

# **Digital Applications for Tangible Cultural Heritage**

Report on the State of the Union  
Policies, Practices and Developments in Europe

Volume 2



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# INTRODUCTION

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# 1

The second issue of the report on the “State Of The Union” on the use of Information and Communication Technologies in the field of Cultural Heritage adopts a different approach from the first one. Apart from completing the information on the European countries provided in the first issue of the Report with the two reports from Sweden (by Halina Gottlieb) and Bulgaria (by Hristina Staneva and by Milena Dobрева) included here in the appendix, the papers of this volume deal with general issues.

The two main contributions by David Arnold and Neil Silberman approach the core of the problem from opposite – and complementary – perspectives.

David deals with the technological challenges arising when applying IT to heritage content. However, his approach is not positivistic. He is aware that the many peculiarities of heritage challenge the ability of technology to cope with the needs of users and applications. The statement appearing early in his paper that “there may be as many digital representations of a single artefact as there are purposes for their creation” pairs with the statement that in archaeology “theory creates objects”<sup>1</sup>. In another passage, a similar concept appears: tangible heritage, the primary target of digitization activities, incorporates intangible features and interpretation. David’s consciousness of the blurred border between intangible and tangible, data and interpretation, objects and

context, theory and facts, may be the better warranty that the answers he gives here to a number of very practical questions are not just a cookbook of easy recipes. Nonetheless, the result is not discouraging. Heritage professionals are invited to take part, as essential protagonists, in the search for better tools, as described, for example, in EPOCH’s Research Agenda.

Silberman regards the problems standing in the middle of the cultural debate. He identifies four main issues, i.e. heritage conservation, common understanding among scholars, marketisation of culture and the social function of heritage. In examining these areas in detail, Neil clarifies some technological problems with great precision. Firstly, he points out that information management problems are not a mere question of agreeing on common data structure, but they derive from different approaches, histories, habits, methodologies and research focus: in a word, from the diversity of the ontologies different specialists use. Exploring how this diversity can be managed may turn IT from a mere facility into a substantial pillar for “innovative, multidisciplinary forms of historiography”. The same concept is expressed as a must on the IT side by Martin Doerr, when he states, as quoted in EPOCH’s Research Agenda<sup>2</sup>, that without ‘fundamental’ investigation on research processes, question and discourse, “research on other topics would continue to be ‘blind’ as to what the real issues are.”

1 I. Hodder (1999) *The Archaeological Process* London. Blackwell, p. 84

2 D. Arnold and G. Geser (2007) *Research Agenda for the Applications of ICT to Cultural Heritage*. Budapest, Archaeolingua, p. 59

In Silberman's description, conservation, marketisation and identity problems share the common issue of sustainability. It is generally accepted that heritage must be preserved, that it has to achieve some degree of self-sustainability and that it has a social value going well beyond "study, education and enjoyment" insofar as it provides a sense of collective, although diverse, identity. Much debate has recently taken place on the common roots of Europe and if these should be explicitly quoted in the European Constitution; however, they are crystallized in the archaeological sites, the historic buildings – including churches and synagogues – and the monuments that populate the European landscape, and they are under the eyes of every citizen and of every visitor. Exploiting this commonality together with individual contributions to collective social memory indeed creates new challenges to technologists and to the capacity of culture professionals to cope with a tumultuous growth of user-created content, needing systematization, verification and supervision. Neil advocates that "ICT can take the lead in monitoring the long-term economic dimension" for the "effective shaping of future policies and development designs".

The economic issues underlying sustainability as outlined by Neil Silberman are dealt with in the next two papers, a survey by Kaminski, McLoughlin and Sodagar of the methods used for valuating heritage in Europe and an economic analysis by Rizzo of preservation policies.

Often, heritage professionals are concerned about the implementation of digital technology because they have no idea of costs. Another paper in this volume reports on costs and efforts required for 3D data acquisition, providing information that is usually unavailable in publications. Although related to specific cases, it may serve as a rough guideline to estimate the cost of such an operation.

This economic perspective completes the picture of this report, which is the natural complement of EPOCH's Research Agenda. On the one hand, it aims at providing the policy framework in which research priorities are placed. On the other, it gives an approach to these issues that may be of some interest also for those who are not professionally involved, or personally interested, in detailing future avenues for technological CH development, but simply believe that heritage keeps an important place in the post-modern 21st century society, although incorporating the technologies which already play such a relevant role in everyday life.

# EUROPEAN DIGITIZATION POLICIES: THE CULTURAL AND POLITICAL BACKGROUND

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European policies on digital libraries, *in primis* i2010 [i2010] have set ambitious objectives for the creation of the European Digital Library in terms of quantity, and have defined *digitisation* (intended as the complex of activities required to capture, store and manage cultural digital assets, be they digital replicas of pre-existing objects of cultural relevance, or directly born digital), *on-line access* and *preservation* as the three key areas for action to achieve them. The Dynamic Action Plan [DAP] has put the focus on resulting key issues, including among others: strengthening coordination and forging stronger links among stakeholders and actors; overcoming fragmentation and duplication; and assessing and identifying appropriate models, funding and policy approaches. On the other hand, Member states have developed national strategies towards digitization and provision of digital content, to be managed through the results of advanced research coming from the academy, research institutions, national projects and EU-funded trans-national cooperation. In particular, a number of FP6 projects have focused on research and development and have aimed at overcoming fragmentation. Significant results have been obtained so far under several regards: national policy harmonization, for example by the NRG activity supported by the Minerva and Minerva+ projects; digital library technology, for example by the FP6 IST EU-funded projects in this area; joint activity by National Digital Libraries; various other initiatives, notably those carried out so

far by the EPOCH Network of Excellence on tangible heritage concerning technologies, standardization dissemination, surveys, training and publications. Although great progress has been achieved, the involvement of “traditional” cultural institutions in digitization is still limited to a few large ones, compared with the richness of European cultural heritage, which is based on the capillary diffusion of its assets.

There are several factors impacting on a potential two-velocity digitization process.

Firstly, **the technology for capturing, storing and managing digital content different from text still requires a greater deal of research effort when compared to text-oriented technology.** Research is still in progress, for example, on image annotation, 3D modelling and visualization, and so on. While text digitization and further treatment, for instance OCR, is a mature technology (but still with some areas open for research: see for example the impossibility of OCR for some early 19<sup>th</sup> century books printed in Gothic fonts), the technology necessary to process 3D data is not yet within easy reach for all cultural institutions, and the debate on guidelines has not yet reached enough consensus, although the awareness on such methodological issues has substantially increased. Digital heritage technologies include a number of research areas ranging from 3D data capture (with all its multiple facets of scanning, image-based modelling, etc.), to 3D modelling (geometric modelling, incorporation of 3D scans into geometric models, procedural

modelling, etc.), 3D visualization, 3D data management (repositories, ontologies for 3D, etc.) and so on. Moreover, application scenarios bring in additional specialization, for example there exists a research area concerning underwater archaeological 3D data capture. All these technologies pertain to what we call “digitization technologies”, but are not always perceived as such, i.e. their paramount importance for the creation of a European Digital Library is sometimes underestimated. Needs and priorities concerning research on digital technology for cultural heritage have been examined in detail in the EPOCH Research Agenda report [Arnold and Geser 2007]. With the notable exceptions of the Methods Network in the UK, DEN in the Netherlands and a few others described in detail in [Niccolucci 2007] there does not appear a serious commitment by the European Member States to push and sustain research in this area, although projects concerning digital technology for heritage are funded here and there under generic research programmes. In this field, the situation described in the first issue of the SOTU Report [Niccolucci and Geser 2005] has not changed that much.

**Multimedia cultural assets are sparse and fragmented throughout Europe in a more substantial way than texts.** Digitizing the content of national libraries and making it available in a European framework would indeed guarantee the availability of a very large part of the printed text patrimony. Since the invention of print, books usually come in multiples, and the fragmentation, or, sometimes, duplication, of libraries and their content was in the past mainly aimed at facilitating public access in person – that in a digital library will be substituted by on-line access. With some notable exceptions of rare and antique books, and perhaps of some specialized collections, digitization coverage of a national library guarantees substantial coverage of that country’s printed material. Possibly, it will be necessary to consider more than the 27 national libraries to have an appropriate coverage of European culture(s) as represented in books, but in most cases there

exists one (or few) central library storing the printed patrimony of a nation’s or minority’s culture. The situation is completely reversed as far as non-book content is concerned. These cultural assets, stored e.g. in museums, consist of unique artefacts, with in principle no (or few) duplicates. Although many museum items are somehow “interchangeable” with similar artefacts stored elsewhere – this is the case, for example, of many “minor” archaeological finds – most of them are nonetheless unique, for being unique individual pieces or for the context which they come from. So digitization policies in the museum domain must cope with a much more dispersed patrimony of cultural objects. In conclusion, **digitization policies** can afford to be initially be less concerned with fragmentation in the library domain, but **must take into account the uniqueness and dispersion of tangible artefacts** when they address tangible heritage content.

Dispersion may mean higher digitization costs. For example, it is unfeasible to create a centralized digitization centre to assist all heritage sites and museums, unless assistance limits to advice, production of best practice guidelines and staff training. Training for museum personnel needs to be more capillary and involve more people. Equipment (e.g. 3D scanners) needs to be moved around, and protocols must be established to achieve similar conditions for data acquisition – which in most cases must take place on-site, either for the fragility of objects or for their immovability. Moving equipment and staff is in general more expensive than creating and maintaining a centralized lab, so the whole operation has higher costs. Storage is another concern, and a major cost factor: 3D models are much heavier to store than 2D ones.

**Fragmentation** affects museum also as far as **ownership** – and hence decision-making and management – is concerned. Statistics concerning museums are unfortunately imprecise at EU level (work has started with EGMUS, [EGMUS], but as shown from the web site under construction there is still much way to go). For the scope of the present paper, the approximate figures given below will suffice. The following table



Table 1: Ownership of museums in Europe (source: Nemo, [www.ne-mo.org](http://www.ne-mo.org)).

Ownership	State	Local gov.	Private	Others	Total	Number
Austria	5%	25%	61%	9%	100%	768
Bulgaria	10%	87%	1%	2%	100%	332
Denmark	7%	15%	78%		100%	276
Estonia	50%		50%		100%	60
France	4%	71%	14%	11%	100%	1400
Germany	9%	43%	36%	12%	100%	5629
Greece	68%			32%	100%	302
Hungary	11%	62%	2%	25%	100%	812
Ireland	5%	7%	89%		100%	169
Italy	13%	46%	30%	10%	100%	4119
Lithuania	16%	59%		25%	100%	NA
Luxembourg	24%	73%	2%		100%	45
Poland	2%			98%	100%	623
Portugal	18%	44%	38%		100%	591
Sweden	33%	67%			100%	95
The Netherlands	3%			97%	100%	1250
UK	14%	36%		50%	100%	1851
Total EU-27	11%	40%	25%	24%	100%	18322

reports the composition of ownership for museums in the EU-27 countries. The source is the independent museum association Nemo [Nemo].

Since the national delegates of this association are well-known museum professionals, these figures are reliable enough, although information is not available for a few countries, which do not appear in the above table (data are not available for Belgium, Czech Rep., Cyprus, Finland, Latvia, Malta, Romania, Slovakia, Slovenia and Spain). The different EU regulations and situations have somehow increased the value of “Others”, which includes in any case non-state-owned museums, for example museums owned by the Catholic Church in Italy (about 12% of the total), while in The Netherlands all museums are private foundations and the number quoted here as “State” refers to those subsidized by the state, with a large part of the “Others” including those prevalently funded by local government. With the notable exception of Greece and to a lesser degree of Sweden (and the possible outlier, as a very rough fifty-fifty approximation, of Estonia), it results that in most European countries the state owns and manages only 10-15% of the museums; a large part, usually over 50%, is owned and funded by local governments; a significant part is

owned by privates or other organizations like churches and charities. Considering also the memory institutions of the countries for which data are unavailable, it may be estimated that the number of museums in Europe reaches and surpasses 20.000 units. The EMF gives a figure of about 35.000 for the total number of museums in Europe, including also the European States that are not EU members. This possibly means that the figure of 20.000 largely underestimates the total number of museums in EU-27.

