitisation

Source: http://www.european-heritage.net/sdx/herein/national_heritage/voir.xsp?id=7.1_BG_en

A comprehensive and long-term policy for setting up an integrated digital information system in the country does not exist. The present practice, however, is still pragmatic, reactive, responding to separate fixed problems and needs, and has a limited application within their framework.

The legislative protection of the digitalized products is provided for by the Copyright and Similar Rights Act (The Official Gazette No. 56 of 1993, amended in 1994, 1998 and 2000), which in July 2002 was harmonized with the European Union Directive on Data Bases. On 26th December 1974 Bulgaria ratified the Universal Convention on Copyright (adopted in Geneva on 6th September 1952, revised in Paris on 24th July 1971).

The Digital Document and Signature Act has been passed, and it entered into force on 5th February 2002.

The funds for developing the information systems software and the computer network are provided mainly by the institutions assigning them, but also by means of co-financing or sponsorship.

Legislation on digitisation:

An integrated information system exists in management of the country – it is provided for by Decree No. 36 of 14th February 2001 of the Council of Ministers on the Setting up of a Comprehensive Automated Management System (The Official Gazette No. 17 of 2001).

Concerning the economy a provision about the information systems for documenting, monitoring and evaluation and about their structure and set of tools, is laid down in the National Territorial Development Plan for the period 2000 - 2006, adopted by Decree No. 208 of 22nd November 1999 of the Council of Ministers (The Official Gazette No. 106 of 3rd December 1999, amendments and additions in No. 24 of 2001).

In the field of cultural heritage preservation, although no comprehensive program exists for establishing interactive information awareness, there are certain developments both in the legislation and in the sphere of practice, namely:

Digital information system of the archaeological heritage has been set up. Ordinance No. 26 of 10th April 1996 on the Development, Usage and Management of the automated information system “Archaeological Map of Bulgaria” issued by the Minister of Culture (The Official Gazette No. 34 of 1996), settles the development, management and usage of the automated information system “Archaeological Map of Bulgaria” (AIS “AMB”).

Digitalisation of the National Scientific-documentary Archive of the immovable monuments of culture is provided for by Ordinance No. 5 of 14th May 1998 issued by the Minister of Culture (The Official Gazette No. 60 of 1998, amendments to it in the Official Gazette No. 20 of 2001); the above Ordinance stipulates the procedure for announcement of the sites of the immovable cultural-historical heritage as monuments of culture, and for archiving the documentation on them. Article 30 reads that the National Scientific-documentary Archive will set up and maintain a computer information system concerning the immovable monuments of culture and the sites of the immovable cultural-historical heritage of Bulgaria, as well as about those related to Bulgarian history, which are located abroad.

The digital entries of the cadastre plans and maps (also containing data about the monuments of culture and their protected areas), of the town-planning schemes and the soil-categories maps, are the subject of Ordinance No. 5 of 10th May 1999, issued by the Minister of Regional Development and Public Works. The digitalisation of these documents is of substantial importance to their preservation in that its structural connection with the territorial development plans of population centres is a significant component of the integral conservation of immovable monuments.

Ordinance No. 1 of 17th November 2000 details the setting up and maintaining of an information register of the cultural organizations; it has been issued by the Minister of Culture (The Official Gazette No. 97 of 2000) .

Information systems and databases

Source: http://www.european-heritage.net/sdx/herein/national_heritage/voir.xsp?id=7.2_BG_en

Several information systems, although unconnected to each other, exist in the field of preservation and contain the respective databases, which are updated and added to on a regular basis; these information systems are:

Automated Information System Archaeological Map of Bulgaria (AIS AMB) is a computer system, by means of which information about the archaeological sites in the Republic of Bulgaria is collected, processed and stored. The database is filled in by the Archaeological Institute and Museum with the Bulgarian Academy of Sciences (BAS) and the National Institute for the Monuments of Culture on the basis of source documents made out by experts of the above two institutions and of the historic and archaeological museums, of other BAS institutes and by individuals. Each registration card of an archaeological site, which is approved of for the AIS AMB, is recognized as an author's publication and is protected by the Copyright and Similar Rights Act. There is no public access to the information on the AIS AMB database; it may be used only for activities relating to the study and preservation of the archaeological heritage, and the Minister of Culture specifies the levels of authorized access to the information in the AIS AMB.

The digital entries of the cadastre plans and maps, the town-planning schemes and the soil categories maps for Bulgaria represent these documents in a digital format as ASCII files, which contain graphic and semantic (descriptive, character-digital) information. The information system has been implemented and operates based on MS Access 97, the operational system is Windows 9x/NT/2000, Microsoft Office 97 - Access 97, with software for the Cyrillic alphabet and file packing software (WinZip). The system is expandable with a view to developing its functionality for multi-user network operation. The information database is an open system, that is, it may be added to and further developed, which allows for its merging with other databases with the same architecture, as well as for connecting of additional modules to the basic information massif. The intention is to prepare an English version of the database with a view to submitting information to foreign investors, business people and for preparation of presentations for various international forums.

The digital information system for the immovable monuments of culture in Bulgaria and abroad is being implemented at the National Scientific-documentary Archive, which is a unit within the structure of the National Institute for the monuments of culture; the required equipment for its purposes has been supplied.

5.4 CYPRUS

Marinos Ioannides, CIPA Delegate to Cyprus

Pavlos Paraskevas, Senior Cultural Officer, Ministry of Education and Culture

INTRODUCTION

Editorial note

Due to the particular situation of Cyprus, more details have been included concerning the history and present situation of the island. The 1974 invasion and subsequent division of the island in two parts, one under the government of the Republic of Cyprus, now a member state of the European Union, and the other outside its control, has had a substantial impact on the cultural heritage, as stated in a European Parliament resolution: "documented plundering of monasteries, churches and cultural buildings has taken place during the Turkish occupation of northern Cyprus". The following summary description has been provided by the authors of the Cyprus survey and does not necessarily reflect the point of view of the editors.

GEOGRAPHY

Location, Area and Population

Cyprus is situated in the north-eastern part of the Mediterranean Sea, 33° east of Greenwich and 35° north of the Equator and has an area of 9.251 square kilometres, of which 1.733 are forested. The population of Cyprus at the end of 2001 in the government controlled area was 705.500. The total population of Cyprus at the end of 2001 (including estimates for Turkish Cypriots) was 793.100. The capital of the island is Nicosia (Lefkosia) with a population of 206.200 in the sector controlled by the government of the Republic of Cyprus. It is situated roughly in the centre of the island and is the seat of government as well as the main business centre. The 1974 Turkish invasion and occupation of nearly 37% of the island's territory literally cut the capital in half.

A BRIEF HISTORY OF CYPRUS

Cyprus has played a leading role in the history of the Eastern Mediterranean. Her history is one of the most ancient in the world. The oldest remains of civilisation go back more than 8000 years. Cypriot prehistory dates from the beginning of the 6th millennium BC.

The discovery of copper on the island in the third millennium BC brought wealth and trade to Cyprus. The settlement of Myceneans and later Achaeans in the 15th century BC resulted in the development of the island into an important centre of Greek civilisation. The Achaeans founded Greek kingdoms in Cyprus on the Mycenean model, and introduced the Greek language and religion as well as the Greek way of life. The institutions of these kingdoms were maintained until the Roman period. Cyprus was very well known to the ancients for her copper mines and her thick forests. Her natural wealth and her strategic position made her the bone of contention between the powers of the Eastern Mediterranean in antiquity. She was conquered in turn by the Assyrians, Egyptians and Persians. Nonetheless Cyprus managed to preserve her language and cultural heritage intact.

In the 5th century BC Athens played an important role in the affairs of Cyprus, collaborating closely with the Cypriot kingdoms. During this period, the King of Salamis in Cyprus was Evagoras, who acquired international fame. After the division of the Empire of Alexander the Great, who had freed Cyprus from the Persians, the island became one of the most important centres of the empire of the Ptolemies of Egypt. Later, in 58BC, Cyprus came under Roman rule. Both in the Ptolemaic and the Roman period, the sanctuary of Aphrodite in Paphos was the centre of the national, religious and cultural life of the island. Christianity was brought to the island by the Apostles Paul and Barnabas. The latter came from Salamis and was the founder of the Church of Cyprus. In 330 AD, on the division of the Roman Empire, Cyprus became a province of the Byzantine Empire and from then on followed fully the fortunes of the Greek Orthodox world. The Byzantine period left a rich artistic and architectural heritage in Cyprus. During the

Crusades, Cyprus was conquered by the King of England, Richard the Lionheart, on his way to the Holy Land. Richard transferred Cyprus to the Order of Knights. The Knights then sold the island to the French Lusignans, who established a feudal kingdom on the pattern of those in the West. The Lusignan period lasted from 1192-1489 AD, when the last Lusignan Queen, Catherine Cornaro, was compelled to transfer her rights to the Republic of Venice, which ruled Cyprus until its conquest by the Turks in 1571.

The Ottoman conquest resulted in the creation of a Turkish Cypriot community in Cyprus. This population came from the members of the Ottoman army who settled on the island and from Christians who of necessity became Moslem. According to the last official census in 1960, the Turkish Cypriot community made up 18.3% of the whole population of Cyprus. During the Ottoman period there are records of many instances when the Greeks and Turks of Cyprus joined together to struggle against the oppressive yoke of the Ottomans. Ottoman rule lasted until 1878, when the fear of the Sublime Porte of a Russian attack, led to an agreement between Britain and Turkey which provided for the cession of Cyprus to Britain in return for assistance from Britain to Turkey in the event of a Russian attack on the borders of Turkish provinces.

The Greek Cypriots saw the assumption of the government of Cyprus by the British as a transitional stage for the transfer of Cyprus to Greece, a demand which they repeatedly made to Britain. The latter rejected the demand on the grounds that Britain needed Cyprus to fulfil her obligations in the area. British rule lasted till August 1960, when, after a four-year liberation struggle against the British, Cyprus was declared an independent Republic. The Constitution of Cyprus, whilst establishing an independent and sovereign Republic, was in the words of de Smith, an authority on constitutional law, “Unique in its tortuous complexity and in the multiplicity of the safeguards that it provides for the principal minority”, and thus “stands alone among the constitutions of the world” (S.A. de Smith, “The New Commonwealth and its Constitutions”, London, 1964, p.296). Therefore, it was no surprise that, within less than three years, abuse of safeguards by the Turkish Cypriot leadership led to total unworkability of the Constitution. This necessitated the proposals for constitutional amendments submitted by the President of the Republic, which were immediately rejected by the Turkish Government and subsequently by the Turkish Cypriot leadership. Turkey, in furtherance of its designs based on territorial aggrandizement, instigated the Turkish Cypriot leadership´s resort to insurrection against the state, forced the Turkish Cypriot members of the executive, legislature, judiciary and the civil service to withdraw from their posts and created enclaves in Nicosia and other parts of the island. Using as a pretext the coup d’état of 15 July 1974, instigated by the then Greek military junta against the Cyprus Government, Turkey invaded the island on 20 July 1974. About forty thousand Turkish troops landed on the island, in violation of the Charter of the UN, the Treaties of Guarantee, Establishment and Alliance and the relevant principles and norms of international law. As a result, nearly 35% of the territory of the Republic was captured and remains occupied until today.

Cyprus and the European Union

In 1990 the Government of Cyprus applied for the full accession of Cyprus to the European Union, to which it was already linked by an Association Agreement made in 1972. The Commission of the European Union in a declaration published in 1993, acknowledged and confirmed the European character and orientation of Cyprus, as well as its eligibility to become an equal member of the Union. At the meeting of the European Council held in 1994 in Corfu under the presidency of Greece, the leaders of the “12” agreed that Cyprus would be included in the next phase of enlargement. This was confirmed in the December of the same year at the meeting of the European Council at Hesse, under the presidency of Germany. On 6th March 1995, The Council of Ministers of the European Union approved the timetable for the start of accession talks between Cyprus and the European Union. In the meantime Cyprus began the process of harmonisation with the legislation and policy of the European Union. On the basis of the 2000 Agenda, and taking into consideration the successful outcome of the Intergovernmental Conference, the European Council decided in December 1997 in Luxembourg, to initiate an overall process of enlargement with the ten applicant countries of Central and Eastern Europe and Cyprus on 30th March 1998. The course of the accession of Cyprus to the European Union was dissociated from the solution to the Cyprus problem in a statement by the European Council at Helsinki in December 1999. Specifically, the Council emphasised that in the event that a political solution to the Cyprus problem had not been achieved before the completion of the accession negotiations, then it would proceed to taking a decision on the accession without the finding of a solution being a precondition. Cyprus was the first candidate country to close all the 31 chapters in the EU accession negotiations. On May 1st, 2004 Cyprus became a full member of EU.

POLICIES

Institutional framework

The Ministry of Education was created in 1965 and was also given responsibility for culture.

Matters of culture are dealt with by a number of other ministries and semi-government organisations as well:

The Department of Antiquities (founded in 1935), which comes under the Ministry of Communications and Public Works, is responsible for ancient, Byzantine and medieval culture and for the culture that developed during Turkish rule, all over Cyprus territory. The Department of Antiquities is responsible for the management and running of the Archaeological Museum in Nicosia and of the District Museums, for the maintenance and preservation of the cultural heritage as well for archaeological research and excavations.

The Ministry of the Interior is responsible, through its Audiovisual and Mass Media Section, for Audiovisual Policy. The Ministry of Interior is also responsible, through the Department of Town Planning and Housing, for the conservation and protection of the architectural heritage.

The Ministry of Foreign Affairs is also involved in cultural matters, having the main responsibility for the country's international cultural relations. It carries out these duties in cooperation with the Ministry of Education and Culture as well as with other Ministries and institutions which function within the cultural field.

With regard to semi-state organisations, there are three that play a significant role in the field of culture:

a) The Cyprus Theatre Organisation (TH.O.C.), which was founded in 1971 and functions under the Ministry of Education and Culture, has the principal aim of promoting the theatrical arts and theatrical education. TH.O.C. at the moment runs three stages (Main, New and Children's), sponsors independent theatre groups and is responsible for the theatre buildings.

b) The Cyprus Tourist Organisation (C.T.O), which functions under the Ministry of Commerce, Industry and Tourism. The C.T.O. develops activities and is also funding programmes and events in the field of the development of cultural tourism.

c) The Cyprus Broadcasting Corporation (Cy.B.C.), which was founded in 1953, functions under the Ministry of the Interior. Apart from its radio and television programmes, it also makes documentaries, films and recordings, organises competitions in the field of the arts etc.

In the field of Local Government, in the last 15 years cultural departments and services have been

created in quite a number of the 25 municipalities of Cyprus, in the urban ones (Nicosia, Limassol, Larnaca, Paphos, Strovolos, Aglantzia etc), and in provincial ones (e.g. Ayia Napa, Paralimni, Dheryneia).

As far as the private sector is concerned, cultural activity is developed by the tens of cultural societies which exist at the moment in Cyprus, some of which have created notable cultural foundations (e.g. the Museum of Folk Art of the "Association of Cypriot Studies") as well as by other private organisations such as banks (the Cultural Foundation of the Bank of Cyprus, the Cultural Centre of the Laiki Group, the Cultural Department of The Hellenic Bank), the A.G. Leventis Foundation, the Pierides Foundation etc.

Specific regulations

A. The first specialised service at the Ministry of Education and Culture, with the exclusive responsibility for culture, was created in 1968 under the name Cultural Services. In 1992, when it was upgraded to a department, it was renamed "The Cultural Services Department". From the very moment of their emergence, and in response to the situation arising from the historic context of that time, the Cultural Services have mainly directed their activities towards cultural development and the creation of conditions encouraging contemporary Cypriot culture to flourish: the creation of cultural awareness and sensibility, promotion of contemporary cultural values, boosting development of contemporary cultural life and assistance to contemporary Cypriot cultural creators were the principal objectives of their activities. The commitment to these objectives exists until today.
Today, the Cultural Services are the chief mouthpiece of the cultural policy of the State as far as it relates to contemporary culture. They are responsible for the formulation of the state cultural policy. They implement various measures for the development of the various fields of culture in Cyprus, for informing the public, for the participation of the public in the cultural life, and for the promotion of the achievements of our cultural activity abroad. As such, they play a particularly important role in the shaping of the cultural physiognomy of the country. The main aim of the cultural policy of the Ministry of Education and Culture is the creation of the institutional and financial preconditions as well as the mobilisation of all the means that permit and encourage the creative expression and activity of all the social groups and individuals that make up our people. Their concrete policy is laid down in the various measures and programmes which they design and implement in pursuing the further development of the field for which they have a mandate.

B. In 1935 the Cyprus Department of Antiquities was created as a result of the creation of the Antiquities Law. With the independence of Cyprus in 1960, the Department of Antiquities which is under the Ministry of Communications and Works, is the governmental authority responsible for the cultural heritage of the island.

C. The protection of cultural heritage today
The Cyprus Government designates as cultural property all antiquities declared by the Antiquities Law of 31 December 1935 and its Amendments no. 48 of 1964, no. 32 of 1972, no. 92(I) of 1995 and no. 4 (I) of 1996. According to the Antiquities Law "Antiquity means any object, whether movable or part of immovable property which is a work of architecture, sculpture, graphic art, painting and any art whatsoever, produced, sculptured, inscribed or painted by human agency, or generally made in Cyprus earlier than the year A.D. 1850 in any manner and from any material or excavated or drawn from the sea within the territorial waters of Cyprus and includes any such object or part thereof which has a later date been added, reconstructed, readjusted or restored. Provided that in the case of such works of ecclesiastical or folk art of the highest archaeological, artistic or historic importance, the year A.D. 1940, shall be taken into account in place of the year A.D. 1850". The register of ancient monuments at present numbers 1146 scheduled monuments from which 184 are in the occupied part of Cyprus. There are 464 ecclesiastical monuments, mostly churches and monasteries. Scheduled monuments are divided into two schedules. Those which belong to Schedule A are the property of the Cyprus Government, those which belong to Schedule B are privately owned. To this second Schedule belong almost all ecclesiastical monuments and houses of folk architecture.

War damage and the current state of cultural heritage

Since the Turkish invasion of July 1974 a large number of ancient monuments and archaeological sites in the areas occupied by the Turkish army are inaccessible to the Department of Antiquities. Efforts are being made to collect as much information as possible on the state of preservation of these archaeological sites and monuments. Perishable remains, if left unprotected for a long period, will face the threat of total obliteration. In addition, antiquities frequently appearing on the international market imply that illicit digging is a frequent phenomenon. Reports on destruction by causes other than neglect, such as illegal excavation,

plundering and destruction by construction activities, come to our attention. As the required information is inconsistently obtained, it is not possible to trace the date of destruction of each one of these sites and monuments but, in conjunction with the rest of the evidence, it may be concluded that there is a general absence of protection of archaeological sites and chapels from human or environmental agents of destruction. All sites were given Turkish designations in an effort to disassociate them from their origins and their meaningful context and alter their cultural connections or identity.

Cataloguing

As far as movable cultural property is concerned, this is listed category by category. There are nine categories: ceramics, stone, metal, faience, glass, wood, ivory, textiles, frescoes/wall paintings. The number of movable antiquities is so great that a designation item by item is an almost impossible task. The item by item designation is used for cataloguing immovable cultural heritage.

New awareness and new efforts

As we all know, attitudes to ecological matters, and to the preservation of cultural heritage in particular, have changed in recent years. There is definitely a need for “conservative planning” in order to make good use of our “archaeological resources”. Cyprus like other countries is also faced and painfully confronted by attacks of public users on historic architecture or even on archaeological ruins with genuine historic depth and continuity. Several positive moves have been made recently. As a result of the rapid development of the tourist industry, the total number of annual visitors to sites in the last five years rose significantly. The three most frequently visited sites in 2001 were the Paphos Mosaics (350,918 visitors), Kourion (316,789 visitors) and the Tombs of the Kings (263,518 visitors). In order to protect sites against the adverse effects of large numbers of visitors, visitor management strategies were developed aiming at creating a site design which would improve presentation and interpretation while maintaining at the same time the integrity of the archaeological site. Within this framework, conceptual Master Plans for the sites of Paphos and Choirokoitia were implemented and a third one for the site of Kourion is now under implementation.

Efforts are also being made towards computerisation.

The establishment of a data base with the classification of cultural heritage is now under formulation. There exists already a complete list and classification of all the ancient monuments situated in Kyrenia district which since July 1974 has been under the occupation of the Turkish army. We can now say that there is a small and gradual increase in public awareness of the problems associated with cultural heritage. There is, also, an increase in municipal ambition for the conservation of important sites and monuments and there is a small number of associations dealing with matters concerning the protection of cultural heritage at the local and regional levels.

Priorities for ICT applications to Cultural Heritage

The success of these proposed actions for protecting the cultural heritage of Cyprus will depend on the following factors: harmonious working relations with and between national authorities, ministries and private institutions dealing with cultural heritage, private, local or regional initiative, the budget allocated yearly to the Department of Antiquities, the body responsible for the cultural heritage of the island, the budget allocated yearly by the church authorities and by the private sector dealing with scheduled monuments, effective interaction between conservation and urban planning, and public awareness of the problems and potential of the cultural heritage. Special effort should be devoted in the immediate future to the task of completing a general inventory and classification of the cultural heritage of Cyprus. Public

awareness should be further raised in order to make more concrete progress as far as the maintenance, the monitoring and the conservation of our cultural heritage in general is concerned.

The impact of war

The cultural heritage of the island suffered a great deal as a result of the Turkish invasion in 1974. Initially, during the days of the invasion, the Cyprus Museum was evacuated and exhibits were transported to a safe place. In the areas, however, occupied by the Turkish troops, museums remained unprotected and without the care of the Department of Antiquities as they were, and still are, inaccessible to the legal authorities. There is evidence to indicate that museums and private collections in the occupied areas of Cyprus were looted and objects were exported for sale on the international art market. Active steps were taken by the Cyprus Government to prevent the plundering of museums of their exhibits and churches of their icons and mosaics. Appeals have been made frequently since 1974 to UNESCO and as a result delegates have been sent to Cyprus by UNESCO, the European Parliament and the Council of Europe to report on the destruction of the cultural heritage in the occupied areas. Constant efforts are being made to inform and induce UNESCO member States to warn the Republic of Cyprus in cases where Cypriot antiquities are intercepted on the illegal market as well as to convince art dealers not to buy or exhibit for sale antiquities which were illegally exported from Cyprus. The office of the Attorney General, the Ministry of Foreign Affairs, the Police and the Cyprus Permanent Delegation at UNESCO Headquarters always act in close co-operation for the identification and repatriation of stolen antiquities. Several objects from looted private collections were bought by foundations/private individuals and were repatriated. Information from foreign journalists reports losses or missing objects from museums. In addition, the storerooms of the foreign archaeological missions at various archaeological sites where objects from excavations were housed for study at the time of the invasion in 1974, were looted. Objects from the private collection of Mr. Chr. Hadjiprodromou of Famagusta, one of the largest private collections consisting of 1254 objects, appeared in the markets of Lyon, London and Basle. 43 objects from this collection were repatriated. The fate of 150 officially registered private collections located in the northern occupied parts, consisting of thousands of objects, is unknown. A request was made by the Cyprus Government in accordance with Article 9 of the UNESCO Convention, for import restrictions of cultural objects to the United States. In 1999 import restrictions were placed on objects of Byzantine chronology and in 2001 the restriction measures were extended to include objects of various types from earlier periods as well.

Preservation strategies

Architectural Heritage Preservation

To address these threats, the Department of Town Planning and Housing has taken action in various ways, thus creating new opportunities for the preservation and enhancement of the heritage of Cyprus.

Inventory and Documentation

Concerning the built heritage, the Department of Town Planning and Housing manages the Architectural Heritage Inventory of Cyprus. This consists of over 10,000 index cards describing an equal number of vernacular structures in all towns and 75 selected villages all over the government-controlled part of Cyprus, accompanied by a series of cadastral maps. The inventory is continuously upgraded through an on-going process with the aim of covering all government-controlled areas, following the specifications of the Granada Convention, ratified by the House of Representatives in 1988. A pilot study for the computerisation of this inventory in co-operation with the University of Cyprus was carried out in 2001.

Conservation and Restoration

Following the analysis of the Architectural Heritage Inventory, more than 70 Preservation Orders have been issued to date, encompassing over 2,500 vernacular structures all over

Cyprus. This is also part of a continuing process, in an effort to cover all government controlled areas. Furthermore, in order to facilitate the provision of incentives to owners willing to restore their properties in areas not yet covered by group preservation orders, provision has been made to allow the issuing of Preservation Orders for individual buildings upon submission and approval of a relevant application. For restoration work, as well as any alteration carried out on listed buildings, a special Consent is required, in addition to the regular planning and building permits, with well over 1000 such Consents having been granted since the 1980s. Restoration work is regularly inspected, while appropriately trained personnel of the Department periodically provide on-site guidance during the progress of work.

Provision of Incentives

To encourage proper restoration and revitalisation of listed buildings, a package of incentives has been provided through the Department of Town Planning and Housing, since 1985. Incentives provided through the Listed Buildings Law of 1992 are upgraded periodically to accommodate inevitable rises in restoration costs. The package currently includes direct cash grants for up to 50 percent of restoration costs, with a maximum ceiling of £40.000; generous tax deductions, including the exemption of restoration costs and rents obtained thereupon from income tax, the refund of property transfer fees, and the exemption from the property tax; the provision of low interest loans, in special cases, to facilitate restoration costs; as well as the transfer of development rights, that is the remaining permitted plot ratio of listed properties within local plan areas to specified commercial zones all over the island. An additional incentive, now available for all listed buildings anywhere in Cyprus, is the 'provided plot ratio,' a bonus square metres of such an amount that, when sold, will complete half of the restoration cost. Moreover, direct intervention by local authorities for urgently needed stabilisation work in abandoned listed properties in danger of collapse is subsidised through a Preservation Fund. To this end, approximately 300 buildings have been provided with the aforementioned incentives, while a further 100 applications have been approved for restoration projects currently under way.

Public Awareness

Lack of public awareness has been identified as a major threat to heritage preservation efforts. To address this issue, the Department of Town Planning and Housing organises and supports several conferences promoting the understanding of heritage preservation and enhancement. In addition, a number of heritage-related events are organised within the framework of the European Heritage Days, through which public awareness has been raised, especially among the youth. With the EUROMED HERITAGE Project, and the extension of European Heritage Days to the countries on the south and eastern shores of the Mediterranean, Cyprus is ready to become a bridge in the effort to raise awareness and add value to the cultural heritage of the region.

Landscape Preservation

The protection of natural areas in the countryside is promoted through the relevant Policy Statement, a legally binding guideline document in the form of an adapted regional plan for the control of development and the protection of the environment in villages and rural areas. Along with this document, a series of zoning plans have been published for the majority of rural settlements, while areas of outstanding natural beauty, selected coastlines and nature protection areas, as well as areas of protected landscapes, including bodies of water, precipices and canyons and mountain peaks, are all delineated on a detailed cadastral inventory which complements the guidelines of the Policy Statement.

