



The DigiCULT Report



Technological landscapes for
tomorrow's cultural economy
Unlocking the value of cultural heritage



Executive summary



European Commission
Directorate-General for the Information Society



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Bernard Smith, Head of Unit
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FOREWORD

Europe's cultural and memory institutions are facing very rapid and dramatic transformations. These transformations are not only due to the use of increasingly sophisticated technologies, which become obsolete more and more rapidly, but also due to a re-examination of the role of modern public institutions in today's society and the related fast changing user demands. These trends affect all the functions of the modern cultural institution, from collection management and scholarly study through restoration and preservation to providing new forms of universal and dynamic access to their holdings.

Technological innovation plays a major role in the way our cultural institutions develop strategies for valorising their collections. It equally impacts directly on all those industries that provide products and services to, or with, the cultural sectors. Traditional demarcation lines between different types of institutions, between different skill and competence profiles and between different stages in the creation and management of collections are fading away.

In this context, the way Europe's cultural institutions should approach technology-driven mutation has to be assessed and options and recommendations provided. This is why the European Commission decided to fund the study entitled "Technological landscapes for tomorrow's cultural economy".

With the help of a steering committee, the European Commission was able to identify and agree on the themes to be covered in the study, to make sure that the methodology was adequate, and ensure that the conclusions obtained were properly validated. The objective was to capture and make visible the opinions of Europe's cultural institutions and actors, and to provide recommendations for policy making in both the cultural institutions themselves and the public authorities directly responsible for funding those institutions.

The European Commission would like to acknowledge all those who provided input and commentary, and in particular those who participated in the workshops, interviews, online Delphi, and case studies.

The work has been performed by a reliable independent consortium of researcher, academics and cultural institutions, and there is no doubt that the readers and authorities will find valuable information in this report. The study should help improve the way Europe's cultural actors prepare for the inevitable changes that will take place in the next five years.

Bernard Smith
Information Society DG
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Head of Unit

II INTRODUCTION

Empowering cultural heritage institutions to unlock the value of their collections



Ladderback armchair made for Derngate, Northampton
Charles Rennie Mackintosh, 1917

Being digital for many European archives, libraries and museums (ALMs) is no longer an option but a reality. They have turned into “hybrid institutions” that take care of both, analogue as well as digital cultural resources. The conversion of all sorts of cultural contents into bits and bytes opens up a completely new dimension of reaching traditional and new audiences by providing access to cultural heritage resources in ways unimaginable a decade ago. As Paul Fiander, Head of BBC Information and Archives, UK, brings it to the point, “the dividend from investment into going digital is substantial.” (DigiCULT SC Meeting, November 19, 2001) And it promises even greater returns in the future.

The digital promise

In the emerging knowledge society, there will be an increasing demand for high quality, enriched digital content as life-long learning is no longer a buzz word and continuous education has already become a must. Cultural heritage institutions are in a prime position to deliver the kind of unique learning resources that are needed at all educational levels.

Information and communication technologies will play a major role to create and deliver these new contents, which goes far beyond the current stage of providing access to information about cultural heritage objects. In the future, users of cultural resources will be able to enjoy new interactive cultural heritage services and products that relate to their personal lives. They will be able to manipulate digital artefacts online and participate in communities of interest. They will be supported by intelligent tools and agents that help them to locate the desired information to create their own stories. In addition, deeply immersive environments will make museum visitors dwell on in amazement in view of virtual worlds they could not experience anywhere than in the digital realm.

According to David Bearman, AMICO, USA, offering highly interactive and rich environments will become a competitive factor within the cultural heritage community. “In the future, we will expect that you can manipulate digital images in many ways, turn them around, look at the bottom, etc. Those resources that you cannot manipulate, will be perceived as second rate. (...) Moreover, the museums they come from will be perceived as second rate.” (DigiCULT Interview, August 8, 2001)

As such, cultural heritage institutions can utilise information and communication technologies (ICT) as effective instruments to direct public interest back to the original objects in their trust, by providing contextual information, enlightened with narratives and visualisations with computer-aided renderings and displays. As experience has shown, appropriate use of ICT does increase the interest in the original collection, and cultural heritage institutions should not leave this opportunity unused to add value to their holdings.

Yet, technology alone will not suffice to meet the growing user expectations. Equally important, it will require the knowledge and the intellectual “capital” that rests within the cultural heritage institutions themselves to create these kinds of new and highly desired content that increase the usage of cultural heritage material. Thus, European cultural heritage institutions not only hold the key to a treasure chest of unique resources, they also have the potential to turn the key to unlock the true value of our rich cultural heritage.

At present, however, these high promises are not yet fulfilled.

Why this study and for whom?

Today, archives, libraries and museums all over Europe face similar challenges as they try to take advantage of the enormous potential the use of information and communication technologies promises for memory institutions. These challenges are not only technical in nature, but affect cultural heritage institutions at their very core:

- How do new technologies affect the core business and how can they be best integrated into the current workflow?
- Which new technologies can be expected and how can cultural heritage institutions avoid to jump on the wrong technological bandwagon?

- What kind of institutional changes are needed to adopt and adapt new technologies?
- How can small institutions manage to participate in the emerging information society?
- What is the potential to commercially exploit cultural heritage resources and what are the future markets?
- What is needed to make cultural heritage services sustainable?

These are some of the questions that form the basis of this strategic study. Providing a roadmap for orientation on the future trends in the European cultural heritage sector in the next five years, the study aims to help decision makers how to best face the future challenges related to building and exploiting a digital cultural landscape within the information society.

Conceptualised as a tool for future planning for decision makers in European archives, libraries and museums, as well as national governments, regional authorities and the European Commission, this study:

- provides an in-depth analysis of the state-of-the art of technologies, organisational situation, cultural services and applications as well as (user) demand in European archives, libraries and museums;
- highlights the surrounding legal and policy framework that sets the conditions for technological developments, organisational changes and economic opportunities in the cultural heritage sector;
- draws conclusions and gives recommendations on measures to be taken in order to exploit the opportunities and to overcome current technological, organisational and legal impediments.

To reach a broad “institutional” consensus across the cultural heritage sector, more than 180 international experts from archives, libraries and museums, as well as policy makers and representatives from special interest groups and research facilities in Europe, the United States, Canada and Australia were involved in the study over the past seven months. In 29 interviews, 6 expert round tables (ERT), and an online Delphi survey, they gave their opinions on future trends in the cultural heritage sector. Furthermore, they provided recommendations that allow actors in the institutions as well as policy makers to take appropriate measures to create favourable conditions for the future development of the cultural heritage sector.

Future key challenges

The experts involved identified the following key challenges that will drive the development in the cultural heritage sector in the future:

- Value of cultural heritage
- Education as the key market for digital cultural heritage products and services
- Cooperation and coordination as key to operating in a networked environment
- Strengthening small cultural heritage institutions by increasing competence and capacity
- Born-digital resources and long-term preservation as key drivers of technological development
- Methodological and coordinated approach to digitisation.

Value of cultural heritage

In the last years, the cultural heritage sector has gained much political attention due to its economic potential and its importance for market development in the information society. The expectations that cultural heritage institutions will become active players in the emerging information economy are high, even within national governments and regional authorities. Yet, to measure cultural heritage in economic terms alone would miss its true value. As Jim McGuigan remarks, “the notion that a cultural product is as valuable as its price in the marketplace, determined by the choices of the ‘sovereign consumer’ and by the laws of supply and demand, is currently a prevalent one, albeit deeply flawed. Its fundamental flaw is the reduction of all value, which is so manifestly various and contestable, to a one-dimensional and economic logic, the logic of ‘the free market’.”⁽¹⁾

The true value that cultural heritage institutions deliver to society is often indirect and non-financial as they strive to provide intellectual enjoyment and raise awareness about the importance of cultural and historical knowledge. Added revenue or the ability to generate revenue often happens indirectly, for other sector economies, i.e. regional development, tourism or the publishing and media industries. As primary funding bodies, national governments and regional authorities should be aware that what they are financing goes far beyond the economic value, but is a cornerstone of establishing a society’s cultural identity.

Education as the key market

In the future education will be the most promising and therefore most significant market for cultural heritage. The experts participating in the DigiCULT study suggested that education should be the focus of every digitisation programme and a central point in every cultural heritage policy. Information and communication technologies are an effective channel to deliver new learning resources to the educational community and empower cultural heritage institutions to fulfil their educational as well as social functions.

To Mark Jones, Director of the Victoria and Albert Museum, UK, education is so important that it should become part of the core business of every archive, library and museum (ALM), “ALM resources are vastly undervalued and underused as an educational resource. It’s not all about money. ALMs should be doing this as part of their core business, it improves collection management as well as access.” (DigiCULT Interview, August 9–10, 2001)

Therefore, when selecting material for digitisation and producing new cultural heritage resources, memory institutions should follow a multipurpose approach and always keep the educational purpose in mind.

Cooperation and coordination

In the networked world, the demand for unique cultural heritage resources does not stop at the institutional walls, but highlights the need for co-operation and co-ordination. As Jennifer Trant, AMICO, USA, noted, “it’s a major technology thing, that technology demands collaboration.” (DigiCULT Interview, August 8, 2001)

Therefore, archives, libraries and museums need to enter into new relationships with their environment, other institutions across sectors, private businesses, intermediary organisations and new user groups. Major objectives of these partnerships are to collaborate in the cost-effective creation of new services, to coordinate digitisation programmes, define standards and structures to provide seamless access and to share resources. Networks with other institutions across sectors will be an essential component of every organisation. The governing principle of these networks will not be competition but partnership.

⁽¹⁾ McGuigan quoted in Throsby, David “Economic and Cultural Value in the Work of Creative Artists” (1999) in *Values and Heritage Conservation*, The Getty Conservation Institute, Los Angeles 2000. <http://www.getty.edu/conservation/resources/valuesrpt.pdf> (download 12-03-2001).

As Andreas Bienert, Prussian Heritage Foundation, State Museums of Berlin, brings it to the point, “there will be network services or no services at all ... If we do not achieve a very new quality of information by using information and communication technologies, then we cannot legitimise expensive and very time consuming efforts in this field ... It is absolutely necessary to achieve this kind of cooperation.” (DigiCULT ERT, Berlin, July 5, 2001)

Ultimately, what it comes down to is the need to not only integrate technological systems but people.

Strengthening small cultural heritage institutions by increasing their competence and capacity

Looking at Europe’s memory institutions from the viewpoint of their awareness of new technologies, we are confronted with a wide spectrum with regards to the adoption and exploitation of the benefits information and communication technologies offer to these organisations. On the one end, there are the pioneer institutions and early adopters of information technologies among libraries, archives and museums. These institutions have a clear plan for digitising their collections and spearhead market development by thinking of innovative ways of how to better exploit their digital collections also commercially on the world wide web. On the other end of the spectrum, we find mostly small archives, libraries and museums, which are neither aware of the new technologies and their possibilities nor do they possess the financial as well as human resources to actively participate in the new development.

In the future, it will be a challenge for the European Commission as well as national and regional governments to increase the capacity and competence in small cultural heritage institutions and create the conditions that allow those under-resourced organisations to participate in the information society.

“As a curator in a small institution, I feel the lack of employee expertise in technological areas is one of the most pressing problems for adoption of new technologies. Definitions of work practices are focused on exhibition and research development, placing technological expertise low on the list of qualifications for employment. In a small institution, where no staff are hired specifically to perform these functions, the responsibility falls on individuals to develop policies and programs often with scant knowledge of development in other cultural institutions. Individual achievements are all wrought in the face of either instructing and training other staff members while, at the same time, needing to keep abreast of technological developments and carrying out the duties for they are employed.” (Geoff Barker, University of Sydney, Macleay Museum, Australia; DigiCULT Delphi, May 22, 2001)

Long-term preservation and born-digital objects as key drivers of technological development

As ever-shorter technological innovation cycles replace existing technologies at a breathtaking pace of 2-5 years, the urgency to address long-term preservation to avoid the inevitable loss of our cultural heritage becomes ever more pressing. Current methodologies of long-term preservation such as technology preservation, migration and emulation are regarded as insufficient methods to preserve digital objects over the long term. In fact, they are considered short-term solutions to a long-term problem. As Greg Newton-Ingham, British Universities Film & Video Council, describes this disadvantage of digital technologies: “It is a technology with the minus that it self-combusts.” (DigiCULT ERT, Stockholm, June 14, 2001)

Although cultural heritage institutions face high-risk related to the uncertainty about the rapid changes in technology, taking a “sit back and wait” approach would be the wrong strategy. Instead, they should develop sound principles and policies for the creation and acquisition of digital material. In addition, national and regional policy makers need to take immediate action and formulate strategies for digital preservation as part of a national information policy.

Immediate political action is also needed with regards to the ever increasing volume of born-digital material. Born-digital material are resources that have been created with the help of information technologies and demand particular hardware and software for reading and viewing. The explosion of electronically published material currently puts enormous pressure on cultural heritage institutions, as they lack the regulatory framework that entitles them to properly collect, store, make accessible and preserve these resources that are published on the world wide web. Given the fact that many web resources disappear within a short time period, without such legislation or other mechanisms that allow cultural institutions to collect these data, a vast amount of our future cultural heritage will inevitably be lost.

Methodological and coordinated approach to digitisation

Today, the volume of material to be digitised is the most pressing issue facing digitisation, and related to that, the need for selection. With the growing scale, the nature of object digitisation changes considerably and poses problems to cultural institutions which remain unresolved, such as mass digitisation, integration of metadata at the point of digitisation, the internal transfer and storage of huge amounts of data and, of course, the exploding costs incurred by all these tasks. Volume and scale of future digitisation highlight the need for automated processes and integration of object digitisation into the overall workflow within cultural heritage institutions.