Will a policy designed on the British Museum, the Louvre and the Uffizi Gallery impact on all them? Rather unlikely. National policies may have little influence on privately or locally owned institutions. Ignoring this fragmented situation would undermine any EU strategy on digitization: small and medium memory institutions are the SMEs of culture, and must receive the same attention SMEs receive in economic policies. EU digitization policies for museums may therefore rely only up to some degree on the large memory institutions, managed directly or indirectly by member state administrations: a large majority (about 85-90% according to the above figures) is owned and managed by others, be they local governments, private or other organizations, and respond to

other priorities than the centrally owned ones. Moreover, there are different funding mechanisms in the European Countries, as described in an accurate EU Parliament publication on the funding of culture [Klamer, Petrova, and Mignosa 2006]. The table on page 8 shows that digitization is a priority only in Austria, France, Ireland, and Luxembourg, while tangible heritage in general is a priority in Belgium, Cyprus, Czech Republic, France, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia, Spain, and the United Kingdom (Scotland) – presumably with some (minor) role for digital technologies too. This publication shows also that diverse models apply to funding in different countries. The report considers only funding of culture, while for our goals also research funds must be taken into account, what introduces an even larger variability. What is also interesting is the diversity in funding systems. Some countries use a centralized funding scheme, at governmental or de-centralized level. Others, typically the UK, have adopted the “arm’s length principle”, that is the insertion of Non-Departmental Public Bodies between the government (which provides funds and defines general strategies) and the final beneficiaries, in order to limit political influence and lobbying on fund distribution. So government influence reaches only the “arm’s length”, where decision is taken over by NDPBs. This scheme is also adopted in Nordic countries, while in others there are councils similar to NDPB with an advisory – and not decisional – role. One might argue that the system works as long as the NDPB is neutral, i.e. it is not parcelled out among political parties or – perhaps even worst – among cultural and academic lobbies. Attempts to correct such deviations have been introduced by several countries, for example using foreign referees, supposedly less involved in national malpractices. Nonetheless, there are still examples where the academic or political mafia determines most of the national choices (see [Niccolucci 2007] for the quotation of an official report denouncing these practices).

Anyway, and ignoring such distortions, the influence of governments on heritage practices is mostly limited to general principles and directives. This is particularly true for countries having a decentralized cultural policy, such as Austria, Belgium and Germany (in the latter there is no federal Ministry of Culture). In others, direct influence is limited by the fragmentation of ownership. Indirect control based on funding is also limited, either because there is the intermediation of an “arm’s length body” or because the central policy privileges prestige projects – which perhaps explains the plethora of projects concerning Pompeii, the Coliseum and Stonehenge.

Another consideration underlines the fragmentation in the museum sector. Official statistics demonstrate that there are **different “consumption” models of the cultural resources** represented by museums and historic or archaeological sites. Giving detailed values for all the 27 member states would take too much space here, so we will limit ourselves to two exemplary cases. In the UK, where statistics are made available by MLA and DCMS (the state department with responsibility on museums, [DCMS]), data from the latter show that Tate, the British Museum and the National Gallery together have accounted for a half of all the visitors of the 20 state supported museums, both in 2004 and 2005. In Italy, official statistics from SISTAN (the statistics department of the Italian Ministry for Cultural Assets and Activities, [SISTAN]) concerning state-owned museums show that the five top-sellers, i.e. the Coliseum complex in Rome, the Pompeii site, the Uffizi Gallery and Accademia Gallery in Florence and the museum of Castel S. Angelo in Rome (in this order), make 50% of the (paying) visitors of the 463 state-owned museums, with the Coliseum reaching alone 20%. A very similar visit pattern applies to historic sites. Just considering UNESCO World Heritage Sites, which is only a (small) part of the European built heritage, and again referring to Italy as the country with the highest number of UNESCO-listed sites, from a 2003 study it results that the three most visited ones (over 35, i.e. less than 10%

of the total) make 64% of the visitors; the least visited one, in Sardinia, does not reach 0,1 % of the total number of presences [Arosio and Cecchini 2003, pag. 10]. According to the above, it is necessary to define **different “business” models** for different kinds of memory institutions: large and over-visited ones, medium sized and small, often deserted ones. It is not known what the visit pattern will be for digital libraries/virtual museums, but it is likely that at least at the beginning they are influenced by the present visit patterns for “brick and mortar” ones. In other words, it is probable that a virtual Michelangelo’s David will be more visited than the 3D model of an anonymous medieval Polish Madonna. However, to remain in Italy, there is an example worth mentioning to clarify how apparently irrelevant factors influence cultural activity. In 1972 two wonderful bronze Greek statues from the 5<sup>th</sup> Century BC, later to be named the “Riace Bronzes”, were recovered in the Ionian sea near Reggio Calabria, in the extreme southern part of Italy. They were brought to Florence for restoration, which lasted until 1980. Then the statues were exhibited in the Florence archaeological museum, and were visited by more than 700.000 visitors, causing the planned exhibition duration of 20 days to be extended to 6 months. A similar success was later obtained by a much shorter temporary exhibition in Rome. Afterwards, they were placed in the Reggio Calabria museum, where in 11 years (1996-2006) they were visited by 728.378 paying visitors: paying visitors here have reached in 11 years the number of paying visitors of the 6-month Florence exhibition! This collapse of popularity (Italian state museums have some 16 million paying visitors per year) cannot only be explained with the initial appeal for the two newly found statues; it is more likely to be caused by the remoteness of the venue, placed 700 km/8 hours away from Rome at the extreme southern point of the peninsula. It is reasonable that a virtual museum as a part of a wider DL would greatly enhance the knowledge of these two masterpieces and, who knows, might induce more people to visit them in person.

In conclusion, **European cultural heritage is diverse under many aspects**. It is hosted in or represented by a huge number of small and medium (and a few large and well known) memory institutions, including: museums of any size, ownership and organization; still inhabited cities; archaeological sites; historic palaces – sometimes used for quite different functions (eg. hosting local authorities or public offices); cultural landscapes; and more. Visit patterns are quite different, ranging from mass consumption (as it is the case of a few very large and famous ones) to frequentation only by scholars or pupils of local schools. Yet, the cultural identity of Europe consists of this mosaic of small pieces and depriving it of many small stones would substantially alter the overall picture.

More problems add to the above. The fragmentation of cultural heritage management, which reflects the necessity of managing it at the appropriate community level, has caused an almost complete **lack of standardization**. In practice, every country, and sometimes every region within countries, has adopted different regulations for documenting cultural heritage, and also in museums standardization is still lacking (for an up-to-date report see the one published on the EPOCH web site [EPOCH]). This diversity reflects into the currently available, or forthcoming, digital assets. There is a desperate need and a deep awareness of the necessity of harmonizing standards. This has become apparent among archaeologists, for instance. An initiative involving several national archaeological services to design a system to map national archaeological documentation to a common standard has just started. A preliminary workshop was held in Brussels in March 2007 under the auspices of the EPOCH project, attended by organizations of 8 countries, to prepare a wider meeting in Autumn 2007. The goal of the initiative is to produce guidelines and mapping tools to a common standard. As yet, interoperability is obtained by reducing the interoperable information to Dublin Core (DC). The problem, however, is that DC was

devised for different goals, and does not preserve the richness of existing repositories, so most institutions are going to use the so-called “qualified DC” with the result that every “qualification” is going to be different from the others and again no standardization will result. On the other hand, it is apparent that a great deal of the information is the same, under different names, as it pertains to the same domain; so the objective of extending the core of interoperable data to a much wider common set is in fact absolutely feasible. Experiments with a few countries carried out within the EPOCH projects have given encouraging results. No further technological development will fortunately be necessary: a mapping tool (named AMA) has already been created by EPOCH, enabling mapping just as an exercise. It is likely that a similar process will be planned for built heritage (see e.g. the intention of the EU Commission Environment Unit to foster a “digital identity card” for monuments, as stated in the Unit’s work program for FP7).

**Multilingualism** adds to difficulty. In this regard, however, things are simpler than in the book realm. Since documentation is rather technical, the creation of multilingual thesauri appears within reach. There already exist excellent monolingual thesauri (English Heritage has inherited the RHCMS one for built heritage, for instance) and translations may be envisaged. The Minerva project has surveyed thesauri at a national level pointing out the few multilingual ones. On mainly administrative topics, HEREIN has developed a thesaurus in almost all European languages. Again, it is a matter of mapping, which should be helped by a tool similar to the one mentioned above existing for documentation ontologies. Such a tool should be capable of dealing with trans-lingual correspondences, which often are not one-to-one. EPOCH is considering support to the development of this simple extension to the AMA tool.

A successful strategy is made up also by the people who work for it. In the DL case, problems arise for the diffuse lack of technological skills among heritage professionals. EPOCH has already provided surveys and suggestions for

academic training, and for making it up-to-date with the technological requirements of the DL era. However, we cannot wait until a new generation of computer literate heritage professionals substitutes the present one. It is necessary to extend the analysis to guidelines on re-training people presently working on heritage, both at memory institutions and in contractor companies, and give them skills compliant with their new tasks. It is therefore paramount to produce **general policies and indications for vocational training**. Museum labour includes also enterprises providing “digitization” services, from data capture to multimedia. It is well known that it is very difficult for SMEs to survive only operating in the heritage market. It is therefore necessary to investigate new patterns and business models for creative industries in the digital cultural area, and provide support for SMEs operating in it. A future where content, methods and technology for the creation of digital libraries are available, but nobody wants to undertake this task because heritage professionals do not own the necessary skills and private companies do not want to do the job because it is not profitable, would relegate Europe behind developing countries: it is not just a matter of putting more money here, but of optimizing its use.

**Synergies** of digitization activities with other policies are of great importance. Impact on **tourism** is perhaps self-evident – a market sector worth 440 billion dollars in 2005 (UNWTO estimate). Many statistics indicate in culture one of the main reasons for visiting a place. It is not the case to enter here into the details of how cultural aspects impact on tourism and economic development. It will suffice to consider the impact on some of the eight key factors for cultural tourism offer to be “able” for the market, and not just “willing”, as suggested by a paper by LORD, Cultural Resources Planning & Management Inc., an internationally known museum and cultural planning firm:

- Perceived quality of the product
- Awareness of the public



- Extent to which the “product” is perceived to be unique or special
- Convenience

It is clear that such factors may greatly benefit from digital presence in a world where Internet is becoming the main way to plan and organize holidays. Of course, tourism exploitation needs further tools, but the interaction with digital library content must be taken into account when designing the latter to fully benefit of the potential synergies. Digitization may additionally be a key factor for **the sustainability of economic development**. The on-line availability of heritage-related information allows planners to manage better the impact of economic development on the cultural environment. A heritage impact evaluation is already envisaged by the legislation of several EU countries. For example PPG16, the UK regulations issued in 1990 on archaeological heritage and remains, which set out the policy on archaeological remains on land, and how they should be preserved or recorded both in an urban setting and in the countryside, states (art. 20) that “... *archaeological assessment [...] need not involve fieldwork. Assessment normally involves desk-based evaluation of existing information: it can make effective use of records of previous discoveries, including any historic maps held by the County archive and local museums and record offices*”. Clearly here availability of on-line information is paramount and saves time, money and possible mistakes. In France, such “preventive archaeology” activity is regulated by the Loi no 2001/44 of 17 January 2001 concerning “*l’archéologie préventive*” that is all the activities (art. 1) aimed at the discovery and preservation of any archaeological remain susceptible to be affected by public or private development works. The law states (art. 3) “*l’Etat dresse et met à jour la carte archéologique nationale. Elle rassemble et ordonne pour l’ensemble du territoire national les données archéologiques disponibles*”. Here archaeological records are ordered by geographic location to facilitate retrieval of the relevant information and,

again, on-line availability of such records would be a great improvement. In Italy, such matters are regulated by the Law no. 109 of 25 June 2005, which obliges contractors of large public works to accompany the project with documents “*sufficient for archaeological purposes [...] in particular available archive documents and bibliography*” and the results of field surveys and aerial photo analysis. The competent authority examines such documents and “any other available documentation” and decides if the works may be authorized or special prescriptions are required to preserve remains of archaeological interest. Reference to reports of previous investigation, including “grey” literature, is very clear, and on-line availability would facilitate the work both of contractors and of controlling authorities. Some interpretations stipulate that the location of main infrastructures within master plans should be revised after the approval of this law, a desk-based task requiring easy availability – preferably on-line – of the records of previous archaeological investigation, now stored mostly in paper format in the archives of antiquity authorities. On this regard, good practices have been activated in several EU countries, for example in some Länder in Germany, (e.g. Niedersachsen and Baden-Württemberg) digital information about heritage presence is used by planners of large-scale facilities, as for instance a new motorway. Not only the exchange of good practices at the European level produces added value, but also cross-border interoperability might support large-scale planning, for example when trans-national transportation networks are involved as it is the case for Pan-European transport Corridors and Axes, or for new High-Speed international connections.

