

**Digitisation and online accessibility of
Europe's cultural heritage and digital
preservation**

**This evaluation sheet was written by
The National and Kapodistrian University of Athens.
It does not represent the official views of the Committee of the Regions.**

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1. Introduction

1.1 Background

This report addresses the topic of digitisation and online accessibility of Europe's cultural heritage and digital preservation. *Cultural heritage* encompasses tangible (monuments, buildings, sites, paintings, books, sculptures, coins, manuscripts, films) and intangible assets (music, oral traditions, performing arts, rituals). *Digitisation* is the transformation of tangible and intangible assets into digital formats that can easily be viewed and transported with no restrictions related to size and locality. Digitisation differs in terms of methods, costs and level of expertise required. *Digital preservation* refers to the transferring of analogue content to its best digital equivalent in terms of quality. It encompasses different means and methods that can be used to maintain digitised material throughout time. Digital preservation is a continuous process in the sense that new technology offers ever improving techniques (better digital quality and more cost-efficient digitisation processes).

Organisations involved in digitisation and digital preservation range from libraries, museums and archive offices to more media-type organisations such as broadcasters, film institutes, recording companies and specialised service suppliers. Digitisation offers the opportunity for *online accessibility* of digitised content for a large audience for social, economic and educational purposes.

Europe is very rich in cultural heritage. A long history, great diversity and richness in languages make European culture very attractive from many different perspectives. However, only a small proportion of the budgets of organisations responsible for cultural heritage is dedicated to digitisation. According to Numeric, an EU study conducted in 2009 to ascertain the progress of EU Member States towards digitisation, only a small percentage of the relevant organisations' budget (less than 1%) was devoted to digitisation¹.

¹ European Commission (2009a).

1.2 Methodological note and scope of the report

The objective of this report is to analyse the most important policy questions facing the EU with regard to digitisation and online accessibility of cultural heritage and its digital preservation, with an emphasis on the scope of action for local and regional authorities (LRAs).

The work is based on desk research, and is presented in the following sections:

- i. Understanding the nature of culture and digitisation, referring to their global dimension, thus setting the scene for what follows (Section 2.1). This will go on to identify what has been done in Europe in terms of policy, governance and individual projects (Section 2.2). This section will pay special attention to the regional level, seeking to identify where initiatives have been taken and where the regions can play a more prominent role in the future.
- ii. Based on the literature review and evidence from different regions, the key considerations related to cultural heritage digitisation are discussed in individual sub-sections (Section 2.3). They are based on the experience gained over the last decade, using both policy arguments and evidence from individual case studies of digitisation at the regional level.
- iii. Conclusions and recommendations will be formulated with a view to synthesising the findings of the previous sections and suggesting ways to take advantage of technology and experience at the regional level in the future (Section 3).

2. Analysis, current situation and case studies

2.1 Setting the scene at global level: definitions and perceptions

UNESCO, as the global guardian of culture, defines cultural heritage in its Declaration of 1972²:

1. **Monuments:** *architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;*
2. **Groups of buildings:** *groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;*
3. **Sites:** *works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of views.*

This first Convention was supplemented by a governance scheme and funds to facilitate the preservation of cultural heritage. Accumulated collective experiences and technical progress have led to significant refinements, distinguishing tangible from intangible assets³:

- *Tangible cultural heritage* includes movable (paintings, sculptures, coins, manuscripts etc.), immovable (monuments, archaeological sites etc.) and underwater cultural heritage (shipwrecks, underwater ruins and cities etc.).
- *Intangible cultural heritage* includes oral traditions, performing arts, ritual, and the like. Intangible cultural heritage can only be heritage when it is recognised as such by the communities, groups or individuals that

² UNESCO (1972).

³ UNESCO (2003a).

create, maintain and transmit it – without their recognition, nobody else can decide for them that a given expression or practice is their heritage⁴.

Cultural heritage cannot easily move and inevitably fades over time; as a general rule, cultural heritage belongs to humanity. However, origins and internal characteristics link it to geographical territories, which may be broad or narrow depending on the affinities and links of individual monuments, sites and intangibles. Immovable and underwater cultural heritage are specific to the locality to which they belong and they are only seldom and through radical acts (commercial or hostile, such as the London Bridge or the Elgin Marbles) transferred elsewhere. Movable tangible assets can relocate but they still preserve their nature (no matter where a Michelangelo Painting is located it is cultural heritage of the Italian Renaissance). Intangible assets are fully tied to the territory in which they are generated.

Technical means and financial resources are needed for the maintenance and preservation of cultural heritage. This is why *digitisation and accessibility* are crucial and respond to a multiple rationale: social, educational and economic. The social and educational rationale refer to the shaping of identities and passing cultural heritage from one generation to the next, as a footprint of history. They are also a way to ensure accessibility for disabled citizens promoting *equal opportunities*. The economic rationale refers to the utilisation of cultural heritage as an attraction for tourism (recreational, study or otherwise), which eventually converts heritage into an engine of economic growth and prosperity. In 1992, UNESCO launched the Memory of the World Programme, aimed at the preservation and dissemination of valuable archive holdings and library collections worldwide⁵. In 2003, UNESCO adopted the Charter⁶. Digital cultural heritage (both born-digital and digitised) is part of Digital Heritage and is expected to be preserved.

The following sections deal with the history and policy of cultural digitisation in Europe. Information regarding interesting cases from outside Europe is presented in a separate document.

⁴ UNESCO (2003b).