Implementation of the European Landscape Convention

In its efforts to promote public awareness on the importance of cultural landscapes, the Department of Town Planning and Housing has submitted a proposal to include the limestone vineyard terraces of the Limassol Wine Villages in UNESCO's World Heritage List, as an important example of the island's rural landscape heritage. Cyprus is already a signatory party to the European Landscape Convention, the drafting of which has been closely followed by the

department of Town Planning and Housing. With the objective of developing a Landscape Strategy for the island, work is currently carried out on the adaptation and modification of relevant provisions in all Local Plans and the Policy Statement for the Countryside, taking into consideration the effective preservation and rehabilitation of cultural landscapes as well as the implementation of the NATURA 2000 network proposals, already under study. Last but not least, the first of a planned series of Preservation Orders has recently been issued for the protection of outstanding trees and groups of trees located outside designated Forest areas (which are already adequately protected through relevant legislation implemented by the Department of Forests).

Networks and/or associations

A. Museums

According to an unofficial and incomplete survey prepared in 1998 by the Leventis Municipal Museum of Nicosia, the number of private (i.e. not established by the state) museums in Cyprus amounts to 51. The survey refers to establishments who use the term "museum" in their official name. Therefore, the museums included in the survey are classified as such according to their own understanding, irrespective of whether they comply with any objective criteria of classification or not. This proliferation reflects the ambition of almost every community or locally (on a community level) based organization in Cyprus to create its own museum. In most cases, this ambition is supported on behalf of the proponents for the creation of museums either by reference to the contribution of the museums to be created to the protection and promotion of cultural heritage, or by reference to the expected developmental impact on the community as a result of the creation of such establishments. Both arguments are weak: neither constitutes the creation of a museum an act of protection and promotion of cultural heritage per se, since the distinctive and unique value of the museum´s collection has to be proved; nor can any direct or indirect link between the creation of a museum and its ability to influence economic and social development (via creation of working places and prospects to become a focal point for the community´s social life) be convincingly established, unless the museum´s own economic viability and sustainability is safeguarded. Moreover, the most important condition that should be observed when establishing a museum is not even considered: namely, that there are distinctive, necessary and sufficient conditions that any establishment should meet in order to be eligible to classify as a museum. As a result, most of these "museums" can hardly qualify as such. Common characteristics applying to the overwhelming majority are the following: they are based on poor foundations with respect to their ability to raise funds and secure the income necessary for their proper operation; due to the fact that their operation is not based on a constitution, neither is the ownership status of the collections of these museums clear, nor is their operation entrusted to the hands of a governing body which is bound to derive its governing powers from the statutes of such constitution; the lack of a constitution makes it also impossible to identify the policy objectives (if there are any) which are followed by those operating the museums; the museums´ operation is not based on sound principles of administration and management; they do not employ specialized personnel and they are usually understaffed; their collections are not organised according to scientific criteria. The above general remarks on the prevailing situation and existing tendencies in the field of museums in Cyprus make not only evident the absence of policy in this field, but also make obvious that, at least until recently, no single authority was officially delegated to deal with that issue. As a matter of fact, the need to formulate a policy for the field of museums and to assign an authority with responsibilities for policy formulation and implementation emerged only after pressure exerted on behalf of those who sought state financial assistance became very intense. As a response to this pressure, a tripartite ministerial committee composed of the Minister of Education and Culture, the Minister of Finance and the Minister of the Interior convened in 2000 and decided to ratify a subsidies scheme for museums. The scheme´s core objective was to financially assist the creation of new museums and to underpin improvements on the infrastructure of already existing museums that preserve, protect and promote cultural heritage. As such, the scheme was not embedded in a broader context of development, linking its

objectives with social and economic aspects. In addition, no single governmental authority has been formally assigned with the task of the implementation of the scheme. Instead, this task has been transferred to an ad hoc created interdepartmental committee, consisting of members representing various governmental departments. The interdepartmental committee proved to be a weak instrument, with limited capacity as regards to its competence to effectively manage the implementation of the subsidies scheme. It was neither intentionally designed as a powerful instrument able to provide guidance to museums, nor was it able to effectively monitor changes, evaluate developments and/or setbacks in the field of museums and assess its own contribution in shaping the field of museums. It was merely an administrative device primarily created in order to respond to a given situation. As such, the committee did not obtain a mandate to produce an integrated policy on museums - one which could relate museum development with aspects of social and economic development. Furthermore, the omission to incorporate operational definitions in the subsidies scheme (definitions such as "what is a museum" and "what is a collection") affected negatively the scheme´s strategic value and also imposed severe confinements as regards to both the scheme´s range of reference and the committee´s ability to properly structure its own field of competence. If we add to this the limited access to resources (only £70.000 were yearly allocated for the purpose of implementing the subsidies scheme), then we can conclude the following: museums policy, as it was expressed by the subsidies scheme, was bound to perpetuate the prevalence of a certain state of affairs in the field of museums, which was seemingly considered to be the permanent and unalterable status quo.

B. The Cyprus Public Record Office

The Cyprus Public Record Office was established in 1978 under the Public Record Law, 1972, to provide for the preservation of public records. In 1991 it was renamed "State Archives" under the new State Archives Law, which repealed the Public Record Law 1972. It is a service under the Ministry of Justice and Public Order. The primary function of the State Archives, as a place of deposit for public records, is to receive from government departments and other bodies subject to the State Archives Law those of their records that must be permanently kept and to hold them for official use. Its further function is to hold and make these records available for research by members of the public. Under the current legislation, the definition of "records" includes all recorded information created or received by a public body, regardless of physical form and characteristics. The State Archives make arrangements for the selection of public records that ought to be permanently preserved, based on their historic or administrative value. The records selected for permanent preservation are transferred to the State Archives within a period of 30 years after their creation. Those that have been rejected as not suitable for permanent preservation are destroyed. Members of the public have access to public records 30 years after their creation. The Minister of Justice and Public Order may prescribe, with the consent of the appropriate authority, any other period, reduced or extended. Extended closure periods may be prescribed if the records are of national security, contain private information given in good faith or have sensitive information. Accelerated opening is prescribed for records that were already open to the public before their transfer to the State Archives.

In spite of many and much more urgent preoccupations, the Cyprus government has been conscious of the need to save its old records. The State Archives have implemented, throughout the government departments, the Records Management Programme, offering thus a "common service" to them. At the same time it protects and preserves the valuable collections that are housed in its premises. At the State Archives Conservation Unit, fragile and destroyed documents are restored on the one hand, while on the other, preventive conservation has become a major issue over the recent years.

The State Archives offer lectures to clerical officers and other officers of the public service as part of their vocational training. In addition, it is involved in organising lectures on preventive conservation. Recently, the State Archives in collaboration with the Cyprus Development Bank organised a series of advanced training courses on preventive conservation of paper. The courses were financially supported by the Manumed project, which falls under the European

Union, Med-Heritage Programme. The objective of these courses was to provide both theory as well as practical training to people in charge of archives, libraries and private collections. The State Archives are for the time being housed in rented premises in a multi-commercial building at the centre of Nicosia. However, with a view to materializing the Cyprus Government's desire to erect a purpose-built State Archives building, an appropriate site has already been assigned and plans are already under way. The new building will give the State Archives the opportunity to expand their activities. It foresees the hosting of seminars and various exhibitions. Moreover, shortage of space will be alleviated, more collections will be able to be permanently preserved and members of the public will carry out their research in suitable and specially designed reading rooms. The quantity of records now stored in the State Archives amounts to 3,54 linear kilometres of shelving. Some of the principal archival holdings are the Governors' Archives and the Secretariat Archives dating from 1878 to 1960 as well as other groups of colonial records. None of the previous rulers of the island (Richard I of England, the Knights of St. John, the Lusignan dynasty, the Venetian Republic and the Ottoman Turks) left behind any collections of public records. Only a small number of Ottoman state documents survived, having in 1878 been taken over by the British authorities at the time of the island's transfer from the Ottoman Empire to the British. Thus, public records in Cyprus means the surviving manuscript and other related records created by the British colonial authorities between 1878-1960, and such Republic of Cyprus Records, whose administrative use has ended and which are available for selection and permanent preservation. Since 1985, the State Archives, in an effort to enrich their holdings with records of earlier historical periods of the island, have been involved in an ongoing project with the UK's Public Record Office, purchasing microfilms of colonial records relating to Cyprus. Furthermore, in 1990 the State Archives commenced a similar project, purchasing microfilms and transcriptions of records relating to Cyprus from the State Archives of Venice. This project has now finished and a new one has commenced with the Marciana Library.

The State Archives of Cyprus have already started taking necessary steps to face the changes that will arise due to the technological development of our era. Some government departments already create records in electronic form. The State Archives are considering such issues as the anagement and safekeeping of these electronic records and their accessibility to the public. The State Archives are looking forward to the automation of all government departments, which is currently under way. This development will give new direction in the flow of its work and all required actions are being taken in order to be able to continue to fill the role of a "common service" in relation to other government departments. The office automation of the public sector and especially the automation of the State Archives will additionally improve the facilities available in the reading rooms and will give readers a better opportunity for more in depth research.

The State Archives will soon have their website on the Internet under the web page of the Ministry of Justice and Public Order. As a start, the site will provide general information regarding the role and functions of the State Archives, some information on the collections kept and photographs of documents.

The new century and its dramatic changes in technology will give a new role to all the State Archives of the world. The sciences of Archive Administration and Records Management should consider Computer Science subjects in order to catch up with the rapid developments. The new archivists should be computer literate to cope with the computerization and automation of governments. Readers will need help and guidance on how to handle and research machine-readable records. The age of paper-written documents will soon co-exist with the epoch of electronic records. Regardless of these technological changes and innovations, the State Archives of Cyprus will continue to be the place of safekeeping of the island's history.

C. The Republic of Cyprus participates in collaboration with the World Heritage Committee, the World Heritage Fund and the Memory of the World on the subject of Protection of Cultural Heritage. in international committees on cultural matters, in the framework of the European Union ("Culture 2000" Programme) and the Council of Europe (Steering Committee for

Culture, Steering Committee for Cultural Heritage, Committee on Culture, Science and Education of the Parliamentary Assembly of the Council of Europe). Within the framework of UNESCO, Cyprus participates in institutions such as the celebration of International Book Day and International Intellectual Rights Day and in the Permanent Committee on the Production of Books and Reading. As regards the field of music, Cyprus participates in the International Music Council with the Cyprus Music Committee. In the field of theatre and dance, the National Theatre Committee and the International Dance Committee function within the framework of the International Theatre Institute of UNESCO.

D. Bank of Cyprus Cultural Foundation

The Bank of Cyprus Cultural Foundation was established in 1984, a decade after the Turkish invasion and the ongoing occupation of the northern part of the island. The Foundation was born out of the Bank's growing concern to assist in the rescue of the island's cultural heritage, which has been pillaged or stolen by the Turkish forces from the occupied areas, and to promote the Hellenic culture of Cyprus at a professional and scholarly level. Thus, while the context of all projects undertaken by the Foundation is meant to be Cyprological, i.e. pertaining to Cyprus (art, history, literature, etc.), the philosophy and policy of the Foundation is to promote the Hellenic character of Cyprus, in as much as this is an island of the wider Hellenic world. This assessment does not by any means detract from the unique, historical development of Cyprus from antiquity to the present. In February 2000 the Greek authorities granted permission for a branch of the Cultural Foundation to be opened in Greece. The branch will have its temporary premises at the administrative headquarters of the Bank of Cyprus in Athens. The object of the establishment of the branch is to strengthen cooperation between the Cultural Foundation and foundations in Greece and to contribute on a nation wide level, with regard to cultural issues concerning the Hellenic world as a whole.

The archive of the Cyprus Bank Cultural Foundation contains Museum of the History of Cypriot Coinage; Cyprus Map Collection; Rare Historical Documents Collection Engravings; Old Photographs and Watercolours; Art Collection of Cypriot Artists and the Museum of the George and Nefeli Giabra Pierides Collection

E. Laiki Bank Cultural Foundation

The active involvement of Laiki Group in the cultural life of the island began in 1983. Since then, the Laiki Group Cultural Centre has adopted a specific policy with regard to contemporary Cypriot visual arts, photography and major publications, with special emphasis on history, tradition and the island's heritage from Middle Ages to the present day. The Centre's main activities include the organising of exhibitions and events, luxury publications, sponsorships, Museum Education Programmes in all government controlled areas of the island and its three major collections (Works of Art, Rare Books, Photographs-Postcards). In August 2000 Laiki Group and the Pierides Foundation established the "Laiki Group Cultural Foundation - Pierides Museum" trust. The trust includes an internationally renowned collection of Cypriot antiquities, a collection of medieval pottery, a collection of old cartography from Cyprus and the Eastern Mediterranean and a library devoted to books on Cypriot studies.The Laiki Group Cultural Centre aspires to develop into a state of the Art Centre of Research and Information, available both to researchers, historians and students as well as to the public at large.

F. The Cultural services of the Ministry of Education and Culture

As one of the main supporter of cultural development in Cyprus, have included in their programming the establishment of the national "Main Cultural Portal". This portal will constitute the foundation on which to construct a national network and an epicenter of communication and collaboration with the European Cultural portal and other national cultural portals.

FUNDING SOURCES AND PROJECTS

Cultural development in Cyprus is chiefly financed by the State. There is, however, also a contribution from local government authorities. The commitment of the big bank institutions towards the establishment and operation of cultural institutions with considerable output is also of significant importance, as it reveals their readiness for allocating financial resources for cultural purposes. Development Policy in the field of culture, was determined - up to and including 2003 - by means of the Five Year Strategic Development Plans. From 2004, after the accession of Cyprus to the European Union, the further planning for cultural development will be included in the "Strategic Development Plans", which will be based on the aims referred to in the Minister´s introductory note. In the Five Year Strategic Development Plan 1999-2003, especial emphasis was given to cultural development and this is revealed by the substantial increase in state expenditure in this field. The basic aims and objectives of the Five Year Strategic Development Plan 1999-2003 were:

1. The provision of increased opportunities for the access of citizens to cultural commodities and services, so that every citizen, on an equal basis and without discrimination, may become a consumer/recipient and also a creator/agent of cultural creation, contributing both to local and international culture.

2. The cultivation of the cultural awareness and cultural sensibility of the citizen.

3. The promotion of decentralization in the matter of the organization of cultural activities, so that the Cultural Services act more at the level of the coordination of cultural activity, creating the appropriate framework of cultural development.

4. The increase of cultural exchanges with other countries, with special emphasis given to exchanges and development of relations with European countries.

5. On the basis of the assumption of the responsibilities for culture mentioned above, the distribution of the relevant resources is made. The annual state budget provides for these resources. The first table shows the resources allocated for culture and their proportion as a percentage of the whole budget for the years 1999-2002 (Current Expenditure – Development Expenditure), while the next table shows the resources allocated for development expenditure and their proportion as a percentage of the whole development budget.

Year	Amount in Euro	Percentage of the State Budget
1999	32.953.290	1,045
2000	58.248.650	1,607
2001	75.542.250	1,722
2002	75.284.160	1,596

The annual budget of the Museum Section amounts to approximately 25% of the total budget of the Department of Antiquities (Total budget: approx. 3.892,00 Euros)

PRACTICES

On-Going And Past Projects

The Cultural services of the Ministry of Education and Culture, as the main supporter of cultural development in Cyprus, have included in their programming the establishment of the national "Main Cultural Portal". This portal will constitute the foundation on which to construct a national network and an epicenter of communication and collaboration with the European Cultural portal and other national cultural portals. The first stage of the operation of the Portal, and the joining in of the first ten partners (state as well as private cultural institutions, and semi-governmental organizations) will be followed by the establishment of the national network, which will bring together cultural institutions from all geographical compartments of Cyprus. The first group of contributing institutions will be made up of local museums and archives, as well as Municipal and Community libraries, whose portal is already in the process of formation. The basic digitisation guidelines refer to the collection, evaluation, encoding and posting of credible information on all sectors of cultural creation, made possible through the use of both public and private funds. The essential force behind our digitisation policy is our intention to make cultural information in Cyprus accessible to everyone indiscriminately, creating at the same time a potent tool which will contribute to the efficient interaction and mutual understanding between the people of Europe. In this framework, the encouragement of bi-lateral and multi-lateral cooperation, through national networks, is an element of most central concern. The Ministry of Education and Culture is taking into account the outputs of NRG-MINERVA for defining the local digitization programme.

Good Practices

Most representative project is:

Jewelmed URL www.jewelmed.org

Objectives of the JewelMed (two year EC-funded project, Concerted Action) are: identification, analysis, preservation and dissemination of manufacturing technologies in goldsmithing and silversmithing from the 7th to the 1st century BC in the Mediterranean area. JewelMed aime at collating and recording data and experiences on Mediterranean Cultural Heritage, within the Euromediterranean Region, gathered in similar projects in order to contribute to the re-utilisation of manufacturing technologies in goldsmithing and silversmithing.

The Concerted Action is focused on four major activities:

- Identification of technologies
- Comparative studies
- Utilisation of supporting technologies
- Dissemination and exploitation activities

Three main results have been achieved since March 2000 (operative start date of the project):

1.Guidelines: an important reference tool prepared by the JewelMed advisors. It is a critical and cognitive starting point for the different activities as well as an infomative dossier to be developed through partners contributions. The Guidelines are divided into two sections: Analysis and dissemination of information and Historical profile and classification instruments.

2.JewelMed Database including:

- administrative data - Information on ownership, location, current exhibition of the object.
- usability data - Information on possible uses of the object based on the observation procedure of similar artefacts.
- production/technology data - Information on techniques, materials and tools used to manufacture the object.
- iconography/decoration data - Information on decorative themes of the object and its componets.

- archaeological data - Information on the location and on the conservation or restoration procedures that applied since the object was found.

3. Comparative study consisting of: a detailed description of methodologies related to techniques identified, with specialized input from the scientific, archaeological and technical organizations participating in the Concerted Action.

With reference to project culture and terminology competencies, a common language was needed to carry out the work on a common basis in different geographical areas, with the available human and scientific resources. This has resulted in an important JewelMed output: the creation of the technical glossary providing a key reference guide for all the JewelMed activities, allowing partners to communicate and to cooperate on a shared-knowledge basis.

Other important projects from different research institutions:

- **Study of the Post-Byzantine Art of Cyprus**, in the frame of the edition of "History of Cyprus" by the Foundation of Archbishop Makarios III.
- Since 1993 several research projects have dealt with the artifacts (mostly pottery) from the Excavations of the House of Orpheus in Paphos. This involves the study and preparation of the material for publication.
- The project entitled "**An Inventory and Research into the Traditional Pottery of Cyprus (18th - 20th cent.)**" started in 1996. At the present stage the project is studying the traditional pottery workshops of Nicosia but it is hoped that it will eventually cover the whole island.
- Study of the collection of Cypriot costumes and other items of folk art in the National Historical Museum of Athens.
- Excavation of a **Late Bronze Age Smelting workshop of Politico**- Phorades
- The scientific analysis of the archaeometallurgical finds collected during **The Sydney Cyprus survey project** in the mining area of Mitsero.
- Study of the Stone Toolsof the Late Bronze Age miners' village at Apliki - Karamallos
- Study and publication of the ancient glass objects in the Pierides Collection, Larnaca
- Water in traditional power producing systems of the Aegean, from Thrace to Cyprus in the framework of the programme “Thrace-Aegean-Cyprus” of the Ministries of Macedonia-Thrace and the Aegean. (Collaboration with the Institute of Greek Mills and other organizations in Greece)

RESEARCH: RELEVANT PUBLICATIONS

Proceedings:

"Cyprus and the Sea" - September 1993 (in collaboration with the Cyprus Ports Authority)

"Cyprus in the 11th Century B.C." -October 1993 (in collaboration with the A.G. LeventisFoundation)

"Languages and Cultures of the Countries on the Silk Routes" -September 1994 (in collaboration with UNESCO and the Department of Turkish Studies of the University of Cyprus)

"The Development of the Cyprus Economy from Prehistory to the Present" - April 1995 (in collaboration with the Bank of Cyprus and the Department of Economics of the University of Cyprus) **Meeting of the International Numismatic Commission** - May 1995.

"The Practical Impact of Science on Field Archaeology", July 1995 (in collaboration with the Wiener Laboratory of the American School of Classical Studies at Athens).

"Four Thousand Years of Figured Decoration on Cypriot Pottery (Relief, Moulded,Painted Decoration, Anthropomorphic and Zoomorphic Vases)", May 1996 (in

collaboration with the Universities of Brussels and Liege and La Maison de l'OrientMediterraneen, Universite de Lyon). **"Mosaics Make a site: The Conservation in situ of Mosaics on Archaeological Sites"**, VIth Conference of the ICCM (International Committee for the Conservation of Mosaics) -October 1996 (in collaboration with the Getty Conservation Institute (Los Angeles), ICCROMand the Cultural Foundation of the Bank of Cyprus).

"Printed and Embroidered Fabrics", November 1997 (in collaboration with the PopularHistorical Museum of Larissa, The Pierides Foundation (Larnaca) and the LeventionMunicipal Museum of Nicosia).

"Cyprus. The Historicity of the Geometric Horizon", October 1998.

"Mosaics. Recent Discoveries, New Research", April 1999.

"Water in traditional power producing systems of the Aegean, from Thrace to Cyprus", June 2000.

"Archaeological Field Survey in Cyprus: Past History, Future Potentials", December 2000. **"Early Metallurgy in Cyprus. The last twenty years, 1982 – 2002"**, September 2002.

"The Philia Culture and the transition from Chalcolithic to Early Cypriot", November 2002. "Egypt and Cyprus in Antiquity". April 2003 (in collaboration with The Cyprus American Archaeological Research Institute)

Representative papers:

- M. Ioannides, Al. Wehr: 3D Reconstruction and Reproduction in Archaeology. International ISPRS Conference in Corfu, Greece, September 2002
- M. Ioannides, A. Stassis: Manufacturing Technologies in the Ancient Jewellery Craftsmanship in Cyprus. First International Conference On Science and Technology in Archaeology and Conservation Amman, Jordan, August 2002
- M. Ioannides, G. Hadjilagos: Standardization: A Necessity for the documentation and archiving in Cultural Heritage. In XIX CIPA 2003 International Symposium Proceedings: New Perspectives to save the Cultural Heritage. Turkey, October 2003
- M. Ioannides, E. Stylianides, S. Stylianou : 3D Reconstruction and Visualisation in Cultural Heritage. In XIX CIPA 2003 International Symposium Proceedings: New Perspectives to save the Cultural Heritage. Turkey, October 2003
- M. Ioannides, A. Wehr: Reconstructing the Past in 3D: In 6th EC Conference Proceedings: Sustaining Europe's Cultural Heritage Conference, Sept. 2004 London UK.
- M. Ioannides, E. Stylianides, Y. Chrysanthou, D. Pillides: 3D Reconstruction and Visualisation of Agios Georgios Site in the City of Nicosia-Cyprus. In Proceedings International Workshop on Vision Techniques applied to the rehabilitation of old city Centres. Oct. 2004 Lisbon Portugal.
- Marinos Ioannides, Aloysius Wehr, Matthias Hemmleb, Albert Wiedemann: Ein effizienter Algorithmus für die Online 3D-Digitalisierung und Rekonstruktion in Architektur und Denkmalschutz. Proceeding: Von Handaufmass bis High Tech – II, Cottbus-Germany, January 2005

NEEDS

The conservation, restoration and promotion of all the Cypriot monuments is the responsibility of one of the two branches of the Department of Antiquities, which are directed by the two Curators of Antiquities. One is responsible for the ancient monuments and the other one for all governmental museums. There are only eleven archaeologists working at the Department of Antiquities and four of them work in the branch of ancient monuments. The numbers show how dramatic the situation is for the enormous task of caring for the large number of protected

sites.The state budget provides approximate Expenditures for ecclesiastical monuments and is 50% covered by ecclesiastical budgets. Economic help is also given by privately owned foundations such as the Anastasios G. Leventis Foundation.

5.5 FINLAND

Kari Uotila, University of Turku

Finnish information technology and the so-called IT society have in the past years been widely respected and become a source of inspiration for many European countries. The Finnish education system has been deemed one of the best in the world, particularly our teaching in the fields of science and mathematics. The products of Finnish engineering are also well known internationally. Alongside this northern country of engineers exists a country that has one of the largest proportions of museums in the world. One might think that combining these two worlds would succeed in such a small country, but unfortunately the joining of cultural heritage and IT in Finland has not always been that effective.

Cooperation in IH?

In European seminars and conferences, one can see the direct and functioning mode of action that several different projects use when moving between IT and museum professionals. It is of course possible that this is merely a phenomenon related to successful projects; unsuccessful cooperation never making it as far as presentation in seminars.

The difference with Finland is significant, for here we have almost no discernible cooperation between IT developers and the museum field. The development of information technology on e.g. the university level (e.g. computer science) is barely relevant to practical museum applications when it comes to e.g. virtual reconstructions, because it mainly concentrates on other unexplored areas.

On the other side of the coin is the Finnish education system in the humanities, where e.g. students who select archaeology also in some way choose a different path for their life. This choice usually doesn't involve an idea of information technology as being a particularly good thing, as something to be encouraged, but it is rather seen as a necessary evil whose role in life they should try to restrict everywhere and at all times.

Basic research in archaeology

If we examine the development of IH technology in e.g. archaeological fieldwork during the past decade, we can see that the use of e.g. total station at excavations is not much more efficient than ten years ago (except in a few special projects). From the beginning of the 1990s, the total station has been used for both outlining excavation areas and documenting finds as points. The archaeological research culture has of course always been conservative by nature – such as when adopting the Harris matrix – but when it comes to IT, updating equipment and software would offer opportunities for faster development.

At only a very few excavations have total stations been used for actually documenting the various structures and layers of the site – in other words, for stratigraphic documentation. Of course, the problem is also related to the researchers' age, seeing as the use of new information technology during fieldwork in projects led by people in the 40+ -50+ age group is rare. The archaeologist heading an excavation must be familiar with the methods utilised and be able to manage and control their use. Older researchers are not willing to give the next generation the new power brought on by new information technology. Only a few years ago, archaeologists in Finland may have thought that time would quickly take care of this problem, but now the newly raised retirement ages force us to reconsider older researchers' need for further training.

The use of the latest field documentation technology, such as 3D laser scanners, is only at the level of mere individual experiments in Finland. GPS locators have been used in various

4. Museum Handheld Devices: Ubiquitous and Immersive Learning and Interpretation Environments for Museums and Cultural Settings.

Interpretation is often a key issue in the planning and realisation of an exhibition. After a long period of experimentations with stationary work stations in the museum space, museums are now starting to examine the potential of mobile, light, nomadic platforms that can be easily personalized and accompany the visitor throughout his visit in a museum exhibition.

IRIS has participated so far in two Museum Handhelds programs. MOBIGUIDE was conceived and designed for the Museum of Fine Arts in Lyon as part of the MOBIVISIT project with close collaboration with museum educators and curators.

FT RD is prime in the 30 month IST European project DANAE (Dynamic and distributed Adaptation of scalable multimedia content in a context aware environment). Its objectives are to specify, develop, integrate and validate in a testbed, a complete framework able to provide end-to-end quality of multimedia service at a minimal cost for the end-user. Museon museum in Hague participates actively in the application design process and is providing content for a multimedia application which will progressively include VR elements. The first prototype is expected to be tested mid 2005 while the full application should be available until June 2006 [http://danae.rd.francetelecom.com].