Finally, digitization has a substantial impact with the **management of heritage** at all scales. Knowledge is a critical factor for effective management. On-line availability of cultural data may enable managers in decision making and in preserving physical heritage. This is one of the side preservation benefits of digitization, but it requires improving the

skills of heritage managers to enable them to profit of this opportunity

In conclusion, the above considerations lead to consider the absolute necessity of developing appropriate digitization strategies taking into account:

- The intrinsic need of diverse and perhaps more refined **technologies** deriving from the nature of tangible cultural assets (as, for example, 3D scanning, modelling and managing the deriving information), by **supporting and disseminating** the results of ongoing research and guidelines for its best use, and, on the other hand, **providing feedback** to programmes and projects in this domain; such dissemination and cross-fertilization is paramount as far as preservation and IPR protection are concerned;
- The **fragmentation and dispersion** of memory institutions and the substantial uniqueness of their content, as opposed to the typical multiplicity of copies of books, by providing localized guidelines and talking to a dispersed multitude of stakeholders;
- The **diversity of management** regulations, budgets, business models, and ownership, by involving all the relevant stakeholders and suggesting scalable and low-cost solutions tailored to the different needs, skills and capability, together with organizational indications;
- The **different documentation systems** deriving from history, culture, local regulations and traditions, to enable going beyond an ineffective core interoperability and preserve the richness of available content, by facilitating the choice of **common standards** and supporting mapping exercises from legacy information; in particular, caring that **linguistic and cultural diversity** is a factor of enrichment and not just an obstacle;
- The need of **supporting the people who work in this interdisciplinary domain**, heritage professionals (training) and enterprises (support to SMEs), by describing **vocational training** characteristics and investigating **business**

**models** and **economic impact** of digitization policies. Such activities will aim at addressing and preparing for other EU or national programmes, for example on vocational training, or the SME support programme included in FP7.

- The **synergies with other domains** (e.g. tourism, planning and heritage management), which need to be taken into account in digitization strategies to exploit them better.

## References

Web pages/sites (as of June 2007)

i2010: [http://ec.europa.eu/information\\_society/eeurope/i2010/index\\_en.htm](http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm)

DAP: <http://www.minervaeurope.org/publications/dap.htm>

DCMS: <http://www.culture.gov.uk/>

EPOCH: <http://www.epoch.eu/>

EGMUS: <http://www.digital-sepia.de/egmusqua/>

Minerva: <http://www.minervaeurope.org/>

Nemo: <http://www.ne-mo.org/>

SISTAN: <http://www.sistan.beniculturali.it/>

A. Klamer, L. Petrova and A. Mignosa *Financing the Arts and Culture in the European Union*. European Parliament, Bruxelles 2006.

<http://www.europarl.europa.eu/activities/expert/eStudies.do?language=EN>

F. Arosio and P. Cecchini *Italia Patrimonio Culturale dell'Umanità*, 2003.

<http://culturaincifre.istat.it/sito/musei/PatrimonioUnesco.pdf>

F. Niccolucci Virtual museums and archaeology: an international perspective. *Archeologia e Calcolatori* 17(2006), in press.

F. Niccolucci and G. Geser (eds.) *Digital Applications for Tangible Cultural Heritage* – Report on the State of the Union on Policies, Practices and developments in Europe. Budapest, Archaeolingua, 2006. Also available from the EPOCH web site.

D. Arnolda and G. Geser (eds.) *Research Agenda for the Applications of ICT to Cultural Heritage*. Budapest, Archaeolingua, 2007. Also available from the EPOCH web site..

# DIGITAL ARTEFACTS POSSIBILITIES AND PURPOSE

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## **Abstract**

Developments in 3D scanning and recording technologies now mean that almost any level of accuracy is achievable in digitisation of historic artefacts. This capability poses challenges to cultural heritage professionals (archaeologist, historian, curator, etc.) who are now confronted with previously unimaginable opportunities and therefore must ask and answer questions of the underlying purpose of collecting digitized models of artefacts, archaeological contexts, historic monuments, buildings or ruins. As with many engineering challenges, there are significant issues of price/performance in undertaking data capture and the range of solutions may lend themselves to addressing different heritage applications.

In this discussion I will address some of the potential purposes for creating and using digital artefacts, ranging from analysis to public dissemination and pose more questions than answers in considering the fitness for purpose of data being collected and the challenges of re-purposing data collected for one purpose for use in a different context.

## **1. Introduction**

There are many potential purposes for creating and using digital representations of cultural artefacts and indeed there are many forms that such digital artefacts can take. It is important to recognise that a digital representation of an artefact is a representation of certain relevant characteristics of the artefact – it is not the complete artefact, nor even a representation

of the complete artefact. It is only a representation of “relevant characteristics”. The definition of what is relevant will depend upon the purposes of creating the artefact.

In principle there may be as many digital representations of a single artefact as there are purposes for their creation, each targeted at a different purpose or combination of purposes.

In practice there are usually reasons for wanting to capture characteristics required for many purposes simultaneously, only some of them known before the exercise of capturing the data is undertaken. The reasons may vary from aspects like the cost of undertaking data capture, to intrinsic characteristics of the actual recording process being undertaken. At one extreme, for archaeologists, data capture is typically a unique opportunity because the act of investigating a site actually destroys much of the evidence. Hopefully this is not true of individual objects, but in many fields the act of digitisation may well involve some risk of wear and tear, ranging from handling fragile artefacts to digitising material that would be sensitive to extended exposure to stronger light than desirable.

For these reasons we should first consider a typical range of purposes and what the relevant characteristics for those purposes might be. Two broad ranges of purposes are:

- applications concerned with documentation and analysis for use by cultural heritage professionals and
- applications with a component of dissemination to the “general public” or at least that

fraction of the public who have a potential interest in the artefacts.

We will now briefly consider these relevant characteristics

## **Relevant Characteristics for Applications of Digital Artefacts**

There are, of course, many aspects of cultural artefacts that can be documented depending upon the analysis to be undertaken. Addison, for example [Addison, 2006] characterizes digital capture technologies in four groups:

Visual: still/video cameras, colour scanners  
Dimensional: 3D scanning, photogrammetry, surveying (EDM/Total station), GPR)  
Locational: GPS sensors. ...  
Environmental: thermal, acoustic, C14, ...

For the purposes of this paper we will consider the categories of data the might be required to support applications in each of the two broad categories in the previous section

## **Documentation and analysis and; Dissemination to the public**

### *a. Documentation and analysis*

Documentation might be as part of cataloguing and recording the contents of a collection, but there are many potential analyses to assist in:

- dating and classification by comparison with other artefacts;
- interpreting the authorship and cultural origins of a digitised illuminated manuscript;
- monitoring deterioration by comparison with the earlier state of the real artefact;
- revealing and image processing the substrata hidden by the final layers of paint in an old master;
- analysing a statue's composition and structure and the processes used in creating it;
- understanding the use of colour in the context of historic lighting conditions.

All of these applications have been attempted using digital representations of artefacts and the relevant characteristics will be different in each case. Some of the “applications” are still speculative or only implemented in demonstrations. These applications, and others, suggest where considerations of data usability may lead to rather different conclusions about the set of characteristics which need to be included in the digital artefact.

The first consideration is obvious, but all too often naively overlooked. Any analysis is supported by the data that is recorded – if the data hasn't been recorded then the analysis cannot be performed. Either different approaches must be adopted to analyse the data that is held or additional data must be gathered. Although this is an obvious statement it may be easily overlooked if the person requiring the analysis does not understand the computational processes involved.

Rather than analyse each of these applications for its individual data requirements, the following is presented as a characterisation of the essential sub-areas about which decisions are required

- i. Shape, size and position. In these accuracy of recording is the most obvious are in which decisions need to be taken. Although interpolation can be used to enhance apparent accuracy later, because artefacts may have worn or been damaged over time and interpolation makes assumptions about the continuity of data, interpolation techniques are potentially suspect as a way of enhancing data sets if accuracy is the objective.

A less obvious consideration is the dimensionality of the data recorded (do you record the 3D surface of an oil-painting, for example, including thickness of paint?).

How are surfaces recorded or derived? There are many mathematical techniques used for defining surfaces and fitting them to a set of points. Devices have been proposed which combine point sampling with surface estimation in real-time, and then check the surface estimates in critical areas by taking additional samples. If there is a high degree



of confidence in the mathematical accuracy of the surface definitions then we can have more confidence when intermediate data points are calculated.

Wherever position is being recorded, and by any method, including manual methods, the issue of accuracy will be important. There are many ways of expressing accuracy and many factors that influence the data's accuracy. Some factors are characteristics of the recording equipment and the equipment's performance may be influenced by the circumstances of data recording (extremes of temperature, light levels, etc).

As technology improves there are increasingly conscious decisions to be made about the degree of accuracy at which it is useful to record the artefact. For example, the digital Michelangelo project [Levoy et al, 2000] reported an exercise in detailed digitisation of Michelangelo's David. The data for such exercises is measured in Terabytes and even to process and archive such datasets for any volume of artefacts would represent a significant challenge to many computer services, let alone any prospect of interactive examination of the full dataset. These challenges have led to the development of new computational techniques (e.g. see [Borgo et al, 2001] for an example applied to the digital David). When such applications are designed for web use then a version of the data at reduced accuracy is inevitably a prerequisite using current technologies.

Sample spacing is another aspect of accuracy – accurately recorded point samples across a surface will only generate an accurate surface if the density of sampling is sufficiently high.

For many artefacts the accuracy at which the context of the object is recorded is also an important factor – for example including the relationship to other artefacts in the same original context. Recording the context brings another set of potential technologies into play, particularly if context on a geographic scale is needed (e.g. GPS and its variants).

Considering the recording of shape, size and position is probably the most obvious

of the various data types to discuss. This has been discussed in some depth both because of its central importance and because it is easy to overlook the potential complexity of the decisions that may need consideration.

ii. Colour and light properties.

Colour and colour perception is a science in its own right. Many factors influence the perception of colour and recording base colours has been a challenge underestimated by virtually every amateur photographer since colour film was invented.

Distinctions in the usefulness of colour information relate to the way data is collected – primarily the degree of care taken to relate colour to base colours by taking into account lighting conditions. This may involve recording colour under controlled conditions (e.g. using a light stage to record light properties of an artefact), but this is only possible where either the artefact can be moved or the normal position is in an internal space where light can be controlled. See Hawkins et al [Hawkins, 2001] figures 2, 4, 9 and 11 for images of the operations of a light stage and a description of the data capture process. See also [Muller et al, 2005]

The other approach normally adopted is to record reference colour information under the same lighting conditions. This would also be part of calibrating a light stage of course.

Other factors which may influence the recording of colour include:

- natural light behaviour; such as shadows and reflection;
- materials, such as translucency and colour bleeding
- environmental, such as bright sunshine or wet materials
- artificial light sources – recording under different illumination spectra (or even multiple spectra)

The careful use of reference colour charts in the recording process can alleviate some of these issues, but others still remain – the extreme example is probably the difficult of modelling jewellery!

Colour information is of course difficult to use without a proper recording of the

relationship between colour information and positional data.

i. Internal structure of an object.

Applications such as monitoring conditions of an artefact require some recording of the appropriate physical characteristics and comparison over time. Positional and colour information will inform some analyses, but in other circumstances data on internal structure may be required (e.g. flaws in a jewel or; structural cracks will be required).

In other circumstances, different internal structural information may be required, for example, X-ray information on the sub-structure of paintings used to understand the artist's creative process or detect earlier, now covered, works. In other cases, X-rays may be used for analysis of the materials e.g. [Staalduinen et al, 2006]

ii. Other material properties

The list of other properties that might need recording is long but some examples would be: density and weight; chemical composition; moisture content and; and structural characteristics (e.g. strength under load etc.). Some of these will be collected from samples of similar materials since the process of determining their characteristics may be destructive.

iii. Informational content of the artefact.

The physical characteristics of a digital artefact are important but only a small part of the significance of an object. The first additional information to be considered is the informational content of the artefact itself. The most obvious example of this might be an illustrated manuscript – both work of art and explicitly containing information. Other examples might be the component images in a picture or scenes in a film (ignoring for a moment the audio component of the film).