This requires the establishment of comprehensive selection policies that are driven by a clear understanding of why and for whom material should be digitised. Organisational policies for digitisation should be directed by a national digitisation programme to set priorities and avoid the duplication of work.

As Erland Kolding Nielsen, The Royal Library, Denmark, points out: “I could see that unless we started from above discussing what should be digitised – what are the objectives, what are our responsibilities and what are not – then you could spend a lot of money on small projects everywhere and commit the Danish sin, as I call it: a little bit of everything, for everybody, everywhere.” (DigiCULT Interview, June 28, 2001)

III OVERVIEW OF RECOMMENDATIONS



A small songbook for use in churches, Amund Laurentsson (printer), Stockholm, 1548?

The following section gives an overview on the recommendations for the different addressees of the study, decision-makers of European archives, libraries and museums (ALMs) on the one side, and policy makers at European, national and regional level, on the other side. A more detailed description of the recommendations and overall conclusions follows in the second part of this executive summary.

We would like to point out that the study consortium is very aware of and recognises the differences that exist between institutions in the various cultural heritage sectors regarding their size, the subject matters that they cover, their missions and purpose, as well as in what might be called their horizons, whether they are local, national, international, where their funding comes from and where they are positioned in public perception. These distinctions make a difference in what ALMs see as success in any part of their ventures including the digital world. Therefore, the decision makers of ALMs need to interpret the following recommendations within the framework of their institutions, to fit their own requirements.

Archives, libraries and museums

Key Challenge 1: Raise the competence in cultural heritage institutions

Cultural institutions should put human resources development high on their priority list.

- Cultural heritage associations and educational institutions should set measures to speed up the transfer and integration of knowledge into professional training and develop special courses for key areas such as digital management and preservation.
- With regard to basic qualifications, cultural heritage associations and institutions should promote the adoption of the European Computer Driving License as an important requirement for continuing professional development.

Key Challenge 2: Cooperation at all levels is key to marketing to new target groups

Cultural heritage institutions should actively seek the cooperation and partnership with other institutions across the sector, research centres, networks of excellence, intermediary organisations, and commercial businesses to reduce risk, avoid market failure and waste of resources. Cooperation should be sought in order to:

- build enriched, interactive environments and new cultural services that customers will demand in the future;
- present and/or market their products and services on common virtual cultural heritage platforms as well as tourism networks that aggregate visitors and users;
- provide packaged material (e.g. course material) for the educational sector;
- digitise and manage cultural heritage resources;
- negotiate licensing models that involve creators and owners of digital cultural surrogates as well as distributors and licensees that work closely with various target groups;
- build protected environments and enable the academic and educational communities to use licensed digitised resources.

Key Challenge 3: Strive to better exploit your own strengths and core competencies

Cultural heritage institutions should build on their strengths, authenticity, knowledge-based interpretation and contextualisation, and use new technologies to develop their own niche markets for licensed resources.

Key Challenge 4: Become methodical

Anchored in national digitisation programmes, cultural heritage institutions should formulate organisational digitisation policies that transparently state selection criteria based on:

- user demands
- the quality of the source material, and
- future management of digitised material.

National and regional governments

Key Challenge 1: Develop a methodological and coordinated approach to digitisation

National governments and regional authorities should formulate clear digitisation programmes enabling cultural heritage institutions to formulate their own organisational digitisation policies.

Instead of funding individual digitisation projects in separate cultural heritage institutions, national governments, regional authorities and other funding bodies should invest in comprehensive digitisation programmes.

National governments and regional authorities should build on ongoing coordination initiatives for digitisation programmes. They should strive to establish an information exchange infrastructure or interface connecting top-down initiatives vertically with regional initiatives, as well as horizontally, with other Member States.

Key Challenge 2: Empowerment of small ALM institutions and regional cultural heritage initiatives

National governments and regional authorities should develop mechanisms allowing small and under-resourced memory institutions to participate.

National and regional governments should ensure that small cultural heritage institutions can participate in all e-culture initiatives and make full use of the opportunities provided by new technologies.

Key Challenge 3: The educational market is a key area for cultural heritage

National governments and regional authorities should see the educational use of digital cultural heritage information as a key target in any national digitisation programme.

National and regional governments should support the establishment of virtual protected environments as the most relevant future platforms for cultural e-learning.

Key Challenge 4: Take care of and ensure access to born-digital cultural heritage resources

In those European Member States that have a legal deposit system, national governments should expand the legal deposit to include electronic and born-digital material.

In countries without a legal deposit system, national governments and regional authorities should nevertheless appoint trusted organisations to collect, make accessible and preserve born-digital cultural resources. These trusted organisations should then enter into negotiations with content providers to decide on rights agreements for deposit and future use.

Key Challenge 5: Secure access to cultural heritage material also in the future

National governments need to take immediate action on long-term preservation and formulate a digital preservation strategy as part of their national information policy.

The strategy should involve the creation of a network of certified organisations that will archive and preserve digital cultural resources.

III OVERVIEW OF RECOMMENDATIONS

Key Challenge 6: Establish a supportive infrastructure for cultural heritage institutions (slipstream model)

Governments and other funding bodies should invest in specialised organisations that support small- and medium-sized archives, libraries and museums in the setting-up and managing of digital collections (e.g. digitisation, collection management, online registration of users, licensing, and transactions).

National and regional governments should support cultural heritage institutions in developing digital on- and off-line products that bring the richness of their collections to a broader public. This includes creating conditions favourable to partnerships with private businesses as well as sponsorship.

Key Challenge 7: Set up effective coordination and dissemination mechanisms for cultural heritage know-how

National governments and regional authorities should set up a coordination and dissemination infrastructure that helps cultural heritage institutions to make informed decisions on future technological developments.

The European Commission

Key Challenge 1: Enable small and under-resourced cultural heritage institutions to participate in future Research & Development (R&D) programmes by narrowing the existing technology gap

The European Commission should ensure that small cultural heritage institutions can participate in all e-culture initiatives and make full use of the opportunities provided by new technologies.

The European Commission needs to lower the entry barriers for small memory institutions and develop a slipstream model for R&D participation.

The European Commission should find a good balance between the funding of innovative, high-risk projects and R&D programmes that allow smaller cultural heritage institutions to catch up.

The European Commission should fund the dissemination of best practice information on digitisation and ensure that this information is readily available to ALMs Europe-wide.

Key Challenge 2: Raise awareness for the potential of cultural heritage in the educational market

The European Commission should fund a current assessment of the educational market as one of the key markets for digital cultural heritage information, and disseminate best practice in the field of educational-cultural projects.

Key Challenge 3: Raise awareness for the use of standards

The European Commission as a primary funding body should actively promote the use of announced or open standards by making standards compliance a requirement for future funding for proposers of cultural heritage (and all other) projects.

Key Challenge 4: Future R&D

In the 6th Framework Programme for Research, Technological Development and Demonstration Activities, the European Commission should solicit proposals for projects in the following areas:

Area 1: Intelligent user guidance and navigation

- Development of intelligent narratives and contextualisation tools for cultural heritage data;
- Automated image analysis tools for historical pictorial data.

Area 2: Digitisation automation and mass storage

- Best practice cases in mass storage;
- Automated mass digitisation;
- Metadata capturing at the point of digitisation and integration of digitisation with collection management.

Area 3: Long-term preservation of complex digital resources and research related to dynamic digital objects

- Long-term preservation strategies for complex digital cultural heritage resources;
- Best practice cases in emulation as a long-term preservation strategy;
- Preservation solutions for dynamic digital objects;
- New approaches to naming on the web and further development of persistent identifier systems;
- Raise awareness for long-term preservation issues outside the cultural heritage community.

Area 4: New tools

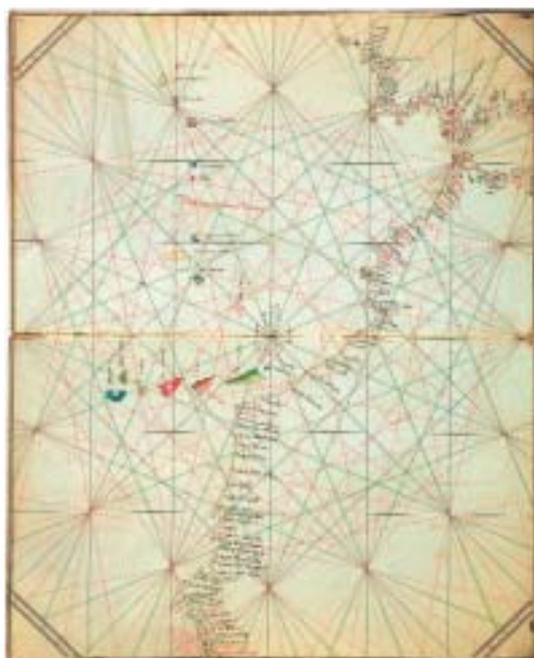
- High productivity tools for non-technical users (e.g. knowledge based authoring);
- Interactivity through a wide range of human-machine interfaces;
- Collaborative tools supporting various modes;
- Intelligent systems supporting users at different levels;
- Research in the usage of advanced technologies within cultural heritage applications.

Area 5: Intelligent Cultural Heritage and Knowledge Technologies

Cultural heritage provides an excellent test bed for future knowledge technologies. The European Commission should therefore foster the use, adaptation and adoption of knowledge technologies by cultural heritage institutions, and encourage further exchange of expertise between cultural heritage experts and knowledge technologists.

IV SITUATION ANALYSIS

Present state and perspectives of the cultural sector: 1996–2001–2006



Gratiosus Benincasa composuit, Ancona, 1480

In the mid-90s, the European Commission launched a remarkable programme to boost the use of information and communication technologies (ICTs) in the emerging information society. The programme promised economic growth, a growing employment market and an overall increase of quality in all aspects of our lives. Triggered by Al Gore's White Paper for building a national information infrastructure ⁽¹⁾ in December 1993 and the Bangemann Report, "Europe and the global information society" ⁽²⁾, in June 1994, the new technologies were considered as one of the key drivers of future prosperity. In 1996, all possibilities to realise this potential were open.

⁽¹⁾ Source: <http://ibiblio.org/pub/academic/political-science/internet-related/NII-white-paper>

⁽²⁾ Source: http://www.medicif.org/Dig_library/ECdocs/reports/Bangemann.htm

IV SITUATION ANALYSIS

Between 1996 and 2001, the European Commission and national governments created regulatory frameworks removing some of the obstacles to the accessibility of the future e-business markets – breaking up the national telecommunication monopolies to lower access costs, for example.

The cultural sector, particularly the publishing and entertainment industries as main content providers, were seen as key players for the development of new products and services to be delivered over digital networks. The future appeared to be “rosy” and anything seemed possible.

However, in the last two years, the initial enthusiasm for the new economy has been severely dampened and there has also been a rude awakening for the content providers in the cultural sector. The fact that people expect Internet content to be free of charge, together with the continuing lack of effective legislation on international copyright, created major barriers for commercially successful ventures on the Internet. As a consequence, in many cases the expected return on investment did not materialise and since the year 2000, some companies of the new economy were forced to close down.

However, this will only be temporary, and given European youth’s embracing of the new technologies, it is quite evident that better times can be expected in the future. Moreover, demand for quality content remains high.

For the cultural heritage institutions, it will become increasingly clear on how to market their unique resources especially to the educational community. A clear digitisation policy will enable memory institutions to create digital cultural heritage resources efficiently, for future access over computer and mobile networks. The key to success will be cooperations and strategic partnerships at all levels with other memory institutions across the sector, intermediary organisations as well as commercial companies. Thus, cultural heritage institutions can reduce risk and avoid wasting resources as the cost of valorising cultural heritage resources commercially will remain high. Staff in cultural heritage institutions will be more versatile and better trained, with the necessary information management and project management skills to develop the personalised services and highly interactive environments that future users will demand. Trained personnel and growing digital collections will be the key to success.

The following situational analysis provides an overview of the situation in the cultural sector presently and potentially by 2006 (if our recommendations in the DigiCULT study find followers). This analysis should also help to develop a clearer picture on what to expect in the cultural heritage sector in the future.