5. Advanced Integrated Services for Cultural Heritage Artifacts Documentation and Dissemination

The recording, documentation and dissemination of finds coming from archeological excavations are time-consuming processes, demanding collaboration from scientists of different disciplines. Archeologists need to collaborate with biologists, anthropologists, historians, architects, designers as well as museum professionals in their effort to unveil forever lost cities, cultures and civilizations and render the results from their research available to the scientific community. One of the most coherent partnerships ever developed in the domain of cultural heritage and IT and telecommunications industry was the one established between France Telecom R&D and the Centre d'Etudes Alexandrines (CEA), a research institute funded by the archeologist Jean Yves Empereur and financed by the French National Research Center (CNRS), devoted entirely in the study of the city of Alexandria. The city, funded by Alexander the Great, flourished during the Hellenistic and Roman period, declined after 642 after the establishment of a new capital in al-Fustat. Nowadays Alexandria remains Egypt's largest port.

France Telecom RD working jointly with the archaeologists of the CEA, designed and implemented a complete system for the recording and documentation of excavated archaeological material, even under the most excessive in terms of conditions excavations like the ones conducted underwater, in Alexandria's port.

More specifically, FT R&D developed a complete intranet database system for the recording and documentation of excavated objects, provided videoconferencing facilities for geographically dispersed scientific collaboration, created the first wire based telephony systems for the needs of the underwater excavations, conceived the Houria terminal, one of the first in the domain of cultural heritage handheld multimedia communicator, and created a WAP based portal to provide visitors with information regarding the excavated sites as well as other leisure activities.

The extended 3D imaging activities undertaken by IRIS included the creation of a virtual workspace, based on the Spin 3D software, which enabled researchers to create artefacts models (e.g. an amphora) and to visualise it in real time with colleagues located in remote locations. As in a virtual chat-room, participants communicate by speech or text using their virtual "avatars". Using this technology, a 3-D image of a cornaline engraved with an intaglio was analysed and interpreted by a specialist in Middle East archaeology working in Lyons' Maison de l'Orient.

Other 3-D graphic applications developed by France Telecom included a virtual tour of Alexandria that faithfully reproduced the ancient city as it appeared at four different periods in history. The virtual guide for this multimedia experience was none other than Alexander the Great, whose 3-D character has been modelled on photos of statues of the famous conqueror. By incorporating 3-D visuals in this way, France Telecom created an original "edutainment" and storytelling tool for a broad audience.

[http://www.rd.francetelecom.com/en/medias/prof_jour_press_alex.htm]

Some representative related publications:

Gioia P., Aubault O., Bouville C., Real-Time Reconstruction of Wavelet Encoded Meshes for View-Dependent Transmission and Visualization, IEEE TCSTV, Vol. 14, NO. 7, Jul. 2004.

Aubault O., Visualisation interactive de scènes vastes et complexes à travers un réseau, Thèse soutenue le 20 nov. 2003, Univ. de Rennes 1.

Balter R., Gioia P., Morin L., Galpin F., Scalable and efficient coding of 3D model extracted from a video, 3DPTV'04 Second International Symposium on 3D Data Processing, Visualization, Thessaloniki, Greece, Sept. 2004

Royan J., Aubault O., Bouville C., Gioia P., Efficient Geo-Visualization Tools, Siggraph'04, Poster Session, Aug. 2004.

Royan J., Bouville C., Gioia P., PBTree – A new progressive and hierarchical representation for network-based navigation in urban environments, VMV 2003, Munich, Nov. 2003.

5.7 GERMANY

Jürgen Mrosek (Staatliche Museen zu Berlin – Generaldirektion GD II, Besucher-Dienste)

On IH in the Federal Republic of Germany

Germany is by its constitution organised as a Federal Republic. The 16 countries are, beyond other matters, responsible for education and culture within the broad legislative regulations set by the federal government. Nevertheless about six years ago the federal government has established a Kulturstaatsministerium (Minister of State for Culture and Federal Government Commissioner for Culture and Media, BKM) which is responsible for cultural policy in the federal government and the cultural presentation of the Federal Republic of Germany in Europe and abroad. The German Federal Archives (Bundesarchiv) are also under the supervision of the BKM. In 2004 the budget of the BKM for the funding of cultural projects was 948 Mill.€. It is however estimated that the German countries and communities contribute about 88% of the overall German public expenditure for cultural purposes.

There are some institutions established to ensure the necessary coordination and cooperation between the different countries and between the federal government and the countries.

The Kultusministerkonferenz (Conference of the ministers of culture of the different countries) has a standing administration as well as the Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung (Commission of the federal government and all countries). The latter has published a report on "Kulturelle Bildung im Medienzeitalter" (Cultural Education in the Age of Media) in 1999, also mentioning the role of the museums in the educational process.

A few cultural heritage institutions are run by the federal government (Deutsches Historisches Museum - Berlin, Haus der Geschichte der Bundesrepublik Deutschland - Bonn, Bundeskunsthalle - Bonn) as well as the German Federal Archives (Bundesarchiv) and the German National Library (Deutsche Bibliothek). Most are run by the governments of the different countries or by local communities, besides museums and castles this also includes regional archives and libraries. In addition there are some institutions run by the federal government in cooperation with different countries or communities, like the Stiftung Preußischer Kulturbesitz (Prussian Cultural Heritage Foundation, financed by the federal government and all German countries), the Stiftung Weimarer Klassik (financed by the federal government, the country of Thuringia and the community of Weimar) and the Stiftung Preußische Schlösser und Gärten Berlin Brandenburg (financed by the federal government and the countries of Brandenburg and Berlin).

About two and a half years ago, in September 2002, the Bundesministerium für Bildung und Forschung (BMBF, Federal Ministry for Education and Research) published the strategic paper "Information vernetzen – Wissen aktivieren" ("Networking information – activating knowledge") describing new guidelines for public funding of ICT projects. The general idea is to enable rapid and comprehensive access to all worldwide available scientific information by way of internet-based information infrastructure. The paper describes three aims: the improved access to information for science and education, the research necessary to provide the technical and structural solutions for this network of knowledge and the integration of different kinds of libraries and information collecting organizations into the network. Although "Intelligent Heritage" is not explicitly mentioned in the paper it can be assumed that it is part of the described programme.

Nation-wide projects

There are programmes for the funding of ICT projects by the already mentioned BMBF and also by the Bundesministerium für Wirtschaft und Arbeit (BMWA, Federal Ministry for Industry

and Labour). The Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) is a semi-government institution is giving support to projects in all fields of science. The DFG is also funding several ICT projects aiming at the improvement of scientific infrastructure in Germany. This also includes the development of new software and techniques for improved scientific information systems and the construction of a national digital library providing access to historic materials.

These activities have resulted in several national projects which all cover aspects of IH such as[4]:

Disciplinary Information Consortia

Funded by the BMBF and the DFG Information Consortia brings together all relevant information in full-text with their discipline, integrating authorization and billing procedures. So far Information Consortia cover the disciplines education and social sciences (http:///www.infoconnex.de), economics and economic practice (http://www.econdoc.de) and natural science and technology (http://www.getinfo-doc.de).

VASCODA

The VASCODA project combines the content providers of several projects including the above mentioned Information Consortia and presents them jointly in the Vascoda portal (http://www.vascoda.de) thus uniting 37 important German libraries, research institutes and information centres. The project is funded by the BMBF and the DFG.

BAM-Portal

The BAM-Portal (http://www.bam-portal.de, Bibliotheken, Archive und Museen; libraries, archives and museums) is planned as the common portal for digitised cultural assets for Germany – later on to be integrated in the European network. The portal is funded by the DFG. The first phase included the development of the suitable technology with test content from libraries, archives and museums to make their digitised resources (information, content services, objects) available to users through a special search engine. The second step was to develop an organisational structure to run the portal under real-life conditions. The third and final step is to enlarge the number of content providing institutions.

EUBAM

This permanent joint Working Group (http://www.eubam.de) of representatives from the ministries of culture, the federal BMBF, the sectors archives, libraries, museums, monument protection, the Deutsche Forschungsgemeinschaft (DFG) and other experts was established in September 2001. EUBAM will inform the relevant sectors on EU activities in the funding of culture and in the digitisation of cultural heritage, and will represent Germany in the related EU bodies.

netzspannung.org

netzspannung.org (http://netzspannung.org) is an Internet platform for artistic production, media projects, and intermedia research. “As an interface between media art, media technology and society, it functions as an information pool for artists, designers, computer scientists and cultural scientists.” This platform also presents numerous virtual reconstructions like the Dome of Siena, the Moscow Kremlin, a virtual museum, a World Heritage Tour and others. This platform has been funded by the BMBF until the end of 2004.

LOSTART

Since the mid-1990s LOSTART (http://www.lostart.de) is a joint project of the Federal German Minister of Culture (BKM) and the different German countries. “The documentation includes information on cultural objects taken from their rightful owners (a) because of persecution under National-Socialism or (b) which had to be sold under the threat of repression or (c) which

[4] The projects mentioned in the following sections are only a selection. Citations are from the respective websites.

had to be left behind because the owners were forced to flee or compelled to emigrate. This also involves cultural objects which today still evince gaps in their provenance such that an illegal dispossession between 1933 and 1945 cannot be ruled out."

Regional projects

Nearly all countries of Germany have websites or platforms bringing together all information on cultural institutions relevant for their region (theatres, festivals, libraries, museums and their collections etc).

DIGICULT-SH

This project is an Internet portal (http://www.kulturnetz-sh.de) for Schleswig-Holstein, the most northern German country. It is funded by the local savings-bank and the country's Cultural Advisory Board and brings together all cultural information relevant for that region. This also includes the installation of a digital communication structure for input/retrieval, decentralised search possibilities, the digitisation of catalogues and object photos. An EU-funded portal (http://www.museen-sh.de) which represents the museums of this country together with their holdings, events, and other relevant information is also available to interested users.

Kulturportal Bayern

In mid-2003 an Internet portal for culture has been launched by the Bavarian Minister for Science, Research and Arts (http://www.kulturportal-bayern.de). It offers information on cultural policy and its legal basis in Bavaria and covers as many cultural sectors as sculpture, theatre, dance, film, music, literature, architecture etc. The 1150 Bavarian museums are presented under http://www.museen-in-bayern.de including search possibilities by localities or special exhibitions.

Berliner Informations- und Service-System (BISSY)

The project BISSY (2000 – 2002) can serve as an example for a regional project which was not funded by a cultural institution but the Berlin administration for Industry and Labour. To prepare for the introduction of UMTS-Technology a number of Berlin ICT-companies developed the project aiming at Berlin tourists and other local users to provide them with any relevant information on various kinds of shops, restaurants, cinemas programmes and other cultural events by use of the forthcoming UMTS-technology at any place in the city of Berlin. The Staatliche Museen zu Berlin (17 collections in the city of Berlin at five different locations) as the main museums organisation in the city was one of the content providers of the project. Unfortunately the delayed introduction of UMTS brought the project to an end.

Museums-specific projects

The Museums Associations of the 16 German countries are also involved in IH-related activities of museums in their regions. Nearly all museums have established an own website ranging from a simple version stating location, kind of collection and opening times to highly sophisticated products with access to digital inventories etc.

LeMO (lebendiges virtuelles Museum Online)

The LeMO (http://www.dhm.de/lemo, actively virtual museum online) is a joined project by the Deutsche Historisches Museum Berlin (DHM, Museum for German History) and the Haus der Geschichte der Bundesrepublik Deutschland Bonn (HdG, House for the History of the Federal Republic of Germany). The first years have been supported by the Fraunhofer-Institut für Software- und Systemtechnik, the Deutsche Telekom and the DFN-Verein (Deutsches Forschungsnetz, German Research Network). LeMO is presenting German History of the 20th century, the first half until 1945 being presented by the DHM and the second half by the HdG.

The virtual trip through the 20th century includes 3D-animations as well as films and sound tracks

TNT – The Neanderthal Tool

The Neanderthal Tools (http://www.the-neanderthal-tools.org) is a EU-funded project. "TNT will develop advanced services and applications to improve access to Europe's cultural heritage, namely to collections and artefacts of the Neanderthal species. Thereby, it will increase the commercial value of parts of Europe's cultural heritage. TNT will enhance user experience in cultural tourism, visualising scientific objects and artefacts and developing a new repository for intelligent heritage and tourism."

Collection of Classical Antiquities Berlin

The exhibition includes three kiosks presenting about 60 min. of multimedia information on six different topics referring to sections of the exhibition. The kiosks are integrated parts of the exhibition design. The project was financed from the exhibition budget.

The Digital History Book – the Greek Classical Period

The special exhibition "The Greek Classical Period – Illusion or Reality" (Berlin and Bonn, 2002) (http://www.klassik2002.de) arranged by the Collection of Classical Antiquities Berlin also included the production of a kiosk multimedia information system for use of visitors. This project was financed from the exhibition budget. The digital History Book is the enriched CD-ROM production of that information system and is offered at the book shops at the Pergamonmuseum and the Altes Museum in Berlin.

Training

Many of the Museums Associations of the 16 German countries offer training courses for members of staff of cultural heritage organisations, some of these courses cover aspects of IH. The majority of those courses are do-it-yourself-training for the design of museums websites including some theoretical background on communication. The Bundesakademie für kulturelle Bildung (Federal academy for cultural education) also offers some courses where questions of IH are presented to the participants. Until recently the Institut für Museumskunde Berlin (Institute of Museology) offered training courses for web-design by museums staff, the funding by the Robert-Bosch-Stiftung (Robert-Bosch-Foundation, one of the important private foundations in Germany) has ended.

Training courses on the management of cultural projects sometimes include the management of IH related productions like websites, multimedia applications for visitors information or digital inventories, these courses are also held at the Bundesakademie für Kulturelle Bildung.

Research

The Deutsche Forschungsgemeinschaft (DFG) has established some special research projects at German universities. "Medien und kulturelle Kommunikation" (Media and cultural communication) is installed at the Cologne University; media is interpreted in a more general meaning. Another group of projects is placed at Siegen University, one is called "Virtualisierung von Skulptur: Rekonstruktion, Präsentation, Installation" (Virtualising Sculpture: reconstruction, presentation, installation) and plans to analyse the relation between figuration and space in a multi-dimensional and multi-directional picture using the example of Baroque sculptures.

The Deutsche Museum Munich has become the "Zentrum Neue Technologien" (Centre for New Technologies) sponsored by the Robert-Bosch-Foundation. In the tradition of PUS-efforts (Public Understanding of Science) it presents to a broader audience latest results of research and innovation from the fields of science, technology and society (http://www.deutsches-museum.de/dmzn)

The „Zentrum für Kunst und Medientechnologie“ Karlsruhe (Centre for Art and Mediatechnology) has just installed its new department called “Institut für Grundlagenforschung” (Institute for Basic Research, http://on1.zkm.de)

Publications on research projects on IH are not very frequent:

Noschka-Roos, A & Lewalter, D. (1993), Akzeptanz und Nutzung des Touch-Screen-Systems „Erneuerbare Energien“. Eine Studie in der Abteilung Neue Energietechnik des Deutschen Museums. Deutsches Museum München (unpublished).

Schuck-Wersig, P., Wersig, G. & Prehn, A., Multimedia-Anwendungen in Museen, Berlin 1998. Mitteilungen und Berichte aus dem Institut für Museumskunde, Nr. 13.

Lewalter, D. (2001), Wer profitiert von Illustrationen ? Untersuchungsbefunde zur Medienwirkung, in: Mitteilungen und Berichte aus dem Institut für Museumskunde, Nr. 26, S. 29-42.

The website http://www.ausstellungsmediumcomputer.de discusses many aspects of computer-assisted information systems in exhibitions focused on environmental aspects. It also includes a bibliography.

Summary

The situation of IH in the Federal Republic of Germany is not easy to access because, according to the Constitution, the different countries of the federation are among other matters responsible for education and culture. The federal government has the right to describe general guidelines and some federal ministries have installed funding programmes for ICT not explicitly mentioning IH projects. On the other hand, ICT is not a major economic factor in Germany and therefore not of high interest to the federal Minister of Industry and Labour. The latest available statistics are for the year 2000 published in 2003: only 5% of the overall national production came from ICT (183.600 Million €), 125.300 Million € came from ICT-services the rest were ICT-products (hardware). Even if the ICT-production has risen by 60% in the last five years as it did between 1995 and 2000, it still remains marginal for German economics.

There are no national programmes for the digitisation of holdings of cultural heritage institutions nor for IH. There are however funded projects for the development of web portals to integrate the available digital information for different kinds of heritage organisations. Many of the different countries have developed web portals of regional relevance also including information from cultural heritage institutions. Kiosk solutions for IH-projects are usually financed from the exhibition budgets.

Under the new scheme for unemployed persons in Germany an entrepreneur is planning a digitising project for all cultural heritage institutions with about 20.000 one-Euro-jobs (unemployed get a job for one or two Euros per hour). This would possibly solve the problem of lacking digitised museums holdings but the whole project is rather doubtful.

What is urgently missing is a database for IH-projects in Germany and any other projects.

TroiaVR

TroiaVR[5] is part of a project called "Virtual Archaeology" consisting of two parts: Troy ("TroiaVR"), and Ancient Egypt ("Virtual Nile Valley"). The project was funded by the German government as a winner of a competitive call named "Competition on virtual and augmented reality" issued by, the German Federal Ministry of Education and Research (Bundesministerium fur Bildung und Forschung)[6]. The result was a project called "Virtual Archaeology", or in full "Virtual reality-based: knowledge management and knowledge marketing in archaeology" launched in February 2001. The project partners were ART+COM AG (Berlin, leader of project consortium), Troia Project (Tübingen University), the German Archaeological Institute (Cairo) and IXL-Satinfo AG (Oberpfaffenhofen). According to a lecture given at CAA2002 by the project team[7], the project goals were:

- To develop IT-components for archaeological virtual reality (VR) presentation systems.
- To make this systems accessible to archaeologists by developing "workbench" tools to create, manipulate, and, present content in a VR environment, and by porting the software to affordable hardware (PC instead of workstation).
- To explore possible ways of linking archaeological information systems closely to the VR system in order to use VR not only for presentation systems, but also as research tool. This is also necessary to provide authentic accurate, up-to-date, and well-documented content.
- To create two archaeological applications: Troy ("TroiaVR"), and Ancient Egypt ("Virtual Nile Valley")
- To research marketing opportunities for archaeological VR presentation systems … [in order to] provide, in the long run, a source of income for archaeologists to sustain further research.

A working installation including reconstructions of Troy II, VI, V III, its past and present landscape setting, and context information, has been shown as part of a successful exhibition and has been visited by a large number of visitors. The system is based on landscape models referring to the four phases taken into account, and includes virtual reconstructions basing on archaeological investigations. Some virtual humans are also present. It is interesting to note that the above mentioned lecture includes a summary analysis of the visitors' reactions and behaviour.

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[5] http://www.uni-tuebingen.de/troia/vr/index_en.html

[6] http://www.dlr.de/IT/IV/VR-AR

[7] P. Jablonka, S. Kirchner and J. Serangeli TroiaVR: a Virtual Reality Model of Troy and the Troad, in M. Doerr and A. Sarris The Digital Heritage of Archaeology. Proceedings of CAA2002, Archive of Monuments an Publications, Greek Ministry of Culture, Athens 2003, 13-18.

5.8 GREECE

Vassilios Vlahakis, Intracom

POLICIES

The role of cultural institutions

The cultural policies in Greece are administered by the Hellenic Ministry of Culture which is also responsible for the management of all archaeological sites and museums across the country. The next level of administration consists of Euphorates covering main historical/thematic/geographic areas (e.g. Euphorate of Classical Antiquities). These are responsible for the running of sites, restoration, etc. programs according to the policies issued by the Ministry. Local governments are involved in cultural heritage as they own museums and private collections of a local character and a number of private collections and museums are also scattered around the country. However the latter do not participate in the definition of cultural policies. In addition to these institutions, we refer to the Central Archaeological Council, which has supervisory and evaluation roles. Typical examples of its role are the investigation and planning of interventions like road buildings and urban development in areas at close vicinity to archaeological and other cultural sites.

Up to now we have referred to the central policy issuing authority and the sub-authorities related to CH management. Considering now the IH arena, we differentiate between the public and the private sector. As far as the private sector is concerned, there is freedom in the adoption and use of digital technologies as they can be privately financed. However, due to the small size of these institutions few can afford to invest in complex and expensive technologies resulting in the adoption of mainly web and simple database technologies. There are notable exceptions to this rule, like the Museum of Natural History, and the Foundation of the Hellenic World which due to their larger size they have achieved to attract significant private funding, which was further enhanced by the public sector through several research projects.

Moving on to the public institutions they receive their exclusive budget (or to be more precise, the vast majority of their budget) through public funding. The last few years the Ministry promoted the Information Society Programme which among other actions targets the introduction of cutting edge technologies and digital infrastructures in all major museums and archaeological sites in the country. The programme is administered by OPEP S.A., a corporation founded by the Ministry and being the central body issuing related calls for tender, and allocating funding. These activities are set to define the future of publicly-owned CH institutions in Greece for the next few years as far as IH is concerned. On top of that majot public CH institutions are participating in EU research projects where new CH technologies are being developed and tested.

Specific regulations

The cultural sector in Greece is dominated by the public, which also acts as the policy maker. Funding for ICT applications in cultural heritage comes from direct funding from the government and the EU. A sensitive issue in such projects deals with the property rights of the produced material. Copyrights on the digitized content (e.g. photographs, texts, etc.) are in the ownership of the Greek state and permission may be granted for use in such projects for research or for commercial purposes.

Priorities for ICT applications to Cultural Heritage

Up to now the use of IH has been limited due to two main reasons: Scarcity of funding and reluctance on behalf of the policy makers and the scientific community in using these technologies. The first parameter is certainly a very important one, which has been addressed quite adequately in the last 1-2 years. Regarding, however, the reluctance of the stakeholders, there is still a long way to go. Young scientists and professionals are more positive towards IH due to their exposure to computers and related technologies and applications. However, they have to face the old generation of archaeologists and policy makers who have are either not aware of the latest development or they avoid them out of fear of indifference in investing time to get acquainted with them. In my opinion these barriers have to be broken and recent initiatives towards IH have to be strengthened. Education plays an important role in that. Unfortunately, even today many archaeology students acquire very little experience in computers and IH during their studies and in many cases they even lack access to basic e-mail and web access. A large number of them learn the new developments in computers and IH simply due to personal interest. We should however note that computing is taught at pre-university education, but its link to IH is many times ignored when the professional skills of archaeologists are taught. Finally, the principle of continuing education is still in its infancy making it very unlikely that older culture professionals will get to learn about IH. To summarize, education can play a key role in the adoption of IH.

Another important issue is the linking of cultural institutions with the industry and the local economy. Museums and other institutions should cease to operate as individual entities simply collecting revenue from ticketing and funding from the state. They should seek collaborations with local communities and companies in the CH market and try to use IH not as a means of making profit but as a means of better disseminating culture to the general public and attracting them, improve their work practices in research and restoration resulting in cost savings and finance their viability in the future. There is certainly a thin line between a cultural institution and a profit institution which should not be crossed.

Associations and networks

There are a number of initiatives for IH research pursued by research institutes and universities in Greece. They receive their funding from the state or through EU research projects. In addition, there are private companies that are active in the marketing and/or development of IH technologies. INTRACOM is the most notable example as it designs and manufactures innovative IH solutions. So far there is no widespread network supporting the development of IH in Greece.

Funding sources for IT projects

Public

Public funding is through research projects aimed at national institutions and universities (issued by the GSRT) and public calls for tender issued by OPEP S.A. The range of funding is typically between a few hundreds to 10-15M Euro.

Private

These come in the form of sponsorships of IH exhibitions and actions by large companies irrespective of their sector of activities. Self-funding is also very common in the form of a private museum financing its own exhibitions, or through donations of cultural foundations affiliated to the private museum.

PRACTICES

On going and past projects

1. ARCHEOGUIDE
2. LIFEPLUS
3. Polemon
4. Odysseus
5. Alexander
6. ORION
7. Tholos
8. Kivotos
9. OPEP calls for tender (Museum of the History of the Olympic Games, IH in the 15 most significant museums and archaeological sites in Greece, IH in 35 museums and archaeological sites in Greece)
10. War Museum
11. Goulandris Museum of Natural History
12. National Byzantine Museum

Typology of products

With reference to the above numbering:

1. multimedia, mobile e-guides, VR, MR, AR, virtual reconstructions, guidance, archive
2. multimedia, mobile e-guides, MR, AR, virtual reconstructions, guidance, archive
3. Web, archive
4. Web, archive
5. Web, archive
6. Technology roadmap
7. VR installation, multimedia, virtual reconstruction
8. VR installation, multimedia, virtual reconstruction
9. multimedia, mobile e-guides, VR, MR, AR, virtual reconstructions, guidance, archive, Web
10. multimedia, mobile e-guides, MR, AR, virtual reconstructions, guidance, archive, Web
11. mobile e-guides, guidance, archive, Web
12. infokiosk, web

GOOD PRACTICES

1. ARCHEOGUIDE
2. LIFEPLUS
3. Polemon
4. Odysseus
5. Alexander
6. ORION
7. Kivotos
8. War Museum
9. Goulandris Museum of Natural History
10. National Byzantine Museum

Journals and links to sites of interest

Books and essays

Others (local newspapers)

1. Kathimerini

2. Imerisia
3. Eleftherotypia
4. Monaco Matin
5. Liberation
6. La Repubblica
7. Science et Vie
8. Science et Vie Junior

Relevant articles/work

V. Vlahakis, N. Ioannidis, J. Karigiannis, "ARCHEOGUIDE: Challenges and Solutions of a Personalized Augmented Reality Guide for Archaeological sites", Computer Graphics in Art, History and Archaeology Special Issue of the IEEE Computer Graphics and Applications Magazine, September-October 2002.

Perceived needs

The last few years there is a growing concern in the use of ICTs in Greece. The Ministry of Culture has initiated a series of initiatives, while a number of private, non-profit institutions have taken important steps towards this direction.

In my opinion the major problem exists with the smaller institutions, which have no financial resources to invest in these technologies or staff to maintain and support them. Their small size is a serious preventing factor for attracting public or private investment. Opportunities exist for those institutions that are active and attract donations from the local communities or can benefit from collaborations with educational institutions. However, bureaucracy is a major problem that together with the anachronistic mentality of some of the elderly policy makers are obstacles for all types of institutions in the country.

The latest importance put on Culture and ICTs by the government is expected to improve the current situation and alleviate the difficulties faced by cultural institutions in the Greece. Based on our experience with such systems, the public has given a warm welcome to such initiatives and their commercial exploitation is expected to be a success story and a lever for the promotion of culture and the development of the relevant market and local economies, at least in the long run.

Final comments

Impact of IH on the civil society

In my opinion, widespread adoption of IH can help attract more people towards cultural heritage and help them find out more about their cultural identity as well, as that of other nations (this is especially important in the EU). The implementation of appropriate national and EU IH policies can significantly influence this task. Appropriate policies can facilitate the growth and spreading of these technologies resulting in:

- additional visitors to cultural sites (especially important for small – rural sites)
- the extra revenue from these visitors could help finance restoration and research
- the influx of visitors could help local economies (especially in rural areas)
- new jobs would be created for scientist and staff at the sites
- new jobs would be created in high-tech industries manufacturing IH.