A classic example of this is the film shot in Norwich by planners seeking to identify areas for development of traffic systems in the 1950's – the film's content shows most of the streets of central Norwich, illustrating snippets of everyday life in the city and a

fascinatingly, rich source of information on the architectural state and physical condition of the city, frozen at a known "point" in time. Although transferred to video by the East Anglian Film Archive, this film has not, to the author's knowledge, ever been digitized, indexed or analysed.

Depending on the applications of the digital artefact this informational content may be more important than the digitised physical representation. At one end of the spectrum, a printed book is a cultural artefact but an individual copy of a version of the printed book in digital form (e.g. of the first edition) may have fewer applications than a representation of the linguistic content, independent of its appearance in print.

*b. Dissemination to the Public*

Public dissemination needs to be based on the appropriate underlying historic information, so the considerations identified in the previous section on the nature of informational content remain relevant. The issues here are more to do with the delivery mechanisms and the implications for the version of an artefact to be delivered.

Here the decisions on data collection may be driven by different considerations. Some of these decisions may be taken (and often regretted) at data collection time; others will be taken about how to derive suitable internet objects from data collected for more scholastic and curatorial purposes.

For example a museum could decide to digitise artefacts for use as part of a web-presence and increasingly there are systems showing 3D artefacts on the web. The complexities of delivering these objects to the client's browser have evolved enormously over the last few years and it remains the case that technology is moving fast in this area. Issues such as the size of data files, model representation and associated software for displaying the models; bandwidth assumed in delivery; watermarking and copyright protection technologies, etc will influence the content of the on-line collection.

However for the purposes of this paper we will assume that these decisions can be subsumed as subsets of the variations in the previous section, coupled with a different set of decisions about how to abstract suitable representations for use in public communication from the data sets generated as part of the assembly of a digital collection. However it may actually be that different data needs to be collected – for example if the publicly viewed models are required to be very real in appearance but undertaking measurements from them is less important then image-based rendering might be adopted.

### *c. Tangible v intangible heritage*

Artefacts of historic or cultural significance have knowledge and information associated with them that complete the picture of their significance. Of themselves, they may be impoverished without the additional context of the knowledge of their production, use, history, ownership, etc. Some of this will be known fact, some deduction, and some will be cultural interpretation. Many culturally significant artefacts have religious or nationalistic contexts – each of which may produce valid culturally-based interpretations. All of these may be correct and significant but they may be conflicting. The contextual information can be regarded as an inextricable part of the artefact and as such the artefact itself becomes uncertain. The cultural components of the information are one example of “intangible heritage”.

In addition, there are cultural artefacts which are intrinsically intangible heritage – stories, music, performance, dance are all examples. In some cases there will be physical artefacts associated with the intangible heritage – manuscripts, etc. In other cases, associated with myths for example, there may be tangible heritage which is, in fact, interpretation of the intangible. The line between tangible and intangible is inexorably blurred and inevitably, even where artefacts are considered purely tangible, linkage to other, non-tangible, information will

be a requirement. However the essential characteristic of intangible heritage is that there is a degree of uncertainty because interpretation has been used which will be to greater or lesser extent subjective.

The linkage to the other data is one example of metadata, which is required for many aspects of digital artefacts.

### *d. Metadata*

Metadata can be defined as data about data. There have been significant efforts to define metadata formats for cultural heritage. Some of these are formal standards (e.g. CIDOC-CRM [ISO, 2006]). In the present context metadata exists at a number of levels:

- i. Data concerned with the provenance of an individual artefact. This would include the producer; the methods of capture; the conditions at the time of capture; information on the settings used for equipment; perhaps on the algorithms used (e.g. for stitching partial scans), etc. There may also be items connected to the artefact of legal interest (owner, copyright status, fee for re-use etc.). (See, for example, [Addison, 2006] for the proposed metadata fields to be associated with Virtual Heritage. The table in Addison’s paper is reproduced in the attachment to this document, for reference)

There are other approaches – for example the Visual Resources Association has produced a guide entitled “Cataloguing Cultural Objects” with important qualifier “A Guide to Describing Cultural Works and Their Images” [CCO, 2003]. This guide addresses the normal information one might see in a museum index, but does not for example, acknowledge the difficulties in recording 3D shape on a card index.

- ii. External links may be needed to data which is part of the same collection (e.g. data about a collection, linking data recorded at the same time, in the same season, by the same collector).
- iii. In principle we need to think about the metadata and provenance of hierarchical

artefacts. For example a city reconstruction may use information on fragments of masonry collected at one time; on the archaeological records; on materials properties; on artefacts collected from this and other sites; on typical design styles from the period, etc. Each subsection of the reconstruction may have different creators and these may be different from the authors of the stories about the environment, or the modellers assembling the complete environment, etc

- iv. Relationship to data collected elsewhere (Previously recorded data about the same item; structural properties recorded in analysis of comparable material samples; analysis of historic lighting materials, flame properties, etc.)

### **Questions/Considerations for those thinking of creating/using digital artefacts**

- a. *Which underlying format of 3D models is best suited to the application?*

A 3D model will be a collection of all the geometric and visual data listed above (in principle shape/geometry and colour/light behaviour, possibly including material properties). The issue of model representation is particularly significant because a model in one representation will not necessarily be simple to convert to a different format. The most obvious example is the contrast between image-based rendering and models represented by their geometric boundary mapped with colour textures.

Boundary representations of artefacts have been used extensively to describe a 3D object as the collection of surfaces and their properties. Such models have origins in other fields – notably Computer Aided Design, where they are used to describe an object in terms suitable for manufacturing it. Two classes of approach are now used to create such models – modelling using some sort of modelling package and capture from range scans. Range scans create “point clouds” and conversion of these clouds

to efficient boundary representations is an on-going topic of research. Between these two approaches lie systems which seek to generate models from 2D images (photogrammetry etc). These may or may not seek to create models of the surface geometry [Debevec, 1999].

Generating realistic images of objects represented in these sorts of formats has been a challenge for at least the last 40 years. Methods which take into account (progressively) hidden surfaces, diffuse colour, shadows, specular reflection, participating media (smoke etc), radiosity, etc have gradually improved the images of artificial objects, but as yet have not quite captured a truly life-like feel of the actual appearance.

More recently the technique of image-based rendering has been developed and used with cultural artefacts in some live applications. For example at the National Palace Museum, Taiwan, [Palace] high quality digital artefacts have been in use alongside their physical counterparts in order to show details that cannot otherwise be viewed by the museum visitor. Examples include a carved olive stone where the carving details can only be shown in the museum by placing a large magnifying glass next to the artefact in the museum case. A second example is a fine example of carved ivory where a piece with 21 concentric spheres carved from a single piece is available as an image-based model in which each layer of the carving can be peeled away to show the underlying layers. Unfortunately these examples are not available on the museum’s website which nevertheless shows some excellent examples of documenting cultural objects on-line.

Image-based modelling is undertaken very differently. The models are captured by photographing the object from “all” directions, lit by known source or sources from “all” directions. This generates a potential large number of images from marginally different directions and intermediate views are then generated by interpolating between the images. In the basic method the boundary representation of an object is not derived (although for some objects (and only some



objects) image processing techniques could be used to generate a model).

Philosophically the starting point for the modelling using boundary representations is different from that on which image-based modelling is based. For boundary models the initial target was structural and geometrical accuracy “decorated” with colour information – and then attempting to compute a life-like image by understanding how light would behave in the modelled environment. In contrast for image-based modelling the original objective was to be able to produce images that were truly life-like. The starting point is therefore to record the actual images and then try and compute more information about the underlying geometry that must have been present for the images to have been generated.

Determining the type of 3D object to be captured also involves making decisions about the needs (or not) of capturing the object’s internal structure. This might require additional consideration of:

- i. Whether surface textures were sufficiently good to represent the object visually or whether volumetric information was needed to be able to show characteristics such as translucency.
- ii. Similarly other information which could be held as surfaces but were connected with internal structure rather than surface geometry might need to be captured (e.g. the underlying structure of cracks).

*b. What metadata format(s) and encodings should be adopted?*

Given the costs of developing collections of digital artefacts and the need for the results to remain usable over the long term, it is really important to consider both the logical and physical format in which the artefacts will be documented and stored.

Much of the work of planning long-term archive of digital objects has been undertaken from a base in the digital libraries community. The management of collections of 3D cultural heritage objects is at an earlier stage and there remains significant debate about whether

the approaches adopted for digital libraries are in fact suitable for related, but different, domain of cultural artefacts.

In the digital libraries area, the Dublin Core Metadata Initiative has been strongly influential. “The Dublin Core Metadata Initiative is an open forum engaged in the development of interoperable online metadata standards that support a broad range of purposes and business models.” [DCMI, 2006]. Projects such as the Metadata Encoding and Transmission Standard or METS are strongly linked to the Dublin Core work. “The METS schema is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library, expressed using the XML schema language of the World Wide Web Consortium. The standard is maintained in the Network Development and MARC Standards Office of the Library of Congress, and is being developed as an initiative of the Digital Library Federation.” [METS].

The Digital Library Federation [DLF] is an international association of libraries and allied institutions, which was founded in 1995. It includes the British Library, Library of Congress and many American Ivy League University Libraries amongst its membership and provides a searchable web-based database of standards information. Although billed as international and including the British Library the federation appears strongly US-based.

The Dublin Core approaches are increasingly appearing to move towards the museums area and are the adopted basis for the work of the MICHAEL project. This project began in 2004 involving development of a multi-lingual portal for sharing information on museum collections in the UK, France and Italy. It has recently been extended to incorporate another 9 European countries. [Caffo, 2006], [MICHAEL]

In parallel to these developments and starting from the perspective of documenting of historic, cultural heritage artefacts in museums the CIDOC-CRM initiative has recently reached ISO standard [ISO, 2006]. ISO 21127:2006 establishes guidelines for

the exchange of information between cultural heritage institutions. In simple terms this can be defined as the curated knowledge of museums. The work is based on the work of ICOM – the International Council of Museums [CIDOC-CRM]. This approach has been adopted by a number of other projects and is the basis of the ontological work included in the EPOCH Common Infrastructure [EPOCH].

Fellner [Fellner, 2005] argues that the intrinsic problem is that we have yet to define the appropriate metadata vocabulary for use with the richer multi-dimensional data that is becoming the norm for digital artefacts, in comparison to the more conventional world of metadata applied to the artefacts of the digital library. It is to be hoped that the evolution of these initiatives will seek to harmonise the approaches at least to the extent of ensuring inter-operability, but there are significant differences of approach. It is perhaps worth noting that it is expected to be possible to map the concepts included in the UNESCO virtual heritage proposed provenance into the other formats.

Multilingual ontologies further complicate interoperability not least because the terms used in one natural language may have no direct equivalent in another and indeed apparently similar words may have conflicting meanings in two different natural languages.

#### *a. How do we ensure long term archive, preservation and access to digital objects?*

Concerns here cover the ability to guarantee:

- long term archive
- physical security
- access in the long term

Part of the answer to long-term preservation issues will be the developments of standardised metadata. However there are two other aspects worth noting. Firstly, that the storage media of the computer age have a tendency to become obsolete in very short time frames. The issue is both the durability of physical material and the obsolescence of the equipment for manipulating them.

CD materials are widely quoted as having a reliable shelf-life of around 15 years – somewhat less than the lifetime of most of the artefacts we are trying to record digitally! A sound policy of moving onto new storage media is an essential part of the process of using digital artefacts and it must be said that computer scientists are notoriously bad at this. Computing services are rather better at recognising the issue.

Secondly, that long term access will also rely on being able to identify the digital artefact within the collection. This identification could also be linked to the copyright, IPR and licensing processes. There are also two initiatives that have been started in the area of long-term identification of digital objects – the Digital Object Identifier (ISO) and the Persistent Identifier (DCMI working group). Both initiatives are designed to provide long-term availability of unique identification similar to the system of ISBN's but for digital objects.

“The Digital Object Identifier (DOI) is a system for identifying content objects in the digital environment. The DOI system is managed by the International DOI Foundation, an open membership consortium including both commercial and non-commercial partners, and has recently been accepted for standardisation within ISO” [DOI, 2006].

The Dublin Core Persistent Identifier Working Group was declared inactive and deactivated by the DCMI in September 2005, although some of that work continues under different guises.