Cultural sector 1996	Cultural heritage sector 2001	Cultural heritage sector 2006
Visions and perspectives		
<ul style="list-style-type: none"> - “Rosy Future” - Visions/assumptions/high expectations: new (economic) frontier with immense potential 	<ul style="list-style-type: none"> - “Dreary Future” - Expectations not fulfilled – vision missing 	<ul style="list-style-type: none"> - “Some sunshine” - Clear view of the benefit/value of cultural heritage
Markets		
<ul style="list-style-type: none"> - “Multimedia and internet hype”: Decreasing traditional markets entice publishers to enter new markets with high commercial value - Assumed “killer applications”: broadband services like video on demand 	<ul style="list-style-type: none"> - Rude awakening: no new mass markets in electronic publishing (video on demand etc.) - Few examples of success in the cultural industries, and even fewer in the cultural heritage sector 	<ul style="list-style-type: none"> - No mass market – but some niche markets - Realistic view of market potentials instead of “killer applications”
Cost of market entry		
<ul style="list-style-type: none"> - Cost of market entry thought to be low 	<ul style="list-style-type: none"> - Cost for building up sustainable services are higher than expected 	<ul style="list-style-type: none"> - Cost of entry remains high; services need clear focus on users to produce some revenues
User demands		
<ul style="list-style-type: none"> - Assumption: consumers look for quality and interactivity 	<ul style="list-style-type: none"> - Uncertain about demands due to lacking data about user demands and expectations 	<ul style="list-style-type: none"> - Users want high value for money, yet information in the public interest is expected to be free - No mass markets, but mass users in specific fields
Services		
<ul style="list-style-type: none"> - Value added, MM-rich products and services delivered over broadband networks 	<ul style="list-style-type: none"> - Unclear how to sell value added services; users are used to “free rides” on the internet - Only a few business models that work - Some cultural heritage and educational services 	<ul style="list-style-type: none"> - Commercially exploitable services and products: personalised, highly interactive services and “culture communities”; users can “package” their own products - Funded services: scholarly, educational services, etc. - Institutions increasingly co-operate with intermediary organisations to create new services and bring them to the market - Value-added cultural heritage services available that are not dependent on public funding
(National) policies and initiatives		
<ul style="list-style-type: none"> - EU driven policy - Policy makers bought into the hype of new IT and multimedia based markets - Strong influence of policy on market development 	<ul style="list-style-type: none"> - Today, it is more difficult to sell IT and multimedia to politicians - Cultural heritage ranks low on the scale of political priorities (and needs to compete with health sector, social security, etc.) - Few countries with a clear strategy for digitisation 	<ul style="list-style-type: none"> - Proven commitment of national governments to cultural heritage - Awareness that both culture and education cost money – yet willingness to pay as benefits for society are essential - Substantial influence in building markets through thematically focused cultural heritage policy

IV SITUATION ANALYSIS

Cultural sector 1996	Cultural heritage sector 2001	Cultural heritage sector 2006
Regulations		
<ul style="list-style-type: none"> - Deregulation of telecom monopolies has positive effect on consumer markets 	<ul style="list-style-type: none"> - Regulations for born-digital objects needed, i.e. in the area of IPR and regulation of e-deposit 	<ul style="list-style-type: none"> - Regulation for scientific and educational uses (framework to create protected environments) - Legislation that regulates the responsibilities for born-digital resources is in place
Employment opportunities		
<ul style="list-style-type: none"> - Expectations for new employment opportunities are high - Multimedia and IT-skills can provide higher-value jobs 	<ul style="list-style-type: none"> - Overall % of growth relatively low for cultural industries, and particularly for cultural heritage sector - Dramatic lay-offs in the IT-sector - Threat for maintaining the scale of employment in cultural heritage institutions 	<ul style="list-style-type: none"> - Overall, a slight job increase in the cultural industries; increasing interest from Member States, decreasing interest at EU-level - Cultural heritage sector: job opportunities are still low, but can be stimulated by investing in cultural industries that make use of cultural heritage collections - The number of administrative staff has decreased, but by re-training staff cultural heritage institutions succeed in increasing the number of highly-skilled, creative employees
Economic and financial issues		
<ul style="list-style-type: none"> - Favourable investment climate - Easy access to venture capital - Policy did not have to pay for deregulation 	<ul style="list-style-type: none"> - Cultural industry: much money spent, but no return on investment - Cultural institutions depend for 90-95% on public funding that is decreasing - Threat of "sale" of potentially profitable cultural heritage resources. (e.g. Corbis) - Less money for cultural heritage institutions but more tasks to accomplish 	<ul style="list-style-type: none"> - Pragmatic ventures: clear understanding of return on investment - Still 85-90% public financing - Professional fundraising and sponsor acquisition are widely used ways for cultural heritage institutions to obtain additional finances
Delivery infrastructure		
<ul style="list-style-type: none"> - Fast technological development expected: from (narrow band) internet to broadband, video on demand, interactive digital TV, etc. 	<ul style="list-style-type: none"> - Technologies with no marketable applications yet - Broadband still not available (and not requested) in private homes 	<ul style="list-style-type: none"> - Broad use of narrowband technologies (inclusive mobile for applications with clear cultural heritage value); in some countries, broadband available in private homes, while in other countries, "islands" of use (on-site)

Cultural sector 1996	Cultural heritage sector 2001	Cultural heritage sector 2006
Tools		
<ul style="list-style-type: none"> - Electronic publishing, multimedia tools 	<ul style="list-style-type: none"> - Efficient but still rather complex tools with low usability - Besides collection management systems, not many tools for cultural heritage sector 	<ul style="list-style-type: none"> - New generation of easy to handle tools for domain experts and other target groups (e.g. teachers) - Cooperative authoring tools - Tools for defining automated workflows and data capturing in integrated systems
Content		
<ul style="list-style-type: none"> - Content not yet adapted for new technologies - Therefore, highest potential for content owners 	<ul style="list-style-type: none"> - Digitisation of cultural objects/collections without focus (“accidental digitisation”) 	<ul style="list-style-type: none"> - Clear digitisation policy and strategies focused on particular themes (clear concepts: which collections, how: methods & standards, e.g. of documentation)
Management and organisation		
<ul style="list-style-type: none"> - Promising new organisational structures: “flat virtual enterprises” with networked creative knowledge workers - Cultural industries will easily adapt to electronic production and delivery 	<ul style="list-style-type: none"> - Cultural heritage institutions rely on traditional hierarchical structures - They lack business view and competency - New media & IT-skills often missing 	<ul style="list-style-type: none"> - Traditional institutions: still relatively inflexible (generation gap) - Some transfer through partnerships with businesses - New competencies & skills incorporated through new personnel, best practice examples - New types of cultural heritage organisations: cultural networks, service providers
Strategic partnerships and cooperation		
<ul style="list-style-type: none"> - Mergers, mergers, mergers - Need to position oneself in the new (e-publishing) markets as soon as possible 	<ul style="list-style-type: none"> - Cultural heritage institutions enter into partnerships mostly within own sector: e.g. libraries co-operate on union catalogues 	<ul style="list-style-type: none"> - Clear cross-sector partnerships on key issues, e.g. standards - Technical support organisations - Strategic partnerships with new types of cultural organisations and businesses - Well established cooperative frameworks across sectors

V KEY ISSUES AND RECOMMENDATIONS



By His Royal Majesty's Command will in this Theater a Great Representation be Performed, circus poster, illustrator unknown, 1839

The key issues and recommendations section provides a synthesis of the results and findings in the four main chapters of the DigiCULT study:

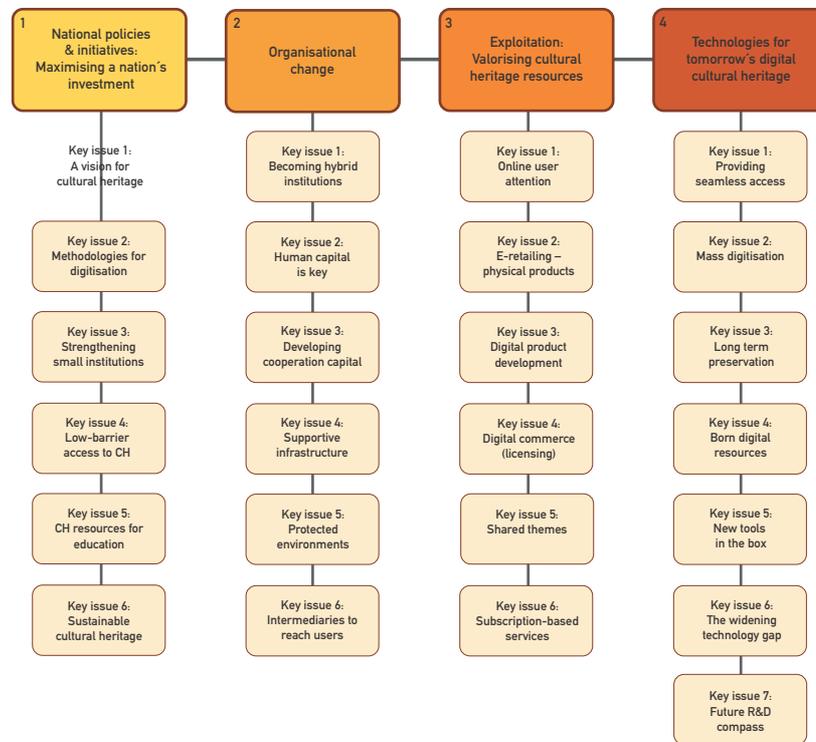
- National policies and initiatives: maximising the impact of a nation's investment
- Organisational change
- Exploitation: valorising cultural heritage resources
- Technologies for tomorrow's digital cultural heritage.

V KEY ISSUES AND RECOMMENDATIONS

The DigiCULT study is based on the analysis of expert opinions in the cultural heritage sector. This includes a number of expert round table discussions, the advice from a steering committee of knowledgeable experts and “practitioners”, interviews with experts on the various facets of the digital landscape and a very successful online Delphi survey that elicited thoughtful views from a variety of international sources. Case studies involving experts, policy makers and the actors of the cultural heritage community completed the basis for this research.

Each section of the DigiCULT Executive summary highlights a key issue based on a specific set of research results followed by concise recommendations on policy, administrative, economic and technological issues faced by the memory institutions and society at large.

The following figure provides an overview of the key issues and recommendations addressed in the four chapters of the Executive summary.



While it is not exhaustive, the summary is a guide for understanding the present state of European cultural heritage in the information society and lays out a roadmap for action in the years to come.

We believe that this is a reasonable view of how the cultural landscape will unfold.

National policies and initiatives: Maximising the impact of a nation's investment

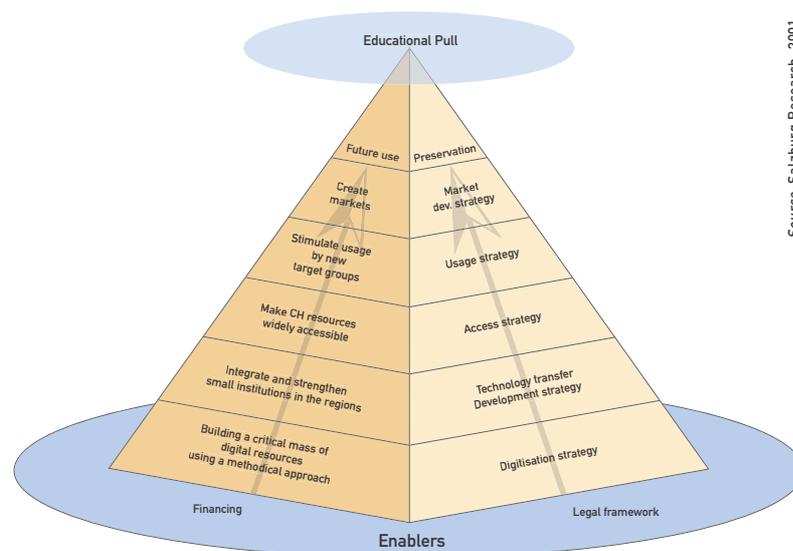
Without effective cultural heritage policy dedicated towards preservation, access and value of cultural heritage, it is unlikely that the full potential of the sector in the information society can be realised. As cultural heritage resources are valuable capital in the emerging knowledge economy, the primary objective of political action is to make the richness of cultural heritage resources accessible to citizens in a way that is usable and understandable.

So far, national governments in the European Member States have spent substantial resources on building a critical mass of digital cultural heritage resources, yet mostly in an uncoordinated and ad hoc manner that centred on individual projects instead of programmes. Last but not least, because of growing budget constraints, national governments have now realised the need to develop a systematic and coordinated method to implement cultural heritage policies to unlock Europe's rich cultural heritage.

The primary objectives of such a comprehensive cultural heritage policy are to:

- build a critical mass of digital cultural heritage resources in response to user expectations (digitisation policy);
- transfer know-how to less enabled institutions and actively promote ALMs in regions (technology transfer, development policy);
- make cultural heritage resources more widely available (access policy);
- stimulate usage through different target groups (usage policy);
- create and develop new markets for cultural heritage resources (market development policy);
- secure accessibility of cultural heritage resources in the future (preservation policy).

In addition, it is also national governments that have the responsibility to enable the implementation of these policies by creating a favourable legal framework and making the necessary finances available. In addition, experts participating in the DigiCULT study consider education to be one of the most important drivers that pushes development in the cultural heritage sector.



Key issue 1: A vision for diverse and multilingual cultural heritage

Memory institutions largely depend on political frameworks and clearly shaped national cultural policies to realise the full value of (digital) cultural heritage resources. Yet, planning and definition of concrete implementation programmes requires political vision. This vision will set the parameters for possible action as it:

- (re)defines the mission and core functions of memory institutions;
- provides the criteria for selecting and digitising past, present and future cultural heritage resources;
- establishes the framework for future decisions of cultural organisations;
- and supplies best practice guidelines with respect to digitisation practices; methodology, and project documentation.

However, the DigiCULT study found that such a vision is clearly lacking in many European Member States. It may be the role of the European Commission to help foster this vision.

01

The European Commission and national governments will need to develop a clear vision concerning the future of the cultural heritage sector and its role in society.

This vision should address:

- the role and value of cultural heritage in European society;
- the criteria used for including or excluding resources from future cultural heritage collections such as issues of social inclusiveness, or the inclusion of new forms of cultural expression;
- multilingual access as a means to communicate to an increasingly pluralistic society and the global community;
- the changing role, objectives and scope of the activities of cultural heritage institutions; and
- the position of education as part of cultural policy and as primary pillar within the information society.

Such a vision would then form the basis for national governments to support cultural heritage in the future.

Key issue 2: Maximising a nation's investment through a methodological approach to digitisation

In the information society, in the long run, only the digital will survive in the memory of a nation as it is more readily available and accessible than analogue cultural heritage resources. Therefore, creating digital material and e-content to be delivered over global networks is a primary responsibility for national governments. Yet, the increasing volume of cultural heritage material on the one side, and limited financial and human resources on the other side, demands taking a highly selective approach to digitising cultural heritage material.