Training

Training is a very important part of the IH equation. It is very important for the new professionals that will enter the market, as well as, for elder professionals already in the market. Typical examples are the archaeologists who traditionally had no interest in technology and

mainly ignore the benefits it can offer to them in their everyday working practices. In other words, teaching and training should be combined for better results, continuous learning is to play an important role.

Dissemination

The last few years a very large number of initiatives have been undertaken in order to develop and use IH. Many cultural institutions have been involved across Europe and beyond. Despite the very good results that were produced, very few examples exist where these results have been used after the end of the project. Usually only a minority of the public is aware of these systems and the rest never find out about them. A more aggressive dissemination should be followed together with a plan to exploit project results after the project end. A possible example is that of developing and demonstrating a prototype IH system at a museum. It should be arranged for the system to be installed for public use in the museum after the end of the project instead of being scrapped and taken away by the developers. Funding is a problem but careful planning can provide money for sponsorships, donations and even a nominal usage fee to cover the expenses of running the system.

Other

It is a big opportunity not to be missed. The benefits extend beyond the cultural sector and have an impact in local and global economies, and social attitudes.

GREECE: PROJECT DESCRIPTIONS

Information collected and edited by Teresa Varricchio (EPOCH survey team)

Editorial note

Only projects relevant for the report scope have been collected. Information concerning such projects was searched on-line, thus only projects that created and maintained Internet sites, or at least are quoted somewhere on the Internet, have been reviewed.

General Information

ODYSSEUS

The Official Web Site of the Hellenic Ministry of Culture.

URL http://www.culture.gr/welcome.html

International Projects

ARCHEOGUIDE

The ARCHEOGUIDE system is an augmented reality on-site guide. This means that it overlays virtual objects on to the physical environment of a cultural heritage site. In consequence, visitors will be able to be present in an archaeological site by carrying a mobile unit and wearing a see-through HMD (Head Mounted Display) with headphones, which will compose the natural environment by a 3D reconstruction of ruins and monuments.

URL: http://www.cultivate-int.org/issue1/archeo/

LIFEPLUS

LIFEPLUS proposes the innovative 3D reconstruction of ancient frescos through the real-time revival of their fauna and flora, featuring virtual animated characters with artificial life dramaturgical behaviours, in an immerse AR environment. In greater detail LIFEPLUS objectives are: 1) Real-time hyper realistic virtual life in AR environments; 2) Automatic Real-time Camera Tracking in unknown environments; 3) Perceptual issues in Augmented Reality (Occlusions, Shadow cues); 4) Design of successful character based installations; 5) Expressive autonomous cinematography for interactive Virtual Environments. Although initially targeted at cultural heritage centres, the paradigm is not limited to those, but encompasses future location-based entertainments, e-visitor attractions and on-set visualisations for the TV/movie industry.

URL: http://www.miralab.unige.ch/subpages/lifeplus

ORION

The main objective is to form a Network of leading experts, which will examine the business and technological landscape in the museum environment and the supporting educational & scientific communities. The ultimate goal of the Network is to define a Research Roadmap for the implementation, application and use of emerging technologies to support and enhance 3D literacy, learning processes, creativity and cultural promotion to the benefit of a wide constituency of users including those involved in education, design and industrial field

URL: http://www.orion-net.org

TOURBOT

The project aims at the development of an interactive TOUR-guide roBOT able to provide individual access to museums' exhibits and cultural heritage over the Internet. TOURBOT operates as the user's avatar in the museum by accepting commands over the web that directs it to move in its workspace and visit specific exhibits. The imaged scene is communicated over the Internet to the user. As a result the user enjoys personalized telepresence in the museum, being able to choose the exhibits to visit, as well as the preferred viewing conditions. At the same time TOURBOT will be able to guide on-site museum visitors.

URL: http://www.ics.forth.gr/tourbot

National projects

Polemon

The very aim of the Polemon Project was the creation of an information system for the National Monuments Record, together with an Integrated Museum Information System, for implementation at national level. The information systems for the National Monuments Record and the museums share a complementary relationship. The need to develop two distinct systems arises from the different depth and breadth of detail each is required to serve. Added to this is the fact that the National Monuments Record handles information compiled and held by separate, independent and geographically dispersed divisions - regional divisions and other services within the Ministry of Culture. On the other hand, a museum is usually an integral institution with its own character, aims and activities. Having said this, the overall makeup of the two systems is congruent as far as information and functions are concerned. The Semantic Index System (SIS) has been used for the implementation of both systems.

URL: http://www.ics.forth.gr/isl/projects/projects_individual.jsp?ProjectID=20

Tholos

THOLOS embodies the emergence of new technologies in the field of virtual communication and interaction. The prototypes are large, attractive cylinders, with a 360° projection surface producing panoramic views of the environment and inhabitants of another city in perfect picture quality. Direct personal contact among visitors to the various THOLOS locations is encouraged by image and sound. The thoroughly researched and tested cylinders will find its place at the heart of major cities - for example at the St. Stephen's Cathedral in Vienna or the Potsdamer Platz in Berlin - making them instant symbols of pan-European identity.

URL: http://www.tholos-systems.com/htm/hom_fe.htm

Kivotos

The present DataBase titled "ARK OF REFUGEE HEIRLOOM" contains photographs and information of some four thousand articles, related to the waves of early 20th century Greek refugees. These tokens of Greek presence in North and Eastern Thrace, Asia Minor and Pontos, are today located in Municipal, Religious and Private Collections, or they are individually kept as family relics in the Prefectures of Evros, Rodopi, Xanthi, Kavala and Drama, forming the Region of Eastern Macedonia-Thrace, NE Greece. More infromation available in greek at the website:

URL: http://www.ceti.gr/kivotos/

5.9 HUNGARY

Editorial note

No report from Hungary is included here. However, we thought that it could be useful to list below some institutions operating in the relevant field and give a short summary of their activity. (Information collected by **Guntram Geser**).

Archeocomp association, Museums in Hungary on the web

The aim of the Multidisciplinary Archaeological Association is to pursue archeometry on a multidisciplinary basis, with special emphasis on IT applications, supporting the training of professionals and promoting publications.

Information about the organisation, Hungarian Archeometry, archaeological conferences and projects, archaeological virtual exhibitions, databases (MUSoNET, Archaeometry, Lithotheca collection) and electronic publications; plus homepages of museum organizations: ICOM HNC, CEICOM in English in the web site: http://www.ace.hu.

Hungarian National Archives

The National Archives in general preserves the records of the central legislative (Parliament), the executive organs (e.g. the ministries) and the judiciary, as well as economic organisations, public bodies and foundations of national importance.

Information about the archives, research projects, databases, publications, legal documents and further links in English and German on the web site: http://www.natarch.hu.

Hungarian Electronic Library

The library's aim is to collect and support electronic publications. It has 4500 documents in the fields of natural sciences, technology, social sciences and humanities in Hungarian and, related to Hungary or Central Europe, in foreign languages. Home page: http://www.mek.iif.hu.

National Széchényi Library

The aim of Hungary's national library is to collect, process, preserve and make available the Hungarian and Hungarian-related written cultural heritage from manuscript codices via printed documents to electronic publications.

A wide range of information about the library, its collections, projects, and on-line databases, mainly in English, on the web site: http://www.oszk.hu.

János Neumann Data Base and Multi-media Centre

The aim of the centre is to digitalise and distribute Hungarian written heritage with special emphasis on fiction, to coordinate all related activities and manage the network services built on the digitisation projects. Important projects include: a catalogue of Hungarian documents on the internet (WebKat.hu), a catalogue of CD-ROMs produced in Hungary, a CD-ROM data base with library accessibility, works of contemporary writers (Digital Literary Academy, Contemporary works), selected publications of literary criticism, popular publications (including folklore), 19th century Hungarian plays and related literature, works by Hungarian thinkers, (Bibliotheca Hungarica Internetiana, István Széchenyi's works), poetry of the Hungarian classics, documents of natural sciences and scientific history. A catalogue of Hungarian public collections (libraries, archives, museums, cultural centres, etc.), the journal Educatio, the collection of legal measures concerning libraries and studies on the digital library are available. Some studies on Hungarian scientists and academics in English.

Home page: http:// www.neumann-haz.hu

5.10 IRELAND

Anthony Corns, Discovery Programme

POLICIES

Institutional framework

The Heritage Council is a statutory body which has wide functions in relation to most heritage matters in the country, with the exception of language and music policy. It advises government and funds projects and organisations such as the Discovery Programme. The Department of Environment, Heritage and Local Government is the principal regulatory body dealing with heritage issues. Other public institutions such as the National Museum, National Archives etc have policy responsibilities laid out in statute. Other relevant government departments include: the Department of Education and the Department of Arts, Sport and Tourism and the Library Council of Ireland. Many local authorities have Heritage Officers appointed by the Heritage Council. No one body is responsible for IH

Specific regulations

Not aware of any specific national regulations. Different public bodies have different requirements

Sectors related to IH that need more attention by public authorities

Definitely training for heritage professionals, greater availability of equipment, public commitment to use of and access to ICT by national heritage institutions

Networks and associations

Not aware of any specific national provision. Numerous one-off projects in various heritage sectors.

FUNDING SOURCES AND PROJECTS

Public sources

Bodies such as the Heritage Council make available funds for projects including use of ICT by way of annual public advertisement.

Private sources

Not aware of such funds although I'm sure they must exist.

5.11 ITALY

Andrea D'Andrea, University of Naples "L'Orientale"

POLICIES

The role of cultural institutions

The institution responsible for cultural policies is the Ministry of Heritage and Cultural Activity (Ministero per i Beni e le Attività Culturali), divided by heritage type (archaeology, historical-artistic, monuments, etc…) and by administrative areas in different sections. Particular cases are the Special Soprintendenze (Pigorini, Pompei, etc.), with specific competences and administrative status, established to answer particular needs. These are also financially autonomous from the Ministry.

The Ministry of Heritage and Cultural Activity has a department of research, innovation and organization, which acts within a general framework of innovation and promotion, and is in charge of managing information systems.

With the recent introduction of the constitutional reform, the Regional Governments may now manage and administrate, either directly or co-involving mixed (public/private) companies, the Cultural Heritage in their areas. However, the precise definition of State competencies and Regional competencies on culture is still object of negotiation and changes are expected in short. Some regions, notably Emilia-Romagna, have regional agencies or active departments for culture, which are also in charge of cultural heritage. Others are less active and limit their action to the management of current affairs. The Emilia-Romagna agency IBC (Institute for Cultural Heritage) has a long experience and manages a very useful web site (in Italian, with English summary information) from which additional information can be acquired: http://www.ibc.regione.emilia-romagna.it.

The Regional Soprintendenze are in charge of coordinating the management of the various institutions and public financing in their areas. Worth noting is that there is no centralization regarding activities involving IH, each entity (central/periphery, national/regional) deciding what and how to finance activities in the field of IH.

The Ministry of Education, University and Research (MIUR) and the Ministry for Innovation may launch national programmes for the financing of research or technology transfer in the field of IH applied to CH.

Specific regulations

There are no regular funds exclusively dedicated for the digitalization of CH. However, there are various financing sources, which are managed by the relevant, either regional or national entities as mentioned above. Often financed projects regard the use of information technologies for the communication (portals, web-sites, multimedia, etc.) for scientific research (remote-sensing, GIS), documentation (GPS, laser-scan, photogrammetry, etc.) and data management (digitalized archives, data-bases, etc.).

The main funding sources are through periodical calls opened following the PON (National Operative Plan) and managed by the MIUR, at a national level or Ob.1 regions, and through the POR (Regional Operative Plan), activated by the regions under the Information Society sector, the transfer of technology and specific research areas. Other specific actions regard the base scientific research (FIRB) and the university one (PRIN), financed by the MIUR.

The National Council for Research (CNR) financed and managed the large-scale project "Safeguard of Cultural Heritage", a large part of it was dedicated to the implementation of IT

applied to CH. The project started in 1997 and was active for five years. Its overall budget was about 115 billion Italian lire (about 88 million Euro).[8]

With the exception of special financing in the 80s, (so-called law for "cultural mines"), no systematic and rational policy of digitalization of CH has ever been formulated in Italy, which today has a negative impact on the efficiency of the management of CH and the opportunity to guarantee the exchange and the inter-operability of information.

Sometimes, competitive calls are launched concerning the implementation of specific projects for the exploitation of local heritage with an intensive use of ICT. These may range up to some million Euro and follow the rules for public procurement.

Priorities for ICT applications to Cultural Heritage

The absence of a comprehensive plan of financing aimed at the transfer of IH to CH makes the realization of coordinated projects a difficult task. Quite often projects aim at a particular formation plan for the personnel involved and hardware solutions and software property. Moreover, the personnel of the Ministry and its periphery seats do not have a proper technical competences adapted to coordinate actions towards a true policy and a "modern" management of CH. Therefore, a "centralization", i.e. a rationalization of interventions is needed, in order to avoid a fragmentation of solutions and policies. This would require a strategy which apparently conflicts with the most recent constitutional reforms. A possible solution would be a policy of formation of the Soprintendenze personnel, capable to determinate the development of horizontal actions (digitalization, conservation, rescue, etc.).

Associations and networks

No network or association, neither on the regional nor at the national level exists which would support the development of IH. There are some regulations established by ICCD (The Central Institute for Cataloguing and Documentation) of the Ministry of Heritage and Cultural Activity for the creation of "standard" archives, regarding format (type files to store) and forms. However, outside the institutional context, i.e. activity performed outside the relevant Soprintendenze, each institution may autonomously promote its development of the IH support. As an example we may mention that the Campania region established a Regional Competence Centre for the Development and Transfer of Innovation Applied to CH and Environment.

Funding sources for IT projects

Public

As a consequence of the above problems, it is difficult to assess a single funding entity:

PRIN – MIUR – Annual – Competitive Call

PON – MIUR – Periodic – Competitive Call

FIRB – MIUR – Periodic – Competitive Call

POR – Regional– Periodic – Competitive Call

Soprintendenze – Periodic – Competitive Call, Direct Contact

Ministero Innovazione – Periodic – Competitive Call

Ministero Beni Culturali – Periodic – Competitive Call, Direct Contact

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[8] Cf. The DigiCULT Report. Technological landscapes for tomorrow's cultural economy. Full report. January 2002. Luxembourg: Office for Official Publications of the European Communities 2002, part: VI.9 Case Study, pp. 73-78. http://www.digicult.info/pages/report.php

Local authorities – Occasional – Calls for tenders on specific projects

Private

Private Foundations and Bank Foundations – Periodic (mainly yearly) – Competitive Calls

Several institutions, mainly bank foundations – Sponsoring of local projects, direct contact

PRACTICES

An extensive survey of projects in Italy in the relavant area would be very extensive and will be carried on in future versions of the present report. Here, we focus on the situation of the Campania region. This is somehow exemplary, because it is a representative of regional activity in Southern Italy, mostly supported by the European Social Fund and the additional funding provided by the Italian Government for Southern regions. Such provisions make much more money available here for cultural heritage than in the North.

On going and past projects

A major digitization project, "Cultural Mines" (Law 41 of 1986), was carried out with no follow-up, what led to the dispersion of the work. Some of the data of this project have however been recovered by the DICE project (www.progettodice.it) and S.I.A.V. (Sistema Informativo Archeologico Vesuviano) of the Soprintendenza archeologica di Pompei (http://www.pompeiisites.org).

A worth to note project is the one launched in 2004 by the Campania Region, which financed the establishment of a consortium INNOVA (managed by CNR, with the participation of all Campanian Universities), as a Regional Competence Centre for the Development and Transfer of Innovation Applied to CH and Environment, which has among its various research activities several particularly dedicated to the development of informatics tools and technologies (intelligent platforms, Web-based GIS, simulation, GRID, etc.) for CH and Archaeology. The centre involves most of the regional researchers (ca. 150) in the areas of archaeology, philology, engineering, informatics, mathematics, geology, and medicine. URL: www.innova.campania.it

Another interesting project, managed by ICR (Central Institute for Restauration), is LabSTECH (http://www.beniculturali.it/labstech3/default.htm) which aims at linking and promoting cooperation between European research centers in the field of scientific and technological applications to cultural heritage. The ICR is responsible of Joint Activity 3 which has the task of collecting information on databases and conventional archives dealing with scientific contents. The present database is filled with the data collected from significant European infrastructures but allows for new entries.

Other projects promoted by ICR may be found at: http://www.icr.beniculturali.it/progetti.htm.

Projects realized by the Ministry of Heritage and Cultural Activity, such as an information system for general cataloguing, norms and standards, may be found at: http://www.iccd.beniculturali.it/

Projects in the Vezuvian and Pompeian areas may be found at: http://www.pompeiisites.org. these initiatives include virtual tours and virtual reconstructions realized with 3D scanner and on-line databases.

Worth mentioning in the field of web interfaces is the project **DICE** - Distributed Infrastructure for Cultural hEritage (www.progettodice.it). It is an innovative project for information regarding the Italian CH. The aim of DICE is to demonstrate the possibility of integration of information originating from all actors involved in CH, which would promote a more efficient valorization of the CH, by creating a technical platform capable of involving all stakeholders (such as e.g. administrative bodies, research organizations, museums, tourism agencies, etc.)

In the same field of web applications is the project ARCHAEOZONE (a portal for classical archaeology), developed by the Institute of Oriental Studies of the University of Naples (under the PON Avviso 68/2002). ARCHAEOZONE aims at the valorisation of a vast corpus of archaeological knowledge accumulated in dozens of years of archaeological investigations and studies conducted by the Institue in various European and Far East areas.

Another initiative, managed by the CNR, is the EACHMED (European and Mediterranean Agency for Cultural Heritage) portal www.eachmet.org, which provides valuable information on the Italian research in the preservation of CH. The portal suggests various methodologies for the valorisation of CH, formation of qualified personnel and the creation of SME in this area. EACHMED is divided into 13 channels, such as Data Archives, Editorial houses, events, technology and formation, etc., and several services, such as direct contact, for contacting users, partner search, for the creation of a network between the enterprises, the expert replies, for the clarification of arguments and useful sites, for a panoramic view of the CH.

Various projects are developed in the area of financing university research (PRIN), base research projects (FIRB) and national calls on PON. Generally, in these projects IH is a tool for research and valorisation of archaeological resources (GIS, intelligent platforms, multimedia, virtual reconstructions, etc.).

Typology of products

Data-bases: structure and organization of data (excavations, monuments, sites, etc.)

Integration of data and inter-operability

Methodologies for intelligent interfaces (portals)

Web based representation of geographical data

Methodologies for data capture (laser scan, GPS, photogrammetry)

Animation, landscape reconstruction, interactive navigation

Multimedia kiosks

Good practices

Due to the extreme heterogeneity of the realized projects, identifying best practice is not an easy task. Neither project aims at a national nor international context, and often Italian partners participate in EU projects as (CH) data providers and not as developers of operational methodologies. There is a lack of a true analysis of success and failure which leads to the adoption and abandonment of various strategies within each project. Perhaps a better coordination and more focused training would promote a more efficient valorisation of many projects which are often good examples of scientific studies but lack applicative and operational impact. Both in the database and GIS sectors (where IT had a greater impact) there is are no standards for metadata and formats. No project escapes these observations. Both the large project on “Cultural Mines” (Law 46 of 1986) and the “Progetto Finalizzato” (finalized project) of CNR on CH (http://www.pfbeniculturali.it/index01.asp) did not have a significant impact on the management, valorisation and preservation of CH; the latter, however, provided some support for research activities in the filed.

Journals and links to sites of interest

Books and essays

Archeologia e Calcolatori, a yearly journal on ICT applications to Archaeology

Relevant articles/work

D'Andrea A., Niccolucci F., L'Informatica dell'archeologo: istruzioni per l'uso, in *Archeologia e Calcolatori*, 12, (2001)199-220.

M. Azzari (ed.), Workshops. Beni Ambientali e Culturali e GIS, in *Geostorie*, Bollettino e Notiziario del Centro Italiano per gli Studi Storico-Geografici, 10, 1-2, (2002)

M.P. Guermandi, *Rischio Archeologico. Se conosci lo eviti*, Bologna 2001.

Perceived needs

Digitisation is without any doubt an extraordinary resource for the valorisation of CH and for the definition of an efficient management policy. Given the lack of transversal policies, able to define "rational" developments of the various IH projects applied to CH, a main need, raised both by the scientific community and by the policy makers, is the definition and application of a coordination activity. However, this contrasts with the recent constitutional profiles of administrative decentralization applied in Italy.

Any kind of intervention must therefore integrate within the national policy framework for a harmonious development of a new culture for the CH, which allows to view our CH not as a "risk/obstacle" in the urban development, but as a means for a gradual, positive growth. The action to be taken in the field are various; a first need would be the definition of a new constitutional chart for the CH, able to correctly define what is CH and which national and cultural interests must be primarily saved and preserved for the future generations. This document must contain indications and suggestions for the definition of the empowerment of the administrative apparatus (a national museum network) and at the same time define updated and updatable criteria and modes for a digitalization of the CH (formats, solutions, architecture, etc.). Only in this way financing, research and training will be able to benefit from latest developments of information technologies. On the other hand, it would avoid misinterpretation, duplication of effort and havoc existing in the field of IH applied to CH, due to the lack of a "centralization" of projects to be developed.

Final comments

Impact of IH on the civil society

Digitisation may serve as a basic resource for the definition of a new policy for the CH, for its "efficient" and "effective" management and for its different valorization, capable to overcome traditional modes of communication (exhibitions, museums, etc.). IH can broaden the valorization and exploitation of CH, restricted today to the "physical" dimension of the museum. The creation of portals and web-sites can overcome geographic and cultural barriers by applying a multi-level policy of communication, not limited only to the scientific community or online exhibitions. Unfortunately, IH is mostly viewed only as an area in need for (public) financing and, without a comprehensive communication strategy, the society cannot perceive the positive effects that IH may have on the management, communication and exploitation of CH - also on a regional level. Even nowadays, the competences of the Soprintendenze are viewed as "obstacles" and "brakes" to the urban development. In the absence of a policy of integration of a "cultural planning" as an element for urban and territorial planning, the society cannot value the impact of the local and national policies on the IH.

Training

The training of personnel is practically absent if we exclude the limited initiatives promoted usually by local entities (museums, parks, etc.). Lacking is a policy for the formation of personnel at a base level and at a high professional level. There are no educators at higher education levels at the base university levels, Ph.D. and postgraduate studies. Moreover, there is

no defined methodology and agreement upon a transversal competence, the existing initiatives being fragmentary and local. The personnel of the centralized and periphery institutions defined as technical staff (archivist, photographer, archaeologists, etc.) lack a formal preparation in the field of IH. Therefore, these competences are asked from external collaborators as consultancy, which limits the correct development of the personnel and its professional training, which often find themselves acting in projects of technological transfer, developed by external consultants.

Dissemination

There is a lack of an instrument for the dissemination of results. For this purpose, thematic portals are useful since they are usually oriented to a specific public and interest group of specialists. Neither conferences and congresses or exhibitions can assume this role.

Other

The European Community should push towards a “rational management” of CH, in order to avoid duplication of effort, projects and development of methodologies incompatible between various countries but often in the same country as well. A single subject should be defined, capable of coordinating the interventions and projects, in order to avoid fragmentation.

5.12 LUXEMBOURG

Jean-Noël Aslijn, Project "Espace et Patrimoine Culturel", Musée National d'Histoire et d'Art

Policies

Cultural Heritage management in Luxemburg is in charge of the Ministry of Culture (Ministère de la Culture, de l'Enseignement Supérieur et de la Recherche).

Within the Ministry of Culture, Cultural Heritage depends on two distinct administrations[9]:

- MNHAL: The National Museum of History and Art (MNHAL : Musée National d'Histoire et d'Art) which deals with the research, protection and archiving of subterranean heritage (subterranean archaeology, caves) as well as the exhibition in the National Museum itself (Luxemburg) or the co-management of collections with local museums. Its attributions include potential development of Intelligent Heritage projects.
- SSMN: the National Sites and Monuments Service (SSMN : Service des Sites et Monuments Nationaux) which mainly deals with the monuments and the monument related sites (i.e. Standing Monuments, castles and Churches). Its main tasks are the Restoration, Enhancement, protection and research of the Architectural Heritage, including industrial heritage. It is due to cooperate with the National Museum of Art and History in the matters of archaeological research. Its attributions include potential development of Intelligent Heritage projects.

These two administrations, also defined as research centers, have their missions defined by the law on cultural heritage as summarized below.

MNHAL

The missions of the MNHAL are to:

- Inventory, study, conservation, protection and enhancement of the national archaeological Heritage
- undertake prospects, surveys and archaeological excavations
- Watch the field research and excavations undertaken by public or private associations and/or individuals.
- Gather, study, conserve and exhibit the national and international history and art collections.
- Collect and preserve iconographical documents and a thematic library related to its activities.
- Organize temporary exhibitions, round tables, conferences and pedagogic activities related to its activities.
- Collaborate to the creation and management of regional museums for history, archaeology and arts.
- Cooperate with the commission of the national sites and monuments.

It is composed of the following services:

[9] As a preliminary overview of IH and use of ICT in the cultural area in Luxembourg,the information below will mainly concern the projects of the MNHAL, and far less the projects of the SSMN.

A. departments and special services:

- Management and conservation of the collections (National Art History collections): prehistory, protohistory, Gallo-roman, medieval, decorative arts, folklore arts and traditions, weapons and forts, fine-arts, contemporary arts, medals and coins, engravings.
- Special services: restoration, education, library and inventory, public relation

B. Scientific services and special services:

- - Prehistoric archaeology service, protohistoric archaeology service, Gallo-roman archaeology service, medieval and post-medieval archaeology service.
- - "Follow-up of land planning operations" archaeology service, archaeological map service, prevention archaeology service, salvage archaeology service.

SSMN

The missions of the SSMN are to:

- Study, preserve, protect and enhance the national architectural Heritage, including industrial heritage, and collaborate with the MNHAL when these activities would induce archaeological excavations.
- Sustain the protection and maintenance of the national archaeological heritage, inscribed on the list of National Heritage, including the supplementary list.
- Watch the application of measures, maintenance and restoration of sites and buildings inscribed on the list of National Heritage, including the supplementary list.
- Manage and maintain the cultural paths network and the relays depending on it.
- Advise and assist, on the demand, the communes as well as the private individuals during the restoration of buildings and sites.
- Propose new affectations for abandoned buildings presenting a great architectural value.
- Organize information campaigns, exhibitions and conferences over the national architectural heritage.
- Propose and oversee the creation of protected areas and global land/urban planning plans for areas presenting a great architectural interest.
- Coordinate and oversee the public initiatives in the matter of restoration of national architectural heritage.
- Manage and coordinate the scientific, museum, education and technical dependencies.
- Advise the Minister in terms of publicity when the matters depend on his authorization.
- Enforce the application of laws and regulations in the matters of the management of signs and ads (commercial signs).
- Cooperate with the commission of the national sites and monuments.
- Maintain close relations with the European council, the UNESCO and the International Council on Monuments and Sites (ICOMOS)
- Publish reports in the area of preservation of the World heritage (UNESCO) and consult the experts of this international organization.

The SSMN is composed, along with the administrative, educative and technical services, of the following scientific sections: ancient heritage and contemporary heritage.

For historical reasons, Cultural Heritage and Natural Heritage are closely linked.

Thus, to some extents, the National Museum of Natural History is to be included in many occasions when the question of cultural heritage management and presentation occurs.