### **Re-purposing data**

Having built a digital object there is an obvious and appropriate desire to re-use the effort invested in any appropriate context. This will inevitably mean that the use will extend to applications that were not envisaged at the time the data was collected. Two challenges are commonly faced.

The easier of these challenges is faced when the application you are seeking to create cannot cope with the detail and volume

of data that has been digitised. This is the common situation when artefacts digitised for scholastic documentation are to be used in web applications, including on-line publication. Here there are many methods that have been worked on by computer scientists for years. For example, almost every year there will be new papers on improved mesh simplification at the annual ACM SIGGRAPH conference (see [www.siggraph.org](http://www.siggraph.org)).

It would not usually be necessary or desirable for a cultural heritage professional to be working on these aspects, but it is necessary that they understand the nature of the data manipulations being undertaken. Some methods are irreversible so that the data once simplified will remain in that form in the new environment or reconstitution may distort the original. Although it may appear that this would only be the case if the original artefact has not been properly archived or is not available for other (e.g. legal) reasons, the original model may not be available *where it is needed* because of the difficulty of shipping large volumes of data (e.g. to a client over the internet). This has the effect that making a simplified model available could potentially both misrepresent the original and protect it against unscrupulous exploitation (cf the much reported theft of copyright by hand held video cameras in the cinema).

There are rather different processes that are designed to compress data in various formats for transmission over networks. These methods would typically be used where the internet bandwidth is not fast enough to send the full dataset in its original format, but the target is to compress and convey the original digital artefact across the network, rather than to simplify it for transmission. Methods may be “loss-less” or “lossy” meaning that after compression at one end of the transmission the re-constitution either reinstates exactly the original in the first case or something “good enough” for the application in the second.

The second case of re-purposing data is where the initial dataset is required with more information added. For example this might occur because the accuracy of digitisation

was unsuitable for the higher performance printers and displays that have since become available. In this case smoother images may be produced by interpolation of the original data, but this data is almost inevitable an invention that cannot be more accurate than the original data, whilst giving the impression of higher quality images. Alternatively the new application may require additional data fields that were not originally collected – a far more challenging situation.

## Reconstructions or visualisations

A related issue is where the original digital artefacts are to be used in an application which attempts to reconstruct an “original” state of the artefacts. Examples would be reconstituting a pot from sherds of pottery [Kampel and Melero, 2003] or rebuilding a castle digitally from the records of the ruins. In these applications we are somewhat from having the intelligent tools to assist the cultural heritage professional with the reconstruction. Most commonly these applications are undertaken using general purposes modellers (e.g. Maya or 3D-StudioMax) and the reconstructions are effectively created by hand.

In the longer term we need modelling tools that use the evidence of the recorded artefacts and act as intelligent assistants. For example in the case of the pottery an assistant the understood the likely styles and the generic properties of pots of a similar age might be able to guide the modeller with suggestions of which piece organisations would give the appropriate continuity of curvature etc. There have been experiments with this sort of tool, but few have yet attempted the equivalent for architectural styles for example. In addition the potential of coupling multiple sources (e.g. archaeological evidence, historic maps and photographs or paintings) has yet to be tapped.

When multiple original artefacts are contributing towards a reconstruction the challenges of hierarchical provenance is likely to be faced. Each component contributing to an assembly will have its own provenance

and the assembly will have a different one. Where multiple reconstructions contribute to a larger environment several levels of hierarchy may be needed to fully document the artefact. The use of such provenance will not only be scholastic, but potentially used for controlling royalties and other legal protection. Built in digital watermarking or copyrighting may also be “hidden” in a digital object’s encoding.

## Conclusions

We have seen many different aspects of the creation and use of digital artefacts. It is inevitable that such artefacts will find their place in the range of techniques for historical documentation and analysis over time. We are in a potentially dangerous situation at present where the tools are immature but there are many potential benefits in the short term of taking up the challenge. These benefits address both scholarly research and dissemination to the public, capitalising on the public’s undoubted interest in the past.

During this phase it is very important for cultural heritage professionals to continue the long traditions of curatorship and caution, but their participation in the search for appropriate tools and processes is also essential if the technologies are to evolve to achieve their potential. In the meantime the pioneers in the use of digital artefacts in historic research need to remain aware of the limitations of current technologies and the restrictions on their applicability.

## References

- [Addison, 2006] Alonzo C. Addison, “The Vanishing Virtual,” in *New Heritage: Beyond Verisimilitude*, Conference on Cultural Heritage and New Media. (Eds Thomas Kvan and Yehuda Kalay) Faculty of Architecture, University of Hong Kong, ISBN 962-7757-08-X (pp36-48)
- [Borgo et al, 2001] R. Borgo, P. Cignoni and R. Scopigno, “An Easy-to-use Visualisation System for Huge Cultural Heritage Meshes”, in *VAST2001 Proceedings*, Vir-

- tual Reality, Archaeology and Cultural Heritage, ACM SIGGRAPH (Oct 2002) ISBN 1-58113-447-9, (pp121-129, p367)
- [Caffo, 2006] R. Caffo “MICHAEL project: Towards a Trans-European Portal of Culture”, in *Electronic Imaging & the Visual Arts, EVA2006 Florence Conference Proceedings* (Eds Vito Cappellini and James Hemsley) ISBN 88-371-1610, Pitagora Editrice Bologna. (pp48-50)
- [CCO, 2003] *Cataloguing Cultural Objects*, <http://www.vraweb.org/ccoweb//index.html>
- [CIDOC-CRM] CIDOC Conceptual Reference Model. Based on the work of the International Committee for Documentation of the International Council of Museums (ICOM-CIDOC) – working group home page <http://cidoc.ics.forth.gr/index.html>
- [DCMI] Dublin Core Metadata Initiative, <http://dublincore.org/>
- [Debevec, 1999] Paul E. Debevec, *Image-Based Modelling and Lighting*, Computer Graphics Vol 33(4), ACM SIGGRAPH (pp46-50)
- [Hawkins et al, 2001] Tim Hawkins, Jonathan Cohen and Paul Debevec, “A Photometric Approach to Digitising Cultural Artefacts”, in *VAST2001 Proceedings*, Virtual Reality, Archaeology and Cultural Heritage, ACM SIGGRAPH (Oct 2002) ISBN1-58113-447-9, (pp333-342, 377-379)
- [DLF] Digital Library Federation, <http://www.diglib.org/>
- [DOI, 2006] <http://www.doi.org/> For an overview of the system see [http://www.doi.org/overview/sys\\_overview\\_021601.html](http://www.doi.org/overview/sys_overview_021601.html)
- [EPOCH] Excellence in Processing Open Cultural Heritage – A Network of Excellence funded under the European Union’s Framework Program FP6. See [www.epoch-net.org](http://www.epoch-net.org) for more information.
- [Fellner, 2005] Dieter Fellner, “Digital Preservation of Cultural Heritage: When the Acquisition Part will be under control – what’s the next Grand Challenge?” Abstract for the VAST 2005 Keynote, in *Proceedings of VAST 2005* (Eds M.Mudge, N. Ryan



- and R. Scopigno), EUROGRAPHICS Association, ISBN 3-905673-28-2 (pp11-12)
- [ISO, 2006] ISO FDIS 21127 Information and documentation -- A reference ontology for the interchange of cultural heritage information – see <http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=34424&scopelist=PROGRAMME>. Also known as “CIDOC-CRM”
- [Kampel and Melero, 2003] M. Kampel and F.J. Melero “Virtual Vessel Reconstruction from a Fragment’s Profile”, in Proceedings of VAST 2003, (Ed’s D.B. Arnold, A. Chalmers and F. Niccolucci), EUROGRAPHICS Association, ISBN 3-905673-08-8 (pp79-88)
- [Levoy et al, 2000] Levoy, M., Pulli, K., Curless, B., Rusinkiewicz, S., Koller, D., Pereira, L., Ginzton, M., Anderson, S., Davis, J., Ginsberg, J., Shade, J., and Fulk. D., The Digital Michelangelo project: 3D Scanning of large statues. Proceedings of SIGGRAPH 2000 (July 2000), ISBN 1-58113-208-5, (pp 131-144)
- [McMillan, 1999] Image-based Rendering: A New Interface Between Computer Vision and Computer Graphics, Computer Graphics Vol 33(4), ACM SIGGRAPH (pp61-64)
- [METS] METS – Metadata Encoding & Transmission Standard <http://www.loc.gov/standards/mets/>
- [MICHAEL] MICHAEL Multilingual Inventory of Cultural Heritage in Europe. Project website <http://www.michael-culture.org/>
- [Muller et al, 2005] Gero Muller, Gerhard H. Bendels and Reinhard Klein, “Rapid Synchronous Acquisition of Geometry and Appearance of Cultural Artefacts”, in Proceedings of VAST 2005 (Eds M.Mudge, N. Ryan and R. Scopigno), EUROGRAPHICS Association, ISBN 3-905673-28-2 (pp13-20, p 155)
- [Palace] National Palace Museum Taiwan <http://www.npm.gov.tw/index.htm>
- [Staalduinen et al, 2006] Mark van Staalduinen, Jan C.A. van der Luube, Georg Dietz, Frans and Theo Leurentius. “Comparing X-ray and Backlighting Imaging for Paper Structure Visualization, in Electronic Imaging & the Visual Arts, EVA 2006 Florence Conference Proceedings (Eds Vito Cappellini and James Hemsley) ISBN 88-371-1610, Pitagora Editrice Bologna. (pp108-113)

Type	o.	Data Encoding/Format
What	i.	HeritageID (a superset of existing WorldHeritageID)
	ii.	Title/Brief Description
	iii.	Heritage Type/Classification (e.g. Cultural: archaeological, ...)
	iv.	Heritage Time Period (e.g. geologic or historic time)
Why	v.	Purpose (why recorded/produced)
How	vi.	Recording Device Parameters (type, sample rate, precision,...)
	vii.	Secondary device(s) (data manipulation)
Whom	viii.	Submitter and date of submission
	ix.	Environmental Conditions
	x.	Rights given/withheld
	xi.	Author/Copyright holder
	xii.	Sponsor/Funder/Client
Date	xiii.	Date (of recording, manipulation)
Where	xiv.	Location (Latitude/Longitude and compass direction if applicable)

Appendix 1: Proposed Virtual Heritage Metadata (“World Heritage metadata structure” from [Addison, 2006])



# THE COST OF 3D DATA ACQUISITION

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## 1. Introduction

Using 3D technologies sometimes frightens users because they are afraid that it involves high costs. Indeed, some of the equipment used for 3D data acquisition is expensive. Staff must be highly skilled, with a significant day cost. Post-processing requires computing time if a good result is desired. Nonetheless, the cost of 3D scanning is comparable with the cost of a professional photographic campaign, which is not considered out of reach for most heritage institutions.

In this article we will try to give figures of the effort required in some case-studies and we will show that thanks to technological advancement costs are decreasing.

The examples shown here are based on work done by Hubert Mara and collaborators of TU-Wien, and by Roberto Scopigno and Paolo Cignoni of ISTI-CNR. Apart from collecting information from them and putting it here in a homogeneous way, all the credit of this very valuable information must therefore go to them.

We will not deal with 3D data acquisition of buildings because the field of variability here is much larger than for objects or artefacts. Concerning this we will just mention an example that can be considered “historical”. About ten years ago the municipality of Florence started a project for restoring the medieval ramparts of the city. The city walls survived until the 19<sup>th</sup> century, when the city became for a few years the capital of Italy, Rome still being under the papal domination. In these years, most of the ramparts were

destroyed to make place for “modern” *boulevards*. Only the gates were left standing as witnesses of medieval times, and some parts of the walls in the “Oltrarno” part of the city, the one placed between the Arno river and the hills opposite the centre. Nowadays, these parts of the walls survive, up the hills on the left hand side of the river and also in the part of the city laying between the river Arno and these hills. At the end of the 20<sup>th</sup> century, the still standing part of the walls required maintenance, and the restoration was the opportunity for creating a 3D model of the wall surface. The intervention concerned a standing wall going from the riverside to one of the major city gates, Porta San Frediano on the ancient road to Pisa. The wall was some 100 metres long. In those years, 3D scanning was still an experimental technology, so the acquisition used photogrammetric techniques. The result was a 3D model of the wall surface, which you would guess as flat, while it was not. The 3D model enabled an archaeological analysis of the different phases of the wall, carried out by medieval archaeologists of the University of Florence with expertise in the study of standing structures. This investigation documented different construction phases and allowed a correct and philological restoration. The cost of the photogrammetric campaign was 25.000.000 Lire (about 13.000 Euros) for a double-faced wall some 100 meters long and 6-8 meters high. It is likely that the cost would not be much different today using photogrammetry, or possibly less using a 3D scanner. However, the benefits of this

expense were very high, both in terms of understanding the wall's history and structure, and in planning its restoration.