⁵ Within this Programme, a Memory of the World Register has been created, listing documentary heritage of world significance and outstanding universal value, recommended by the International Advisory Committee, and endorsed by the Director-General of UNESCO, UNESCO (1992).

⁶ In this Charter it is argued that the digital heritage is common heritage and hence should be preserved, digital means should be updated to avoid loss and action is needed in terms of developing strategies and policies, selecting what is to be kept and preserved and then doing so responsibly. UNESCO (2003a).

2.2 Policy making at the EU level

The European Union, the Member States and regional and local authorities recognise the universal principles adopted by UNESCO and seek to take the necessary steps to speed up digitisation in an efficient and effective way. They also acknowledge that digitisation is progressing slowly and market forces alone will not lead to the digitisation of cultural heritage⁷. Within the Commission, the following Directorates-General are involved in some way in the digitisation and on-line accessibility of cultural heritage: DG Education and Culture, addressing content, DG Research and DG Entrepreneurship, supporting research and innovation respectively, and DG Information Society, which has the technical knowledge and manages the funds for digitisation. DG Regional Development offers the possibility for regions to use ERDF funding for digitisation, preservation and access.

2.2.1 EU Policy

The i2020 Digital Agenda is the current policy document shaping ICT strategy for Europe. It addresses the benefits of a digital single market for achieving social and economic sustainability⁸. Digitisation of cultural heritage is amongst its seven areas of interest, crucial for the promotion of cultural diversity and creative content. The Agenda stresses the importance of public funding for delivering mass digitisation projects, alongside private sector participation. It suggests the use of modern translation technologies for enhanced accessibility for EU citizens to digitised material and calls for additional funding of Europeana⁹ to ensure its sustainability¹⁰.

Historically, the digital strategy evolved from a range of initiatives and documents, the most important of which are:

- The *Lund digitisation action plan*¹¹ (2001) was a first raft of actions for improving the digitisation of cultural and scientific content in Europe. It proposed the establishment of a sustainable technical infrastructure to make European digitised cultural and scientific content accessible in a coordinated fashion and the promotion of “centres of competence”. The latter are

⁷ European Commission, 2009.

⁸ European Commission, 2009b.

⁹ Ibid.

¹⁰ Ibid.

¹¹ E-Europe (2001).

consortia of organisations with leading skills and competences in key technical domains. These services may be established or promoted at national level or at European level, including making use of the opportunities under the current IST 2001 work programme.

- The *Digital libraries initiative (DLI)*, launched in 2005¹² and aimed at enhancing accessibility of cultural resources in libraries and preserving their content for future generations¹³. Europeana was launched in this context. In the Communication, the Commission acknowledges that *the Regional Funds co-fund digitisation initiatives in some of the Member States and could further contribute to digitisation*¹⁴.
- The Commission Recommendation on the *digitisation and online accessibility of cultural material and its digital preservation*¹⁵ (2006) suggested that Member States establish national strategies and exchange information. It recommended using ICT for digitisation of cultural heritage, on the initiative of the Member States and the regions. Member States are expected to take appropriate measures to speed up the process and avoid duplication of effort, to promote the European digital library and to create mechanisms to facilitate the use of orphan¹⁶ and out-of-print works¹⁷.
- The *European Agenda for Culture*, adopted by the Commission in May 2007¹⁸ focused on the promotion of cultural diversity and intercultural dialogue, promoting culture as a catalyst for creativity in the framework of the Lisbon Strategy for growth and jobs and promoting culture as a vital element in EU external relations. The Agenda stressed the importance of the regions in all cultural dialogues and encouraged their involvement in all related fora. Digitisation of culture is amongst the five priorities set by the Culture Programme 2007-2013 for the funding of structured-dialogue platforms¹⁹.
- A 2008 Commission Communication described the progress achieved to create a digital library and the actions taken so far at national level to address

¹² European Commission (2009c).

¹³ European Commission, Europe's Information Society Thematic Portal, Digital Libraries Initiative, Cultural Heritage, Online Consultation.

¹⁴ European Commission (2009c).

¹⁵ European Commission (2006).

¹⁶ "An orphan work is a work protected by copyright but the current owner is unknown or untraceable by diligent search.", European Commission (2009d).

¹⁷ Out of Print Work is a Work which the Rights holder has decided is no longer commercially available regardless of the existence of tangible copies of the Work in libraries and among the public", *ibid*.

¹⁸ European Commission (2007).

¹⁹ European Commission (2010a).

legal, financial, organisational and technical issues²⁰. As with the DLI, the Commission again stressed the importance of Regional Funds for funding digitisation projects.

- In 2009, a *Commission Communication on Copyright in the Knowledge Economy* tackled issues associated with digital preservation and dissemination of scholarly, cultural and educational material, the use of orphan works, access to knowledge for persons with disabilities and user-created content²¹.
- In September 2010, the Commission announced a new *strategy to support the digitisation of European cinemas* and presented financing options for covering the estimated high cost of digitisation through the European Regional Development Fund, the EU Media Programme and state aid programmes²².
- In March 2010, the European Commission adopted a proposal to establish a European Heritage Label, distinct from the UNESCO World Registry. The European Heritage Label is intended to be reserved for sites which have played a key role in the history of the European Union, and it will be the first step towards the digitisation of immovable property (monuments). Following its adoption by the European Parliament and the Council, the Commission's proposal will come into effect in 2011 or 2012²³.