- MNHNL: National Museum of Natural History (MNHNL : Musée National d'Histoire Naturelle) is in charge of the study, protection, archiving and presentation of Natural History related collections, including human remains dating from prehistory, until the transfer to the MNHAL is complete (pending).

Its attributions include potential development of Intelligent Heritage projects.

Alongside these 3 institutions, specific task forces have been assembled during huge land planning projects as for the "Liaison de la Sarre" highway construction project which covered a long and wide band of the south-eastern part of Luxemburg. The Administration des Ponts et Chaussées (National Roads and Bridges Administration) hosts a team of archaeologists whose missions are the research, protection and archiving of subterranean heritage in the areas concerned by the land planning project. Its attributions include potential development of Intelligent Heritage projects.

The Government of Luxembourg is currently developing an ICT project called e-Luxembourg, which already led to the renewal or the creation of most existing websites. Web content end service is currently being updated and completed. The projects and applications under development will be linked to these sites. In this project, in the frame of the Ministry of Culture part, the complete digitizing of the MNHAL collections is under way. This long term operation is still currently going on and will not go public this year.

In this main framework, a project named "Gestion du savoir" (Management of knowledge) is being developed by the MNHAL for the management of collections (including digitization of collections). The system developed will serve as a platform for the assembly/diffusion of knowledge about Art History, Archaeology, History collections through intranet and internet. Its main objectives are to create a complete database of the Museum collection resources in order to guarantee a long term preservation of information as well as a wide diffusion of this information. His database is developed in collaboration with other cultural institutions in Europe and uses products developed specifically for museum collection management known as Museum+.[10]

This IH project is under construction and will give access to all the available information about collections in the MNHAL through a web interface. It is conceived in order to interoperate with other systems developed within the MNHAL as the EPC project database and GIS (see Below).

Due to a long history of collaboration with international administrations and research centers, and due also to the limited extent of the teams involved in the country itself, a ot of temporary or long term collaborations are active, which also regularly involve IH missions. The competence is then shared with private or public centers, laboratories, offices and agencies.

As a consequence a variety of different projects are led about Luxemburg, some of which implying IH applications.

Most ICT and IH projects have started in the nineties and occur to be currently under completion. It is supposed that the end of the first decade of the 21st century might see the first "large» scale development of IH applications and/or tools, on the web, on sites and in the museum in Luxemburg.

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[10] See: Bulletin d'information du Musée National d'Histoire et d'Art, Musée Info, n°17, décembre 2004

One must note that a reorganization of Cultural heritage services in Luxemburg came in the mid eighties, and was completed in 2004, and that few IH projects have been published yet, apart from book or article edition and publishing (Notae praehistorica, (2001);Bulletin de la Société Préhistorique Luxembourgeoise, 23-24, (2001-2002)). The different projects and realization concerned include Cultural Heritage oriented GIS, virtual reconstruction of monuments, 3d scanning for archiving and virtual reconstruction of prehistoric human remains, new museum website, Cultural heritage Database, applications and Multimedia applications for the presentation of sites and monuments.

The creation of the National Fund for Research (FNR) and its recent implication in the field of the Cultural Heritage management gave a new impulse to the existing research bodies in Luxemburg for further IH developments.[11]

Specific regulations

There is no specific regulation concerning the use of ICT and the development of IH in the communication of Culture. However, te main European guidance and regulations are globally observed and currently being ratified or transposed into the national regulations and legislations. The internal framework program E-Luxembourg includes recommendations for the development of IH in the cultural institutes.

In the process of the reorganization of the cultural institutes, some recommendations have been proposed for the promotion of ICT and IH in the cultural area (quote):

[…] given the experience acquired with the law from 28th December 1998, the evolution of the cultural scene since the last 15 years and the breakthrough of ICT the concerned text puts forward the ambition to create a modern and flexible framework, within which different cultural institutes could evolve […]

> "[…]Le projet de loi sous rubrique a pour objet de se substituer à la loi du 28 décembre 1988 concernant les instituts culturels de l'Etat. Cette loi a consisté à adapter les missions, l'organisation et le fonctionnement ainsi que le cadre et la qualification du personnel à l'évolution de la vie culturelle. La réforme proposée constitue donc la mise en oeuvre de la déclaration gouvernementale d'août 1999 qui disposait:
> "Pour garantir un meilleur accès à tous à la Culture, le Gouvernement actualisera la loi du 28 décembre 1988 concernant les instituts culturels de l'Etat.
> Les six sections de l'Institut grand-ducal, prédécesseurs des instituts culturels y trouveront leur place.
> Les activités du Centre national de littérature et celles du Casino Luxembourg - Forum d'Art contemporain sont confirmées. Le Gouvernement favorisera la collaboration avec d'autres instituts culturels nationaux et internationaux et aidera à décentraliser leurs activités en vue d'une meilleure sensibilisation du public à l'art et à la culture scientifique"
> Au vu de l'expérience faite avec la loi du 28 décembre 1988, de l'évolution de la scène culturelle depuis les quinze dernières années et de la percée de nouvelles technologies de l'information et de la communication, le texte sous rubrique a l'ambition de créer un cadre moderne et flexible, dans lequel les divers instituts culturels peuvent évoluer. Suite à l'expérience tirée des activités et de l'évolution du Centre National de l'Audiovisuel et du Centre national de littérature, le présent projet de loi propose de hisser ces derniers au rang d'"Instituts culturels de l'Etat".

[11] Legal references: Loi du 25 juin 2004 portant réorganisation des instituts culturels de l'Etat. (A-2004-120-0002).

> Afin que les instituts culturels puissent correspondre à un service public culturel moderne et accueillant, le cadre personnel doit être élargi, et ce aussi bien au niveau des "anciens" que des "nouveaux" instituts. […]"[12]

The E-Luxembourg framework program documents are accessible through the net at this url: http://www.eletzebuerg.lu/legislation/vigueur/index.html.

Areas needing special attention

The evolution of archaeological methodology and the increasing use of IT applications, Computer aided design, Computer graphics, Geographical Information Systems and Databases have led most archaeologists and Cultural Heritage operatives to consider IT and ICT as "toolboxes" for their own purpose. This situation led to the production of all kind of digital archives which are now available for research and archiving, but, unfortunately, are yet unpublished.

The use of this material for communication and presentation of culture has become quite common, though no global guidance has yet been applied in this matter.

The diffusion of the archaeological information, through articles and synthesis, uses these data. However, ICT as modes of expression have not yet been considered from a global point of view, and so individual appreciation prevail.[13]

The implication of the National Fund for Research and its support to the project "**Espace & Patrimoine Culturel**" (FNR 02/05/24) can be regarded as a step further in this direction. The project is aimed at the development of a Cultural Heritage Oriented Database and GIS. This tool, once completed is designed to serve as a decision making aid for the management of land planning, with a dialog between all the actors, AND an information tool for the general public and the state administrations (internet and intranet). This objective will mark a milestone in the diffusion of Cultural Heritage in Luxembourg.

On this basis, the development of ICT tools and projects would find a common platform to access the information and get to documentation (Images, VR, QTVR, CAD, texts…), in connection with the project "Gestion du Savoir" (Management of Knowledge) developed for the management of the art and archaeology collections within the MNHAL.

Specific needs:

- In the near future, the public authorities should continue promoting the use of ICT and the development of IH solutions for the information and formation of the general public, as well as the young professionals. One can hope that special funds would be reserved for this purpose.
- In the perspective of developing tools and applications, a better or reinforced collaboration between all Heritage agencies or institutes is recommended. Some projects could be co-opted and co-directed. This would help achieving goals in better conditions and with the involvement of all actors and institutions.

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[12] Legal references : **5215/04 Projet de loi portant réorganisation des instituts culturels de l'Etat** Rapport de la Commission de l'Enseignement supérieur, de la Recherche et de la Culture (12.5.2004)

[13] Following to the discussions and debates regarding the modification of the status and reorganisation of the Cultural Institutes in Luxembourg, the national authorities will be increasing the promotion and support for a better diffusion of Cultural Heritage through the Web or ICT solutions. Legal references : 5215/04 Projet de loi portant réorganisation des instituts culturels de l'Etat Rapport de la Commission de l'Enseignement supérieur, de la Recherche et de la Culture (12.5.2004)

- The development of special research programs for the management of the Natural and Cultural Heritage, in relation with Land and Resource planning, is, of course, strongly recommended.
- The recognition of Cultural Heritage as a **resource** that needs to be protected, studied and promoted is absolutely necessary. This is also a specific sector in which IH and ICT applications should be reinforced and/or generalized.
- The Cultural Heritage of Luxembourg is as rich and qualitative as in neighboring countries. Though, it is far less studied or even known, and often underestimated by the inhabitants themselves, apart of the "standing monuments", castles and churches. Promotion campaigns on the importance of the Cultural Heritage of the country would help a lot preventing problems and disaster for the next decades (growing and increasing land planning, urban and suburban planning).
- The collaboration with international administrations and research institutions clearly stands as a necessity. The creation of networks, groups of interest, and formal associations or consortiums is regarded as absolutely primordial to reinforce and complete the existing networks. This topic is promoted by the MNHAL and presented as a conclusion during presentations and conferences. Specific additional budgets would be necessary to achieve this objective.

These points stand as recommendations for ameliorating the situation during the next decades. The use of ICT and the development of IH are parts of the solutions.

Networks and associations

The MNHAL is associated with all the other national administrations in Luxembourg for the development of solutions for a better management of Cultural Heritage, including ICT and IH solutions (see examples).

Collaboration and partnership with other national research centers (Public Research Centers) and associations exist. They are developed on the basis of specific projects and needs. Globally, the networks at a national level are very opened and functional.

The networks are also, and quite automatically, extended to foreign, mostly neighboring, research teams (state, academics and private sector). France, Belgium and Germany are the first lines of collaboration.

Current projects undertaken at the MNHAL have developed collaboration[14] with:

- Universität des Saarlandes, Saarbrücken (Germany), Physische Geographie und Umweltforschung.
- Universität Würzburg (Germany), Physische Geographie.
- Staatliches Konservatoramt Saarbrücken (Germany).
- Rheinisches Amt für Bodendenkmalpflege, Bonn (Germany).
- Université de Liège (Belgium), Laboratoire d'Infographie et Multimédia pour l'Histoire de l'Art et l'Archéologie.
- Ministère de la Région Wallonne, Direction de l'Archéologie (Belgium) (pending).
- Institut National de Recherches Archéologiques Préventives (INRAP) (France), (Pending).
- Direction régionale des Affaires Culturelles, Metz, Lorraine (France).

[14] The partners listed above do not represent an official network, but rather a floating network that can be extended to complete specific operations or to reorient the current projects as the needs arise.

- Rijksdienst voor het Oudheidkundig Bodemonderzoek , Amersfoort (The Netherlands)

Specific 3D scanning applications were realized by:

- Lab3, Paris La Garenne-Colombe (France)
- Neurodata Design, Alleur (Belgium)
- Centre Hospitalier Régional, Liège (Belgium), Service de radiologie.

Other contacts were made with research centers across Europe, mostly with surrounding countries, in order to start collaboration within the frame of the current GIS project after Phase 2 (construction of the system) is complete :

- Archaeology Data Service, York (United Kingdom)
- Universiteit Leiden, Hans Kammermans and Universiteit Groeningen, Pieter Martijn Van Leusen (The Netherlands)
- Martin Luther Universität Halle Wittenberg, Franz Berthemes (Germany)
- Laboratoire Archéologie et Territoires (CNRS - Université de Tours) (France).

For now, this network is not funded by any commission or funds, but would use the credits allocated by the National Fund for research to achieve certain tasks as needed. The main collaboration stands in the form of data and methodology exchanges, advice and consultancy, methodological reflections on standards and interoperability.

The situation of the Country's Cultural Heritage being currently evolving, a wide reflection is being undertaken to restructure collections and information in order to create a set of data source for further developments, including IH and ICT based tools.

In addition, other projects undertaken by the Ministry of Culture are developed through the **European Commission** Framework (National Library, National Archives).

The SSMN also stands as the National body for the European Campaign "A common Heritage" of the European Council.

Funding sources (public)

Budget of the Ministry of Culture: Funds are distributed on an annual planning grid. Each special project has to be debated and accepted for special funding. Projects and operations that comply with the objectives and framework of common activities can be engaged on the common budget after acceptance of the propositions (for high level funding, competitive calls are necessary). Total budget: undisclosed information.

Budget of the MNHAL: Funds are distributed on an annual planning grid. Each special project has to be debated and accepted for special funding. Projects and operations that comply with the objectives and framework of common activities can be engaged on the common budget after acceptance of the propositions (for high level funding, competitive calls are necessary). Total budget: undisclosed information.

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Fonds National de la Recherche :

The National Research Fund was set up by the Law of May 31, 1999. According to Article 2 of this law, the missions of the Fund are:

- to receive, manage and use funds and donations of public or private source in order to promote research and technological development in the public sector on the national level, referred to as 'R&D', and
- to maintain an ongoing process of reflection in the field of national R&D policy orientation, according to economic data and scientific and technological developments, as well as on the basis of in-depth studies.

To fulfill this mission, the Fund is invited:

- to develop proposals relating to the objectives of the national R&D policy,
- to suggest priority actions in order to reach these objectives,
- to develop, on the basis of the retained objectives, multi-annual activity programs and hereby contribute to the establishment of a multi-annual R&D program on the national level,
- to assure, by the allocation of financial means put at its disposal, the implementation of these multi-annual activity programs and the follow-up of their implementation,
- to guarantee the systematic and regular evaluation of the results obtained, in order to allow any readjustment of priorities that is felt necessary,
- to promote in general the efficient coordination of national R&D activities, as well as the Luxembourg participation in international R&D cooperation programs, and
- To present to the Minister responsible for scientific and applied research, on its own initiative, any proposal, suggestion and information regarding the implementation of the national R&D policy.

Potential beneficiaries of the Fund's intervention are:

- The public research centers created on the basis of the Law of March 9, 1987 on 1. The organization of research and technological development in the public sector; 2. the technology transfer and the scientific and technological cooperation between private companies and the public sector,
- the public institutions of higher education created on the basis of the Law of August 11, 1996 on the reform of higher education,
- the Centre d'Etudes de Populations, de Pauvreté et de Politiques Socio-Economiques, a public establishment created by the Law of November 10, 1989, and
- The bodies, services and public institutions authorized to undertake research activities as well as development and technology transfer activities in their fields of competence, with the aim to promote scientific progress and technological innovation.

In line with its mission, the Fund may organize activities aiming at promoting scientific culture, allocate grants to scientific researchers and allocate subsidies to individuals and associations who pursue activities of scientific nature.

The Fund's intervention may also concern the participation by the afore-mentioned beneficiaries to programs organized by the European Community or other international organizations.

The National Research Fund is a public establishment with scientific, financial and administrative autonomy, administered by a Board of Administration, assisted by a Scientific Council and supported by a Secretariat.

Specific projects have been undertaken to archive 3D scanning data regarding anthropological finds and archaeological material. These dynamics rely mostly on National Funding. These must be regarded as part applications to be included in further developments.

Practices

Relevant projects

"Espace & Patrimoine Culturel" - EPC, FNR/MNHAL: IT, GIS, Database - Archaeology, Cultural heritage, information, Research, Administration[15].

The EPC project is developed by the MNHAL, with the support of the FNR, in the framework of the program "Vivre demain au Luxembourg", Axe 5 "Organisation de l'espace". The project is restricted to support several pilot areas at the beginning and will be enlarged to the whole territory of Luxembourg including data of historical, architectural, natural and cultural origin.

The project has set itself the goal to develop a computer aided decision tool for the administrations, public property developers like administrations and communities, constructors, planning offices and private persons. It will be possible to include vital known and potential new areas of cultural interest into the decision making process which is of great importance when considering the continuing trend of the demographic and economical growth in Luxembourg. Under this perspective the development of maps showing the sensible zones of Luxembourg is carried out having regard for current building projects. The differentiation of the known cultural heritage sites and the proposal of new areas with cultural importance lead to the disclosure of areas with different levels of protection for the cultural heritage which shall be taken into account. The project develops its guidelines under the rules of sustainable development and permanent protection.

The project is run in cooperation with most administrations and ministries in charge of heritage and Land planning : the ministry of culture (MNHA and SSMN), the ministry of finance (Administration du Cadastre et de la Topographie, ACT), the ministry of interior (Direction du l'Amenagement du Territoire et de l'Urbanisme, DATUR), the ministry of public works (Administration des Ponts et Chaussées, P&Ch; Services Géologique et Archéoogique, SGL) and the ministry of environment (Administration des Eaux et Forêts, AEF) a series of existing geo- and other stored data is available and incorporated into the project. Without this support the project would be impossible to accomplish. It also relies on the collaboration with international state services and research centers in France, The Netherlands, Belgium, Germany and the United Kingdom (current active collaboration, others are pending).

"Gestion du Savoir", MNHAL: IT, Collections, Database - Archaeology, Cultural Heritage, Information, Art History

"E-Luxembourg", Government of the Great-Duchy of Luxembourg: General framework for the communication of e-contents

Projects undertaken in the framework of the regular missions of the MNHAL:

Various local applications undertaken during excavation or restoration projects, mainly devoted to the archival of heritage data in the process of salvage or prevention excavation (3d scanning of buildings, graves, sites – topographical and close range scanning).

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[15] http://www.ulg.ac.be/archgrec/EPC/HOMEPAGE.htm.

A local database of digital photographic archives is been produced for internal use, first, but would be available for further diffusion when necessary.

The complete digitization of collections, in the process of framework projects or for local needs, is under completion. The documentation and description phase is currently under way.

This set of data sources will be completed within the coming decade (5-8 years, thousands of documents), or might be finished in a shorter term if it benefits of the support of a specific global program and budget.

The processing of these data is mainly undertaken in relation with both the "Espace & Patrimoine Culturel" and the "Gestion du savoir" projects.

Project deliverables

EPC project (Step I pilot-zones and step II: completion included):

- Cultural oriented GIS system (internal)
- Cultural Heritage oriented website including an open-source Map-server for the EPC project.
- Intranet platform for the diffusion of GIS CH thematic maps
- Web Knowledge base
- Potential Multimedia kiosk accessing the system inside the Museum
- E-publication
- Web applications within the EPC portal for accessing the special modules (access to IH content related to sites – see current fieldwork applications, 3d scanning, VR, when applicable)
- Communication system for Q and A within the EPC portal
- Archaeological information system (analytic DB) – (internal but restricted access from the EPC portal for specific information and demands)
- Landscape models for education purpose on the evolution of landscapes through time (potential deliverable – under discussion)
- Specific modules within the EPC portal for the import/export of data and synthesis (standardized reports, access to public data source).
- Interoperability modules for the interconnection of GIS systems from other countries and with other national portals, including the Gestion du savoir portal (data standards, SMR, cross walking)

Gestion du savoir project:

- Internet/intranet portal with restricted levels based on access-rights.
- Collection catalogue and description
- Mapping system for displaying the information about finds and sites.
- Interoperability system with EPC portal (intranet)
- E-agenda
- Tracking system for the works and documents involved in exchanges and exhibitions
- Resource-person database

Project evaluation (preliminary and temporary, since both projects are running)

Strong points:

- International collaboration and guidance
- The objectives have been rationalized with regard to the Global allocated budgets
- Definition of Pilot-zones for rationale approach and testing
- Interoperability perspective

Interministerial coordination

Rationale deadlines

Weak point:

- The Abundance of non digital and low quality data source was shortly underestimated. Some adaptations had to be made to the initial planning of digitization.
- Small team – 3 to 4 resource-person(should be reinforced during phase III)
- Amount of manuscript field notes dating from early 20th century and loss of unpublished data from amateur researchers during the 20th century. Some sites have been poorly documented (non EPC specific issue but consequent in the EPC conception process).

Reference to research papers & books in the area

(see also http://www.bnl.lu/ and http://www.prehistory.lu/biblio.htm)

Bulletin de la Société Préhistorique Luxembourgeoise

Musée info (MNHAL journal)

Notae prehistoricae

Bulletin de la Société préhistorique française

Helinium

Trierer Zeitschrift

Acta Geographica Lovaniensa

Saarbrücker Studien und Materialien zur Altertumskunde, Sastuma

http://www.prehistory.lu/biblio.htm

http://www.mnha.public.lu/boutique/librairie/antiquite/index.html

Most representative paper :

Hauzeur, Anne. Altwies – "Op dem Boesch" (Grand-Duché de Luxembourg): résultats préliminaires de l'étude pluridisciplinaire des occupations rubanées, campaniformes et protohistoriques, in Bulletin de la Société Préhistorique Luxembourgeoise 23-24(2001-2002), 129-326

Perceived needs

Increased funding for international collaboration: the existing funding is project specific or depends on the acceptance of third party national bodies. The allocation of a specific budget for this matter would facilitate the establishment of networks within the frame of punctual projects or long term projects.

Training with international actors on the matters of interoperability and standards: the needs to train actors on a European level on top matters as standards and interoperability needs to be considered as a primary goal within the national institutions in Luxembourg. Budgets and funding for this matter are available through the FNR program and could also be included in the common budget of the MNHAL.

Development of specific tools and modules for accessing and diffusing ICT applications results (besides framework projects such as EPC or Gestion du savoir: The IT applications undertaken in Luxembourg since the early nineties have rarely gone public. The development of a specific publication for IT results and digital media related to these could be overseen in the coming proposals for the publicity policy of the MNHAL.

Final comments

Cultural Heritage in Luxembourg is not perceived by the majority of the civil society as a primary resource or a pride. This concise conclusion explains a lot why the development of the national institutions in charge of the CH in Luxembourg has evolve differently compared to the neighboring countries. The consequence on the means of expression and diffusion, including ICT solutions and IH developments comes as a corollary conclusion.

The work of the actors of the CH domain during science festivals and national events slowly helps changing the minds. The wide use of the web by the civil society also puts to light the absence of ICT diffusion in the country. The changes could come very quickly according to the recent decisions of the government of the Great-Duchy (http://www.gouvernement.lu/).

The demand of the civil society is now increasing, opening the way to a whole new implication and implementation of ICT tools in every aspect of the state communication, including CH.

In particular, as far as training is concerned, most professionals working in the MNHAL have a basic training in IT (office suites and digital picture and vector Graphics, mostly illustration). About 10% of the professional are trained on DB, CAD/3D and GIS. The same are globally aware or trained in the use of standards. 5% are trained in programming.

This situation is currently changing due to the involvement of the MNHAL in IT projects. For most specific application, conception and programming, independent contractors are hired on a defined duration basis

5.13 MALTA

Angele Giuliano, Across Limits

Special thanks go to Mr Charles Farrugia of the National Archives and Dr Nadia Theuma of the University of Malta for the information given on their various running

Introduction

2004 was a focal year for digitisation of cultural heritage in Malta, since it saw the kickstart of many different aspects relating to policies and projects, and also the continuation and strengthening of other aspects that were already in operation since 2003. It was also a momentous year because our accession in the EU on 1st May, and even here, in our celebrations we never forgot the heritage that surrounds us. In fact for 15 minutes before midnight of the 1st of May we broadcasted all over Europe thanks to satellite, digital images of our heritage projected on the bastions of Fort St. Angelo, one of our fortification jewels in the natural Grand Harbour near Valletta, our capital city.

Policy

Heritage Malta, the National Agency entrusted with the management of national museums and heritage sites and their collections in Malta and Gozo, worked heavily throughout 2004 on the first draft of the National Digitisation Policy for Cultural Heritage. Consultation meetings were held with both the Ministry for Tourism and Culture, and also the Ministry for Investment, Industry and Information Technology with very positive outcomes. The draft policy's main points were also formally launched in the 1st Annual Conference of Heritage Malta with the theme "Investing in Cultural Heritage" that was held on the 24th November at the Valletta Waterfront.

The overriding objective of the Maltese policy is : "Ensuring that Maltese Cultural Heritage is preserved and therefore appreciated by present and future generations."

The sub objectives of the policy are:

- Education – from the child to the pensioner
- Research and technological innovation
- Accessibility - Easier Public Access to cultural resources
- Positive economic factors – new economy, cultural tourism, sale of IPR
- Co-ordination of Initiatives concerning the different cultural heritage sectors including even intangible heritage
- Uniform approach of different memory institutions (archives, libraries, museums, etc.) for integrated access to cultural heritage

The strategy of the policy will follow as much as possible the Life Cycle approach as follows

- Creation of individual digital resources
- Management to make resources accessible and meaningful
- Collection Development – databank of resources
- Access – for education, research, tourism, entertainment, culture
- Repackaging – creating multiple uses of the same resource (e.g. online exhibitions, e-learning etc)

Malta is following in the footsteps of the more experienced countries and the ideals are all enforced in several European and international based documents amongst which notable to mention are:

- The Lund Principles and Action Plan

- The Charter of Parma
- The National Representatives Group (NRG) reports
- The results of the Minerva and Minerva PLUS European projects

The next steps in 2005 will be a wider public and stakeholder consultation on the National Digitisation Policy, and the creation of a priority list of both tangible and intangible heritage that would need immediate and urgent interventions of digitisation in order to ensure proper preservation and documentation.

Current Projects & Digitisation Initiatives

MinervaPLUS (www.minervaeurope.org)

Malta continued to contribute in the 6th Framework Programme Co-ordination Action project MinervaPLUS, with active contributions to events and knowledge transfer, thanks to its member partner Heritage Malta, represented by Mrs Antoinette Caruana, the Chief Executive Officer. The knowledge on digitisation gained thanks to Minerva PLUS is being put to good use locally.

TriMED

This Culture2000 project focusing on Mediterranean Islands and the Trilogy of Wine, Oil and Bread, in which the Maltese partner is the Ethnography section of Heritage Malta, contains aspects of digitisation of intangible heritage, thanks to a set of live video interviews with old Maltese farmers that explain their trade and techniques in the production of olives, wheat and grapes, and in their processing until they become the products that form such an integral part of Maltese (and Mediterranean) cuisine. The other Mediterranean islands participating in the project are Majorca (Spain), Corsica (France), Naxos (Greece), Sicily (Italy) and Cyprus.

IKONOS (http://www.ikonosheritage.org/**)**

Continuing in its efforts as a Euromed Heritage II project led by the Malta Centre for Restoration, the IKONOS project focused on several pilots of using the advanced methodologies developed by MCR, including Thealasermetry. The latter methodology is a marriage of 3 techniques (theodolite total station, photogrammetry and laser scanning) which was developed by MCR to produce accurate 3-Dimensional models of cultural heritage sites and artefacts. Thealasermetry has already been successfully applied at Corradino temples in Malta and is currently also being utilised in a survey being carried out by MCR for the Midi consortium at Manoel Island.

DELTA (http://www.imednet.it/delta/**)**

The DELTA Project, funded under the Euromed Heritage II programme, was conceived in order to contribute to the enhancement, in the Euro-Mediterranean region, of the potentialities of integrated development between economic, environment and cultural heritage, which have not yet been wholly exploited. The Maltese partner for DELTA, the Foundation for International Studies, has launched a mini-digitisation project on culture and crafts in the Cottonera area in Malta.

Microfilming and Digitisation of the Consolato del Mare records

During 2004, the National Archives, which is a section of the Libraries and Archives Department under the Ministry of Education microfilmed and digitised the records of the Consolato del Mare for the years 1698 up to 1730. The funds for such an initiative came from the Navigation du Savoir project, in which the University of Malta was a leading partner.