## 2. The 3D scanning pipeline

based on work by Roberto Scopigno and Paolo Cignoni [1]

Scanning a 3D object requires to perform a series of actions, often called *3D scanning pipeline*:

1. acquisition planning;
2. scanning (range maps acquisition);
3. range maps alignment;
4. range maps merge;
5. output mesh editing;
6. mesh simplification;
7. attribute data management (e.g. color data integration and mapping);
8. conversion to application-specific data formats.

The raw output data of the acquisition step (phase no.2 in the pipeline above) is a series of partial scans called *range maps*. In order to produce the final model the first task is to assemble all the range maps in a single coherent structure. This step is usually called *alignment* or *registration* of the set of range maps.

In most cases, range maps registration can be divided in three different phases:

- *Initial Pairwise Placement*: the first registration step is to locate all the range maps in a single common coordinate system and to provide a first rough registration. This process is done on range pairs: each pair of adjacent and overlapping scans is aligned (one another).
- *Fine Pairwise Registration*: after the first step, alignment is finely tuned, usually using an iterative process which minimizes the alignment error between each pair of range maps.
- *Global Registration*: the pairwise registration produces good results but, since the error minimization takes place sequentially on mesh pairs, the error tends to accumulate and it may result in significant discrepancy after a number of pairwise steps. The solution is to perform a global

minimization process, which distributes the residual error among all pairs in order to spread the error evenly among all range map pairs.

The registration is the most time consuming sub-phase of the entire 3D scanning pipeline, due to the substantial user contribution required by current systems.

The remaining two main steps (merging and data simplification) are implemented via automatic procedures, where the user has just to select some initial parameters. At most a few hours of unattended processing are in general sufficient to perform merging and simplification.

On the other hand, the initial placement is heavily user-assisted in most of the commercial and academic systems (interactive selection or manipulation of the range maps). Moreover, this action has to be repeated for all the possible overlapping range map pairs. If the set of range maps is composed by hundreds of elements (the scanning of a statue 2 meters tall generally requires from 200 up to 500 range maps, depending on the shape complexity of the statue), then the user has a very complex task to perform:

- for each range map, find which are the partially-overlapping ones;
- given this set of overlapping range maps, determine which one to consider in pairwise alignment (either all of them or a subset);
- process all pair-wise initial alignment.

Therefore, any solution that reduces the user work in this phase has an immediate impact on the overall post-processing time. Two main approaches have been considered in the literature to fulfill this goal:

1. Improve the efficiency of the alignment phase by improving the software process (designing either more efficient user interfaces or less computationally complex algorithms);
2. Remove partially or totally the need of an explicit registration phase by tracking the location of the scanner with respect to the scanned object. In fact, if these



two relative positions are known, the registration matrices can be computed in an automatic manner. In most cases, even an approximate knowledge can be sufficient to skip the initial registration step.

Tracking can be implemented in many different manners:

- magnetic tracking; this approach is used by the handheld Polhemus FastScan scanner (<http://www.polhemus.com>), which uses a Polhemus magnetic tracking subsystem.

Pros: light weight, small size, medium cost;

Cons: highly sensible to other electromagnetic sources and/or noise, it works well only in controlled environment.

- robotic tracking (robotized arms or gantries); the Digital Michelangelo project (see below) chose this type of solution.

Pros: high accuracy;

Cons: heavy weight, reduce substantially the transportability of the scanner, medium to high cost, mechanical design depends on the characteristics of the object to be scanned.

- vision- or image-based tracking; many different approaches are possible, and only a few have been experimented in 3D scanning.

Pros: light weight, small size, low cost;

Cons: targets placed in the scene are often needed; accuracy could depend on visibility and lighting conditions.

- inertial tracking; used by some commercial devices appeared on the market recently

Pros: light weight, small size, low cost, no visibility problems;

Cons: none (but this technology has to be checked).

It is not simple to derive from the information publicly available the effective working time required to produce 3D models, since these data are often either considered confidential or not relevant, and hence not published. Some of the information presented in the following has been acquired by personal communications with the respective colleagues.

### 3. The cost of 3D scanning in archaeological excavation

by Hubert Mara [2]

As 3D-acquisition of large and small finds require different technologies, we focus on small finds, which require the biggest attention and therefore working time on archaeological excavations. The following sections show two different scenarios of the use of 3D-Scanners regarding cost-effectiveness. The first example regards the use of a 3D-Scanner for the in-time documentation of new finds at excavations, while the second example demonstrate the use for research and preservation tasks within museums. The cost-estimation is based on the collaborative work together with the Austrian *Bundesdenkmalamt* (Government Agency for Cultural Heritage) and the *Kunsthistorisches Museum* (Museum of History of Art) in Vienna. Remark: For privacy reasons, we are giving no precise numbers and anyhow the reader might consider the fact that salary and taxes may differ between different countries.

The following example shows the impact on cost-effectiveness of purchasing a 3D-Scanner for permanent use at excavations. Therefore we have up to three different employees working at the same objects: First we have an expert (archaeologists, Phd/Prof.) supervising the work and cross-checking the documentation. Than we have a Senior Assistant (Master) with expert skills and finally we have a Junior Assistant (non-academic) with a month of training at the job.

We assume that the personnel cost including all taxes, social security, etc:

Salary € 5.000 / Month for an Expert

Salary € 3.500 / Month for a Senior Assistant

Salary € 2.000 / Month for a Junior Assistant

For the traditional scenario for manual drawings most of the work will be done using expert skills, while the results have to be discussed and some drawing materials like transparency paper are used.

Expert, cost per month	Senior Assist., per month	Junior Assist., per month	Materials, maintenance, per month	Total cost per month	No. of objects per month	Cost per object
€ 500 (10%)	€ 3500		€ 50	€ 4.050	100	€ 40,50
Expert, cost per month	Senior Assistant, per month	Junior Assistant, per month	Materials, maintenance, per month	Total cost per month	No. of objects per month	Cost per object
€ 250 (5%)	€ 1750 (50%)	€ 2000	€ 250	€ 4.250	250	€ 17

Therefore we may estimate the costs and outcome per month:

For the use of a 3D-Scanner and PCs we have costs for maintenance and insurance (M&I). We still need an expert to cross-check, but his effort will be less, because all results are based on the 3D-scanner and therefore are entirely accurate and only minor revision by the expert is required. Again we need a junior assistant with (archaeological) expertise and some technical (e.g. CAD) skills for the final drawings, while the acquisition and a draft can be done by the Junior Assistant having some basic ICT skills and a brief training on archaeology. Keeping in mind that finds are usually small objects that take little time to scan and require very few range maps, it may be estimated that 250 objects may be acquired per month, which means about 1 per hour. Therefore we estimate the costs and outcome per month.

More than half of the costs are saved (€ 23,50) per object using a 3D-scanner, and at the same time this technology produces 2.5 times more results. Since this equipment costs up to € 40.000 (including all extras, a PC and training), it is necessary to acquire approx. 1.800 objects to get even, corresponding to about 7-8 months of acquisition. In other words, in an excavation (or in a research team) where it is expected to record at least 1800 objects, using a 3D scanner will save time (for exactly 1800 objects, using a scanner will require 7-8 months, working by hand will take 1 year and half) and will repay completely the equipment! Furthermore it must be stressed that 3D-Scanners and their operating software are still in a pre-mature development stage and therefore we can predict an increased output by software-

updates and short amortization time due to lower hardware prices. For example, recently there appeared new scanners for small objects costing only 2.500 \$. They show no significant loss in precision, but a slower processing time.

#### 4. The cost of 3D scanning for museum documentation

by Hubert Mara [2]

This example shows the impact on rental of a 3D-Scanner for specific tasks, because museums still have large numbers of small objects, but relatively few compared to excavations. This can be explained by the fact that museums typically store objects of extremely high artistic and research value. Therefore they have also the demand to save working-time for documentation of their objects, but also to save hidden costs. These hidden costs for manual documentation derive from the limits of manual documentation (a cost example for a drawing is given at the end of the section):

First of all a manual drawing has a subjective component depending on the skills of the craftsman. In particular this means that the artistic component of a manual drawing may lead to wrong research results and the costs for correcting it. Therefore you at least double the costs for the drawing and the research based on it.

Secondly, a manual drawing is always performed to certain publication rules. Therefore the slightest changes (e.g. changing the scale) requires the complete rerun of the manual drawing, because line width, font sizes for measures, etc. have to be changed. This means that the costs for publication

	Manual Drawing	3D-Acquisition
Measuring the object	€ 8.000	€ 12.000
Draft Drawing	€ 8.000	
Final Drawing	€ 8.000	€ 8.000
<b>Total (1<sup>st</sup> Publication):</b>	<b>€ 24.000</b>	<b>€ 20.000</b>
<b>Additional Publication:</b>	<b>€ 16.000</b>	<b>€ 8.000</b>

of the same object in two different books doubles the costs. Therefore the use of digital drawings estimated from 3D-Models can dramatically reduce the costs, because the drawings can be adapted in less than half of the time. Furthermore any additional view, beside the typical front view, can be estimated easily without handling the often fragile objects.

The third case is the worst-case scenario: It is often necessary to use tactile tools for an accurate manual drawing an object and therefore an object can easily be damaged. Beside the ideational loss of value, there is restoration (e.g. of ceramics), which cost about € 100 / hour, while small damages can be dealt with within a day (e.g. € 1.000), a the restoration of broken object can last several days up to weeks (e.g. € 10.000 up to 40.000). These costs can easily be prevented by 3D-acquisition, because it is contact-free and 3D-Scanners (except X-Ray and Computer Tomography) can operate within the museum saving costs and risks for transportation.

Finally we show the cost-effectiveness of 3D-Acquisitions on a typical publication of a museum covering approx. 100 objects using an external contractor for manual drawings in comparison with 3D-Acquisition. For manual drawings we assume € 40 per hour for a draftsperson. For 3D-Acquisition we assume € 40 per hour for the rental of a 3D-Scanner and € 80 for a technician.

Summarizing the two examples, it has been shown – based on actual data – that the use of today’s 3D-acquisition technology can lower the documentation costs by a factor of two, while the amortization of such a rather expensive tool as a 3D scanner takes about 2 years, while the lifetime of a 3D-Scanner is five or more years as it consists of maintenance free parts. Even just renting a 3D-Scanner

and a technician for the specific task is 20% cheaper than a traditional draftspersons. In addition, we have other benefits like re-use of digital data for further publication and easier access for research. Finally we can prevent the rise of high unpredictable costs for damaging objects of cultural heritage as 3D-acquisition is the most gentle way of documentation. One main disadvantage consists in the difference between drawing – which includes an interpretation of the object, a simplification of its appearance and the enhancement of significant features – and 3D data acquisition, which is more like photography, acquiring all the details with the impartiality of an inanimate device.

## 5. The cost of scanning complex artefacts

based on work by Roberto Scopigno and Paolo Cignoni [1], [7].

We consider the following acquisition projects:

- The Maddalena project by the University of Florence [3], a joint work by the DET, University of Florence, Italy and of the Institute for Information Technology, NRC, Ottawa, Canada on the wooden statue of *Maddalena* (about 2 m tall) by Donatello, placed at the Museo dell’Opera del Duomo of Florence, Italy;
- The acquisition of the *Minerva of Arezzo* by ISTI-CNR [4], a bronze statue, 150 cm tall, kept at the Museo Archeologico of Florence, Italy. The scanning was aimed at better understanding and studying the restoration of the artifact.
- The Digital Michelangelo project by Stanford University [5], mainly focused on Michelangelo’s *David* 3D scanning (height: about 5 m).

- The acquisition of Michelangelo's *Pietà* by the IBM group of Bernardini et al. [6].
- The acquisition by ISTI-CNR of the *Vergine Annunciata*, a marble statue 80 cm tall by Tino di Camaino placed in the Duomo of Pisa.

The table below compares the different time of acquisition for each of the above projects, considering also the different technologies.