To use the limited resources most effectively, national governments are challenged to develop sound models and guidelines to ensure a comprehensive and systematic approach to releasing the value of (digital) cultural heritage resources. Providing such models, guidelines and examples of best practice as basic decision making tools for cultural heritage institutions is the prime responsibility of national governments. National governments, as the primary financiers of cultural heritage institutions, are in a key position to significantly influence the quality of the projects intended to increase the value of cultural heritage resources.

Creating a critical mass of digital cultural heritage content demands a coordinated approach to avoid wasting resources. Such coordination mechanisms are currently established as part of the eEurope initiative. In April 2001, Member State representatives agreed to coordinate national digitisation policies to avoid a duplication of effort, known as the “Lund principles”. Nevertheless, it will take the mutual effort of European, national and regional authorities to guarantee an effective information exchange in both directions: bottom-up, from the regional to the national and European level and top-down, from the European bodies to the national and regional level.

However, all national governments are not equally endowed with financial resources to support methodology development and to provide guidelines. It therefore falls to the responsibility of the European Commission to ensure that there is adequate information available for use on a country by country basis.

02

The European Commission should fund a study of best practice information on digitisation and ensure that this is readily available to ALMs Europe-wide.

03

National governments and regional authorities should use their position as primary financiers to encourage best practice in cultural heritage institutions. They should strive for the highest quality to be delivered by projects.

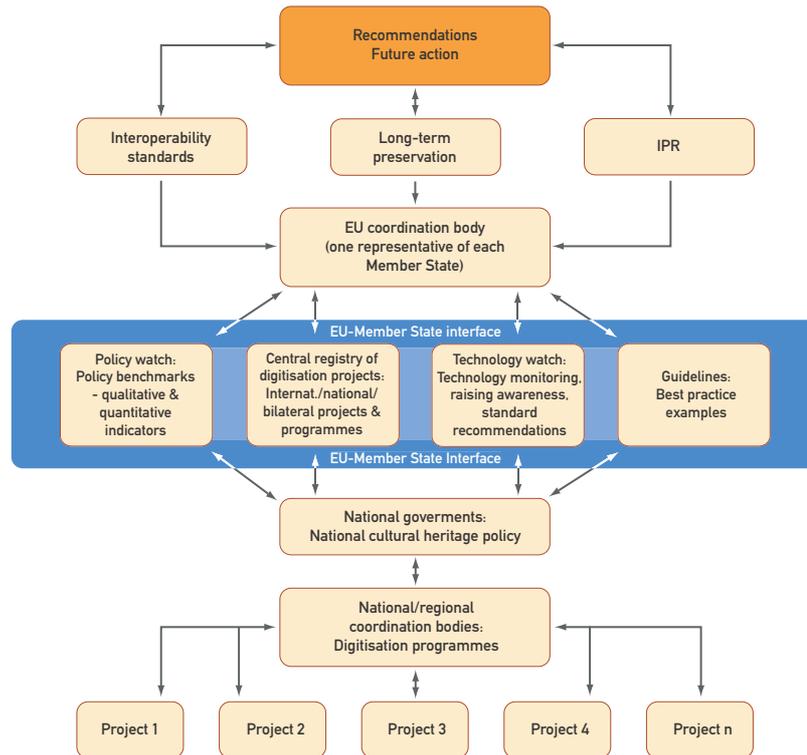
To do so, national governments should consider the following strategies:

- support the development and publishing of methodologies as a basis for institutional digitisation policies;
- publish and demand compliance with technical and quality standards and guidelines;
- evaluate cultural heritage institutions on the basis of their adherence to these best practice guidelines;
- issue criteria and measure impact and quality of digitisation projects;
- issue certifications to cultural heritage projects that follow or employ best practice guidelines and fulfil certain quality criteria;
- and, finally, mark institutions with a quality seal on national cultural portals.

04

National governments and regional authorities should build on ongoing coordination initiatives for digitisation programmes. They should support the establishment of an information exchange infrastructure or interface that connects top-down initiatives vertically with regional initiatives, but also horizontally, with other Member States.

Creating a cultural heritage information interface



Source: Salzburg Research, 2001

Key issue 3: A participatory heritage to strengthen regions and small institutions

With up to 95 percent of European cultural heritage institutions being small entities, valorisation and exploitation by means of information technologies also means enabling these institutions to participate by setting up supportive organisations and virtual infrastructures (e.g. networks, platforms, and more advanced environments). Both in Europe and in North America we can see that there is a trend towards a decentralised model with a common methodology for digitisation, but with the initiative in the cultural heritage inventory coming from regions and local authorities. It can be expected that the success of this model will become increasingly evident. More and more European countries will see that the way to unlock the value of cultural heritage is to expand the number of digitised collections, and to support small cultural heritage institutions by providing centralised centres of expertise.

These new and established organisations and infrastructures would primarily fulfil two functions: on the one hand, they serve as information transfer centres that provide training and further support small institutions with developing the skills of their staff. On the other

hand, such infrastructures would allow small institutions to become more visible in the information society and “market” their activities, collections, services and products.

05

The European Commission as well as national and regional authorities should ensure that in all e-culture initiatives small cultural heritage institutions can participate and make full use of the opportunities provided by the new technologies.

06

National governments and regional authorities should develop mechanisms that allow small and under-resourced memory institutions to participate.

This includes:

- investing in the capacity of institutions by raising the number of staff;
- ensuring the availability and take up of an appropriate range of possibilities for professional and continuing education as well as training in the cultural heritage sector;
- providing easy access to best practice examples, methodologies and guidelines;
- establishing a support infrastructure in the form of cultural Research & Development centres, (virtual) information service centres or specialised centres of excellence to foster know-how transfer.

07

National governments and regional authorities should further support initiatives to make small cultural heritage institutions and regions more visible.

This includes:

- setting up online networks and platforms where small cultural heritage institutions become more visible and are able to market their activities, collections, services and products in cooperation with cultural tourism agencies and educational institutions;
- getting small institutions on board of larger projects and initiatives.

08

The European Commission should carry out an in-depth analysis and monitoring of the development of different strategies for digital cultural heritage in the European Member States. For reasons of synergy, the knowledge gained should be brought to the notice of the Ministries of Culture and the cultural heritage institutions of Member States.

The analysis should focus on the effectiveness of centralised vs. decentralised models to assess their applicability to nation states with differing political frameworks.

Key issue 4: Low-barrier access to cultural heritage

To realise an information society for all, digital cultural heritage resources need to be easily available and accessible for all citizens. Therefore, an effective cultural heritage policy needs to address the various aspects that determine easy access to cultural heritage resources, including:

- cost of access;
- the technical barriers;
- intellectual and physical impediments that may prevent citizens to access digital cultural heritage resources.

Although most Member States advocate the view that access to cultural heritage resources should be free of charge, there seems to be an increasing pressure from national

governments to charge for cultural heritage resources. Such a trend needs to be evaluated carefully, as it is a fact that, with increasing costs to receive access, the number of users drops, while there is marginal return for the institutions. On the other side, there are also examples in Europe where national governments consider offering access to cultural heritage resources over the Internet as a universal service, along the lines of public service broadcasting. Whatever model national governments select, they need to find the right balance between fee-based cultural services and free services.

09

National governments and regional authorities should create favourable conditions that allow all citizens to gain access to digital cultural heritage resources.

This implies to:

- ensure that the access to resources of general public interest is free of charge;
- develop criteria to make transparent why specialised services must be charged for;
- lower the technological barriers by offering cheap and fast Internet access for all;
- foster equal access by developing and publishing guidelines for creating digital cultural heritage resources for the visually impaired and persons with other disabilities;
- create central, low-barrier access points to cultural heritage;
- cooperate and enter into partnership with other Member States to establish a network of national access points to culture.

Key issue 5: Cultural heritage resources for education

Experts consider education as one of the primary drivers for the future development of the cultural heritage sector. Because knowledge becomes obsolete more quickly in the information society, it is a fact that learning does not end at the termination of school life but will be a life-long experience. Life-long learning has already become a reality.

Beyond the obvious economic benefits of a well-educated population, education also plays a crucial role in fostering integration and mutual understanding among citizens. A key factor in this understanding is a knowledge of and respect for the historical traditions and cultural expression of a European multicultural society. Digital cultural heritage may play a key role in educational programmes, as cultural heritage institutions increasingly become important providers for new pedagogical tools.

Cultural heritage information is high on the list of interests for individual learners. Accordingly, when making decisions on priority areas for education, re-education and upgrading, national governments should not neglect the importance of cultural heritage information. Policies on digitisation of this information will be crucial in providing the kind of access that will be required in coming years.

This is not to say that national authorities have been negligent. The value and importance of education is well known and many European Member States are already debating the issue. Despite the lack of concrete policies, a body of experience exists from the projects linking educational and cultural domains. As a result, national governments are in a strong position to influence the market for educational material particularly in the area of cultural heritage.

10

National governments and regional authorities should see educational use of digital cultural heritage information as a key target of any national digitisation programme.

Digitisation plans and programmes should be clear about the intentions and objectives with regards to future use. Therefore, in drafting digitisation plans, national governments should ensure that digitised resources can be used for multiple purposes, yet with educational use being always on the list.

In addition, national governments should encourage projects with educational value. Such projects should actively foster the cooperation between content providers and teachers as well as research institutions to create new educational content based on cultural heritage resources.

11

The European Commission should fund a current assessment of the market for educational use of digital cultural heritage information and best practice in the field of educational-cultural projects.

For commercial content providers, educational exploitation is one of the more interesting fields for cultural heritage resources. An assessment of the educational market for cultural heritage products should go beyond the current view of market size and viability. It should also include knowledge gained from the many projects that cross the educational-cultural domain.

Key issue 6: For a sustainable cultural heritage

Reducing the value of cultural heritage to its economic level, as is currently the trend within many national governments, means only considering *one* part of what constitutes the value of cultural heritage and what ultimately might influence the individual choices of citizens as primary users of cultural heritage resources. What needs to be understood by national governments is that the value of cultural heritage and the benefit that is gained in building and maintaining digital cultural heritage repositories goes beyond the economic value.

As primary financiers of cultural heritage institutions, national governments need to be aware that what they are funding is the intellectual value that constitutes a cornerstone in a society's national identity. Thus, the authorisation to invest large sums into the valorisation of cultural heritage must derive from an overall objective in the public interest – namely to unlock the value of cultural heritage for regional development, quality of life, education and life long learning, and to stimulate the cultural industries, i.e. tourism, publishing and broadcasting. This should be considered when the demand for a commercial exploitation of cultural heritage resources is put on memory institutions.

12

National and regional governments that also expect cultural institutions to exploit their collections commercially should provide substantial medium- to long-term additional funding.

13

When funding major national cultural heritage initiatives and projects, national governments and regional authorities should not expect a direct economic return of investment. Instead, they should ensure that they can create synergies and leverage results in other publicly funded sectors (e.g. online learning) as well as cultural industries (e.g. cultural tourism) to maximise the impact of their investment.

14

National and regional authorities should develop value indicators to measure the impact of their investment in cultural heritage.

Organisational change

In order to fulfil their missions in the information society, cultural heritage institutions must become highly interoperable with users and partners. Interoperability in organisational terms is not only and not foremost dependent on technologies. The frequent assumption that the implementation of information and communication technologies (ICTs) can serve as a ‘motor’ for organisational change in an institution is more than questionable. In practice, such notions lead to short-sighted and unsuccessful technology projects. The main prerequisites for the successful use of ICTs such as decisive changes in the workflow, “re-skilling” of personnel, as well as partnerships with supportive organisations should not be neglected.

The organisational change part of the DigiCULT-study highlights the following issues: Cultural heritage institutions will have to:

- become “hybrid” institutions in the sense that they will have to provide information, material and knowledge in-house as well as online;
- set human resources development on top of their priority list;
- cooperate on all levels to provide high-value services;
- make use of supportive infrastructures and protective environments to make accessible digitised resources;
- as well as use intermediaries (cultural networks) to reach users.

Key issue 1: Becoming hybrid institutions

By becoming hybrid institutions, cultural organisations struggle to find the balance between the analogue and digital worlds. Institutions that become hybrid (national libraries, research libraries, TV archives, etc.) are forced to bridge two different worlds: the physical and the digital.

In their long history, memory institutions have developed infrastructure capital that is directed toward the handling of physical objects (written records, manuscripts, books, film rolls, tapes, pictures, etc.). Today these same institutions also have to deal with intangible objects, the born-digitals. This will require new overall solutions, the implementation of new procedures and workflows, and new tools to collect, make accessible, exhibit, contextualise and preserve these objects.

Memory institutions should be able to work with the tangible and the intangible, providing both their traditional services (e.g. books and other printed material) and new online services. However, with limited financial resources, memory institutions will need to find the right balance between these services.

15

Taking care of traditional as well as new digital resources, hybrid memory institutions need to be prepared to face additional challenges related to: human capital and the availability of skilled staff, cost of ownership for technologies, managing the life-cycle of digital resources, as well as the cost to cooperate in a networked environment.

Key issue 2: Human capital is a key resource of memory institutions

Today, memory institutions are forced to adjust to the digital environment and implement new technological solutions at a speed that puts enormous pressure on personnel to acquire new knowledge and skills. Therefore, human resources development is a key task in cultural institutions. This not only applies to IT competencies; highly qualified personnel are necessary at all levels.

In the information society the most important intellectual capacity of a memory institution lies in the contextualisation, interpretation and explanatory narratives it can bring to networked cultural heritage resources. Whereas there is substance in the view that “the real value” of memory institutions is in the librarian, archivist or curator, in fact, the efficiency of the intellectual capital of an institution depends on the interplay of the staff (human capital) and technology (infrastructure capital).

16

Cultural institutions should put human resources development high on their priority list.