Digitisation means making a copy, which can be problematic from the point of view of intellectual property rights (IPR). Legal challenges in digitisation mainly relate to copyright issues that need to be resolved before material is made available online. Standards and legal provisions are set at the EU and national level and individual projects need to comply. Information on specific IPR topics related to digitisation should be available at the regional level.

Policies supporting the digitisation and preservation of digital content are expected to gain in importance as experiences multiply, technical progress increases options and decreases costs and IPR issues are addressed. As the area matures, and with the Digital Agenda and Structural Funds now in place to support regional actors, more opportunities are expected to emerge for LRAs wishing to become more active.

²⁰ European Commission (2008).

²¹ European Commission (2009e).

²² European Commission (2010b).

²³ European Commission, Culture.

2.2.2 Governance

At the European level, the Commission sets policies and objectives, issues recommendations, approves funding and convenes policy groups to provide guidelines for the prescribed policies. Strategies are usually drawn up at the national level. Two important committees are currently promoting the topic:

- A *Member States Expert Group (MSEG)* has been set up to report regularly on the progress of Member States towards implementation of the 2006 recommendation on digitisation, online accessibility and digital preservation²⁴. Annual national progress reports inform all interested parties of progress in each Member State.
- A “*Comité des Sages*” (Reflection Group) has been created and is expected to deliver a report at the end of the year with recommendations to the European Commission, European cultural organisations and all stakeholders on ways and means to make Europe's cultural heritage and creativity available on the Internet and to preserve it for future generations.

At the same time, in view of the need for interoperability and transfer of knowledge, specific groups have been created with individual mandates. The most prominent are as follows:

- In 2008, a cooperation platform called “*Content Online Platform*” was created by means of a Communication, including 77 high-level experts from all groups involved in digitisation: creators, rightsholders, content providers, consumer associations, ISPs, broadcasters and the telecommunications industry²⁵. The purpose of the stakeholders’ group was to summarise discussions on new business models, legal offerings and piracy, management of copyright online, protection of minors and cultural diversity.
- In the area of music, an *Online Commerce Roundtable* was created²⁶ to discuss territorial restrictions in the licensing of musical works. The Roundtable brought together participants in the distribution of digital music.

At the regional level there is no formal governance scheme for the digitisation of culture. Each region has its own internal set up. More often than not there is no formal strategy on the topic and it is mostly individual actors who take

²⁴ European Commission, Europe’s Information Society Thematic Portal, Member States Expert Group (MSEG).

²⁵ European Commission (2009f).

²⁶ European Commission, Competition, Media, Online Commerce Roundtable.

initiatives with some kind of formal partnership (funding) or informal agreement with the region. Inter-regionally, Committee 3 of the Assembly of European Regions (Culture, Education & Training, Youth, Media & Information Technology, inter-regional and international cooperation Committee) deals with cultural heritage issues, but digitisation of culture was not among the priorities of its Strategic Plan for 2007-2012²⁷.

2.2.3 EU-funded projects

The European Commission offers funding opportunities mainly through the Framework Programme for R&D (starting with the 5th FP and continuing with the 6th and 7th) and the Information and Communication Technologies Policy Support Programme of the Community Innovation Programme, both managed by DG INFSO. A more detailed description and a more inclusive list of projects are presented in a separate document. In summary, the focus and priorities of the past are presented in this section.

The *digitisation of libraries* is the most prominent and historically the first effort, starting with the European Library (TEL) project. DELOS was also co-financed by the EU's 5th Framework Programme for the development of a research community on Digital. In November 2008, the first European digital library network was created (Europeana).

Within the context of DG Education and Culture, the Culture Programme 2007-2013 is currently co-funding the development of a European Network on Archival Cooperation, a project aiming to offer all European citizens comprehensive and easy access to their historical memory via the Internet²⁸.

The BRICKS Project – Building Resources for Integrated Cultural Knowledge Services - brought advances in the exploitation of digital cultural resources with the creation of a Cultural Heritage Network composed of cultural heritage organisations, research organisations, technological providers, and other players in the field of digital library services²⁹. EPOCH was a network of about a hundred European cultural organisations combining efforts to improve the quality and effectiveness of the use of Information and Communication Technology for Cultural Heritage³⁰. In the DIVERSIDAD, a project aiming to promote the exchange of urban cultures in Europe was launched by the European Music Office and the association Diversités. A digital platform was

²⁷ Assembly of European Regions (2007).

²⁸ European Commission (2010a).

²⁹ The BRICKS Community, [The BRICKS Project](#).

³⁰ [EPOCH](#), European Network of Excellence in Open Cultural Heritage.

created to provide a common space for artists to cooperate in the joint creation of music. A further three programmes are related to digitisation, online accessibility and digital preservation of cultural heritage (3D-COFORM, V-City, PrestoPRIME) forming excellent teams to test and enhance alternative technical solutions. V-City is a programme aiming to develop a method for the fast and cost-effective reconstruction, visualisation and exploitation of complete, large-scale and interactive urban environments. PrestoPRIME is a project for the preservation of digital audiovisual content. For the future period 2011-2012, the 7th EU Framework programme has indicated a budget of EUR 50 million for the creation of multi-lingual platforms, EUR 30 million for digital preservation and EUR 100 million for facilitating access to cultural resources³¹.