Microfilming and Digitisation of Passport Applications

During the year in question the digitisation of passport applications for the years 1813 up to 1923 continued. This is a joint project of the National Archives with the Genealogical Society of Utah.

Microfilming and Digitisation of Memorial and Public Secretary Records

Sponsorship from the general public coordinated by the Friends of the National Archives made it possible to microfilm and digitise the series of Memoriali (1800-1814) and the records of the Public Secretary (1800-1814).

Upcoming Initiatives

Several interesting national digitisation initiatives are currently in the very initial phases of inception. During 2005 these will continue to evolve and thanks to direct national, European or international funding, should however start to function. These include:

- Digitisation of Ethnographic collections
- Virtual Walkthroughs of national palaces and places of interest
- Creation of e-learning packages for children using digitised information
- Interactive software for academic research on digitised collections

5.14 THE NETHERLANDS

Guus Lange, National Service for Archaeological Heritage (ROB)

POLICIES

The role of cultural institutions

In the Netherlands cultural policies are developed centrally by the **Ministry of Education, Culture and Science** (Onderwijs, Cultuur en Wetenschappen, OCW). The Cultural department is headed by a State Secretary (assistant minister) who is politically responsible. The Ministry takes an active role in the evaluation of digitisation projects (Velthausz and Bruinsma, 2002) and promotes Intelligent Heritage by issuing guidelines, quality standards and controlled funding of developments. It is a member of the EU-programme MINERVA, a network of Member States' Ministries of Culture and is active in the redefinition of the Lund principles. (http://www.minocw.nl/english/index.html)

The **Ministry of Economics** (Ecomomische Zaken, EZ) also shares in the development of vision and policies on Intelligent Heritage and is responsible for the funding of the major ICT development programmes. (http://www.minez.nl/index.jsp)

The **Netherlands Council for Culture** (Raad voor Cultuur) is one of the most influential advisory boards of the central government and the two houses of parliament on cultural issues. (http://www.cultuur.nl)

The **Advisory Council for Science and Technology Policy** (AWT) advises the Dutch government and parliament on policy in the areas of scientific research, technological development and innovation. (http://www.awt.nl/)

Most of the activities and part of the preparations of policies on Cultural Heritage is done by four (to become three) separate State Services:

(1) Netherlands Department for Conservation (Rijksdienst voor de Monumentenzorg, RDMZ) - The Netherlands has some 50,000 protected historic buildings and distinctive townscapes. The Department for Conservation is responsible for conserving buildings and other structures of cultural or historical value and for increasing public interest in them. The Department also serves as a knowledge institute and an advisory organisation. (http://www.monumentenzorg.nl/uk/index.html)

(**2) National Service for Archaeological Heritage** (Rijksdienst voor het Oudheidkundig Bodemonderzoek, ROB) - The ROB is responsible for implementing the Monuments and Historic Building Act, and is now developing into a centre of excellence in archaeological heritage management. It collaborates with other parties involved in archaeological heritage management, aiming to be service oriented, stimulating and proactive in its work. Its core tasks are policy development and implementation, the gathering and dissemination of information, research, and monitoring compliance with the Monuments and Historic Building Act. (http://www.archis.nl)

The former two Services will be combined in 2006.

(3) Netherlands Institute for Cultural Heritage (Instituut Collectie Nederland, ICN)

The Netherlands Institute for Cultural Heritage is a leading, independent knowledge institute for the preservation and management of moveable cultural heritage. The ICN has four core tasks: advising on the preservation and management of collections, carrying out research, training

restorers and managing the ICN collection. Archaeological material is not included in the collection and tasks of the institute. (http://www.icn.nl)

4) National Archives (Nationaal Archief)

The National Archives Department manages national government documents which are 20 years or older, on the basis of the Public Records Act. These documents are managed and made available to historians, members of parliament, journalists, etc. (http://www.nationaalarchief.nl)

Together these organisations are the executors of the governmental policies and their first task is to safeguard the cultural heritage. They do this in co-operation with local governmental bodies, non governmental organisations and private parties. The second role is to operate as knowledge centres for professional and non professional organisations that are working in these sectors, including education. They are active in stimulating knowledge exchange and advance skills by organizing courses and workshops. They initiate debates and policy development, give advice, spread information and issue publications. Together they are interfacing the outside world with the documentation, archives, museum collections, education, landscape, archaeology and environmental and town planning.

Soon there will be one State Inspectorate (now there are four) that sees to the activities in these four sectors.

Important guardians of cultural heritage are of course the large national museums, which nearly all have been privatized, but are supported by the ministry (OCW).

There are four umbrella organisations for the different Cultural Heritage sectors:

1. **The National Contact Monuments** - Stichting Nationaal Contact Monumenten, NCM (http://www.stichtingncm.nl).

2. **The Council for Dutch Archaeology** - Stichting voor de Nederlandse Archeologie, SNA (http://www.sna.nl)

3. **The Netherlands Museums Association** - Nederlandse Museumvereniging, NMV (http://www.museumvereniging.nl.

4. **The Association for Documentary Informationservices and Archives** - Stichting voor Documentaire Informatievoorziening en Archieven, DIVA (http://www.divakoepel.nl).

Many more organisations and institutions play a part in CH-sector. In the appendix I a (biased) overview is presented.

The universities are responsible for the higher education and research on Cultural Heritage. Remarkably the preservation and restoration of objects of art is taught at an elevated level (ICN - Rijksmuseum) but for archaeological material no formal education exists.

- **The Royal Netherlands Academy of Arts and Sciences** (Koninklijke Nederlandse Akademie van Wetenschappen) acts as an umbrella organisation for the institutes primarily engaged in basic and strategic scientific research and disseminating information. It advises the government on matters related to scientific research; assesses the quality of scientific research (peer review) and provides a forum for the scientific world and promotes international scientific co-operation. The KNAW embraces the entire field of learning. The Science Division (mathematics and physics, life sciences and technical sciences) and the Humanities and Social Sciences Division (humanities, law, behavioural sciences and social sciences) together cover all the various fields of scientific discipline.

The KNAW, which houses numerous institutes with extensive medical, historical and ethnological archives, is presently promoting the formation of a national digital archives infrastructure (Data Archiving and Networked Services, DANS) for the humanities and the social sciences, which should also comprise archaeological archives and archives of the built environment (http://www.knaw.nl**).**

The Netherlands Institute for Scientific Information Services (NIWI) is the library for the KNAW, and consists of a large collection biomedical journals and a historical collection. NIWI provides information about research and researchers in The Netherlands, in all scientific fields. The IT-A section of NIWI is responsible for carrying out ICT projects, e.g. the development of the web technology CMS i-Tor, and for ongoing improvement in the supply and acquisition of electronic information. NIWI will end its operations in this form later in 2005. (http://www.niwi.knaw.nl/en/innovative_technology_applied/)

- **The Royal Library** (Koninklijke Bibliotheek, KB) is initiator of many digitizing projects on documentary and publication issues (http://www.kb.nl/index-en.html). One noteworthy initiative is the project Memory of the Netherlands - Het Geheugen van Nederland (http://www.geheugenvannederland.nl) as an example of how digitised Cultural Heritage may enrich our daily life very easily without even investing much in Intelligent Heritage.

- **Netherlands Institute for Art History** (Rijksbureau voor Kunsthistorische Documentatie, RKD). The institute (a foundation since 1995) collects and maintains the largest collection in the world of documentation, archives, image collections, and publications on western art from the Middle Ages to the present with a focus on Dutch art. It is one of the leading knowledge centres on history of art in the world. The RKD co-ordinates the development of the Dutch version of the Arts and Architecture Thesaurus (http://www.rkd.nl).

- **Digital Heritage in the Netherlands** (Digitaal Erfgoed Nederland, DEN) is government-funded association (to become a foundation) to co-ordinate and to stimulate the activities of all heritage content providers. Its task is to gather, to define, to spread the use of instruments, reference models, procedures and national and international standards to guarantee quality, compatibility and interoperability of the Intelligent Heritage process. Hence it invests in strengthening the use of digital cultural heritage in education (http://www.den.nl/).

- At the regional level, the provinces (nl: provincies) and at the local level, the towns and communities (nl: gemeenten) are responsible for their own local Cultural Heritage policy and are also responsible for the safeguarding of the monuments and archives. Apart from museums and archives they are also keepers of warehouses (nl: depots) were archaeological and historical objects and art collections, ideally together with the documentation, are stored. These depots are sometimes thought to play a role in interfacing archaeology with the public, but no policy or guidelines have been developed yet.

This list is not by any means intended to be complete. Many private and public organisations at regional and/or local level are very active in digitizing activities. Most initiatives however are likely to be monitored by one or the other institution mentioned above.

Specific regulations

A relatively small number of projects are funded by EU-programmes.

For national projects on Intelligent Heritage the following possibilities for funding are available:

- The **Ministry of OCW** engages in many projects to promote Intelligent Heritage on its own and through the **Mondriaan Foundation** funding projects in the visual arts and design and for Cultural Heritage, including Intelligent Heritage www.mondriaanfoundation.nl/).

- The **Ministry of Economics** (EZ) plays a very active role in the development of the information society, by funding very large ICT-projects, including IH, through its agency **SenterNovem.** (www.senternovem.nl/)

- **SURF** is the Dutch higher education and research partnership organisation for network services and information and communications technology (ICT). The Mission of SURF is to exploit and improve a common advanced ICT infrastructure that will enable higher education institutes better realise their own ambitions and improve the quality of learning, teaching and research. It provides the high speed network (SURFnet) and licence services, the Scientific Technical Council (WTR) and subsidises projects. (http://www.surf.nl/en/home/index.php)

- **SICA** is the liaison organisation for EU-funded projects, but does not provide funding itself. (http://www.sicasica.nl)

Regional and local projects by non governmental organisations can find funding with the Prince Bernhard Foundation and numerous other private foundations. Cultural heritage is not benefiting from any of the funds from the national lotteries.

Priorities for ICT applications to Cultural Heritage

The archiving of digital heritage is of major concern to the sector. If our cultural heritage is to be preserved for future use then it is beyond question that the archives, filled with observations, stories and reports on what we and our forebears did with or thought about this heritage, should be as arduously safeguarded as we protect the visible and invisible monuments. After all, besides the excavated objects, this documentation is the only source left for accessing the past. Unfortunately, sustainable use of the documentation is not well organised. The archiving tradition is not well developed in some of the fields of cultural heritage. Doing thorough researches and publishing results in volumes and reports, yes, but the careful storage of material and documentation is often the last activity on the list. It is no wonder that the attention to archiving is under pressure, when new challenging researches are waiting or already on the way. Now that we are witnessing the transition of analogue to digital media, the situation becomes acute. Why is that?

Paper documentation, although it might be not well described nor orderly stored, it is still accessible. It may take ages to get to the information, but, in principle, it can be done. With information in digital format – digitally born - this is not the case. Without the proper hardware and software and key data and information could and will become definitively inaccessible. This is no new knowledge and everybody heard the horror stories for years. Until recently the problem tended to be ignored to a large extend. With the advent of a Digital Government, it is realized that a trustworthy government is based, not only upon the wide availability of information, but also the guaranteed availability in the long run. The subject of durable access to digital archives has become a central issue. The National Archives has a special department on sustainability of information and is in a number of dedicated projects investigating problems and solutions. The Royal Library plays a role in many of them. These initiatives go hand in hand with the concern about the conceptual accessibility of digital information. If data is accessible technically, does it make any sense to the naïve user? Or, even more challenging, can machines make sense out of the mass of information for us? Obviously a thoroughly and fundamentally discussed and agreed upon metadata structure will make cross-cultural and sensible and automatic exchange of information and knowledge possible. For the larger

community of user/producers WEB-services are being developed further into flexible tools for web repository browsing for anyone without programming experience.

We will find the solutions for these challenges and much of the groundwork has already been done. In the near future, we will witness the acceptance of a set of (international) guidelines and procedures for the archiving of digital material to guarantee the access to anybody anywhere at anytime to relevant but probably very divers repositories of data, information and knowledge. Metadata schemes and ontology building are introduced with the aim to add machine interpretable semantics to the data. Mark up language and network robots open up our repositories for anyone, at anytime and from anywhere, independent from the hardware and software used. Together they will provide the user with intelligent answers, showing unforeseen relations between data, even beyond the own domain. To enable this multicultural interoperability is the aim of the major recent projects like Digital Community of the Past, DANS, National Reference Collection, CATCH, Reference_Networks (see below).

But what we need most is a new awareness about the importance of archiving, and, especially in the case of archaeology, preferably before we find that there is hardly anything interesting left but the archives. Then it will be too late to take measurements of course. We have to act now.

Archiving rather then publishing should be the ultimate goal of our actions. Fortunately the great divide between these two is vanishing in the digital world to date. Archived material seems to gain in importance for the user already. If provided with the proper tools the digital format allows and invites individuals to look for themselves "what it is there to know?" Perhaps, when archives become more easily accessible, we will se a mechanism develop that credit researchers not only for their scientific output (still only on paper?) but also for their well organised and accessible archives.

To bring about this kind of attitude changes an extensive training offensive should be launched. Since the huge interest of the general public in genealogy, archivists of the large community archives are well aware of the benefits of digital presentation and storage. A step has to be made into the direction of the other heritage archives. At a central level this has already been picked up (see for instance "Memory of The Netherlands"), but at a local level, where possibilities are much smaller, developments are slower. The need for more computer literacy and knowledge about digital archiving principles holds also for the staff of cultural heritage institutions, both central and local, as they have to make the actual contributions to the archives in the desired way. Unfortunately there are no initiatives for developments in that direction visible. Experience from the 80's onwards shows that such developments will not take place spontaneously. Only when people are put under pressure to become involved while user-friendly programmes are offered, the new possibilities have a chance to be accepted. The Millennium Bug Experience shows that even non-issues (in the CH sector) can bring about great changes in people's attitudes and governmental money flows, if pushed hard enough. Unlike this, continuous access to information, however, is not a trivial challenge!

A field that received relatively little attention is the use of computer vision techniques in Intelligent Heritage. This is rather odd given the strong visual disposition and possibilities of the Web and the role visual inspection plays in the cultural heritage sector. If computer vision can be made to work in Intelligent Heritage it will tremendously help in the recognition task that is fundamental to all our stories, policies and researches. The speed and amount of information the computer can browse through and deal with is incomparably larger than human capacities. It is only with computer vision techniques that we can hope to make sense of the unlimited amount of images in the literature that serves as comparison material. Images, moreover are language free, and therefore are by definition multicultural accessible. We make sense of our environment first by inspection, and then we learn the concepts "behind" it and use words to communicate our ideas. Computer vision is already successfully used for quite a number of years now in, for instance, crime prevention and detection (face recognition, finger prints etc.), (food) industrial quality control, robots etc. The recognition of objects of art and/or archaeological finds on the Internet and in the literature, together with enrichment by automatic analysis of the accompanying text, will mean a major breakthrough in the knowledge accumulation and

dispersion and may even play a crucial role in the prevention and the solution of art robberies and illegal trade.

It is realized that this type of research will take a long time to produce results and ambitions should at first not be too high, but, ultimately the benefits of the new possibilities that are offered to archive and library research are hard to overestimate.

Funding sources for IT projects

Public

Where in the earlier days direct contact with the Ministry of OCW was the way to get projects funded, to date, public funds are more often distributed by the competitive call mechanism. For the very large programmes Cultural Heritage has to compete with other sectors. The call mechanism knows no regular schedule, but is widely announced.

Private

Private sources operate generally with the direct contact approach.

PRACTICES

On going and past projects

ARCHIS – The maintenance of the Sites and Monuments Record is one of the tasks of the ROB and stated as such in the Monument's and Historic Buildings Acts of 1961 and 1988. In the renewed - "Malta" - legislation, which is currently discussed in parliament, this task remains central to the ROB. Digitisation of the Sites and Monuments Register started already in 1974. These data files that were maintained in a STAIRS database, external from the ROB. The data formed later a substantial part of the input into the ARCHIS database. It run on Masscomp/Unix and featured INFORMIX dbms and the Open Source GIS-package GRASS. Both the database applications and the GIS applications were developed by ROB-staff. (For a detailed description of the developments of ARCHIS see P.A.M. Zoetbrood et al. 1997: "Documenting the Archaeological Heritage". In: W.J.H. Willems, H. Kars and D.P. Hallewas (eds): Archaeological Heritage Management in the Netherlands. Fifty Years State Service for Archaeological Investigations. ROB, Amersfoort.

The Archaeological Information System received initial funding from NWO and has been developed since 1988 and came in full operation in 1992. It was meant to provide the infrastructure for the development of a Centre of Expertise, one of a number of such scientific centres in the Netherlands. These Centres were then thought to become self dependent after the initial period of development, while in future it was thought that clients would pay for the information and knowledge available. The clients for ARCHIS were mainly the participating archaeological university institutions. Together with the ROB they formed the management board. As we know now, none of these Centres of Expertise ever reached the self-supporting state and probably never will. The full management and maintenance of the ARCHIS-system were officially adopted by the ROB in 1998.

ARCHIS published a list of permitted words - broader and narrower terms - for the recording of archaeological objects and features. Specialists throughout the country were consulted in the development of the list, which has become a de facto standard in the Netherlands.

ARCHIS was the agent of developments at the ROB where office automation followed in order to bring full benefit of the advanced possibilities of mapping and information retrieval to the individual researcher. A spin off from the ARCHIS development was early access to the Internet for ROB employees. The ROB boasted to be one of the first 25 websites at the start of

1995, and being the first governmental web site in the Netherlands. Typically, nothing of these old artefacts survived in the archives, not even as snapshots!

URL: http://www.archis.nl

ArchWeb – Together with the other archaeological institutes and the National Museum for Antiquities the (not named as such in those days) "portal" ArchWeb was developed during 1995. Of this initiative the mailing list function has survived until to day and is maintained by the SNA.

URL: http://www.sna.nl

Cultuurwijzer

Members of the heritage community together with the ministry of OCW were quick to realise that co-operation would benefit individual digitalisation projects that we could see coming. After several years of incubation the association DEN (http://www.den.nl) was formally launched in 1999. It developed the interoperable search interface Cultuurwijzer which allows for accessing the archives of a large number of co-operating heritage centres.

URL: http://www.cultuurwijzer.nl

ARCHIS2 - Ten years after introduction, although it worked to great satisfaction at the home base, the server-client model of ARCHIS never had worked satisfactorily for all partners. This was among other things due to difficulties of maintenance at the client side and sub optimal network connections. It was very difficult to deliver quality of service outside the local ROB network. The development of the more Web-based applications in the late 1990's allowed the development of ARCHIS as a web-service. It is in operation now. Again ARCHIS is the focal point of many new developments at the ROB (and beyond).

URL: http://www.archis.nl

KICH – The "Convention of Valetta" (Malta 1992), stipulates that archaeological remains should as much as possible be preserved in situ. In order to provide town planners, architects and rural developers access to the combined information of monuments, historical-geographical features and other landscape related values, together with archaeological sites the project Knowledge Infrastructure for Cultural Heritage is under construction. It involves integrated access to specific databases from the Ministry of Agriculture, Nature and Food Quality (LNV), Alterra – knowledge centre of the University of Wageningen, the RDMZ and the ROB.

URL: http://www.kich.nl

NRc –The National Reference Collection for archaeological and construction material will show type collections of materials and material heritage to the professional user and the interested public. The collections will be available as images and references will be made to the relevant background information (literature, maps), the whereabouts of the physical representatives and the group of specialists currently involved in the research of the specific material. A central topic of the NRc will be a complete revision of the ARCHIS list of preferred terms for archaeological remains according to current international standards such as CIDOC-CRM. The NRc will be developed in separate projects dedicated to particular groups of archaeological and historical building material. The content of the NRc will be kept up-to-date by these specialist groups, while infrastructural facilities and organisational support will be provided by the NRc-portal organisation. The NRc is seen a vital stimulator to the quality of service of heritage organisations from universities and museums to private excavation units and

history minded amateur research groups (cf. A. G. Lange, 2003: "International Reference Collections." In: K.F. Auserer, W. Börner, M. Goriany and L. Karlhuber-Vockl (eds.): Computer Applications and Quantitative Methods in Archaeology. BAR International Series 1227, pp. 137-140).

The NRc is explicitly internationally orientated: not only is the distribution of archaeological material totally independent of modern frontiers and researchers should have access to and be able to study all available material also abroad, also new developments in the infrastructural sphere can best be developed in a co-operative manner. International projects (ARTeFACT – Culture2000) are pending, building upon other EU-funded projects like ARENA (see A. G. Lange, 2004: "Reference Collections: founding the future". In: A. G. Lange (ed.): Reference Collections: foundations for future archaeology. ROB, Amersfoort; pp. 139-145).

URL: http://www.archis.nl/Projecten/NRc

REGNET - One outstanding example is the participation of the (private) Museum of Education (MUSEON) in the EU-funded IST project REGNET, follow up of the Open Heritage project that dates back to 2001. REGNET provides multicultural access to a number of art history museums. It is here that for the first time the concept of distributed knowledge centres being facilitated by a more centralized super infrastructure is introduced in the humanities. The same principle followed in the NRc and the next projects.

URL: http://www.regnet.org

Digital Community of the Past – DIVA (Digitaal Genootschap van het Verleden) also will use peer-to-peer/collaboration software to record local histories provided by both professionals and amateur historians, by providing the infrastructure and organising the contributions.

URL: http://www.digitaalverleden.nl/en/home.php

DANS – Initiative taken by the KNAW and NWO to guarantee long-term access to research data archives in the humanities and social sciences. Also here the organisation is typically designed for wide participation and distributed responsibilities. In involves a central organisation for support and development works that works in close co-operation with decentralized topical centres the main task of which is to make content available. In addition, thematic development programmes will be defined for developing useful new services.

URL: http://www.knaw.nl/cfdata/nieuws/laatstenieuws_detail.cfm?nieuws__id=267

DARE – The programme Digital Academic Repositories (DARE) is an initiative of the Dutch universities to make all research data and information accessible. Also involved are KB, KNAW and NWO. The SURF foundation coordinates the activities. One project is called e-Depot for Dutch Archaeology.

URL: http://www.surf.nl/themas/index2.php?oid=18

CATCH – Continuous Access To Cultural Heritage (2005-2009) of NWO aims at bringing together new ICT-developments and the Cultural Heritage Sector. This programme signals a new era in the development of Intelligent Heritage. The computer departments of the Dutch universities are going to devote their combined expertise specifically for the cultural heritage sector. They will develop new tools that the sector asks for. This includes, among others, tools for handwriting recognition, image retrieval, semantic interoperability, and personalisation of web access.

URL: http://www.nwo.nl/nwohome.nsf/pages/NWOP_5XSKYG

Memory of the Netherlands – Co-ordinated by the Royal Library (KB: Geheugen van Nederland) is one of the largest and most successful digitization projects in the cultural heritage sector. It started in 2000 with the target of making content on arts, history and culture available in a standardized and stable environment. Although it lacks at this moment semantics, as understood here necessary to allow multidisciplinary interoperability, but the project continues and places this high on the agenda. Many local initiatives are listed in the appendix II, displaying local or regional top artefacts. Not surprisingly truly integrated and multidisciplinary interoperability has yet to be developed largely.

URL: http://www.geheugenvannederland.nl/gvnnl/all/index.cfm/language/en

Reference_Networks – (Referentie_Netwerken) focuses on developing semantic interoperability. It is funded by the "Natinaal Actieplan Elektronische Snelwegen" and is carried out by a combination of private ICT companies, ICT university institutes and Heritage institutes.

URL: http://www.trezorix.nl/tzx/tzx/i000477.html

MultmediaN - (Multimedia Netherlands) is a very large ICT project for the "new media" - video, pictures, audio and spoken language. It aims at the creation and transfer of knowledge on the processing of multimedia data streams, connecting and interacting with computers and humans, providing semantic access and enriching content and automatic discovery of new knowledge. 20 industry organisations and government and non-profit organizations and about 60 scientists develop software for new video, audio and speech technology.

URL: http://www.multimedian.nl

Dutch heritage institutions are participating in EU-funded projects like:

EPOCH, http://www.epoch-net.org/ (heritage institutes)

DELOS, http://www.delos.info/ (libraries)

PRESTOSPACE, http://www.prestospace.org/index.en.html (audio visual centres)

Typology of products

In museum settings all kinds of display have been developed. The most favourable application for digital presentation seems however to be the web site. For museums the site functions mainly as an appetizer inviting the citizens to pay a physical visit. For knowledge centres web sites are the means to show and explain the tasks being carried out and to provide quality enhancing forms and procedures for the sector. More and more also the stored data and information is made public.

Approximate estimate of funded projects by size:

Project size	% on total
Small size (up to 100.000 Euro)	60

Medium size (100.000 to 300.000 Euro)	5
Large size (300.000 to 600.000 Euro)	5
Very large size (over 600.000 Euro)	30

Average duration of funded projects

Project duration	% on total
Short (up to 1 year)	45
Medium (1 to 2 years)	30
Long (more than 2 years)	25

Good practices

DEN, the Royal Library and SURF collect, guard and promote best practices in Intelligent Heritage. Their sites give valuable information based on first hand experience.

Relevant background information:

Netherlands Council for Culture, 2003: From ICT to E-culture. Advisory report on the digitalisation of culture and the implications for cultural policy, http://www.cultuur.nl/files/pdf/adviezen/E-cultuur_engels.pdf

SURF Scientific Technical Council (WTR) 2004. Reaping the Rewards. The Trend Report 2004. http://www.surf.nl/download/Trend-Report-2004_UK.pdf

Journals and links to sites of interest

To our knowledge there are no Journals, Series or Books on Intelligent Heritage in the Netherlands. Consulted are:

1. Jodi - Journal of Digital Information
2. DigiCult
3. Advances in Knowledge Organisation - Proceedings of the International Society for Knowledge Organisation [ISKO]
4. CAA proceedings

DEN issues a newsletter with topics on Intelligent Heritage.

Selected websites:

Monuments and archaeological sites

Council for Dutch Archaeology (SNA), http://www.sna.nl
Departement for Conservation (RDMZ), http://www.rdmz.nl
Dutch Art & Architecture Thesaurus, http://www.rkd-db.nl/aat/index.html
National Contact Monuments Foundation (NCM), http://www.stichtingncm.nl
Netherlands Service for Archaeological Heritage (ROB), http://www.archis.nl

Archives and documentation centres:
Archiefnet is a search device for archival web services at home and abroad, http://www.archiefnet.nl/
Association for Documentary Informationservices and Archives (DIVA), http://www.divakoepel.nl
Instituut Collectie Nederland (ICN), http://www.icn.nl/

Related institutions and services:
Dutch Ethnological Collection Foundation (SVCN), http://www.svcn.nl
Dutch Museums Association (NMV), http://www.museumvereniging.nl
Netherlands Digital Heritage (DEN), http://www.den.nl
Netherlands Intitute for Art History (RKD), http://www.rkd.nl
Netherlands Institute for Scientific Information services (NIWI); http://www.niwi.knaw.nl

Educational:
Cultuurnetwerk: National knowledge centre for arts and cultural education in the Netherlands, http://www.cultuurnetwerk.nl
Cultuurwijs: Searching for culture in the Netherlands aimed at education in primary and secondary school. http://www.cultuurwijs.nl
Erfgoed Actueel (Bureau for education and cultural heritage), http://www.erfgoedactueel.nl
Heritage education, http://erfgoededucatie.pagina.nl

Perceived needs

A serious problem is the management of ICT-facilities. Daily management is mostly “sourced out”. ICT is usually not seen as belonging to the core business of the heritage sector. It is true that outsourcing solves a lot of problems for the general management in terms of liabilties in production and personnel management. This also means that no one, who knows of the sectors’ needs, is directly involved in the daily management of the computer department. In the smaller organisations this leads to a total dependence on the whims of the private company that is interested, besides to making a sound profit, in keeping the burden of the management as stable and as low key as possible. No impetus for change or even help one may expect from them in the more challenging questions.