For hybrid institutions this means coming to terms with the following challenges:

- be prepared for more physical handling of material as well as more competencies needed to meet the intellectual demands of users;
- keep and further improve the key traditional competencies that are valuable in the physical as well as digital spheres;
- monitor, develop, incorporate and share new competencies that are necessary in order to be interoperable and expose the existing human capital to upcoming new ideas, concepts, new services to be offered and new products to be developed.

17

Cultural heritage institutions should in particular further develop the knowledge, expertise and skills of their staff in relation to tangible and intangible cultural resources, i.e. providing object descriptions, contextualisation, explanations and interpretations.

With regard to IT personnel, cultural heritage institutions are running into severe problems. Particularly in smaller institutions there is a manifest lack of technological expertise. New areas of expertise must be covered e.g. in the development of digitisation projects as well as the preservation of digitised and born-digital sources. Furthermore, there is a need to update knowledge and skills in traditional areas related to the digital environment, e.g. metadata creation in cataloguing.

18

Cultural heritage institutions should develop information management know-how, intensively share IT-expertise, and actively involve their staff in hands-on training programs.

19

Cultural heritage associations and educational institutions should set measures to speed up the transfer and integration of knowledge into professional training and develop special courses for key areas such as digital management and preservation.

20

With regard to basic qualifications of their staff, cultural heritage associations should promote the adoption of the European Computer Driving License.

Key issue 3: Developing cooperation capital

Developing cooperation capital is one main key to success for cultural heritage institutions in the networked environment. Cooperation provides many general advantages for institutions as for example gaining strength in negotiations with other cultural sector players or reaching new users groups. The DigiCULT-study in particular highlights the importance of cooperation in creating value added services and rich environments for broader user groups as well as fostering more cross-domain cooperation of cultural heritage institutions.

Cooperation in creating value added services and rich environments for broader user groups

Cooperation is central to unlocking online the value of cultural heritage resources for broader user groups. For these user groups, not masses of “raw data” (digitised objects and basic documentation) are needed but enriched, interactive environments and packaged material (e.g. course material that fits into the curriculum).

At the basic level, this demands the creation of metadata that includes elaborated descriptions of objects that can be integrated in contextualising structures, e.g. historical concepts and narration. For the creation of such data and structures, targeted initiatives, programs and projects are required to form collaborations between the relevant expert communities.

In building attractive online as well as in-house digital environments project groups are needed that include subject experts and scholars as well as specialists in interactive multimedia design and production. Ways to build such groups are in particular: developing media creativity within institutions, purchasing creativity from media companies, making use of media culture centres, as well as working together with cultural network organisations. Which option will be used by an institution will depend on the project objectives and the available resources.

Furthermore, cultural heritage institutions within multicultural societies need to find appropriate ways of involving and allowing for the participation of different communities that demand and merit to be present in the cultural record and memory.

21 Cultural heritage institutions should not only provide “raw data” (digitised objects and basic description), but cooperate in building enriched, interactive environments. If their target audience is the educational sector, they should also provide packaged material (e.g. course material).

22 Cultural heritage institutions who regularly exhibit digital objects should develop in-house competency or cooperate with innovative companies or organisations specialised in interactive multimedia design and production. With regard to the presentational forms, they should explore new approaches in the usage of advanced technologies for building attractive virtual environments for cultural heritage applications.

23 Cultural heritage institutions should seek to find appropriate ways of how to involve different cultural and ethnic communities in society.

Cross-domain institutional cooperation

The traditional separation between archives, libraries and museums is a major barrier to efficient access to resources and knowledge. An important issue in the cultural heritage sector therefore is cross-domain cooperation that allows for bringing together resources and knowledge from the different institutions.

Yet, such cooperations are not easily achieved as the institutions struggle to come to terms with many other major tasks. Promising examples of cross-domain cooperation, e.g. in the Northern countries, are based on themes different memory institutions can easily buy into, as for example local history. A major further incentive is, if funding for projects is bound to cross-domain cooperation of institutions.

24

In order to foster cross-domain cooperation, national governments, regional authorities, and cultural councils should bind funding for cultural heritage projects to the participation of cross-domain partners.

25

Cultural heritage institutions should participate in national or regional cross-domain projects in order to contextualise and present their rich resources together.

Key issue 4: Supportive infrastructure

Many cultural heritage institutions are not capable of setting up and managing sustainable digital collections without outside assistance.

This issue is particularly relevant with respect to the collections of traditional archives, as well as the special collections in libraries and museums. While it may be the objective to unlock these treasures and make them more readily available in the information and knowledge society, to do this in a sustainable fashion might cost considerably more than smaller or medium-sized institutions can afford.

There is also the question of whether or not the public purse can afford to finance a trial and error approach that may result in unsustainable ventures in the cultural heritage sector.

Therefore, there is a clear need for specialised and well funded organisations that support ALMs in setting up and managing digital collections (e.g. digitisation, collection management, online registration of users, licensing and transactions). The model that drives innovation will not so much be knowledge transfer but a splitting of functions. The memory institutions and scholarly communities will provide the real value they can bring into the information society: that is knowledge and expertise related to digitised objects, i.e. descriptions (e.g. metadata), contextualisation, explanations and interpretations, and stories that truly involve potential users.

26

Instead of funding individual digitisation projects of cultural heritage institutions, national governments, regional authorities and other funding bodies should invest in comprehensive digitisation programmes.

27

National governments, regional authorities and other funding bodies should invest in specialised organisations that particularly support small- and medium-sized cultural heritage institutions in setting up and managing digital collections (e.g. digitisation, collection management, online registration of users, licensing, and transactions).

28

Cultural heritage institutions should not individually attempt to address all the problems involved in digitising and managing digitised cultural heritage, or expect that they can solve them on the basis of a knowledge transfer model. Cultural heritage institutions should split tasks with specialised organisations and focus on providing the real value they can bring into the information society: knowledge and expertise related to the digitised objects.

29

Cultural heritage institution should use a multi-tiered partnership and licensing model that involves creators and owners of digital surrogates of cultural heritage resources as well as distributors and licensees that address special user groups.

Key issue 5: Developing protected online environments

Cultural heritage institutions perceive many risks in the digital environment. They fear losing control over digitised resources once they are “out there” on the Internet as well as harming their reputation if, for example, images of objects are used in inappropriate ways and contexts. These fears keep institutions unwilling to make their resources available online. Trusted competency and service centres can convince institutions to bring their digitised resources into protected environments for licensed uses by scholarly and educational communities.

This demands:

- to make a clear distinction between commercial versus scholarly and educational uses;
- to come to an agreement with resource holders that respects their rights and allows them to provide their resources for non-commercial uses;
- usually, such an agreement will grant perpetual, non-exclusive rights to aggregate materials and distribute them electronically for scholarly and educational uses;
- these uses are bound to the protected environment and allowed only under well-defined terms.

The protected environment concept is spearheaded by renowned organisations such as the Scottish Cultural Resources Access Network (SCRAN) or the Mellon Foundation that has funded similar digitisation projects (e.g. JSTOR and ArtSTOR).

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National and regional governments should support the creation of protected environments that enable scholarly and educational user communities to access high-value cultural heritage resources. This implies to exempt educational use from the current European Union copyright directive.

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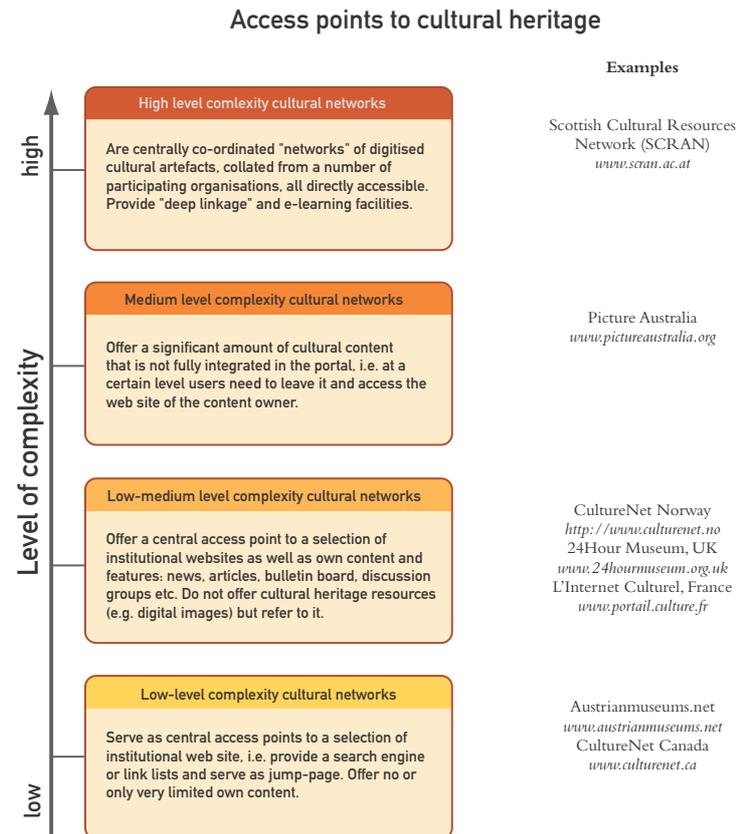
Cultural heritage institutions should participate in building protected environments and allow for licensed uses of their digitised resources by scholarly and educational communities.

Key issue 6: Reaching users – the role of intermediaries

Intermediary organisations play an essential role in bringing the value of cultural heritage to larger interest groups (e.g. scholars, learners, tourists) and the public at large. Traditional memory institutions that seek to bring their hidden treasures into the emerging digital cultural economy will not be effective enough to reach larger segments of certain user communities (e.g. the educational sector or cultural heritage markets related to tourism). This is due to a lack of marketing and technological capacities of individual memory

institutions (that also have no tradition of this type of work) and to the necessary critical mass to generate markets and rich services that are needed to attract and involve users.

Therefore, intermediary organisations that build user platforms and environments are of critical importance to the cultural sector. They provide access to information resources of many institutions (within and/or across sectors) as well as function as portals to (protected) virtual environments that include digital collections (see graphic).



Source: Salzburg Research, 2001

Teaming up with intermediary organisations may considerably reduce the entry barriers for smaller institutions and provide a wide range of opportunities: from being present in event calendars or news tickers, up to participating with their collections in major digitisation initiatives (depending on the aims and models of the existing intermediary organisation in a country or region).

32

Cultural heritage institutions should actively participate in consortia that establish intermediary organisations and services.

In bringing cultural heritage resources to larger interest groups, institutions and intermediaries in the cultural heritage field can build on online services that already have been established in the educational and tourist sector. To address, for example, the educational community, they can interlink with the existing European and national educational servers, as well as projects which aim to enhance the use of new media by teachers.

33

Cultural heritage institutions and intermediaries should interlink with established educational and tourist sector services.

Unlocking the value of the cultural heritage sector into the information society will demand huge efforts and investments in building new organisations and services that support existing institutions in coming to terms with different issues that determine success or failure in the digital environment.

In the discussions on the digital economy, the concept of disintermediation (i.e. the elimination of intermediary organisations that stand between producers and users of products and services) figures prominently, yet, to bring cultural heritage into this economy will demand to exactly build these intermediaries that were missing in the old economy.

34

National governments, regional authorities and funding organisations should actively support the establishment of intermediary organisations and services in the cultural heritage sector and their cooperation with services in other sectors, such as education and tourism.

Exploitation: Valorising cultural heritage resources

Making exploitation work for cultural heritage institutions

Today, many cultural heritage institutions are seeking a place in the online market and are looking for “niches” and business models that might work for them. The objective of these institutions is not to become commercial but to gain some revenues in order to finance at least a part of their cost-intensive operations (e.g. total cost of ownership of collections).

In sorting out what is appropriate for exploitation, experts in the cultural heritage field draw a line between commercial services versus uses that should be free of charge. In the latter group most often mentioned are educational uses of material as well as basic information services, e.g. online catalogues, bibliographical information or standard research on collections.

Whereas for higher-value services charging seems appropriate, it needs to be highlighted that in the educational sector the subscription fees will most often not be paid by the individual users (teachers, students) but by the educational institutions or the responsible public entities.

In the exploitation part of the DigiCULT-study an overview and assessment of online business models for cultural heritage institutions is given. The following paragraphs summarise the results and provide a set of recommendations for policy and institutional decision-makers.

Key issue 1: Online user attention and information

Selling user attention (e.g. banners on a web site) has low commercial potential. Offering online advertisement opportunities might be a business line for major cultural heritage institutions, networks or portals. But, generally, advertisement for cultural heritage institutions seems suitable mostly in the framework of major sponsorships for a project rather than the whole web site.

Selling user information is clearly not an appropriate line of business for cultural heritage institutions. What the institutions themselves need to do is gather more detailed information on their users to be able to adapt and further develop their services according to changing user demands.

35

Cultural heritage institutions should use the attention they receive from visitors for marketing their own products and services.

36

Cultural heritage institutions should gather and exchange user information in order to adapt and further develop the services they provide to users.

37

For smaller, less known institutions cultural heritage networks and platforms should act as aggregators of attention and provide them with user information and feedback.

Key issue 2: E-retailing: physical products

Selling physical products via online channels is an option and actually a practice of many cultural heritage institutions (in particular museum giftshops). For small institutions it might be a plus, for major institutions or specialised actors it can represent a considerable line of business.

Generally, institutions that want to develop an e-retailing business need to be aware of the potential channel rivalry between their in-house and online shop. Additional costs for the online business line might not pay off.

Prerequisites for success are to establish a brand and in particular to develop unique products that are (ideally) related to in-house collections. Furthermore, in order to bring their products to the attention of many potential consumers cultural heritage institutions need to intensively cooperate with intermediaries in the sector (including e.g. tourism agencies).

38

Cultural heritage institutions should explore the opportunity to develop unique physical products related to in-house collections as well as to market and sell them online.