The following table reports the effort needed for scanning some statues of the Duomo di Pisa.

Such projects have been compared because they all deal with similar artifacts,

i.e. statues. The projects quoted here date back to a few years ago. Although there have been improvements both in hardware and software, such data are nevertheless interesting to compare. As far as hardware is concerned, a dramatic drop in price has taken place with NextEngine, a 3D scanner costing 2500 \$, 1/10 of other comparable equipment, with possibly a small decrease of scanning performance in terms of velocity. Post-processing software has also been improved, so for example the latest version of MeshAlign, the program developed at ISTI-CNR by Scopigno and Cignoni allows saving 15-20% on post-processing time.

Project	Year	Object scanned	Scanner	Scanning time	Post-processing sw	No. of range maps	Alignment sw	Alignment Time	Notes	Reference
Maddalena	2000-2003	Marble statue, 190 cm tall	Opto31 by Optonet		Polyworks	170	Polyworks Modeler	50 hours		
Minerva	2000-today	Bronze statue, 155 cm tall.							Scans repeated several times	[1]
	Oct. 2000		Prototype 1 built by CNR (structured light)	5 days	MeshAlign v.1.0	146	MeshMerge v.1.0 MeshSimplify	6 weeks	Final mesh 30M faces, 0.57 mm	
	Apr 2001		Prototype 2 built by CNR (laser scanner)	4 days	MeshAlign v.1.0	172	MeshMerge v.1.0 MeshSimplify	3 weeks	Final mesh 30M faces, 0.5 mm	
	March 2002		Minolta Vivid900	1 day	MeshAlign v.1.5	297	MeshMerge v.1.0 MeshSimplify	1.5 week	Final mesh 26M faces, 0.5 mm	
	Oct 2002		Minolta Vivid900	1 day	MeshAlign v.2.0	306	MeshMerge v.2.0 MeshSimplify	4 days	Final mesh 24.7M faces, 0.5 mm	
Digital Michelangelo	1998-99	Michelangelo's David, marble statue, 550 cm tall	Cyberware laser triangulation with robotized tracking, mounted on gantry	1080 hours (27 weeks)		~4000		1500 hours (37.5 weeks)		
Pietà	1999-2001	Marble statue, 225 cm tall	Virtuoso (structured light) with image-based tracking	90 hours (14 days)		800 scans		6 weeks		
Vergine Annunciata	2003	Marble statue, 80 cm tall	Minolta Vivid900 + computer-controlled rotating platform	2.5 hours	MeshAlign v.2.0	97	MeshMerge v.2.0 MeshSimplify	7 hours	Final mesh 1.2M faces, 0.25 mm resolution	

Comparison of productivity among different projects

Project	Maddalena	Minerva I	Minerva II	Minerva IV	David	Pietà	Vergine
Method	Sw based tracking	Sw based tracking	Sw based tracking	Sw based tracking	Robotic tracking	Image-based	Low-cost mechanical + sw based tracking
Rangemaps/day	27	5	11	76	21	27	155

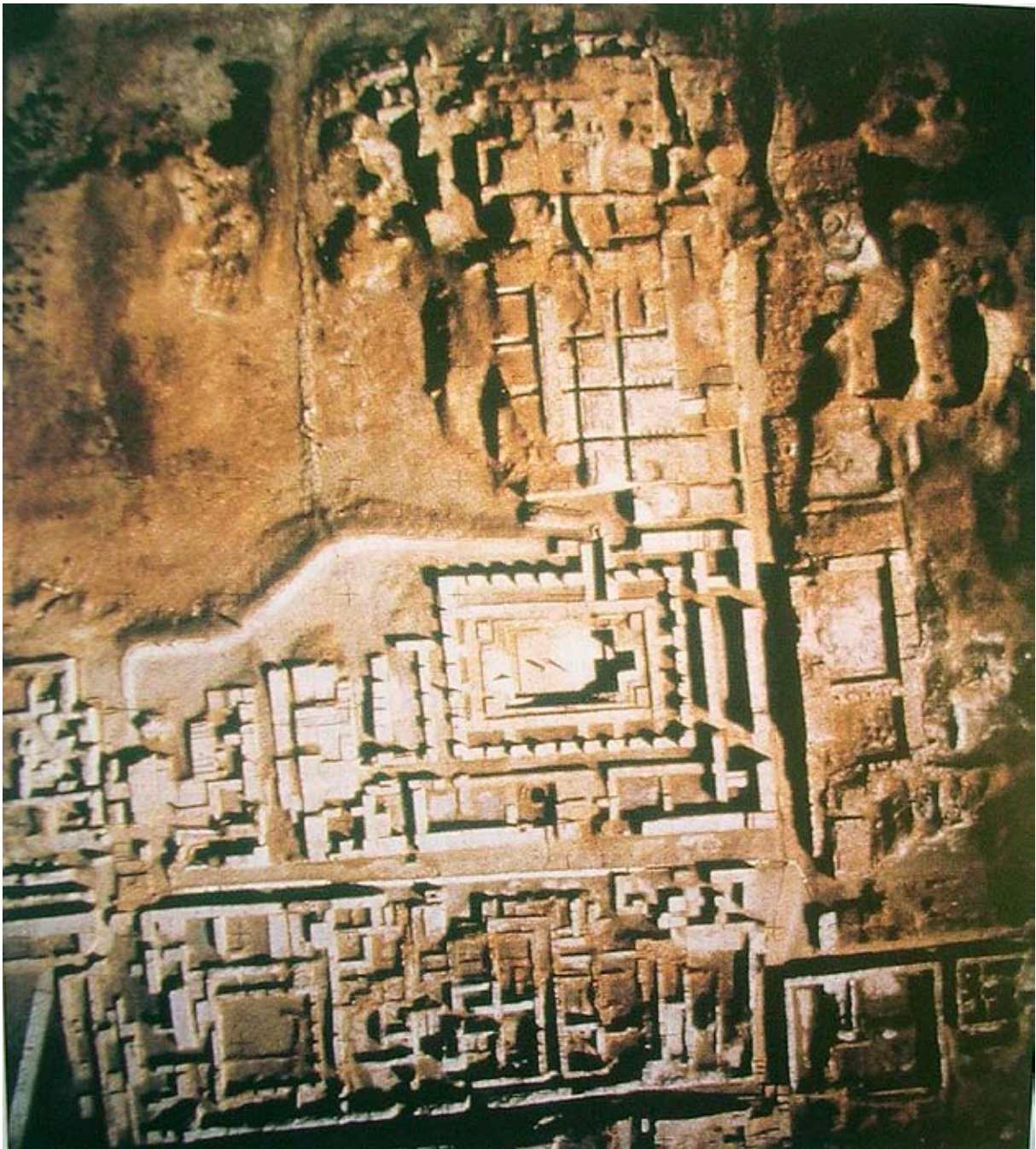


Scanning parameters for marbles statues in the Duomo di Pisa.

Statue	Announcing Angel no.3	Announcing Angel no. 4	Announcing Angel no. 5	Column	Counsellor no. 1	Counsellor no. 2	Counsellor no. 3	Counsellor no. 4
Size: (height if not otherwise specified)	78 cm	100 cm	97 cm	85 cm	149 cm	142 cm	142 cm	142 cm
Range maps:	94	116	153	115	253	254	240	310
Scanning sampling:	0.35 mm	0.4 mm	0.4 mm	0.4 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Scanning time	4 h	4 h	5 h	4 h	1 day	1 day	1 day	1 day
Align time:	1 day	1 day	1 day	1 day	3 days	2 days	4 days	3 days
Fusion grid size	0.25 mm	0.4 mm	0.4 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Model size (traingles):	6.5 M	7.1 M	6.9 M	12 M	25 M	22.7 M	27 M	26 M
Statue	Arrigo VII enthroned	Arrigo VII lying on his sepulchre	Sepolcro's basrelief	Announcing Angel 1	Announcing Angel no. 2	Virgin Mary	Male head	
Size: (height if not otherwise specified)	170 cm	188 cm (horizontal length)	222 cm (horizontal length)	165 cm	165 cm	78 cm	26 cm	
Range maps:	398	176	250	272	210	97	24	
Scanning sampling:	0.4 mm	0.3 mm	0.3 mm	0.5 mm	0.5 mm	0.4 mm	0.4 mm	
Scanning time	7 h	8 h	8 h	8 h	6 h	4 h	1 h	
Align time:	10 days	1 day	1 day	5 days	10 days	1 day	3h	
Fusion grid size	0.5 mm	0.3 mm	0.3 mm	0.3 mm	0.5 mm	0.5 mm	0.3 mm	
Model size (traingles):	40 M	29 M	35 M	25 M	15 M	6 M	2.3 M	

## References

- [1] R. Scopigno, P. Cignoni, M. Callieri *3D Scanning: some comparative evaluation of previous campaigns*. Internal unpublished record, ViHAP3D Project, 2003.
- [2] H. Mara *Some considerations on the cost of 3D Scanning*. Internal report, CHIRON Project, 2007.
- [3] G. Guidi, M. Pieraccini, S. Ciofi, V. Damato, J.A. Beraldin, and C. Atzeni. Tridimensional digitizing of Donatello's Maddalena. In *Proc. 2001 International Conference on Image Processing*, pages 578–581, 2001.
- [4] C. Rocchini, P. Cignoni, C. Montani, P. Pingi, R. Scopigno, R. Fontana, L. Pezzati, M. Cygielman, R. Giachetti, and G. Gori. 3D scanning the Minerva of Arezzo. In *ICHIM'2001 Conf. Proc.*, Vol.2, pages 265–272. Politecnico di Milano, 2001.
- [5] M. Levoy, K. Pulli, B. Curless, S. Rusinkiewicz, D. Koller, L. Pereira, M. Ginzton, S. Anderson, J. Davis, J. Ginsberg, J. Shade, and D. Fulk. The Digital Michelangelo Project: 3D scanning of large statues. In *SIGGRAPH 2000, Computer Graphics Proceedings, Annual Conference Series*, pages 131–144.
- [6] F. Bernardini, J. Mittleman, H. Rushmeier, and G. Taubin. Case study: Scanning Michelangelo's Florentine Pieta'. In *ACM SIGGRAPH 99 Course Notes*, Course 8, August 1999.
- [7] SBAAAS and ISTI-CNR *D6.6 Heritage Tools Demo Report*. ViHAP3D Project, 2004.



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## 1. Context and background

The built cultural heritage of small and medium-size historic towns across Europe represents a diverse and unique European heritage. The historic towns strive to be dynamic centres of regional development and attract cultural tourism while at the same time preserve their tangible and other cultural heritage. But the rapid economic and social transformation processes of the last about 20 years pose considerable challenges to achieving a balanced and sustainable development.

Preservation, revitalisation and promotion of tangible cultural heritage such as historic urban ensembles, heritage sites and monuments are costly. Therefore willingness and capability of investing in this heritage is necessary. The operational programme of the European Territorial Cooperation 2007–2013 for Central Europe states: “In general, the richness of the cultural heritage in the programme region is endangered since the investment perspective is lacking for large parts of the heritage. Efforts regarding the restoration and revitalisation of cultural sites concentrate on those areas, where the economic perspective including the positive impact on employment (especially for women) is clearly visible. Compared to the programme region as a whole, the number and size of these zones is limited. In general, there is an urgent need for intensified awareness with regard to risk-control, the prevention of further degradation and the recovery of impaired heritage, through

safeguard and innovation and through the involvement of private actors.” (European Territorial Cooperation 2007, 16)

Salzburg Research at present participates in two projects under the Interreg IIIB CADSES Programme: “Hist.Urban. Integrated Revitalisation of Historical Towns to Promote a Sustainable Urban Development” (<http://www.histurban.net>) and “Heritage Alive! - Leveraging the Value of World Heritage Sites in the Regions for the Benefit of All” (<http://www.heritagealive.eu>). Development of cultural tourism is a core theme of both projects.

Hist.Urban works to strengthen the capacity of small and medium-size historic towns in revitalising and promoting their built cultural heritage within an integrated, sustainable urban development. The following municipalities participate in, or directly benefit from, this project: Graz and Salzburg (Austria); Plzen (Czech Republic); Kaufbeuren, Regensburg and Wismar (Germany); Xanthi (Greece); Pécs (Hungary); Faenza, Teramo, Urbino and Verona (Italy); Sopot and Sanok (Poland); Arad and Oradea (Romania).