Language technology, archaeological excavations, museum displays all need specific ICT solutions. In this the humanities are comparable to the laboratory environments in the beta sciences [i.e. natural sciences].

It would be ridiculous to suggest to these latter scientists to send their programmers and laboratory personnel home, and hire fresh “greenhorns” from somewhere outside the institute. But this exactly has happened in the heritage sector. It is essential, even for smaller heritage organisations, that there is a small staff of ICT-specialists available that can actually develop and implement show cases of new applications. Once such pilots proof successful the outsource firm can take over further implementation and management responsibility.

Basic development can, of course, also be sourced out, and often is. The price however is high, in terms of input from the asking institution and money. Experience shows that these kind of tracts have serious draw backs in terms of flexibility and adequateness of responses. For instance, what might be a vital problem to the asking institute might only be a marginal issue to the providing firm. A possible way out is to use of non-profit Application Service Providers (ASP) for the Intelligent Heritage sector.

The local ICT personnel need back up from and a strong interaction with centrally positioned ASP and heritage knowledge centres in order to make knowledge transfer and development as smooth as possible.

ICT development does belong to the core business of the modern heritage institutes if they want to make an effort in opening up their data, information and knowledge to a wide audience.

Final comments

Impact of IH on everyday life

Archaeology belongs to the domain of the alpha and gamma sciences [i.e., humanities and social sciences]. Its goal is to describe past communities providing a context to the thoughts and actions of the present day individual and communities. Archaeology ultimately belongs also to the domain of the natural sciences. Not only are these used as a tool in analysing archaeological remains, archaeology, like for instance astronomy, wants also to explain rationally the history of the world and perhaps even predict its future. Before we can contribute anything to the latter we need many descriptive researches. Both purposes, description and explanation, would be served tremendously if archives and databases are open for investigation by the interested citizens, professional and non-professional.

Moreover, the "democratisation" of information and knowledge will

- attract more "outside" participants in the scientific and policy making debates,
- enhance the status of the heritage institute as a factor of weight in political debates,
- strengthen the decision making process, making it transparent and trustworthy,
- increase appreciation of cultural heritage (management),
- raise the awareness of the context of our everyday life as individuals and as groups in the socio-economic and cultural environment,
- could be developed into an instrument against illegal trade and art robbery.

The danger of misuse of easily available information is real, but does not out weigh the benefits. When necessary, measures can be taken to shield off very sensitive information.

Training

The training of professionals to use new IC techniques is absolutely mandatory. It is often seen that the skills of the professionals are less developed than that of the users (non-professionals) from "outside". Also the ICT apparatus available is often not up–to–date and lags behind developments.

Dissemination

There is no existing network for dissemination of project results, although DEN, SURF and the ministry of OCW play active roles by organising congresses and workshops on Intelligent Heritage.

Other

Relatively few international initiatives are taken (See however MINERVA, REGNET, NRc above).

5.15 POLAND

Agata Wąsowska-Pawlik, Zoltán Gyalókay – International Cultural Centre in Cracow

POLICIES

Institutional framework

There are cultural administration bodies located at the central (state), regional (Voivodship), provincial (poviat) and municipal (gmina) levels.

The central state administration is the main actor which sets cultural policy objectives and funding principles. The Ministry of Culture (former Ministry of Culture and National Heritage) is responsible for legislation, searching and securing new sources of non-public financing for culture, monitoring the implementation of cultural policy and keeping track of ongoing changes in the system. In other words, the main Ministerial tasks are to set the legal, financial and programme frameworks which facilitate the development of culture. The Ministry does not engage in the direct management of culture, even though it organises a few activities for the most important cultural institutions and provides financial support to cultural events of a regional or local character.

Local authorities (at all tiers: region, province and municipality) and – to a certain degree – non-governmental organisations have acquired an important role in cultural policy whether it be according to state set objectives or creating their own development strategies. In the latter case, it is important to underline the autonomy and independence of local governments.

(Source: www.culturalpolicies.org)

Funding sources

Public funding

Ministry of Culture (Operational programme "Media with Culture") It aims among others to enhance the use of media for popularization of several cultural activities http://www.mk.gov.pl/website/index.jsp?catId=316 (The website is only in Polish)

Ministry of Science and Information Society Technologies (more about the projects of the Ministry on):

http://www.mnii.gov.pl/mniien/index.jsp?place=Menu06&news_cat_id=110&layout=2

Private funding

Polish–American Freedom Foundation, education, competitive call, www.pafw.pl

The Leopold Kronenberg Foundation, heritage,

http://www.citibank.pl/poland/kronenberg/index.htm

Polish Foundation for Science Advancement www.pan.pl/ pfun, science, education

PRACTICES

On-going and past project / good practices:

A virtual sightseeing in the Castle-Museum in Bielsko-Biała on the homepage of the museum – http://www.muzeum.bielsko.pl

A virtual sightseeing in the Wilanów Museum Palace (Warsaw) on the homepage of the museum – http://www.wilanow-palac.art.pl/

A virtual sightseeing in the Castle-Museum in Pszczyna on the homepage of the museum – http://www.zamek-pszczyna.pl/english/start.html

A virtual presentation of the Wawel Hill in the Roman Age, created by the firm MM Interactive and the Festival Bureau "Kraków 2000"

http://www.mminteractive.pl/krakow.html

A virtual presentation of Cracow in the Roman Age, created by the firm MM Interactive and the Festival Bureau "Kraków 2000" http://www.mminteractive.pl/krakow.html

A virtual presentation of the reconstruction plans of the Wawel Hill from the beginning of the 20 century, on the recent exhibition in the Wawel Castle in Cracow.

A virtual presentation of the Archeological Site in Biskupin on: http://www.biskupin.pl/eng/wirtual.htm

The Museum of the History of Polish Jews is being designed as a narrative multimedia museum. More: http://www.jewishmuseum.org.pl/index.php?page=1020200001

Needs

Most of the Polish cultural institutions have web sites. Nevertheless, often it is difficult, to find up–to–date information on these websites, because they are administrated by specialists of informatics, who not always keep contact with the professional staff of the institutions. In case of smaller organisations the web visibility is the responsibility of local government.

Many institutions have also virtual presentations in the framework of their websites, created as individual undertaking of the institution. In our knowledge, there are no structural solutions with a wide range, initiated by the central government or the governments of several counties. However, the Ministry of Science and Information Society Technologies has elaborated the "Development Strategy of Information Technologies in the Polish Republic – e-Polska for the years 2004-2006". This strategy sets some recommendations for heritage institutions to enable on-line access to monuments (digitalisation of collections, exhibits).

There is a need to help to develop IT aware staff in the institutions of cultural heritage.

Above sentences are only working remarks. The authors are in the process of better elaboration of the giving topic. Any comments are warmly welcome.

5.16 PORTUGAL

Tony Lavender, Centro de Computação Gráfica (CCG)

POLICIES

The role of cultural institutions

Cultural policies in Portugal are the responsibility of two particular Government Ministries. The body responsible for the widest interpretation of IH is the Ministério da Cultura (Ministry of Culture) and the one that deals with built tangible heritage is the Ministério das Cidades, Administração Local, Habitação e Desenvolvimento Regional (Ministry of Towns, Local Administration and Housing).

Ministry of Culture

The web site http://www.min-cultura.pt provides an organigram of the Ministry, and lists all institutions and organisations responsible to the Ministry. Two secretaries of State assist the Minister – one responsible for Cultural Assets and the other for Visual and Performing Arts. The Ministry has four regional offices for the Northern Region (based in Vila Real), the Central Region (Coimbra), Alentejo (Évora) and the Algarve (Faro).

Of all the varied institutions and bodies overseen by the Ministry of Culture the following three are highlighted as having particular interest for the EPOCH survey:

Instituto Português de Museus [IPM] (Portuguese Institute of Museums),

The Portuguese Institute of Museums (IPM) is the national institute for museums and acts under the Ministry of Culture. The IPM is directly responsible for 29 museums, including all nine national museums. The IPM has the task to define and implement a national policy for the museums sector as well as to provide professional and technical support. In the area of online access to museum collections IPM coordinates the Matriz Net project which enables both specialists and the general public to access a substantial number of object records.

URL: http://www.ipmuseus.pt/en/ipm/A15/IH.aspx

Instituto Português do Património Arquitectónico [IPPAR], (Portuguese Institute of Architectural Heritage)

The purpose of IPPAR is to maintain, preserve, protect and improve Portuguese architectural heritage, including in the real estate of special historical, architectural, artistic, scientific, social or technical value that exists in continental and insular Portugal. This is done by designating or listing monuments and sites of special interest, through the carrying out of prevention, recovery and restoration works in State owned properties and sites, through the classification of archaeological real estates and sites and by the management of the main national monuments. In this latter respect IPPAR is in charge of the direct management of a wide set of monuments and sites, which have been systematically preserved, recovered and improved for the purpose of safeguarding them and for the creation of suitable conditions for visitors.

The two main areas of intervention that IPPAR is responsible for are:

(a) Heritage Recovery and Improvement; and

(b) Protection of Built Heritage and its contexts

Heritage Recovery and Improvement involves direct intervention upon cultural monuments and assets, through qualified actions involving the inventory, recovery, repair, maintenance, restoration and accomplishment of several projects in both the built heritage and its own surroundings and also in the mobile and integrated heritage, such as paintings, religious sculptures, furniture, etc., as well as so-called "original" real estate heritage, like carvings, murals or ornamental tiles). In this context, IPPAR is responsible for the management of the main national monuments (palaces, monasteries, castles and archaeological sites).

The area of Heritage Protection covers actions of a technical-administrative type related to direct intervention in immobile assets under different ownerships – be they State, Church or private. This is possible through the promotion and preparation of processes of heritage classification, and also the establishment of special protection zones, which aim to legally protect cultural assets and their contexts. In order to achieve protection IPPAR is required, on the one hand, to issue binding statutes for projects or actions carried out by third parties on listed properties or those situated in protection zones while, on the other hand, to technically supervise the several instruments for urban planning, territorial arrangements and environmental impact studies.

The IPPAR web site is at: http://www.ippar.pt

Instituto Português de Arqueologia [IPA] (Portuguese Institute of Archaeology)

The aims of the IPA are three-fold as follows:

To ensure the development of political principles and the fulfilment of the obligations of the State in the area of archaeology throughout the whole of the national territory and in the contiguous coastal areas in collaboration with the other organs of the Ministry of Culture;

To promote the institutionalisation of archaeology through a policy of co-operation with other public and private bodies in order to ensure an adequate inter-institutional articulation in the prosecution of the policies defined for the sector; and

To collaborated in the execution of projects and vocational activities for raising public awareness about their archaeological heritage by stimulating initiatives destined to promote archaeological knowledge and dissemination amongst the public.

The IPA web site is at: http://www.ipa.min-cultura.pt/

Ministry of Towns, Local Administration and Housing

The work of the Ministry of Towns, Local Administration and Housing is conducted by the Direcção-Geral dos Edifícios e Monumentos Nacionais (Directorate General for National Buildings and Monuments). DGMN was established in 1929, and restructured in 1993. Its activities are aimed at protecting and enhancing Portuguese architectural heritage and accommodating public buildings. In this latter respect DGMN has been entrusted with the conception, planning and co-ordination of activities leading to:

- The construction and conservation of public sector buildings;
- The safeguarding and enhancement of Portuguese architectural heritage; and
- Assessing and promoting good quality construction.

DGMN is also involved in the following activities:

1. Inventories including the development of the Architectural Heritage Inventory (in conjunction with the IPA), which is an information system assembling data from the Documentary Sources programme, the Charter of Risk and its own Intervention and Research activities.

2. Intervention such as the planning, project design and implementation of works leading to conservation, construction and enhancing of the architectural heritage, which involves technical, scientific and financial co-operation with other bodies, thus ensuring multi-disciplinary actions.

3. Dissemination of information about activities and methodologies used through the publication of its magazine MONUMENTOS and other thematic works and by the promotion of temporary exhibitions, conferences, seminars and congresses.

The DGMN web site is at: http://www.monumentos.pt/english/destaques.asp and the Architectural Heritage Inventory can also be found here.

Other government bodies involved to a limited extent in cultural activities are the Ministério da Defesa Nacional (Ministry of National Defence), which is responsible specifically for military museums, similar institutions and their collections, and the Direcção-Geral de Turismo (Department of State for Tourism) of the recently created Ministério do Turismo (Ministry of Tourism).

Tourists are interested in many aspects of the country that they may be visiting including its architectural, historical and/or cultural heritages. In view of this DGT is responsible for identifying relevant buildings, sites and events that can receive various levels of funding to assist with their preservation. One such project in 2001 – officially a case study - involved the restoration and renovation of the Palace of the Marquises of Valle Flôr in Lisbon to its originally state for the use of its new owners who are the Pestana Hotel group. The relevant web site is at: http://www.dgturismo.pt/

Specific regulations

In addition to the POCTI programme of the Fundação para a Ciência e a Tecnologia (FCT) which will be further addressed below, another widely targeted government initiative, the Programa Operacional Sociedade da Informação (POSI) [Operational Programme for the Information Society] is concerned in part with promoting public access to IH through the use of new technologies for dissemination purposes. Support is made available on a competitive basis for the digitisation of essential national assets concerning historical, architectural, archaeological, musical and documentary heritage through the Programa Operacional da Cultura (POC).

The POSI web site is at:
http://www.fct.mces.pt/pt/programasinvestimento/posi/posifiles/posi.html

A few years ago a paper (in Portuguese) about the economic importance and communication of cultural events was written by Claudia Ferreira of the Faculty of Economics at the University of Coimbra (Nº 167, Janeiro 2002). It was entitled "Intermediação Cultural e Grandes Eventos: Notas Para um Programa de Investigação sobre a Difusão das Culturas Urbanas" available via the following web site: http://www.ces.fe.uc.pt/publicacoes/oficina/167/167.pdf

Priorities for ICT applications to Cultural Heritage

1. There is a well-documented need for more training for museum technical personnel in the area of information and communication technologies as they are now being and/or could be applied to the display and accessibility of cultural assets.

2. Although much has been and is being done by the IPM to enhance museums in Portugal, there is always more that can be done to upgrade facilities particularly in respect of new means of displaying IH.

3. Also there is more that can be done to communicate information about archaeological sites to the public in general and to enhance on-the-spot information at individual sites using small portable communication devices.

Associations and networks

In addition to the works of the Ministry of Culture at the national level, the four regional departments of culture responsible to the ministry include amongst their goals:

- the co-ordination of actions at a regional level of all the organisations and services dependent on or provided by the Ministry of Culture; and

- the support of local cultural initiatives that by their nature cannot be integrated into national programmes or that is regionally specific.

Amongst the organisations that the departments are responsible for are often quite large numbers of small museums that are not administered by the IPM. An example of such a museum is the Museu Arqueológico e Lapidar Infante D. Henrique in Faro, which is part of the responsibility of the Algarve department (for access enter via espaços culturais on web site:

http://www.cultalg.pt/EspacosCulturais/index.html?subpagina=espacos.html&dominio=200011&dopesq=Mostrar+Espacos

The Rede Portuguesa de Museus (Portuguese Museum Network) aims at promoting communication and co-operation between them, in order to bring about the upgrading of museums in Portugal. It is organised as both a physical network and an information network and it combines the dissemination of information and the stimulation of communication, while at the same time is providing an aid to programming, interconnection and the upgrading of facilities. Its web site is: http://www.@rpmuseus-pt.org/

Individual municipalities also have set up a number of organisations associated with various aspects of IH, which often combine civic bodies, higher educational institutions and other prominent institutions in order to support and promote local cultural assets. The Bracara Augusta Cultural Foundation is one such organisation founded in 1986 by the Braga City Council, the University of Minho, the Portuguese Catholic University and the Braga Catholic Church.

The Foundation in association with the Archaeological Unit of the University of Minho and finance from the Programa Operacional da Região do Norte were instrumental in making a CD-ROM entitled Virtual Journey to Bracara Augusta that presents the public and visitors with the wide range of Roman remains that can be found in and around Braga. This presentation, in Portuguese, English and Spanish can be accessed direct at:

http://www.cm-braga.pt/html/bracara_augusta/index.html

Funding sources for IT projects

Public

Cultural Heritage has recently (2004) been included as a new area worthy of support for funding related to Portuguese national scientific research and development projects involving ICTs by

the Fundação para a Ciência e a Tecnologia (Foundation for Science and Technology), which is responsible to the Ministério da Ciência e do Ensino Superior (Ministry for Science and Higher Education), in their Programa Operacional "Ciência, Tecnologia, Inovação" [POCTI] ("Science, Technology, Innovation" Research Programme) in accordance with their web site: http://www.fct.mces.pt/pt/apoios/projectos/concursosabertos/todosdominios/

A request for information about the selected projects within the 2004 diet was made to FCT to gather information for this questionnaire, but at the time of finishing this report it had not been answered. However, the 38 applications submitted under the CH category can be inspected at web page:

http://www.fct.mces.pt/Evaluation/contents/C0301/Painel_Net/default2.asp?ID_ElemPainel=559#

Local and regional funds also exist that are available to assist with various aspects of cultural projects. Funds are normally allocated annually after the various proposals are evaluated in relation to competitive calls. One such fund mentioned above is the ON – Operação Norte – Programa Operacional da Região do Norte, which funded the Bracara Augusta Multimedia Kiosk project under one of their priority action lines that includes cultural heritage activities. The ON web site is at: http://www.ccr-n.pt/on/

Portuguese Government funds combined with European funds are available from the Programa Operacional da Cultura [POC] (Operational Program for Culture) under open competition. Currently Measure 2.2 is relevant to the use of ICTs for accessing culture in both Action 1 – Recording and digitisation of immobile and mobile heritage and it dissemination and Action 3 – The treatment and digitisation of bibliographic archives and foundations. The POC web site is at: http://poc.min-cultura.pt/index2.htm

Private

The privately financed Calouste Gulbenkian Foundation supports a wide range of cultural institutions and programmes in many sectors. Amongst its activities it provides support for independent bodies and individuals, as well as scholarships for research into Portuguese culture. Two programmes of potential interest involve support for writing books in the areas of archaeology, history of art and cultural heritage and for the recovery, restoration and appreciation of Portuguese movable or immobile patrimony. In the latter case some 50,000 € are available annually for one or not more than two projects but to date it does not seem that any of these projects have involved applications of new technologies.

PRACTICES

On going and past projects

IPM projects

1. The digitisation of all information concerning IPM museums collections and inventories enables catalogue information about the collections of all of the museums co-ordinated by IPM is made available on the Internet through its MatrizNet, which can be inspected at: http://www.matriznet.ipmuseus.pt/

2. The National Photographic Inventory is an image archive that includes photographic records of the objects held within IPM museums collections.

BN (National Library) projects

The national Information Society Fund – supported partially by European Funds – approved the Digital National Library project, which was completed at the end of 2003. The main goal was to get the largest number of books and important documents in different areas of Portuguese History, Science and Literature digitised and accessible to all citizens through the Internet. The results have been available since early 2002 at the following Internet address: http://bnd.bn.pt

IPPAR projects

1. The "Inventorying and Digitising the Historical-Cultural Heritage" project, which was approved by the "2000-2006 Culture Operational Plan", has been ongoing since July 2001 and it uses a more accurate Geographical Information System (GIS) to data search of the immovable assets of several cities. Currently, GIS data search maps of Lisbon and the historical centres of Santarém, Faro, Tavira, Évora and Beja are available from the IPPAR websites: http://www.ippar.pt or

http://www.ippar.pt/patrimonio/patrimonio.html

This work includes the digitisation of the listed immovable assets, protection zones and special protection zones in CAD and the association of the alphanumeric information, from GIS, with the digitised geographical information using ArcView software.

2. Portugal is also associated with the European Heritage Network (HEREIN) through IPPAR. The network is a permanent information system of the Council of Europe linking European governmental departments responsible for cultural heritage conservation. It has been developed as an instrument for implementing and monitoring the European conventions on the architectural and archaeological heritage. The HEREIN web site is at: www.european-heritage.net

CCG projects

1. Santa Clara-a-Velha Virtual (concluded - 12/1996 to 12/1998) [=200,000 €]

Santa Clara-a-Velha Virtual concerned the recreation of the Santa Clara-a-Velha Monastery situated in Coimbra at various times in its existence whereby with the use of VR technologies it is possible to virtually navigate through this sacred place. Initiative for the Project came from IPPAR and the Mosaic Initiative of the Ministry of Culture and the Project also produced various multimedia contents. See: J. C. Teixeira, A. Silva and L. Soares: Virtual SANTA CLARA-A-VELHA: Virtual Environment and Cultural Heritage, in Computer Graphik TOPICS, April 1998, Vol.10.

2. Sé de Braga (concluded – 01/1999 to 07/1999) [=27,500 €]

The "Braga Cathedral" Project concerned the compilation of a multimedia record of the history of one of the most beautiful Cathedrals in Portugal. It was based on archaeological findings during the most recent local excavations. See: P. Bernardes, L. Fontes and A. Marcos: Multimedia Kiosks and the Ancient Times: an Archaeological Reconstruction and History of Braga's Cathedral, in Computer Graphik TOPICS, Vol. 11, 5 May 1999, pp. 21-22.

3. Macau Virtual (concluded - 07/1999 to 12/1999) [=180,000 €]

The Macau Virtual project - commissioned by the Scientific and Cultural Centre of Macau - modelled and presented the most representative aspects of the Portuguese presence in Macau, especially its architectural and cultural richness, for display to the general public in the Macau Museum in Lisbon.

4. **Cabo Espichel** (concluded – 01/2000 to 12/2000) [38,500 €]

The Sanctuary of Our Lady Cape Espichel in Sesimbra constitutes a valuable asset of national architectural heritage and in 1995 a project to restore, renovate and alter it for re-use by DGEMN was started. In parallel with the restoration DGEMN decided to carry out and fund an exhaustive multimedia register of all aspects of this monument but principally those that were likely to disappear or suffer during the renovation and alteration processes.

5. Archeoguide (concluded - 01/2000 to 06/2002) [270,000 €]

Archeoguide was an international project, which was funded 50% by the European Commission. It involved the development of new ways of accessing information in local cultural heritage locations such as museums, historical buildings or archaeological ruins.

6. Tibães Virtual (concluded – 10/2000 to 12/2001) [22,750 €]

The Virtual Tibães project was concerned with the development of a multimedia Kiosk for the Monastery of St Martin of Tibães.

7. **Bracara** Augusta (concluded – 05/2000 to 06/2001) [175,000 €]

The Virtual Journey through Bracara Augusta Project had as its objective the provision of an Interactive Multimedia Information System for presenting archaeological interpretations and scientific information related to the ancient Roman city of Bracara Augusta (now Braga). See: P. Bernardes, R. Ferreira, H. Lains, M. Martins and A. Marcos: Virtual Tour to Bracara Augusta, in: Computer Graphik TOPICS, Vol. 12, May 2000, pp. 9-10.

8. Virtual Showcases (concluded - 10/2001 to 12/2003) [1,750,000 € Total EU; 400,000 € PT]

The international Virtual Showcases Project aimed to use three-dimensional visualisation and augmented reality technologies for exploring a new showcase device in order to develop new ways of the three-dimensional exhibition of museum artefacts either in existence or completely virtual.

9. Fort **Sacavém** (concluded – 07/2001 to 03/2002) [45,000 €]

Situated on the Mount of Sintra on the right bank of the River Trancão and some 800 metres from its confluence with the River Tejo, Sacavém Fort, which was built between 19th and 20th Centuries, occupies a strategic position dominating the surrounding area. Originally constructed to house one of the garrisons guarding the approaches to Lisbon, it has been more recently renovated to hold the archives of DGEMN, who sponsored the project that was concerned with the preservation of its original characteristics in a multimedia record.

10. **artnouveau** (concluded – 09/2002 to 02/2004) [638,000 € Total EU; 64,000 € PT]

This international project with partners from Germany, Greece, Portugal and Spain aimed to define new user-centred approaches for experiencing art and culture both individually as well as in a group of users. The project was funded under the EU IST-programme.

URL: http://www.artnouveau-net.org

11. **Guias de Visita Portáteis** (running – 10/2003 to 05/2005) [233,000 €]

This project proposes to develop a mobile multimedia solution consisting of portable and autonomous visit guides for supplying en route information related to locations of ecological interest. Edia (Empresa de desenvolvimento e infraestruturas do Alqueva SA) [The Development and Infra-structures Company of Alqueva Ltd], as the client, intends to utilise the solution in the Ecological Museum installed in the Coitadinha Estate.

12. @rtec (running – 01/2003 to 12/2004) [Total 1,010,000 Total EU; 627,650 € PT]

The @rtec project – Art and Technology in the Cultural Industries – co-financed by the InterReg III programme aims at strengthening and fulfilling the objectives of co-operation and cultural, technological and training development in order to reduce the gap between border zones and great urban centres. The project involved two partners from Galicia and three partners from the Minho Region of Portugal.

(Budgets are approximations as original contracts were in Portuguese Escudos)

Typology of products

Various types of final deliverables have been provided to institutions in and outside Portugal including digitised information in relation to museum collections and inventories, multimedia presentations including kiosks, a number of virtual and augmented reality reconstructions and some mobile multimedia guidance devices, as indicated in Part II, 1.1 above.

Approximate estimate of CCG-funded projects by size:

Project size	% of total	(See 1.1 above)
Small size (up to 100.000 Euro)	41.7	2, 4, 6, 9, 10 [PT]
Medium size (100.000 to 300.000 Euro)	41.7	1, 3, 5, 7, 11
Large size (300.000 to 600.000 Euro)	8.3	8[PT]
Very large size (over 600.000 Euro)	8.3	12 [PT] + 8, 10, 12[Total EU]

Average duration of CCG-funded projects:

Project duration	% of total	(See 1.1 above)
Short (up to 1 year)	33.3	2, 3, 7, 9
Medium (1 to 2 years)	50.0	1, 4, 6, 10, 11, 12
Long (more than 2 years)	16.7	5, 8

(N.B. Responses to the above are related to CCG projects only as budgetary information concerning other Portuguese projects is not available to the respondent)

Good practices

The international Archeoguide project gained two prizes in the Laval Virtual 2002competition; namely the Science and Education trophy and the Grand Prix de Jury 2002, which were awarded by an international jury of specialists. Laval Virtual being a unique competition, which encompasses the widest range of VR and AR applications, as well as the high quality of the works and products evaluated.