In 2009, ICT PSP awarded EUR 25 million to the Digital Libraries initiative. Within this context, HOPE (partnership of European social history organisations for improving access to their scattered digital collection, EUR 2.7 million EU funding), think MOTION (improvement of Europeana content, EUR 2.2 million EU funding), FLAVIUS (multi-lingual web content management, EUR 1.9 million EU funding) and iTRANSLATE4 (machine translation for the multi-lingual web, EUR 2 million EU funding) were projects co-funded by the EU³².

These projects offer indications of areas of opportunity for future regional projects. They are characterised by elements of innovation and excellence. Regionally tailor-made projects can be supported by the ERDF, which offers individual regions the possibility of using their funding quotas for digitising cultural heritage. These projects can either be submitted via sectoral information society programmes managed at the national level (hence regional actors apply as beneficiaries directly to the national authorities) or earmarked through regional quotas for culture or the information society for a broader regional digitisation programme. However, it seems that so far regions have had other priorities and only individual projects have been funded through Information Society schemes.

2.2.4 The position of the CoR on the digitisation of cultural heritage

The Committee of the Regions (CoR) is sensitive to the fact that the digitisation of cultural heritage is an important tool for regional prosperity. It has welcomed all initiatives at the EU level and has always stressed the role of the LRAs.

³¹ European Commission (2010c).

³² European Commission (2009g), (2010d).

In 2006, the CoR welcomed the DLI initiative proposed by i2010 Agenda, and acknowledged the need for the development of centres of competence in Member States and the reform of copyright legislation³³. In its Opinion on “Media Literacy” and “Creative Content Online”, the CoR encouraged local and regional authorities to play a key role in managing their cultural and linguistic heritage by means of creative content online. It suggests the promotion of new business models in creative industries and media, promoting creative works that are (co-)financed by media organisations or even in practising e-Government³⁴.

In 2010, the CoR again acknowledged the need for a reform of copyright policy, and in the same year welcomed the Digital Agenda for Europe i2020 and emphasised the need for EU Member States to work in a horizontal and multidisciplinary fashion, overcoming traditional boundaries, breaking silos and reaching for a mindset change towards collaboration with a special focus on the dissemination and implementation of project results at local level. The CoR acknowledged the importance of Living Labs as a platform for university-industry collaboration and recognised its impact in renewing local level service processes and increasing regional cooperation. It stressed the role of libraries as a useful and effective way of providing comprehensive information services to the general public regardless of social status, based on the fact that best European practice is seen where libraries have been developed as digital cultural and information service centres and are located in places where people pass by on a daily basis, e.g. shopping centres³⁵. Last but not least, the CoR welcomed the establishment of the European Heritage Label and recommended that monuments, archaeological, cross-border and intangible sites be classified for the purposes of the new label to establish the diverse kinds of sites eligible to receive it. It suggested that a maximum number of three candidate sites per Member State be proposed. It stressed the importance of local and regional authorities in proposing the sites³⁶.

In addition to the favourable opinions expressed, the CoR has been present in consultations, conferences and workshops addressing the topic but has not taken any specific policy initiatives.

³³ CdR 32/2006 fin.

³⁴ CdR 94/2008 fin.

³⁵ CdR 104/2010 rev.2.

³⁶ CdR 105/2010 fin .

2.3 Critical considerations shaping issues and policies

The digitisation, preservation and on-line accessibility of cultural heritage became increasingly important over the last decade in Europe. Experiences have accumulated thanks to a large number of policy documents, individual projects and consultations and have helped identify critical considerations. They are analysed further below, with the emphasis placed on the challenges expected to be faced when implementing digitisation projects, enriched by case studies indicating how different types of interventions and actors have tackled their projects.

The cases presented below are all implemented at the regional level. More often than not however, it is unclear how such projects are initiated. Regional authorities and cultural organisations may all be initiators and/or be involved in digitisation projects. Their close cooperation seems to be vital. The LRAs are the obvious actors to create regional strategies and ensure funding from national and European sources. It is in the context of regional development planning that more expensive projects can be funded. Furthermore, unless the digitised outcome generates its own income streams (which is seldom the case), LRAs will need to take measures for the maintenance and preservation of the products/services. Cultural organisations, as individual actors, can initiate ideas and implement and monitor them.

The following considerations appear relevant for LRAs wishing to embark upon the digitisation of their cultural heritage:

1. Direct economic benefits to the region are rare. Digitisation projects cost money and only in specific cases generate their own income.
2. Indirect economic and social benefits relate to the educational aspects of digitisation, which, together with preservation, are often the inspiration behind such projects.
3. Many issues arise in the implementation of projects: cost issues, access to funding, selection of the appropriate type of technologies to fit the user needs. Such choices are difficult to make and risk *locking in* individual projects for a long time, and they therefore need to be carefully addressed.
4. Finally, an important issue is deciding on and drawing up potential collaborations. Regions themselves are not implementation agents. Furthermore, local projects may not have the scale to permit cost-efficiency. Joining forces with other regions and cooperating with the private sector can make sense.

2.3.1 Income generation

Economic considerations include income generation, the funding of investments and ongoing costs.

Direct income generation mainly results from complementing cultural heritage with virtual reality techniques. Many regions use digitisation as a means to increase awareness regarding their attractions and to improve the information offered with the intention of attracting tourist flows, and hence regional income. The two cases below demonstrate the interest of the regional authorities and the willingness of the ERDF to use digital means to reconstruct famous battles and increase the number of visitors and their interest in the region (B.1 and B.2).