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In order to avoid market failures, cultural heritage institutions should reduce risks and seek partnerships with established user focused agencies, institutions or companies (e.g. tourism agencies).

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Smaller institutions should intensively cooperate with cultural heritage intermediaries, networks and portals that aggregate visitors to market their products.

Key issue 3: Digital product development

Developing and marketing digital cultural products (e.g. cultural CD-ROMs) is still a risky and costly business. Returns from most off-line multimedia products have shown to be very limited, profit often being not more than 1 – 3%, with many products not reaching the break-even point. Experts recommend that the development of online cultural heritage multimedia be made the priority, and that an off-line product be offered only in the case of an online success and a proven demand for such a product.

After the experiences of the last ten years in the multimedia market the willingness of cultural industry players to put money into cultural multimedia projects will be limited. Yet, in order to develop attractive products and bring them to a broad market creative and commercial partnerships might be very helpful.

41

National and regional governments should support cultural heritage institutions in developing digital on- and off-line products that bring the richness of their collections to a broader public. If partnerships between institutions and creative or commercial companies are needed for market success, appropriate measures should be put in place to stimulate such partnerships, e.g. public-private co-financing or sponsorship models.

42

In order to generate digital cultural products, including material from lesser known institutions and collections, national and regional governments should support setting up creative and commercial centres that might favourably be implemented within organisations that manage cultural heritage networks and platforms.

Key issue 4: Digital commerce – licensing

Digital commerce, i.e. selling or licensing digital/digitised objects online, is today explored by many cultural heritage institutions. Licensing digital surrogates of objects from (special) collections is seen as the most promising market, yet, it must be highlighted that this is primarily a business to business market.

According to a market study conducted for the Canadian Heritage Information Network (CHIN), across the most relevant market segments (i.e. publishers, broadcasters, multimedia companies, advertisers and corporations) relevant cultural heritage resources are mostly images, and to a much lesser degree other material such as film and video footage. Being the most content-driven cultural industries, publishers and broadcasters are the most likely to have a need for intellectual property of cultural heritage institutions, while the small multimedia companies (i.e. CD-ROM and web site developers and producers) are much less relevant.

Barriers to market entry are high and cultural heritage institutions need to find and intensively develop their niche in competition with stock agencies or brokers that set the state-of-the-art in online licensing (and surely dominate the advertising and corporate market for licensed images).

The list of key elements that cultural heritage institutions need to effectively exploit resources online are:

- standard electronic on/off-line catalogues;
- standardised and well understood rate structures for various uses;
- end-to-end clearance (preferably a centralised one for many cultural heritage institutions); as well as
- quick turnaround time.

An option for cultural heritage institutions may be to seek partnerships with existing agencies or brokers (rather than build in-house systems), yet such an option seems to be realistic only for institutions with high valued art or unique special collections.

Overall, it must be highlighted that it is only where the intrinsic, authentic nature of cultural heritage sources is perceived as valuable (and the expert knowledge related to relevant material is an essential plus) that a considerable market potential exists.

43

Cultural heritage institutions should build on their strengths, authenticity, knowledge-based interpretation and contextualisation, and use new technologies to develop their own niche markets for licensed resources.

44

Cultural heritage institutions should develop the necessary elements they need for licensing resources effectively (e.g. standard electronic on/offline catalogues, standardised rate structures for various uses, end-to-end clearance, and a turnaround time that is appropriate for the main customers).

Key issue 5: Strategic development of shared themes of common interests

Cultural heritage collections do not lend themselves easily to commercial exploitation. For example, out of a historic image archive only a small fraction of the holdings (perhaps 5 to 10 percent) might be of any commercial relevance if available in digital form online. In addition, future customer segments are not readily evident. ‘They do not just walk through the door’. The personnel of the institution would have to completely refocus its work on marketing and selling the material to the most relevant customers. Experts believe that first, a ‘critical mass’ of digital cultural heritage collections should be produced to enable

customers to find what they are looking for. This approach seems to influence many cultural heritage institutions towards mass digitisation of their holdings, yet these investments are unlikely to pay off.

A more reasonable approach to market digital surrogates of cultural heritage resources would be to develop shared themes of common interest in which players throughout the cultural sector (including e.g. publishers and broadcasters) could buy into. Such themes would:

- stimulate the public interest in particular cultural heritage topics and resources;
- create new market potential for institutional and commercial players in the cultural sector; and
- provide a basis for a purposeful digitisation of certain special collections.

45

Cultural heritage institutions should, together with cultural councils, cultural industry and media partners, strategically develop and heavily market cultural and historical themes in order to create a basis for the purposeful digitisation of certain special collections.

Key issue 6: Subscription-based information services and virtual environments

Libraries

Information services are a major domain for libraries, with traditional commercial (non-subscription-based) services being document supply and custom research. With regard to new online services one can say that commercial success or even sustainability in the world of scholarly and educational libraries is far from being easily achievable (if it is a declared target of projects). These libraries stick to their mission as ideally free information hubs and develop valuable online solutions for special material needed in scholarly research and education (e.g. digitisation of journals, material for course readings).

Yet, in the digital environment competition is growing for the future face of 'the library' and the question will be whether the established libraries will in the long-term be the places to go for relevant e-material. Mainly because the major commercial players increasingly control the complete online information chain and, in particular, the subscription-based services.

Without a complete change in the model of scholarly publishing, libraries will have to direct users to these commercial services for online access to most current published material.

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In order to play a relevant role on the market for online access to e-material, libraries should build up their own digital collections from all resources they can get, e.g. by managing collections for various parties in the publishing cycle as well as digitising parts of their collections.

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The European Commission should commission an in-depth market analysis of international and European players on the market for subscription-based access to published works as well as conditions that might lead to market dominance and control.

Archives

With regard to historical public records and other archive material an explorative DigiCULT case study looked into the online genealogy and family history market. This booming market is today dominated by major commercial players that are US based (Ancestry.com, Genealogy.com). Furthermore, it needs to be highlighted that these players are expanding, i.e. integrating the information of European databases into their stock.

48

With many European archives now starting projects to get into the online genealogy and family history market, in-depth analysis and regular monitoring is required, taking into account international as well as national developments.

- The European Commission should commission a study on the European/global market for genealogy.
- In order not to let extra-European players completely take over the genealogy & family history market, appropriate sector and institutional policy measures should be set.
- Public records and related archival institutions should themselves closely observe and proactively explore their opportunities on the genealogy market. They should define and develop their own position and strategy (depending e.g. on their holdings) as well as favourable strategic partnerships.
- Institutions in the field should also look into lessons that can be learned from the genealogy & family history market. A key factor for commercial success in this market is building and/or supporting communities of users.

Museums

Subscription-based virtual environments, in particular for e-learning, are today being explored by major museums as well as new cultural heritage organisations (e.g. louvre.edu, SCRAN, AMICO). In Europe, these projects are not commercially driven, but developed within projects that are publicly funded. The aim of these projects is to build protected environments that provide high-value cultural heritage resources for educational use. Commercial ventures related to the cultural heritage sector are rare (e.g. Fathom.com) and of questionable success.

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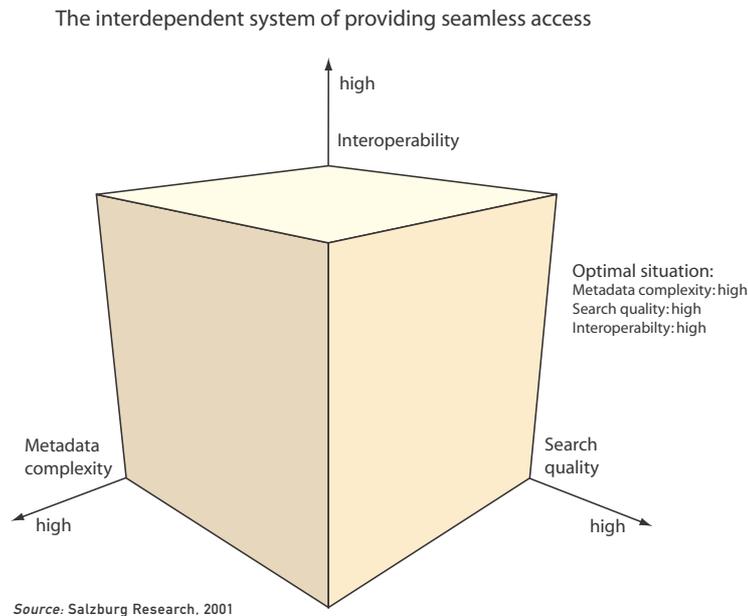
National and regional governments should support the establishment of virtual protected environments as the most relevant future platforms for cultural e-learning.

Technologies for tomorrow's digital cultural heritage

Key issue 1: Providing seamless access

With the advent of networked communication, the provision of access to cultural heritage resources has become one of the main activities of cultural heritage institutions. It has initiated a paradigm shift from building collections to providing seamless access to digital cultural heritage resources. This requires the convergence and interoperability of diverse systems.

From a technological point of view, to enable seamless access across sectors means finding a compromise between a high level of interoperability, the granularity of provided metadata, and the quality of search results. The higher the granularity of metadata the better the search results, but at the cost of interoperability. What has been achieved so far is the ability to search across sectors, yet at the expense of search quality.



The primary barriers to seamless access today are related to the following issues:

- cross-sector incompatibility of metadata standards to describe cultural heritage objects;
- lack of de facto standards for the cultural heritage sector;
- lack of awareness for new standard developments due to missing mechanisms for cultural heritage institutions to obtain accurate, valid and trustworthy information on standards;
- lack of controlled vocabulary for cross-sector, international search;
- lack of support for multilinguality;
- international, national, regional/local, institutional and sector barriers that hamper effective collaboration between standard developing consortia and bodies.

To achieve seamless access to cultural heritage resources as the basis for other future services, the following issues need to be actively approached:

- reach an agreement on metadata standards in a collaborative process involving all stakeholders across the boundaries of archives, libraries and museums;
- foster and encourage the use of open and/or de-facto standards in the community;
- provide mechanisms and tools to enable cultural heritage institutions to make informed decisions on standards development;
- further develop the technical requirements for user-focused and target-group sensitive authority files and multilingual thesauri to enable access across institutional, sector and national boundaries.

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The European Commission, special interest non-governmental organisations, international standards consortia and ALMs together will need to continue to cooperate to establish sector standards.

Experts envision different stakeholders for standards synchronisation. These are a central European Union standards authority, non-governmental organisations, national/regional bodies and international consortia. Therefore, a first step is to establish consensus on an international cultural heritage standards authority and its tasks. To do this, all relevant stakeholders need to be involved to develop a viable model on how to best reach agreement on sector standards and dissemination of results.

51

The European Commission, national governments and regional authorities as primary funding bodies should actively promote the use of announced or open standards by making standards compliance a requirement for future funding for proposers of cultural heritage projects.

As primary funding bodies, the European Commission as well as national governments are in the position of making standards compliance and other quality measures part of the agreement with proposers. Therefore, they need to issue clear guidelines for the submission of different types of electronic documents. This ensures future accessibility in the long-term.

52

National governments and regional authorities should set up coordination and dissemination infrastructures that help cultural heritage institutions to make informed decisions on future technological developments.

Besides a national help desk, experts participating in the DigiCULT study especially favoured the foundation of regional cultural Research & Development (R&D) centres to actively support smaller memory institutions in the regions through a range of services.

As members of all important standards consortia, these regional cultural R&D centres would:

- participate in standards test beds, evaluate and translate the results and guidelines and make them widely available to regional cultural heritage institutions;
- provide training on standards and their use;
- raise awareness about newly developing standards;
- monitor and test new technologies for the cultural sector and issue recommendations and guidelines on the implementation of new technologies in cultural institutions;
- hold courses and workshops for staff in cultural heritage institutions such as digitisation, project management, life-cycle management of digital resources, etc.;
- support small archives, libraries and museums in technological questions either on site and/or via a help desk.

53

With the help of European Commission framework programmes, projects that focus on building target-group specific intelligent guides to cultural heritage resources should be solicited.

These intelligent guides should include:

- “intelligent” querying interfaces that offer: multilingual support, near natural language interaction, context-sensitive (i.e. role-specific, profession-specific) querying and presentation of content;
- adaptive/learning systems that support the ability to process frequently asked questions (FAQ) and associate them with experts’ answers in a knowledge base;
- intelligent guides that exhibit collaborative behaviour, thus being able to contact “neighbouring” agents in order to make further relevant information accessible to the user.

Key issue 2: Mass digitisation of objects

Today, the volume of material to be digitised is the most pressing digitisation issue, and related to it, the need to select. With growing scale, the nature of cultural object digitisation changes considerably and poses problems to cultural institutions that are not yet solved, such as mass digitisation, integration of metadata at the point of digitisation, the internal transfer and storage of huge amounts of data and, of course, the exploding costs related to all these tasks. Volume and scale of future digitisation highlight the need for automated processes and integration of cultural object digitisation into the overall workflow within cultural heritage institutions.

In addition, it requires the establishment of comprehensive selection policies that are driven by a clear understanding of the *why* and *for whom* material should be digitised. Organisational policies for digitisation should be directed by a national digitisation programme to set priorities and avoid the duplication of work.

54

National governments and regional authorities should formulate clear digitisation programmes that can guide cultural heritage institutions to formulate organisational digitisation policies (see also the chapter: National Policies and Initiatives).

55

Anchored in national digitisation programmes, cultural heritage institutions should formulate organisational digitisation policies that transparently state the selection criteria based on:

- user demands,
- the quality of the source material (fragile material, etc.),
- future management of digitised material, and
- conservation and preservation issues.