The project was co-ordinated by INTRACOM S.A., the largest Telecommunications Industry company in Greece, and its other partners were IGD and ZGDV (Germany), POST REALITY and the Ministry of Culture (Greece), A&C2000 s.r.l. (Italy) and CCG (Portugal). The project was concerned with building a system providing new ways of accessing information at cultural heritage sites in a compelling, user-friendly way through the use of advanced ICTs including AR, 3D-visualisation, mobile computing and multi-modal interaction.

See: V. Vlahakis, N. Ioannidis, J. Karigiannis, M. Tsotros, M. Gounaris, D. Stricker, T. Gleue, P. Daehne and L. Almeida, Archeoguide: An Augmented Reality Guide for Archaeological Sites, in IEEE – Computer Graphics - 2002, pp.52-60, http://computer.org/cga/cg2002/g5toc.htm

URL: http://archeoguide.intranet.gr/project.htm

Another successful project was the Virtual Showcases project, which was also a EC-funded project with ten partners drawn from Austria (Institute of Computer Graphics and Algorithms at Vienna University of Technology, Vienna Museum of Technology and Imagination Computer Services, Belgium (Barco), Germany (Fraunhofer Institute for Computer Graphics at Rostock, Forschungszentrum Informationstechnik GmbH and the Deutsches Museum of Bonn) and Portugal (CCG, Museu Dom Diogo de Sousa and the SINFIC company of Lisbon).

The Virtual Showcase (VS) project looked at how established and functional everyday environments can be enhanced rather than replaced by virtual environments through the introduction of a new stereoscopic display system called the VS. This showcase looks like a real showcase and real cultural and other artefacts can be placed inside it, which allows for three-dimensionally improved presentations. Inside virtual representations and real artefacts may share the same space thus permitting new ways of merging and exploring real and virtual content. The virtual part of the showcase can react in several ways to the presence of a visitor, thus enabling intuitive interaction with the displayed content.

URL: http://www.virtualshowcases.com

Selected literature:

Cristina Escaleira, Isabel Fernandes and Adérito Marcos: Bringing VR technology into the reality of Portuguese museums, in: Proceedings of 2nd International Workshop on ICTs, Arts and Cultural Heritage - Digital Art Technologies, Applications & Policy, Foundation of the Hellenic World, Cultural Centre (Hellenic Cosmos), Athens, Greece, 31 October / 1 November 2003.

Tony Lavender: Visual Arts and ICTs, in Proceedings of 1st International Workshop on ICTs, Arts and Cultural Heritage with Special Emphasis on Applications, Local Development and Informal Learning, Universidad de Deusto, Donostia-San Sebastián, Spain, 5 May 2003.

Tony Lavender and Tonia Zervaki, Preserving digital art: problems, perspectives and policy challenges, in: Proceedings of 2nd International Workshop on ICTs, Arts and Cultural Heritage - Digital Art Technologies, Applications & Policy, Foundation of the Hellenic World, Cultural Centre (Hellenic Cosmos), Athens, Greece, 31 October / 1 November 2003.

Adérito Marcos, Paulo Bernardes and Vítor Sá: Multimedia Technology and 3D Environments used in the preservation and dissemination of Portuguese Cultural Heritage, in: Proceedings of ICTE – International Conference on Information and Communication Technologies in Education, Badajoz, Spain, 13-16 November 2002; http://www.ccg.pt/Publications/_PDFs/Publications/2002/ArtigoCG-RV_final.pdf

Nuno Matos, Pedro Pereira and Adérito Marcos, ARK: Augmented Reality Kiosk, in: Human-Computer Interaction – Theory and Practice (PART II) (Vol. 2 of the Proceedings of HCI International 2003, 22-27 June 2003, Crete, Greece), Constantine Stephanidis and Julie Jacko (Eds.). Mahwah, New Jersey, London: Lawrence Erlbaum Associates, pp. 168-172; http://www.ccg.pt/Publications/_PDFs/Publications/2003/ark-augmented_reality_kiosk.pdf

Perceived needs

There are some four areas of needs identified by a number of participants involved in the safeguarding aspects of Portuguese IH. They are as follows:

Policies: While there are a number of overall programmes concerning cultural assets and other programmes concerned with the expansion of new technologies at a national level, there does not seem to be a policy for actually increasing the use of new technologies in disseminating information about and access to cultural assets. Where this is happening it is mostly due to the actions of a few enlightened institutional directors.

Funding: A number of funding programmes exist to support ICT developments in IH but seldom does the level of theoretical support rise to that actually mentioned. For example, the most recent competition for projects under POC suggests that grants of 75% of eligible costs may be awarded but practical experience based on successful applications indicates that actual support awarded barely reaches 55%.

Training: There is on on-going need for more training of museum technicians in the use of several of the more sophisticated ICTs. This is particularly so when considering the newly emerging VR and AR technologies, where there have been only a few instances of use reported in recent years. Also there is a general need to bring IH specialists together with ICT technical experts, so that each can learn more about the work of the other, which in term will raise an awareness of how ICTs can be used more effectively in IH fields.

Institutional articulation: Related to the latter part of training above is the need for more contacts between directors of IH institutions, between directors of R&TD organisations that have worked on IH new technology projects and also between directors of both IH institutions and R&TD organisations meeting together to understand possibilities on the one hand and needs on the other.

Final comments

Impact of IH on the civil society

The number of visitors to IPM (and probably other) museums continues to rise steadily, which reflects upon a general policy of encouraging the general public to visit museums and improvements to their fabric and display facilities funded by state authorities. New technologies are making their way into museums but these developments do not seem to be particularly rapid or specifically encouraged in any way other than through the possibility of being undertaken as the result of some funded research and/or development project. However, it is not clear whether or not there is a general system for disseminating the results of projects in Portugal.

The current poor state of the Portuguese economy is reflected by the fact that projects that have been approved are often in financial difficulties due to the late payment of instalments: a situation which is, however, not unknown as far as European projects are concerned. Also it is not uncommon for approved projects submitted under competitive terms to be financed at less than the level of funding that has been indicated in the information for applicants. An example of this happened in 2004 with an application to the FCT that was submitted under a maximum limit of 100% of eligible project costs and which was accepted for consideration at some 67% of total eligible costs. In another similar circumstance a colleague was advised not to submit an

application for a programme that advertised a maximum grant of 75%, as it was highly unlikely that a grant of more than 52.5% would be made available.

When institutions interested in developing new experiences for IH are having to find such a large percentage of funding from their own or other public or private sources the situation has a negative effect on the range of projects that can be undertaken, as frankly public and non-profit organisations just do not have the money to support all that might be done with new technology.

5.17 ROMANIA

Irina Oberländer-Tarnoveanu, CIMeC - Institutul de Memorie Culturala

POLICIES

The role of cultural institutions

In Romania the Ministry of Culture (named "the Ministry of Culture and Religious Affairs" between 2001 and 2005) is the main central government body in charge with cultural policy. Despite official claims in favour of decentralization of all the governments, at least during the past eight years, the cultural system remains still a centralized one.

There are over 100 cultural institutions (museums, theatres and operas, film studios, cultural centres, journals and publishing houses) directly subordinated to the Ministry of Culture, including a network of 42 county directorates for culture and cultural heritage responsible for the implementation of cultural policy and legislation in their territorial administrative units. That means several thousands people directly subordinated to the Ministry of Culture. Hundreds of other cultural organizations under local administration depend on the Ministry of Culture for projects funding, approvals of all kinds and methodological control.

Every four years the change of governments between the two main political forces, representing centre-left and centre-right coalitions, determines a change in cultural policies too. Each new government took some decentralization measures by subordinating many cultural institutions to local authorities. Some attempts proved successful but many not because local authorities were not prepared to finance and administrate those institutions from one day to another. Therefore in some cases the Ministry of Culture had to take back into its subordination (and funding) operas and theatres on the edge of collapse. While decentralizing with one hand, the Ministry of Culture subordinated newly founded museums, cultural centres and organizations with the other.

The results are as mentioned above: a heavy centralized system, chronically under funded, with budgets spent often in a non-transparent way, following political commands and extra-cultural interests and ignoring the very cultural policies approved on paper. Political interventions in the management and activity of some institutions, both from central and local levels were not rare during the past four years, during the previous government. The newly installed government (December 2004) promises a better planned decentralization, transparency of decisions and funding based on open cultural projects competition.

The use of computers and new communication technologies in cultural organizations grew slowly, more under the pressure of the developments in society than as a policy of central or local administration. That field is still underdeveloped because of costs, lack of skills, and

conservatism of cultural managers. New information and communication technologies were not considered a high priority in our cultural policies until recently.

The exception is the Institute for Cultural Memory (CIMEC), a unique public institution under the Ministry of Culture founded in 1978 for the computerization of the national cultural heritage inventory. CIMEC works on contracts for the departments of the Ministry of Culture and participates in various European, regional and national projects. CIMEC developed and maintains national databases, digital archives and a strong web presence in the field of cultural heritage (movable, archaeological, built heritage and performing arts).

Its Web site (http://www.cimec.ro), opened 1996, is the main gateway to the Romanian cultural heritage with 500,000 visitors per year. CIMEC is a member of the EPOCH NoE.

Nevertheless we have to mention some other central initiatives in the IH domain: in 1999 the Ministry of Culture acquired a sophisticated scanner for the digitisation of the manuscripts of our national poet Mihai Eminescu, kept in the Library of the Romanian Academy. The digitisation went slowly due to lack of personnel. Recently a first CD-ROM and expensive volume based on scanned manuscripts of the poet were presented to the public.

The Ministry of Culture took a very important initiative in 2003: to use a credit of $600,000 from the World Bank for two national projects in IH:

The first project is the Digital Library of Manuscripts and Rare Books (120,000 pages scanned in 2003 and 2004 at the Batthyaneum Library in Alba Iulia, which are going to be accessible on the Web at www.apograf.cimec.ro).

The second project is the National Catalogue of Cultural Heritage, a web–based database using open source software, open for all museums, libraries and other organizations willing to catalogue their collections, sites and monuments inventories and other cultural resources (www.pan.cimec.ro).

CIMEC acts as main operator of both projects. The projects are under development and the results will soon be available on-line. In order to encourage the development of a network, 55 cultural institutions in the country got computers and digital cameras. The focus on digitisation and cataloguing shows the real problems of the cultural sector in Romania: to start the IH building from the foundation. It will take years to fulfil those tasks alone.

Apart form the Ministry of Culture there is a National Agency for Research (periodically either an independent ministry or included into the Ministry of Education) which runs national research programmes. Few of them include cultural heritage (e.g. CERES, http://www.mct.ro/web/2/default.htm administrated by the Institute of Physics, INFOSOC, www.infosoc.ro, administrated by the Institute for Informatics Researches).

Along the years several small applications and studies in IH were financed such as museum multimedia guides, restoration documentation database, studies for the Electronic Museum of Romania or Digital Museum of Science and Technology. The projects developed by the Institute for Computers, Institute for Informatics Researches and other organizations had a low impact in the field. The special relations between some traditional institutes and the National Research Agency were an important factor in the attribution of the projects and money while cultural organizations had little to say and a passive role. No public access to the results of most of those projects is available on the Web.

Recently, a so–called priority research programme in favour of the Ministry of Culture for developing software tools for on-line and off-line access to cultural memory was gained by the Institute for Computers (November 2004) while the main organization in the field, the Institute for Cultural Memory, was eliminated from the short proposals list on formal reasons The parallelism with the project of National Catalogue of Cultural Heritage of the same Ministry of Culture is ignored by all parts: the stakeholder, the financing body and the gainer of the bid. That tells a lot about the lack of co-ordination and the subjective way of spending public money in Romania.

In universities there are some modest initiatives in IH such as an interdisciplinary laboratory at Alba Iulia or small applications in archaeological excavations and virtual reconstructions at the University of Bucharest, History Faculty. No research programme in IH is available.

Specific regulations

Communication of culture is one of the main objectives stipulated in the statutes of the Ministry of Culture. Until recently, ICT played a secondary part in the budget spent on dissemination of cultural products compared to those for exhibitions, publications, festivals, art performances and other events. With the growing importance of the integration into a global information society there are good prospects that in the coming years both programmes and funding will improve the ICT infrastructure, digital content, training and education of users to the benefit of both citizens and cultural actors.

New initiatives can be favourable to an increase of IH applications in our country. For instance, in January 2005 the Romanian Ministry of Communications and Information Technology proposed a new programme called 'Knowledge Economy'. The focus of the programme is to facilitate Romania's progression towards a knowledge-based economy and to work towards bridging the country's digital divide with EU countries. IH projects can be financed in this programme. Donors - USAID, EU, UN, EBRD and the World Bank - play an active part in this initiative.

Romania's digital divide is the highest among EU accession countries and remains a significant concern. The Universal Access Law, which guarantees information access rights has passed, but an implementation plan is still under development. In 2004 the access to the Internet grew by 50%, but overwhelmingly in the urban areas and richer communities.

Priorities for ICT applications to Cultural Heritage

Almost all sectors related to IH are underdeveloped in Romania: computer literacy and Internet access; training for personnel; hardware availability; number of visitors to museums and heritage sites; cultural tourism; modern research and documentation; and digital content. In order to fasten progress we clearly need a strategy and national programmes for IH. Buying more computers for museums, libraries and other heritage organizations is the easiest part. More important is to train the content providers, to stimulate projects for the computerized inventory of cultural heritage, digitization of documents and image archives, GIS applications, virtual reconstructions of archaeological sites, historic monuments and landscapes, multimedia kiosks and Web content. A priority should be better and cheaper access to the Internet.

Associations and networks

There are no functional associations for the development of IH. Participation in European projects and networks of excellence, trans-national co-operation and staff mobility is very stimulating for Romanian cultural organizations and should be promoted. A Romanian museum involved in a European co-operation will never be the same. Archaeological researches with participation of foreign teams bring often new methods, new standards, and a growing use if ITC.

Funding sources for IT projects

Public

Public funding is the main source for cultural heritage area. The distribution of funding is done in part directly through annual budgetary allocation for institutions and in part through competitive calls for projects once a year, in February, when the Ministry of Culture makes

public the list of projects chosen to be funded from the central budget. The budget on programmes and projects was more a desire than a reality. Until now there were no transparent criteria for projects selection, no independent commissions, and no guarantee that the officially selected project will be financed in the end or not. The new Minister of Culture wants to increase competition for funding through calls four times a year and a more transparent way of public money allocation. We have to wait and see.

Private

Private sector is very little present in the field of cultural heritage.

PRACTICES

On going and past projects

The Digital Library and the National Catalogue for Cultural Heritage mentioned above are the main IH projects in development. I would like also to mention the Digital Archives of Archaeology project developed by CIMEC under ARENA European Project (CULTURE 2000 Programme, 2001-2004). We digitised the Archaeological Repertory of Romania archive (32,000 cards) and 4,000 documents and images from the historical archive of the National Museums of Antiquities kept at the Institute of Archaeology in Bucharest.

Typology of products

There are very few multimedia kiosks (e.g. at the National Art Museum in Bucharest), e-books and museum guides on CD-ROMs, Websites and portals. There are few attempts of virtual reconstructions and no final product for the public.

Approximate estimate of funded projects by size:

Project size	% on total
Small size (up to 100.000 Euro)	100%
Medium size (100.000 to 300.000 Euro)	
Large size (300.000 to 600.000 Euro)	
Very large size (over 600.000 Euro)	

Average duration of funded projects

Project duration	% on total
Short (up to 1 year)	90
Medium (1 to 2 years)	10
Long (more than 2 years)	

Perceived needs

The most relevant needs concerning IH are the computerization of heritage inventories; recording of sites and monuments using modern techniques (geophysics, aerial photography, GIS etc.); integrated systems and standards for archaeological excavations and surveys; funding for digitization, virtual reconstructions and e-learning projects; Web pages and portals; multilingual interfaces; training of personnel; and growing European co-operation.

5.18 UNITED KINGDOM

William Kilbride, Archaeology Data Service

POLICIES

The role of cultural institutions

There is no specific institutional framework for heritage information in the UK, nor for 'intelligent heritage'. Consequently the delivery and development of heritage information services falls into the competence of many agencies in different sectors. This diversity means that in some respects the United Kingdom is a microcosm of European cultural heritage.

The principal division exists between those agencies that operate across the United Kingdom and those whose activities are confined to the 'home nations' of England, Northern Ireland, Scotland and Wales. The independent authorities of the Channel Islands, and Isle of Man are not considered here nor are UK dependencies and territories (Gibraltar, the Falkland Islands, Ascension Island and so forth).

The following agencies operate across the United Kingdom.

- ADS / AHDS Archaeology – Archaeology Data Service / AHDS Centre for Archaeology – is the JISC and AHRC national data centre for archaeology, the historic environment and cognate disciplines. ADS has four responsibilities: the long term preservation of digital resources; providing access to data; providing training and guidance in the creation of digital resources; and providing technical advice to the research councils and applicants. Though each of these responsibilities are in the first instance provided for the education and research community, in practice there is often little distinction between this and the wider heritage community. Consequently in archiving data ADS also offers archival facilities by the whole community; in providing access to data ADS brokers information on behalf of many public and private sector agencies and does not restrict that access to the academy; requests for training and guidance are answered from very many agencies. ADS was founded as a consortium and has important functional relationships with AHDS, FISH, AHRC, EH, Heirnet and many others

- AHDS – the Arts and Humanities Data Service – is the AHRC/JISC national data centre for the arts and humanities. It provides digital preservation, access to information and training to university based arts and humanities scholars, and provides technical advisory services to the AHRC. AHDS is a distributed service with six centres: AHDS History, AHDS Performing Arts, AHDS Literature Language and Linguistics (OTA), AHDS Visual Arts and AHDS Archaeology (ADS), with a secretariat at the AHDS Executive.

- AHRC (AHRB) – the Arts and Humanities Research Council – is expected to come into existence on 1st April 2005 as successor to the AHRB (Arts and Humanities Research Board). AHRC is a major grant giving institution with competence to fund university research in cultural heritage. Inter alia, it funds research into archaeology, classics, history (including ancient, medieval) librarianship, the visual and performing arts, literature and museum studies. Major sources of funding are available through this agency from its twice yearly 'Resource Enhancement' (up to 300k) and has competitive, but occasional grant programmes for 'Innovation' and 'Museum development'. Its major research grants (up to 500k) are highly prized. As the newest research council, AHRC has not yet finalised its ICT strategy, though in 2004 it issued a call for proposal for demonstrators to take this strategy forward. AHRC has important functional relationships with ADS/AHDS who are its principal advisors on

information technology. Grant holders are required to submit digital archives to ADS/ AHDS for long term preservation within 3 months of the end of their project, and ADS/AHDS review the technical aspects of grant applications before they are considered by the research panel. This technical review can result in rewards being withheld or altered to ensure their technical competence.

- The British Academy is a major source of funding for humanities research, and funds the British Schools in Rome, Athens, Amman and elsewhere. Many of its historic responsibilities and grant-giving programmes were transferred to the AHRC (AHRB) in the late 1990s, though it remains an important grant-giving agency for intermediate level grants in the humanities. The British Academy has important functional relationships with the Council for British Archaeology which acts as its 'overseas school at home', and with the ADS/AHDS to whom grant recipients are required to submit digital archives within

- CBA – the Council for British Archaeology – is an independent advocacy and information on behalf of archaeology in the UK. Activities include an active publication arm, education and conservation advisors and a network of memberships including local branches and a 'Young Archaeologists Club'. Publications include Internet Archaeology, the British and Irish Archaeological Bibliography and a series of Research Reports, all of which are offered online. CBA is in part supported by the British Academy. CBA has important functional relationships with all archaeology bodies in the public, private and amateur sector.

- DCC – the Digital Curation Centre – has recently been formed to provide an advisory service to those undertaking digital preservation on behalf of others. It has specifically been funded to ensure that expensive and difficult to recreate data sets in the sciences can be looked after in the long term and to provide a college of expertise among those involved in digital curation on a daily basis. It is part funded by the JISC and the E-science programme. In this sense it advises on the sorts of very large or very integrated data sets that may not be appropriate for preservation in a conventional digital repository. Inter alia, DCC intends to offer a training programme and manuals for those involved in digital preservation. DCC has important functional relationships with the JISC, DPC, NESC and its expert college which includes ADS and ESDS.

- DPC – the Digital Preservation Coalition – is a membership body that exists to raise awareness of the problems of digital preservation at the highest level. It has recently commissioned a review of UK preservation needs which aims to turn the 'vague threats of disaster' often reported with digital preservation into a series of real, costed propositions. DPC has functional relationships with its membership which includes the British Library, the National Deposit Library, the Consortium of University Research Libraries, JISC, AHDS, DCC and many others. It seeks to have an impact in political circles and consequently seeks to develop and extend relations with keey parliamentary and civil service stakeholders.

- ESDS – Econony and Society Data Service - is a service jointly funded between ESRC and JISC, providing digital archiving and advisory services in the social sciences. The remit of ESRC includes certain areas of heritage policy and demography and consequently specific areas of heritage research fall under its remit. ESDS has functional relationships with DPC and AHDS History.

- ESRC – Economy and Society Research Council - is a major grant-giving agency for heritage policy and demography for university researchers in the UK. ESRC's competence is the social sciences and economics, so opportunities for heritage research with its funds are limited to those which have a broad thrust in its principal areas of competence. ESRC

has functional relationships with AHRC, JISC the British Academy and with ESDS whom it funds.

- FISH – Forum for Information Standards in Heritage – is a membership organisation that recommends and promotes standards in the heritage sector. As a membership organisation, FISH does not initiate or fund any specific work, and has no staff of its own. It acts as a clearing-house for new standards in the heritage sector and facilitates wide consultation on new technology that may be developed by its members. Terms of reference include archaeology, the built environment, artefacts and museums. FISH has functional relationships to its members who include EH, MDA, ADS, RCAHMS, RCAHMW, DoENI and others. It has affinities to MDA which is also a membership organisation concerned with standards and to the HEIRNET consortium.

- HEIRNET – Historic Environment Information Resources Network – is a consortium of the major online information providers for the historic environment, convened by the CBA. Heirnet aims to provide a UK wide coherence to information provision, which would not otherwise be possible for agencies whose primary interest are prescribed by their funding. Inter Alia, HEIRNET has provided tools for collection description, a survey of available data sets, conferences for members and is behind HEIRPORT, a UK-wide portal for access to information on the historic environment. HEIRNET is hosted by CBA and has functional relationships with its partners, especially ADS and EH National Monuments Record who have been its major sponsors in material terms.

- JISC – the Joint Information Systems committee of the Higher and Further Education Councils – provides network infrastructure for the post 16 education sector in the UK. In addition to providing a high capacity production network (Super Janet), it provides electronic resources for use by the sector within its remit. This include an extensive range of subscription-based collections and a number of presentation and advisory services that include UKOLN, ADS and DCC. These are in turn held together via an Information Environment of standards and good practice on how its services should interoperate (mainly the work of UKOLN). Users interact directly with services, but included within this programme is an E-learning framework and portals framework in which resources are accessed with pedagogical or institutional mediation. JISC has functional relationships with ESDS, ADS, AHDS, NESC, DCC and DPC and has been a valuable source of funding for very many cultural heritage initiatives.

- MDA – formerly the museum documentation association – mda is a membership organisation that provides technical assistance and an advice network on all aspects of museum documentation. MDA was responsible for the development of the Spectrum standard for museum recording. MDA has functional relationships with its membership, MLA and FISH and hosts the 24 Hour Museum.

- NESC – the National E-Science Centre – is charged with developing high performance computing applications into active research. Funded through the E-science programme it acts as a lead body to a number of projects and centres around the UK. Activities include the development of a research only IT network called 'UKLight' and integration with similar programmes in other countries. E-science has recently be renamed 'E-research' as its remit include social sciences and may extend to the arts and humanities. NESC has functional relationships with JISC, the research councils, DCC, partners overseas and the many research projects it funds.

- UKOLN – United Kingdom Office for Library Networking – is an advisory service for museums libraries and archives in the UK. In addition to providing detailed technical advice to individuals, it provides detailed support services to agencies such as the JISC and MLA – who in the past have adopted UKOLNs recommendations as standards to be adopted by projects which they fund. UKOLN has important functional relationships with JISC and MLA and many others.

The Home Nations: England

- MLA – the Council for Museums Libraries and Archives is a publicly funded agency that provides strategic direction for investment in museums, libraries and archives in England. It has particular expertise in ICT and sponsors or leads very many strategic initiatives. It has provides technical advisory services for the lottery funds, and is leading the development of the Peoples' Network which is putting digital resources and infrastructure in public libraries in England. It maintains Cornucopia, a collection level catalogue of English Museums. MLA has functional relationships with many of the libraries, museums and archives in England, with the major public and private sponsors of investment, and with standards agencies including UKOLN and MDA.

- English Heritage is the government's principal advisor on all matters pertaining to the historic environment in England. It manages a very large number of heritage properties and visitors centres in England and protects many more through the legislative powers it holds on behalf of the government. It undertakes and funds considerable amounts of research, publication and public information. It provides specialist services through its Centre for Archaeology and maintains the largest single archive of archaeology in the UK in the National Monuments Record. Though constitutionally restricted in territory, English Heritage is the largest single heritage agency in the UK. Consequently its working practices are often-times adopted in Scotland, Wales and Northern Ireland. English Heritage has functional relationships with very many agencies, including local government, FISH, HEIRNET, CBA, MLA, MDA, ADS, the lottery funds that invest in heritage, other departments of government, the Ordnance Survey and the private developers whose activities it regulate

The Home Nations: Northern Ireland

- DOENI – The Department for the Environment for Northern Ireland – is the government's principal advisor on all matters pertaining to the historic environment in Northern Ireland. It manages heritage properties and visitors centres in Northern Ireland and protects many more through the legislative powers it holds on behalf of the government. It undertakes and funds considerable amounts of research, publication and public information. Historic Scotland has functional relationships with very many agencies, including local government, CBA, RCAHMS, the lottery funds that invest in heritage, other departments of government, the Ordnance Survey and the private developers whose activities it regulates. DOENI also maintains an extensive public archive of archaeology and the built environment in the Northern Ireland Sites and Monuments Record

The Home Nations: Scotland

- Historic Scotland is the government's principal advisor on all matters pertaining to the historic environment in Scotland. It manages a very large number of heritage properties and visitors centres in Scotland and protects many more through the legislative powers it holds on behalf of the government. It undertakes and funds considerable amounts of research, publication and public information. Historic Scotland has functional relationships with very many agencies, including local government, CBA, RCAHMS, the lottery funds that invest in heritage, other departments of government, the Ordnance Survey and the private developers whose activities it regulates.

- RCAHMS: The Royal Commission on the Ancient and Historic Monuments of Scotland exists to provide a long-term memory of all aspects of the built environment and archaeology of Scotland, to record the heritage of Scotland, and to promote access to its archival holdings through education and outreach. RCAHMS has functional relationships with Historic Scotland, ADS, FISH, HEIRNET the Ordnance Survey and local government. Through a bi-lateral partnership it provides specific technical support to RCAHMW

The Home Nations: Wales

- CADW is the government's principal advisor on all matters pertaining to the historic environment in Wales. It manages a very large number of heritage properties and visitors centres in Wales and protects many more through the legislative powers it holds on behalf of the government. It undertakes and funds considerable amounts of research, publication and public information. CADW has functional relationships with very many agencies, including local government, the archaeological trusts for Wales, CBA, RCAHMW, the lottery funds that invest in heritage, other departments of gove