B.1 The Aljubarrota battle interpretation centre in Portugal: Income generation at a regional level

The Aljubarrota Battle Foundation has invested EUR 10 million in the visualisation of the battle which led to Portugal's independence as a nation and forged the Anglo-Portuguese alliance (14 August 1385). Aspects of the battle are explored through modern multimedia, including a 30-minute film. Since October 2008, the CIBA has welcomed 40,000 visitors. One third of them are local students making use of educational services. The project received EUR 2.7 million funding from the ERDF and is expected to boost the economy of the region of Alentejo.

Source: [European Union Regional Policy, Investing in our Regions](#)

However, although such projects are expected to increase the attractiveness of cultural sites, they may under certain circumstances prove a double-edged sword. If the digital content is disseminated extensively via the media, people may feel sufficiently familiar with it and consider a physical visit superfluous. A certain trade-off may be created between increasing awareness and willingness to visit a site.

While tourism seems to be the sole direct income generation activity, cultural digitisation increases educational opportunities and, through its return on educational investment, supports income in the long run. Cases B.1 and B.2 are used as powerful tools for teaching history to regional, national and foreign students.

2.3.2 Promoting education

Many regions adopt virtual reality applications for educational purposes. Educational projects can take different forms, such as visualising historic events for the benefit of future generations, combined with tourist attraction (B.2) or pooling resources from a larger region, as in the case of Scotland (B.3), in order to enable teachers and students to appreciate a large collection of remotely located material.

B.2 Innovative Centre of Thermopylae: An interregional strategy for the digitisation of cinemas

The Innovative Centre of Thermopylae in the Municipality of Lamia combines multimedia applications and virtual reality techniques to educate visitors on the historic battle of Thermopylae. Multimedia applications include eight dynamic tables where the historical framework of the battle and its impact up to the present day is examined. In the Virtual Reality hall, visitors can enjoy a three-dimensional film about the military equipment of Greeks and Persians. The tour comes to an end with a journey in time, with the visitor being transported to the battlefield and participating actively in the preparation of the soldiers before the battle. The project was developed by the Foundation of the Hellenic World and was funded by the Regional Operational Programme of Sterea Ellada, under the 3rd Community Support Framework. The Centre is expected to enhance tourism in the region.

Source: Foundation of the Hellenic World, [Innovative Centre of Thermopylae](#)

The most frequently encountered digitisation projects which promote education are undoubtedly projects related to digitisation implemented in libraries and museums (example cases are given in B.4, B.9 and B.12 under issues related to implementation and cooperation respectively). Funding opportunities and policy encouragement are frequent and many countries have therefore embarked upon such projects. Europeana is an excellent example of a joint initiative in this area.

B.3 SCRAN (Scottish Cultural Resources Access Network): The use of digital culture in education

SCRAN is a project for the development of a networked multimedia resource base for the study, teaching and appreciation of the history and material culture of Scotland. It is supported with over £7 million from the UK National lottery, with important founding partners such as the National Museums of Scotland, the Royal Commission on the Ancient and Historical Monuments of Scotland and the Scottish Museums Council. SCRAN's core is 1.5 million records of artefacts, buildings and sites of interest, 100,000 of which are online multimedia resources: video or sound clips, animations, graphics, plans, virtual reality objects and in particular, colour photographic images.

Source: [SCRAN \(Scottish Cultural Resources Access Network\)](#)

2.3.3 Issues arising during implementation

In the implementation of digitisation projects, challenges arise from the different actors engaged in digitisation and digital preservation. Setting common standards facilitates projects, allows for compatibility and reduces costs. The “digitise once, distribute widely” strategy³⁷ suggests that organising the process properly from the beginning can save future costs and problems. The same strategy should be applied to digital preservation. This can only be achieved through a sustained coordination effort at regional, national and European level. At a regional level, organisations involved in the digitisation of the same “type” of cultural heritage (i.e. museums, libraries) could join forces and create common platforms (B.4). Collaboration can also be pursued between different types of cultural organisations, provided that one of them takes the lead. At the national or regional level in Europe the creation of specialized centres for digitisation and common specialised training can help disseminate the benefits of skills to more regions.

Challenges also arise at a technical level from the different digitisation techniques available. On-the-job training and the requirement for economies of scale call for the greatest possible capacity utilisation of the means available.

³⁷ European Commission (2009c).

B.4 Bavarian State Library Centre: Developing the technical infrastructure for mass digitisation

The Bavarian State Library in Munich is one of the leading research libraries in Germany, with one of the largest collections worldwide of rare manuscripts, old printings, incunabula and maps. The Library currently hosts 25,000 volumes and 10 million pages, and has launched a number of initiatives that will lead to mass digitisation of printed material: digitisation of books of the 16th and 18th century, PPP partnership with Google for scanning more than one million books from the library's copyright-free holdings, digitisation-on-demand services offering users the right to request any book in digital format, growing digital collections of medieval Latin and German manuscripts, of historical maps and incunabula. Bavarian State Library decided to build the technical infrastructure that would facilitate its mass digitisation scheme. The infrastructure was developed jointly with the Leibniz Supercomputing Centre. The basic technical platform of the Munich Digitisation Centre is the so-called ZEND ('*Zentrale Erfassungs- und Nachweisdatenbank*') system; a workflow tool and repository architecture based on different Open Source software (e. g. Apache Servers, MySQL Databases, Web interfaces based on PHP and PERL and free image processing tools such as ImageMagick). By the end of 2007 more than 24 M files (45 TB data) had been processed successfully by this system and stored in the Storage System of the Leibniz Supercomputing Centre.