56

Funding bodies of digitisation projects, i.e. national governments, regional authorities as well as non-governmental funding bodies should give a funding preference to projects that prove a good understanding of why and for whom material is digitised.

However, there is a risk that the barrier for small ALMs is too high to participate in digitisation projects because they often lack the expertise and the resources to fulfil these funding requirements. There is a need for a knowledge-based online support tool that could help small institutions to get a first assessment of their collections and ensuing digitisation

requirements. A second step could be to get institutions in touch with experts, so as to improve their chances of gaining access to sources of funding through appropriate programmes.

57

The European Commission should sponsor pilot Research & Development projects and solicit studies in the following areas:

- Best practice cases in mass storage: a study should be solicited to aggregate information on existing case studies for large scale storage in the cultural sector but also in other sectors (for example, NASA and CERN) that deal with massive amounts of data. What can be learned from experiences in these areas about means and costs to handle large-scale projects?
- Automated mass digitisation: fund pilot projects that investigate the possibilities of automated mass digitisation of different kinds of materials, resulting in guidelines that show the limitations but also the potential for future development for certain media types.
- Metadata capturing at the point of digitisation and integration of digitisation with collection management: in cooperation with software vendors, (distributed) systems should be developed that allow to capture and integrate metadata into existing collection management procedures during the phase of digitising material.

Key issue 3: Long-term preservation

As ever shorter technological innovation cycles replace existing technologies at a breathtaking pace of 2-5 years, the urgency to address long-term preservation to avoid the inevitable loss of our cultural heritage becomes ever more pressing.

Current methods of long-term preservation such as technology preservation, migration and emulation are regarded insufficient methods to preserve digital objects over the long-term. In fact, they are considered short-term solutions to long-term problems. To make things worse, experts do not see any rapid technical solution to the problem in sight.

Yet, for cultural heritage institutions to take a “sit back and wait” approach until the whole scene has settled down and the results of research are known, would be the wrong strategy. Instead, they should develop sound principles and policies for the creation and acquisition of digital material that will help them to provide those materials with a significantly improved chance of survival.

Given the urgency of the problem, immediate action from all stakeholders at various levels is required.

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National governments and regional authorities need to take immediate action on long-term preservation and formulate a strategy for digital preservation as part of a national information policy. The strategy should involve setting up a network of certified organisations to archive and preserve digital cultural resources.

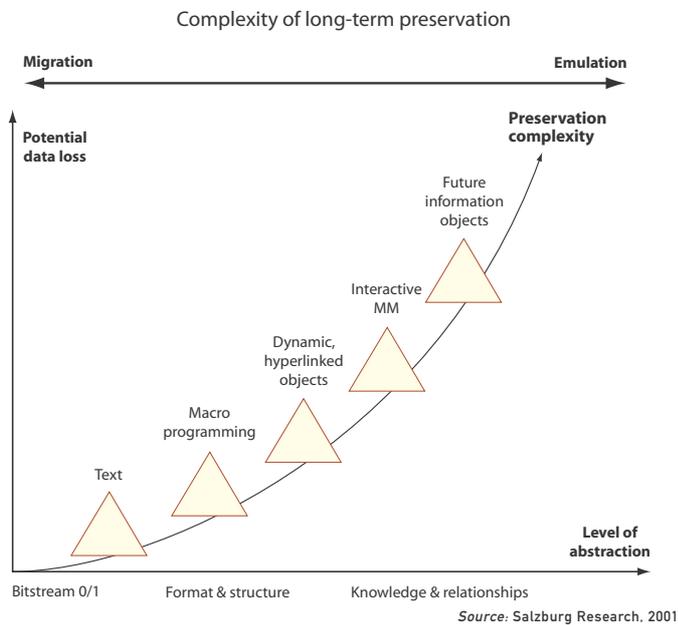
A national preservation policy should include a clear idea on who should be responsible for the preservation of digital cultural heritage in the future. As digital preservation is a costly undertaking that requires great expertise, we recommend the establishment of a network of certified organisations that take care of different types of material. These organisations should closely cooperate at the national and international level and actively seek to participate in Research & Development trials to foster documentation and information exchange for guidelines. These organisations should also monitor all relevant developments

in the digital preservation area. Features of such certified trustworthiness could include: experience in digital archiving, participation in R&D activities, organisational stability and longevity.

59

The European Commission should support Research & Development in the following areas:

- long-term preservation strategies for *complex digital cultural heritage resources*, i.e. immersive environments, multimedia and rich, highly interactive applications, including the creation of a repository of preservation guidelines for different media types, showing migration paths for different materials;
- best practice cases in *emulation* as a long-term preservation strategy, including the above mentioned media types.



Key issue 4: Born-digital resources

Today, we face a situation where electronic material on the web is constantly disappearing. As voluntary responsibility is considered too risky, there is an urgent need to draft the legal framework that regulates the responsibility of archiving and preserving electronic material. Such regulations need to satisfy both, authors and publishers as content rights holders and the archival institutions that represent the interests of the users.

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In those European Member States that have a legal deposit system, national governments should expand the legal deposit to include electronic and born-digital material.

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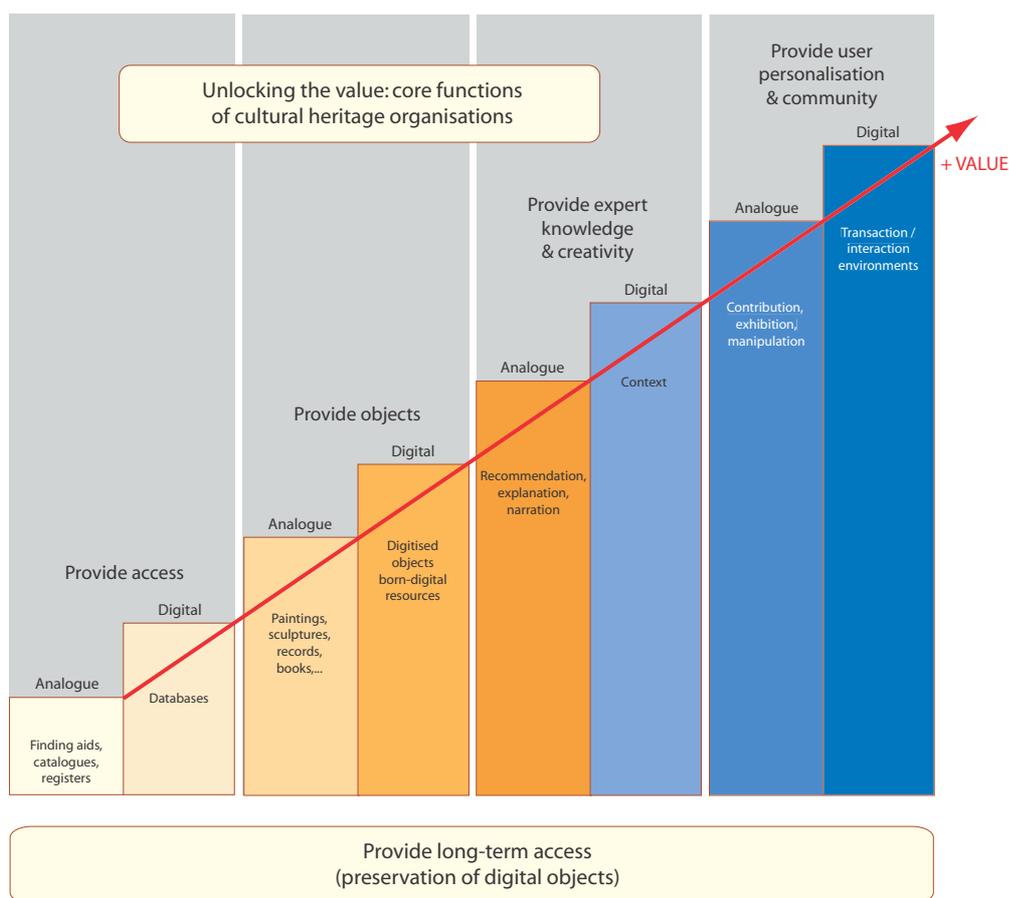
In countries without a legal deposit system, national governments and regional authorities should nevertheless appoint trusted organisations to collect, make accessible and preserve born-digital cultural resources. These trusted organisations should then enter into negotiations with content providers to approve on rights agreements for deposit and future use.

62 The European Commission should support actions to raise awareness for long-term preservation of born-digital resources outside the cultural heritage community.

In particular, such actions should address industry as well as all other areas where born-digital material is created, to facilitate awareness at the beginning of the resource life-cycle, at the creation stage. To this purpose, the European Commission should also publish preservation guidelines for non-cultural sectors (e.g. accompanying measures, take-up actions, etc.).

Key issue 5: New tools in the box

For memory institutions to reach broader audiences, they need to move beyond resource discovery and offer services that also relate to people’s lives. This means to use one’s core competencies, i.e. the knowledge and expertise of curators, librarians and archivists on holdings and collections, to build knowledge-rich multimedia information resources that provide explanation and guidance as well as additional context. In addition, cultural heritage institutions need to provide the tools to enable users to create their own meaningful stories.



Source: Salzburg Research, 2001

To generate those knowledge-rich, interactive multimedia services, memory institutions need tools and systems that are interworkable. These tools and systems should integrate people in collaboratively shared spaces that are both interactive, allowing a high degree of user involvement and control, and intelligent, systems that are able to “learn”.

Immersive interactive environments as one key area for museums, personalisation and customisation tools, intelligent recommender systems, new forms of navigation support and intelligent guides as well as non-technical authoring tools and distributed hypertext systems for collaborative work, are only a selection of tools that cultural heritage institutions will need at their disposal in the future. In addition, there will be a range of other systems that are currently used and further developed in other industry sectors that will support memory institutions to deliver the kind of tailor-made and highly interactive services that allows them to fully unlock the value of their resources.

However, the true achievement does not necessarily lie in the ability to understand all those systems in their technical detail, but to put them together and integrate them with existing collection management systems. Due to the lack of technology skills but also of business and marketing know-how, cultural heritage institutions should seek cooperation with private companies, larger institutions or new types of cultural heritage institutions that provide the skills and know-how they lack.

63

In the 6th framework programme for research, technological development and demonstration activities, the European Commission should solicit proposals in the following areas:

- high productivity tools for non-technical users, for example knowledge based authoring;
- interactivity through a wide range of human-machine interfaces, e.g. three-dimensional, highly immersive, interactive environments, augmented reality, etc.;
- collaborative tools supporting various modes: expert-to-expert, layman-to-expert, layman-to-layman, e.g. distributed hypertext systems for advanced content authoring and management;
- intelligent systems that support users at different levels, e.g. recommender systems, personalisation and customisation systems, knowledge-based intelligent agents, etc.

64

To minimise the risk and gain access to knowledge and skills they lack, cultural heritage institutions should seek strategic partnership with intermediaries, private companies, and/or larger cultural heritage institutions to commonly build the kind of new cultural services customers will demand in the future.

Key issue 6: The widening technology gap

Experts estimate that less than 10% of all cultural heritage institutions in Europe are in the position to participate in the digital era. The great majority of memory institutions – the local museum focusing on the history of a village, the community or church library or the highly specialised historic archive – do not even possess the human, financial and technological resources to participate in the information society.

There is a risk of widening the gap between the leaders in the cultural heritage sector and the technologically less developed institutions by focusing Research & Development (R&D) projects exclusively on technological innovation. In addition, the formal and administrative criteria to partake in European Union R&D projects are too high. The biggest impediment here is the lack of capacity in the cultural heritage sector.

65 The European Commission needs to lower the entry barriers for small memory institutions and develop a slipstream model for R&D participation.

Similar to the SME programmes that are an established part of EU-funding, future European R&D programmes should leave room for initiatives that allow smaller cultural heritage institutions, that do not yet work with information and communication technologies, to participate. Such programmes should focus on consolidation, sustainability and technological innovation but also on teaming up between the leaders in the field and technologically less developed memory institutions.

Teaming up with organisations that already have much experience and using them as centres of excellence, could be one way of approaching the threat of a technology gap between cultural heritage institutions. In the proposal evaluation, a bonus should be given not only for technological innovation, but for projects that demonstrate knowledge-transfer to technologically less developed institutions (slip stream model).

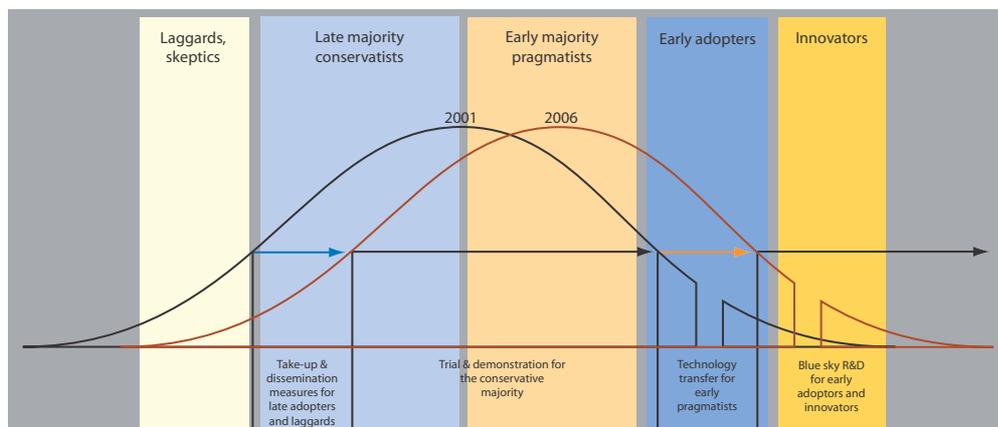
66 National governments and regional authorities need to lower the entry barriers for small memory institutions and actively foster cooperation between large and small cultural heritage institutions for knowledge transfer.