Source: Thomas Wolf-Klostermann (2008)

In view of the huge variety of the cultural heritage requiring digitisation, a central strategy at national level could be drawn up either through the creation of a single technology platform for digitisation or through the issuing of Technical Manuals that could be referenced at regional level. LRAs can benefit immensely from the existence of such platforms.

Techniques must be reviewed in order to make digitisation cost-efficient and affordable. This issue is inevitably linked to the technical infrastructure available at regional level and to the intended funding for technology upgrading and modernisation. Using pilot regions to select techniques and thus avoid duplication of efforts is a good way to ensure rapid and cost-efficient replication in many regions (B.5).

B.5 The Irish Genealogical Project: A regional strategy for the digitisation of culture

The Irish Genealogical Project began in the late 1990s, with the purpose of establishing a computerised database of all pre-1900 church and civil records throughout all of Ireland, north and south. Thirty five local centres are to be established throughout the country. They will store on computer the historical information currently contained in sources such as parish registers, census returns, title allotment books, Griffiths valuation, gravestone inscriptions etc. The Ulster Historical Foundation is responsible for the computerisation of records for County Antrim and Down, including Belfast. This project aims to avoid duplication of work already done, to provide an existing infrastructure for further cooperative development in the region and to be a potential component of or contributor to larger networks.

Source: Library and Information Commission (1998)

In terms of audio-visual material, digitisation risks vary for each different method of storage (LP, open reel magnetic tape, compact cassette and replicated CD/DVD) and playback (deterioration of magnetic tape, availability of R-DAT players). In film digitisation, film scanning is expensive, there is a lack of appropriate equipment, experienced operators are scarce, there is deterioration of older tape, older videotape players are unable to compensate for degraded signals and there are low colour signals³⁸. Europe has not sufficiently progressed in the area, as pointed out in a survey of cultural organisations: less than 0.9% of survey responders and only 20% of broadcasters reported the use of simultaneous high-speed audio-visual digitisation equipment³⁹. However, the ERDF is supporting regions willing to digitise cinemas as a demand stimulation policy (B.6).

B.6 Portugal: An interregional strategy for the digitisation of cinemas

In Portugal, an interregional scheme for digitisation of (mainly municipal) cinemas in the North, Centre and Alentejo regions is close to completion, having obtained funding from the ERDF under the general heading of 'Cultural Facilities'.

Source: European Commission (2010e)

³⁸ PrestoPRIME (2010)

³⁹ European Commission (2009a)

Other regions adopt a different approach for the digitisation of cinemas and provide regional investment subsidies to individual actors (B.7).

For the digitisation of 3D monuments, various techniques are proposed and different technologies have been developed: laser scanning, topographic and empirical methodologies and photographic techniques⁴⁰. Cooperation and coordination at a European level helps ensure optimal selection on a case-by-case basis. The on-going 3D COFORM project is a step towards the improvement and alignment of existing methods (B.8).

B.7 Film Foundation of North Rhine-Westphalia – NRW: Digitisation of cinemas

In May 2010, the Filmstiftung Nordrhein-Westfalen launched its own support programme for cinema digitisation in NRW. The programme seeks to provide a flat investment subsidy of EUR 20,000 per screen, with the cinema operator expected to pay 20% of the cost, and is available to cinemas in NRW with up to six screens and an average annual turnover of EUR 180,000 or less. The investment subsidy is available in addition to other public funding.

Source: Anne Yliniva-Hoffmann (2010)

B.8 Byzantine churches of Mani: Selecting the right technique

In the region of Mani, although laser scanning would have been the most appropriate method for creating the textured models of the two buildings, photogrammetric modelling was chosen instead, due to a low budget and the need for medium accuracy. The 3D model of the outer surfaces of the two churches was acquired through the photogrammetric processing of the images using two photogrammetric software packages, Photomodeler and 3D Builder. The photo camera that was used for the image capturing of the photogrammetric images was a 6.3 Mpixel NIKON D1X dSLR camera equipped with a 17mm wide-angle lens. The camera was properly calibrated using the embedded module of the Photomodeler application.

Source: Pavlidis et al. (2006)

Technical choices also depend on user needs. Different types of users, such as students and scholars or tourists and travellers, view services from different perspectives. Key principles on the usability of cultural web applications include

⁴⁰ Pavlidis et al. (2006)

visibility, affordability, natural mapping, constraints, conceptual models, feedback, safety, and flexibility. When improving the usability of cultural web applications, one should consider the scope and aim of the site, meaningful organisation of the website's functions, quality of content (for example, consistency, completeness, conciseness, accuracy, objectivity), design of functional layout, consistent use of graphics and multimedia components, as well as provision for navigation tools and search mechanisms⁴¹ (B.9).

Within the context of usability, the needs of disabled citizens take a prominent position. Assessments indicate that only 5% of books published in Europe are converted each year into accessible formats such as audio, Braille or large print. Moreover, around 95% of available material is provided by specialist agencies, funded through charities or public subsidies, working under copyright exceptions. Visually impaired persons and other print-disabled people argue that they should have access to books and other protected materials under the same conditions as everybody else and at comparable prices⁴².

⁴¹ MINERVA Working Group 5 (2003)

⁴² European Commission (2009e)

B.9 VeriaGrid system: Testing the usability of a Greek virtual cultural map

The VeriaGrid system (www.theveriagrid.org) is a platform based on digital cartography. The platform supports a vector map of the city of Veria organised by layers and linked to multimedia objects (for example, text, images, photos, video clips). The objects can be retrieved on a flash-enabled platform for personal computers, personal digital assistants (PDAs), and mobile devices. The main objective of the usability task test was to evaluate user interaction with the basic functionality and usability of the particular system. In this manner, a set of 14 tasks was developed that reflected the performance of simple and typical procedures. The test was addressed to users in the region and was tailored to their needs. Selecting the test involved 10 users, Veria residents and university students, divided into two groups depending on their knowledge of IT and World Wide Web technology. The study revealed that the cumulative mean values for time needed and errors performed by the 10 participants across the 14 tasks were not particularly high. Although expert users needed less time to complete the tasks and performed fewer errors than novice users, the difference between the two categories of participants was only statistically significant in the latter case. The results of the analysis of the satisfaction questionnaire revealed that overall user satisfaction with the VeriaGrid system was positive, but expert users were more satisfied than novice users. Furthermore, the findings of the interviews provided insight into what users liked or disliked most about the system.

Source: E. Garoufallou et al. (2008)

In terms of digital preservation, the need to understand how to preserve high volumes of rapidly changing distributed information needs to be addressed.

Another key issue is the preservation of “born-digital” material. The nature of this material is such that it is easily replicated, altered or destroyed. Furthermore, it is largely affected by the medium (hardware, software, operating systems and browsers) that has been used for its creation and storage; hence it is sensitive to obsolescence. The Internet itself is an unstable medium subject to constant change and its own potential vulnerabilities⁴³.

⁴³ R. Jianhai, J. McDonough (2009)

2.3.4 The relevance of cooperation

The regions are often too small for scale-efficient projects and can eliminate this barrier through interregional cooperation, in which the avoidance of duplication of work could make regional projects more attractive (B.5 and B.6). Such cooperation can go beyond national borders with regional networks created across countries, provided they share common interests (B.10).

The initiative does not necessarily need to be taken by the region or a cultural organisation. Civil society can be an active partner and mobilise regional and national authorities for the benefit of its own region initially, but expanding to neighbouring regions as well (B.11).

B.10 The REGNET Project: A case of transregional cooperation

The Cultural Heritage in REGIONal NETWORKs project (REGNET) was introduced in 2001 for a period of two years and included 23 partners, cultural organisations (museums, libraries and archives) and IT-industry representatives from 10 European Union States as well as Bulgaria and Russia. It aimed to provide a network of IT services to cultural heritage organisations, offering services such as data entry, search and retrieval, and e-Business. The project had a budget of over EUR 5 million, 48.5% of which was funded by the EU.

Source: S. Grossmann et al. (2002)

B.11 Dolenjska Multimedia Centre: Establishment of a multimedia centre in Slovenia

The Dolenjska Multimedia Centre operates within LokalPatriot, Novo Mesto, a local youth organisation for culture, and has become one of the key actors in the development and implementation of know-how in the south-eastern part of Slovenia. With funding from the Ministry of Culture and the former Ministry of the Information Society, as well as the ERDF (ERDF contribution: EUR 79.553), the m3c Multimedia Centres Network of Slovenia aims to network with existing and emerging intermedia initiatives in all Slovene regions and to encourage international cooperation. As of July 2007, 15 centres were part of the network: Ljudmila - Ljubljana Digital Media Lab and Cyberpipe in Ljubljana, KIBLA Multimedia Centre in Maribor, PINA Primorje Information Atelier in Koper-Capodistria on the Coast, Mostovna Cultural Centre and Mink Multimedia Centre, Tolmin in the Goriška Region (Western Slovenia), Multimedia Centre of Dolenjska (MCD) in Novo Mesto, South-Eastern Region, Posavje Multimedia Centre in Krško, KRIK Pomurje Multimedia Centre in Murska Sobota, Središče Art Centre and Prlekija Regional Multimedia Centre in Pomurje Region, Kunigunda Regional Multimedia Centre (KRMC), Velenje in Savinjska Region, Koroška Multimedia Centre in Slovenj Gradec, Carinthia Region, Pulsar Multimedia Centre in Škofja Loka, Gorenjska (Upper Carniola) Region, and Mat Kultra Multi Media Centre in Zagorje ob Savi. The new multimedia portal of the Centre has been developed as part of the future national cultural portal.

Source: Slovenia Cultural Profiles Project, m3c [Multimedia Centres Network of Slovenia](#)

Cooperation may also be sought with the private sector, either through contractual arrangements or through Public-Private-Partnerships (B.12).

B.12 UK Libraries: Promoting partnerships with the private sector

The British Library has achieved significant advances in the digitisation and online accessibility of its collections through a number of medium- to large-scale partnerships: the first with Microsoft, announced in 2005, aiming to digitise 25m pages from more than 100,000 out-of-copyright books; it came to an end in 2008, having digitised some 60,000 books, and the resulting digital material continues to be available from the British Library. The Bodleian Library at Oxford is currently engaged in two successful PPP initiatives to digitise its collections. The first of these is with ProQuest, to digitise some 65,000 items from the John Johnston archive of printed ephemera. The second is a partnership with Google to digitise the majority of its out-of-copyright works (i.e. those published before 1885). The digitisation will be carried out onsite by Google staff.