67 In the 6th framework programme for research, technological development and demonstration activities, the European Commission should find a good balance between the funding of innovative, high risk projects and R&D programmes that allow smaller cultural heritage institutions to catch up.

Experts estimate that 90% of all cultural heritage institutions are not yet ready technologically to participate in the information society. On the other side, we have a small percentage of technological innovators and early adopters who successfully implement the latest technologies in their business. The two groups have very different needs.

The greatest challenge for the 6th framework programme for research and development is to find the right balance for funding targeted Research & Development programmes that support both the leaders and the laggards in the cultural heritage sector.

Diffusion of technology in cultural heritage institutions:
stimulus through targeted R&D programmes

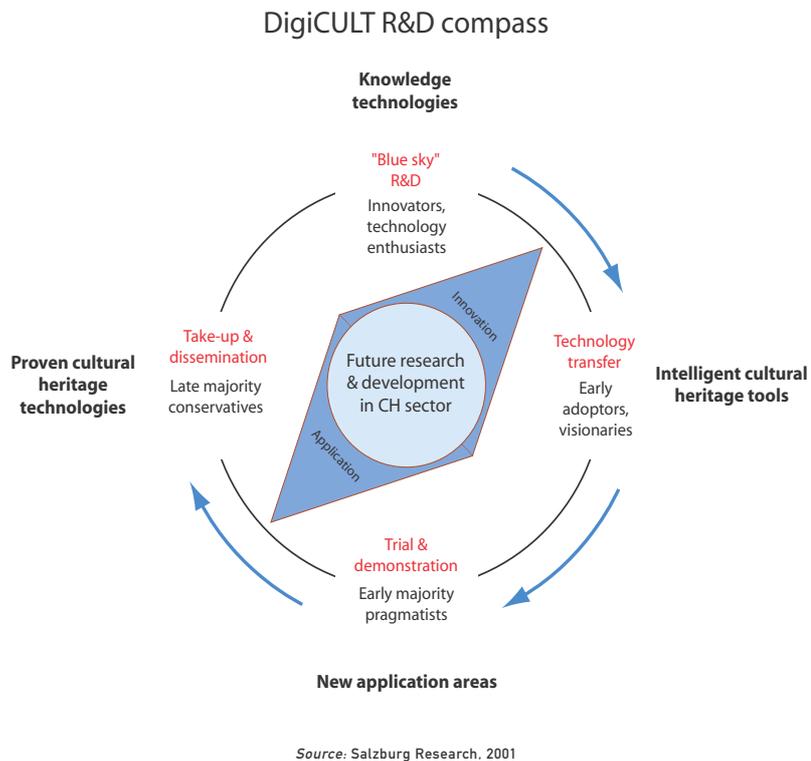


Source: Salzburg Research, 2001

Key issue 7: Future R&D compass: Knowledge technologies for cultural heritage

Cultural heritage is an application domain that traditionally does not drive technological innovation. Nevertheless, cultural heritage poses some of the most challenging questions for technology that are not yet solved, e.g. highly complicated knowledge representation problems with extremely complex requirements such as fuzzy concepts, temporally changing views of knowledge objects and different schools of interpretation. Contrary to popular thinking, the cultural heritage sector could in fact, be a very good application area for building new technologies as it offers many technological challenges that could be drivers for significant innovation.

The above assertion can be justified: cultural heritage is about *knowledge*. Furthermore, it is about *knowledge in a societal context* and even more complex, about *knowledge* whose societal *context changes* over time. Thus, cultural heritage institutions should be prime users of knowledge technologies and, interestingly, by creating catalogues and classification schemes, they are themselves in the *business of developing knowledge technologies* (albeit with often inadequate tools).



One of the major policy recommendations is to foster the use, adaptation and adoption of knowledge technologies by cultural heritage institutions, and to foster further exchanges of expertise between cultural heritage experts and knowledge technologists.

68 Foster collaboration between intelligent cultural heritage and FP6 knowledge technologies.

In future Research & Development programmes, cultural heritage applications should become testbeds for innovative knowledge technologies.

69 Combine knowledge bases, learning systems and agent communication systems under a common vision related to cultural heritage and ambient intelligence.

The vision of “ambient intelligence” requires a combination of technologies: existing knowledge repositories must be made accessible through appropriate knowledge exchange standards.

70 Foster research into business models and systems for trading cultural content, leading to the exchange of knowledge goods between diverse societies.

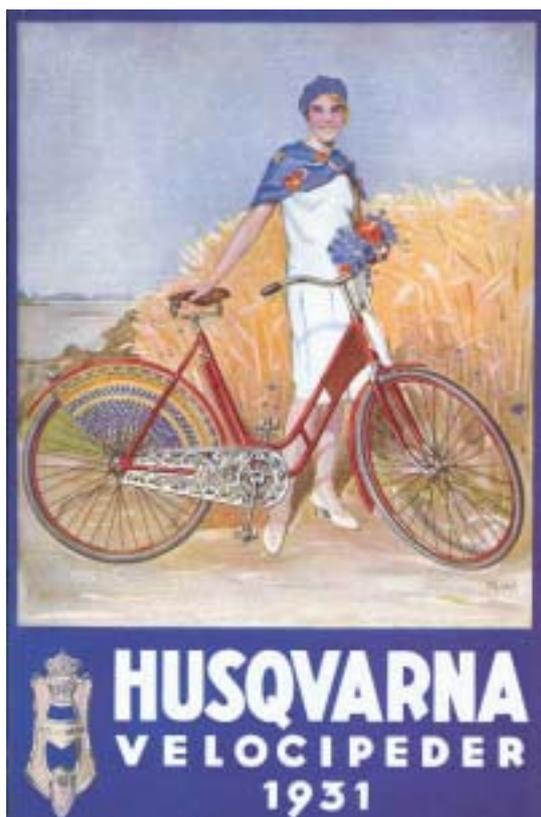
Media companies are interested in acquiring content in order to create media products from it (Microsoft, Warner, Bertelsmann, etc.). ALMs are prime holders of content but have little experience in adding sufficient value to it in order to develop the content they own into products. It is therefore suggested to support research and development on business models that relate culture and economy in ways that demonstrate the value of cultural heritage not only in quantitative terms, but also in qualitative terms.

71 Advanced research programme: Foster research into cognitive engines that process artefacts of cultural heritage autonomously.

This includes technologies for feature recognition to ultimately enable semi-automatic cataloguing, systems that can aggregate feature spaces to symbolic representations, as well as technologies that can manage culturally aware interpretation of interactions between agents, be it human or machine based.

VI CONCLUSION

Future perspectives



Husqvarna advertisement for bicycles, 1931

What has been described as “dreary future” in the situation analysis at the beginning of this Executive Summary, can turn into “some sunshine”, if the various stakeholders and decision makers in the cultural heritage sector take action. Although some of the issues described here, may not be solved within the next five years, the experts participating in the DigiCULT study are confident that the majority of challenges will bring us closer to the goal of unlocking the value of the cultural heritage sector.

A future with a vision

At present, defining clear visions for the future of the cultural heritage sector is on the agenda of several European Member States. And other national governments, who have not yet set the course for the future development, will do so in the context of comprehensive European initiatives like e-Europe. In the future, such a clear vision embracing a diverse, multicultural and multilingual perspective of cultural heritage will provide the basis for all political action and inform programmes and implementation initiatives. If national governments really succeed in expanding the vision of cultural heritage to also provide room for the many different cultural and, literally, multilingual voices within society, there is the possibility of governments using culture as an integrating force within an increasingly fragmented society. In addition, national cultural heritage policies will define access to information as a basic right of all citizens in the information society, with this access being free of charge.

In 2006, national governments will have clarified the responsibility of who is taking care of born-digital cultural resources. Depending on their different administrative structures and funding mechanisms, national governments will either establish central or distributed archiving services. In addition, with regards to a legal deposit for electronic resources, national libraries will play an important role.

In 2006, digitisation policies will be in place that provide a clear road towards a critical mass of cultural heritage resources. Education will be one of the key drivers in the cultural heritage market, and educational institutions, teachers, students, and life long learners will constitute the most important user groups of digitised cultural heritage resources. Although intellectual and other non-economic values will be acknowledged, national governments will stimulate public interest in cultural heritage resources especially in the educational and tourism sectors and actively create market demand for digital cultural products and services. However, the primary measure unit to determine the value of cultural heritage resources will be their use, and not necessarily their commercial value in the market. Moreover, what the public purse will pay for is the intellectual value, not the commercial value of cultural heritage resources.

Organisational change

In 2006, a top priority of cultural heritage institutions will be to increase the capacity of their human capital. Supported by regional and national information support centres, they will receive professional training to increase their technology skills and improve their knowledge in project management. These centres will also provide technical support, especially for small and under-resourced cultural heritage institutions.

In 2006, there will be no more trial and error approaches to digitisation. Cultural heritage institutions will digitise traditional holdings based on clear policies and strategies that are mainly driven by a strong demand for high quality digital learning material. They will split functions with technologically specialised organisations, who have been set up to manage and archive digital collections. Thus, cultural heritage institutions can focus on their real value (contextualisation, knowledge, expertise) and need not enter into risky and expensive activities beyond their capability.

In the networked environment, cooperation at all levels, between sectors and between

institutions working at different scale, is a key success factor. There will be intensive information exchange on all topics that demand a coordinated and consensual approach, such as digitisation, standard compliance, best practice and quality procedures. In addition, by teaming up with centres of excellence, small institutions especially can benefit from successful know-how transfer (slipstream model).

With regards to presenting their collections and holdings, they will face the challenge not only of presenting digital objects, but of enriching and augmenting user experience using their knowledge and expertise, through easy-to-use tools.

However, in the networked environment, cultural heritage institutions will also face increasing competition as users do not differentiate between institutions but instead assess organisations by a set of clearly recognisable sector standards. Only institutions that implement best practice standards into their day-to-day work will reach the necessary level of quality. For example, the ability to interact with digital cultural artefacts will be one quality measure and organisations that fail to meet these standards will be rated as second class and mediocre. The result will be declining user numbers, and linked to that, decreased funding from public bodies.

Running commercial services

In 2006, there will be a clearer view of the conditions under which cultural heritage institutions can gain some margin in commercial ventures. Memory institutions will increasingly run commercial services, yet their business activities will be communicated and understood as activities undertaken to recover some of the costs they have incurred in providing their services to the scholarly and educational communities, as well as to society at large. For going commercial, intermediary organisations in the cultural heritage sector will play a key role.

If public investment covers the initial costs (over a suitable time period that goes beyond the normal project period of 3–4 years), cultural heritage institutions will be able to cover the running costs. Yet, additional funding will be needed to continue implementing a target-oriented digitisation programme. Instead of trials to convert cultural heritage institutions into commercial units that search in vain for the hidden commercial value in their collections, a strategy is in place to develop cultural and historical themes together with cultural industries and the media. This thematic focus approach is used to bring interesting cultural and historic material into the market. By establishing certain themes that commercial companies (e.g. publishers) and other stakeholders can buy into, cultural heritage institutions have clues at hand in order to purposefully “mine” their collections.

There will be a strong public interest in the new landscape that is manifest in the usage of digital resources and services for a variety of personal, group related and local purposes. These users will not necessarily be the current clientele of memory institutions but new types of users. Leading institutions will also use the latest technologies to attract the attention of the younger generations.

New user platforms and virtual protected environments will be key areas of the technological landscape of tomorrow’s cultural economy. They will be the places to go first for a variety of user groups, be it school classes, lifelong learners, and tourists. Within the “attention economy”, these new platforms and protected environments will function as collectors and aggregators of attention for the offerings of cultural heritage institutions and the many contributions they give to the knowledge society.

Basic indicators for the success of cultural heritage will be: the number of existing platforms, the multitude and plurality of services offered, and overall, if services are used by certain larger user segments.

Using technology

Open and/or established sector standards will be used widely but semantic interoperability and multilingualism will still be a challenge. With regards to seamless access, users will be able to directly search and retrieve information from heterogeneous cultural databases, using more intelligent search tools that deliver better quality results. Some multilingual search engines will be available, although information about objects will remain in the native language. Through the widespread use of authority files and thesauri, users will receive adequate search results. Digital objects will be presented in enriched, highly interactive environments and can be manipulated, altered and used to create one's own story. Users will be supported by intelligent and increasingly knowledge-aware technologies.

Through European, national as well as regional initiatives, the majority of small cultural heritage institutions have established a web presence, and have reached a skills level enabling them to participate actively in cultural heritage projects.

One of the issues that will not be solved within the next five years is long-term preservation of complex digital objects. Although cultural heritage institutions will have a better understanding on how to actively manage the life-cycle of different media types, the available technological solutions and strategies will remain short-term answers for a long-term adventure.

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Ref: Circ.592&A-1966

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Maker: Charles Rennie Mackintosh

Year: 1917

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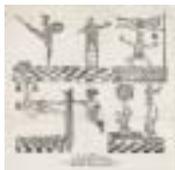


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Med Kongl maj:ts allernådigaste tillstånd uppföres uti härwarande theaterhus /Ö/ En Stor Representation (By His Royal Majestys Command will in this Theater a Great Representation be Performed)

Circus poster (45 x 60 cm), illustrator unknown

Year: 1839



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Husqvarna advertisement for bicycles 1931.

Husqvarna vapenfabrik was in the beginning a rifle factory, but at the end of the 19th century the manufacturing of sewing machines, motorcycles, stoves, bicycles etc. began. 1978 Husqvarna was bought by Electrolux, and today with the manufacturing of motor saws Husqvarna is keeping its leading position.

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Wax death mask of Mary, Queen of Scots, 1587

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Tabula Peutingeriana

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