Source: Grant Agreement ECP-2007-DILI-527003, ARROW Report on business models, 13th July 2010, Edition 2

3. Conclusions and Recommendations

The digitisation and online accessibility of cultural heritage and digital preservation are major global challenges that serve historical (forging identity and intergenerational preservation), social (access for disabled people and people living in poverty), educational (better local understanding through audiovisual support and remote access for students and scholars) and economic (tourism and technical progress) purposes. All developed countries and many emerging countries have embarked upon it. However, costs are high, benefits cannot always be monetised and important organisational, technical and legal considerations hamper its smooth and rapid implementation.

European policies recognise and reinforce cultural diversity on the one hand, but also see room for identifying European cultural heritage and policies supporting some kind of cultural integration. Digitisation of cultural material and its online accessibility in different languages will make it easier for citizens to appreciate their own cultural heritage as well as the heritage of other European countries, and use it for study, work or leisure.

It is difficult to identify the appropriate level for intervention, in the context of subsidiarity. The need for economies of scale, technical interoperability and national sovereignty suggest that interventions should be at a higher level, and the first initiatives and funding sources have therefore begun at European and national level. At the moment, regional initiatives are on a small scale, often co-funded with national and/or EU funds. In just a few cases funding is ensured through interregional partnerships and cooperation with the private sector. Ideas for such partnerships can be found in a few EU regions (B.10, B.11, B.12) but also beyond Europe, in the US, Canada and New Zealand.

Despite the small number of current initiatives, cultural heritage is locally embedded and, as experiences accumulate and the institutional framework and technologies mature, LRAs can and should play an increasing role in cultural digitisation. In this context, the CoR has welcomed the Digital Agenda initiative for 2020 and considers the digitisation of cultural heritage an important tool for regional prosperity and encourages regions to take initiatives in this direction.

The Committee of the Regions and interregional networks can play a very active role in helping LRAs to adopt regional strategies and implement important projects. This can be done through support for identifying funding and cooperation opportunities outside the region and through the organisation of events for skills enhancement, policy learning and identification of projects of common interest.

It is recommended that individual LRAs take a strategic approach before pursuing individual projects. A stepwise and cautious approach will contribute to the successful implementation of digitisation. As it is not an easy task, skills need to be developed. Recommendations can thus be grouped into four categories:

Be strategic

Most regions have a variety of cultural monuments and intangible assets but, since they have other concerns, it is difficult for them to prioritise a *regional/local strategy on digitisation, preservation and accessibility*. While in the long run all cultural heritage is expected to be digitised, costs and technical difficulties call for clear prioritisation, and this is not an easy task since trade-offs are significant: the region needs to take account of its own needs (preservation of regional identity, generation of local income, creation of local skills and potentially competitive advantages, facilitation of access for disabled citizens) as well as global and European principles and opportunities.

Regions with evidence-based strategies can influence the setting of national and European agendas and priorities. Local and regional authorities must play a core role in making the appropriate suggestions and should be vested with decision-making rights in all fora in which they participate. However, this will not be possible if the region itself does not have an established strategy and the arguments to justify it.

Do not reinvent the wheel, but create adaptation skills

There has been considerable progress in relation to technical means, standards, the representation of rights holders and organisational set-ups over the last decade thanks to global, European and national initiatives, as well as independent NGOs. As territorial units, regions are too small to reinvent techniques and organisational schemes. On the technical side, the methods implemented should respect the plurality of languages in the region and ensure content and service maintenance in all languages. Techniques are available for digitising written texts, and improved automatic book and document feeding equipment is needed, as well as better-performing optical and intelligent character recognition. For digital preservation, tools for automatic analysis and indexing will help to ensure that information remains accessible and available for re-use. Issues regarding storage media for the preservation of “born-digital” heritage should be resolved.

Within this context, the needs of users in different language areas should be respected, as well the needs of disabled citizens. Usability tests and soft technologies are important and should not be neglected by focusing only on strictly technical aspects (B.9).

At the local and regional level what is needed is access to the pool of knowledge that is reachable (public domain) or the purchase of specialised services, when knowledge is not publicly available. Emphasis on selecting appropriate technologies, serving local users and respecting budget constraints is important at the local level.

This can only be achieved by specialised employees. Education and training are therefore the cornerstones of a successful regional agenda to take advantage of all opportunities offered at national and European level. Local personnel able to scrutinise options and make choices are invaluable. The creation of Living Labs is one way to strengthen local-level service processes and increase regional cooperation, but more traditional life-long-learning initiatives can prove equally effective.

Exploit funding schemes and partnerships, wherever possible

Regions may or may not have sufficient own-resources for cultural digitisation. To identify funding opportunities (Structural Funds), or help agents and organisations to identify and apply for relevant calls for projects (FP, ICT-PSP and Culture) is a way to multiply available resources.

More challenging but also more fruitful may be the creation of partnerships with the private sector. Models exist and have operated well in certain regions. In this case, however, LRAs are expected to play a facilitating role between the private sector and the cultural organisations promoting individual projects rather than being a partner in the project (B.12).

Launch cooperation schemes

The regional and local scale is too small to exploit synergies. When scale is important, the initiative to create inter-regional partnerships is a good substitute for size: tackling economies of scale through economies of scope. The creation of specialised centres for digitisation with the involvement of the private sector can serve many neighbouring regions and beyond. Exchange of information on legal issues and partnering of all kinds provides good leverage for increasing the value for money in the digitisation of cultural heritage (B.6, B.10), while partnerships with the private sectors can prove beneficial for both partners under certain circumstances (B.12).

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