Heritage Alive! develops and trials novel approaches in the interactive communication of cultural heritage (e.g. tour guides and learning quests). Historic towns that participate in, or directly benefit from, this project are Corfu (Greece), Salzburg (Austria), Sighisoara (Romania) and Urbino (Italy). Other “locations” of this project are the archaeological site Perperikon (Bulgaria), the historic village Hollókő (Hungary) and



two wooden churches in Poland that are inscribed on the World Heritage List, the St. Michael Archangel Church in Binarowa and the St. Philip and Jacob Church in Sękowa.

The following chapters build on an ongoing study of Salzburg Research within Hist.Urban and experiences from Heritage Alive!. The study focuses on development options and strategies of historic towns in the experience economy, particularly with respect to cultural tourism.

## **2. Cultural heritage as an attractor of tourism**

Tourism is one of the most important sectors of the European economy. Depending on the definition of the tourism sector, its contribution to the Gross Domestic Product (GDP) of the European Union varies between 4% (tourism industry) and about 11% (tourism economy). Correspondingly, the number of people employed ranges from 7.3 to 20.6 million, respectively representing about 4 and 12% of total employment. The sector shows an annual growth rate of about 3% and creates about 100,000 new jobs per year. (European Commission, DG Enterprise 2004)

Europe is the region most visited by international tourists. The World Tourism Organisation in its "Tourism Highlights. Edition 2006" for the year 2005 reports international tourist arrivals in Europe of 441.4 million, which is a share of 54.8% of the world market of 806 million. Of the international tourism receipts in 2005 of 547 billion, Europe earned about 280 billion (51.2%). (WTO 2006)

One major factor of the attractiveness of Europe is the cultural richness of its countries. For example, Europe has more cultural sites inscribed on the UNESCO World Heritage List than any other part of the world, with well over 300 entries of cultural and natural significance. The inscription often carries with it increased publicity and a sense of prestige and status (according to UNESCO estimates tourist visitation of +40-60% is not uncommon within two to three years of

inscription of a site on the World Heritage List).

In fact, Europe's patrimony is an important asset in economic terms, and cultural tourism is good business, especially also in the new EU Member States. For example, a quarter of Cyprus' Gross Domestic Product (GDP) comes from tourism. Even in industrial countries like France and Germany, tourism accounts for 7% and 8% of GDP respectively. (cf. European Commission, DG Research 2004, 5)

Cultural and natural heritage tourism is one of the fastest growing segments of the tourism business. Roughly 30% of European tourist destinations are chosen by virtue of the presence of heritage sites. This number increases up to 45-50% if the wider cultural sector such as important festivals and other cultural events are included. (Linty 2005)

Cultural tourism is understood to be a key factor for the economic development of many European towns. Small towns of 10,000 to 50,000 inhabitants and medium-size towns of 50,000 to 250,000 inhabitants accommodate more than 60% of the European population. Many of them have rich and unique cultural heritage in the form of built heritage in the city centre and surrounding areas.

In fact, a larger part of cultural tourism already concentrates on urban areas such as "cultural quarters" of larger cities and historic towns. As the European Institute of Cultural Routes write on their website: "Even though urban tourism is one of the earliest forms of tourism in Europe, it was not considered a major source of income until the beginning of the 1990's, with the exception of capital cities, such as Paris and London, and some exceptional cases, like Bruges or Venice. Since then, interest in tourism has spread rapidly throughout many small and medium European cities, which previously have not considered themselves as tourist destinations: Dundee and Aix-en-Provence are examples of small and medium-sized cities that have recently decided to promote tourism even though it has not been part of their tradition." (EICR 2007)



Ever more small and medium-size towns want to use cultural tourism as an opportunity for economic development. As mentioned by the European Institute of Cultural Routes, many of them have not been a known tourist destination before and, therefore, are at present developing appropriate approaches, tourism offerings and the necessary infrastructure for welcoming and hosting tourists.

This necessitates that historic towns define their distinct place in the tourism landscape, position themselves and develop a unique cultural tourism offer. This offer should not be seen as already given, e.g. in their well-preserved built heritage and the particular “atmosphere” of a historic town, but needs to be developed very consciously.

In particular, historic towns must take into account the competition that is on in the “experience economy” in which tourism and leisure providers such as large cultural cities, theme parks and other leisure venues strive to constantly enhance the experiential value of their offering. However, firstly historic towns will need to gain a good understanding of the motivations and characteristics of cultural tourists.

### **3. Motivations and characteristics of cultural tourists**

The term “cultural tourism” is often used in a rather vague fashion. There are useful general definitions of cultural tourism such as the one proposed by the consultancy company LORD that defines “cultural tourism” as follows: “Visits by persons from outside the host community motivated wholly or in part by interest in the historical, artistic, scientific or lifestyle/heritage offerings of a community, region, group or institution.” (Lord 1999, 3)

A more detailed definition is provided by the International Cultural Tourism Committee of the International Council on Monuments and Sites (ICOMOS): “Cultural Tourism is essentially that form of tourism that focuses on the culture, and cultural environments including landscapes of the destination, the values and lifestyles, heritage, visual and

performing arts, industries, traditions and leisure pursuits of the local population or host community. It can include attendance at cultural events, visits to museums and heritage places and mixing with local people. It should not be regarded as a definable niche within the broad range of tourism activities, but encompasses all experiences absorbed by the visitor to a place that is beyond their own living environment.” (ICOMOS-ICTC 2002, 22)

However, such definitions are not of much help if the task is to develop strategies for attracting visitors with an interest in culture to a certain destination. It is important to develop a thorough understanding of the interests of tourists in different cultural offerings particularly in the context of travels to urban areas such as historic towns.

#### **3.1. A spectrum of culturally motivated tourism**

“Cultural tourism” can be understood as a spectrum of more or less intensive culturally motivated travel interests and behaviours. What is clear from available surveys is that only for a smaller part of tourists “culture” is the prime motivation to visit a destination. As results from the ATLAS Cultural Tourism Project show, “it is important to realise that not all visitors to cultural sites are motivated by culture. Less than 20% of cultural visitors would consider that their normal holiday was a cultural holiday, and just over 20% of the tourists interviewed would characterise their holiday as cultural. So even the tourists visiting cultural sites would not generally consider themselves to be cultural tourists.” (ATLAS Cultural Tourism Project 2002)

Also a report on “City Tourism & Culture” of the World Tourism Organization and European Travel Commission, which draws on ATLAS survey results, emphasises that “culture is the single most important motivation for city trips, although relatively few visitors view themselves as ‘cultural tourists’.” Only about 20% of city tourists rate culture as their prime motivator, but a far greater number of tourists is actually involved in

cultural activities while on a city trip. (WTO-ETC 2005, viii)

### *Spectrum of culturally motivated travel interests and behaviours*

According to the degree of cultural interest the following types of “cultural tourists” can be distinguished (cf. Lohmann/Mundt 2002; Lord 1999; McKercher/Cros 2002; Prentice 2004):

Type A – The purposeful cultural tourists; estimated share of the recreational travel market: 20%:

For these tourists culture is the primary motive for visiting a destination. They are specifically attracted by the cultural opportunities the destination offers such as museums, galleries, concerts, cultural festivals, etc. Often they will visit a destination because of a particular exhibition, concert or festival. Furthermore, the motivation could be a cultural creative programme that allows for self-development, e.g. a summer academy offering painting, photography, literature or theatre courses. In surveys such tourists will state to be “greatly motivated” by culture.

Type B – The sightseeing cultural tourists; about 45%:

For these tourists culture is an important motive, but their behaviours are different from tourists of type A. The orientation is generally more recreative and the interest in the available cultural opportunities is less purposeful. They are holidaymakers who among other activities visit cultural sites and/or events during their holidays, e.g. tourists on a “city break” or “sun & beach” tourists on an excursion. The primary motivation could also be to visit friends or relatives. In surveys such tourists will state to be motivated “in part” by culture.

Type C – The casual or incidental cultural tourists; about 20%:

For these tourists culture is only a weak (additional) motive for visiting a destination, but when there they take the opportunity to

see a monument or visit a freely accessible event of a festival.

Type D – The culture-averse tourists; about 15%:

Such tourists do not like to visit cultural attractions or attend cultural events. Rather their interests may concentrate solely on “sun & beach”, visiting friends or attending a sports event.

While tourists in the categories A and B of the typology above certainly are the most important target groups when marketing cultural tourism offerings, due to their different expectations and behaviours they cannot be reached with the same marketing messages. Rather they need to be addressed and communicated with in a different way according to their motivations and specific interests.

Consultant Gail Dexter Lord thinks that destinations that want to strategically build on the economic benefits of cultural tourism cannot rely on purposeful cultural tourists, but must also try to reach all other types of tourists who have the potential to participate in cultural activities along with other travel related offerings. (cf. Lord 1999)

Among the relevant strategies for this are promotional activities that stimulate the motivation of visitors to participate in cultural activities and packaging of tourism products which increases exposure to cultural activities of a broader group of visitors. In other words, an important goal is to motivate people who come for “sightseeing” (which is for free) to spend some money on visiting an exhibition, attending a cultural event or buying local products.

### **3.2. Characteristics of cultural tourists**

Cultural tourists have some characteristics that make them a very interesting tourism target segment:

### *Higher education attainment level and income*

It is an established fact that education is the single most significant factor that influences cultural participation, affluence and travel. Cultural tourists are more likely to have a higher than average educational level and, related to this, more money available for travel and related expenses. This is confirmed by survey results of the ATLAS Cultural Tourism Project and IPK International:

“The visitors in general and the cultural tourists in particular are very highly educated. Over half have had some form of higher education, compared with about one third of the EU population. Higher education levels tend to lead to better jobs and higher incomes. It is not surprising, therefore, that cultural tourists tend to have professional (34%) or managerial occupations (18%) and have salaries about one third higher than the EU average.” (ATLAS Cultural Tourism Project 2002; cf. WTO-ETC 2005, 8-12)

With respect to city trips, IPK International data shows that those in the top income groups are four times as likely to make a city trip as those in the lowest income group; the same pattern is to be found with respect to educational levels. (IPK International 2002)

### *More likely in a higher age range*

Purposeful as well as sightseeing cultural tourists tend to be in a higher age range, hence, the trend towards the “aging society”, which is due to the increasing life expectancy of people as well as low birth rates, works in favour of cultural tourism destinations.

Older age groups not only are growing in proportion and staying active longer, on average they also have the highest spending power and are ever more willing to spend rather than to save their money. This applies not only to the so called “50plus generation” but also to older age groups; the expenditure on private consumption of people who are over 60 years old is already at 74% of that of consumers aged 45 to 59. (Eurostat 2002)

Consumer research data also shows an increasing willingness of seniors to spend their money: Of 1800 German seniors aged between 50 and 79, almost 50% agreed to the statement ‘I rather prefer to live a good life than saving money all of the time’. Ten years ago, only 25% could identify with this statement. (GfK 2002)

### *Important role of women*

It should be noted that women generally show a higher cultural consumption and participation in cultural activities than men. Accordingly, they make up a higher proportion of cultural tourists. Women also control increasingly more income and make decisions regarding family vacations and children’s leisure activities. With respect to groups of travellers, women are more likely to be the tour group promoters and planners. In short, cultural heritage destination with respect to their image and profile will be well advised to think of what appeals to women who are planning an individual, family or group travel.

### *Choice of travel time*

Seasonality is a somewhat less critical factor for cultural tourism offerings as cultural tourists tend to more often take holidays outside normal peak seasons. City breaks which are more or less strongly motivated by cultural interests are anyhow “all year round business”. According to IPK International the distribution of city breaks in 2004 was January – April 26%, May – August 42% and September – December 32%. (Freitag 2005)

### *Choice of destination*

The Eurobarometer survey “Europeans on holiday” 1997/98 pointed out that among the most important criteria for choosing a tourism destination are the “scenery” and the climate. Also historical interest and environment were of high importance, indeed, they were almost on a par with the cost of travel and accommodation. (Eurobarometer 1998)

For cultural tourism in Europe there exists an abundance of options with only a few obvious geographical preferences. The Mediterranean regions generally attract more interest as they hold a large share of Europe's cultural heritage, have a mild climate, and allow for combining cultural activities with a stay at the sea side. Areas close to the traditional tourist destinations remain popular, because they are easier to get to, familiar and less costly. Low cost flight connections have added to this tendency, though also have placed some new destinations on the cultural tourism landscape (see section 5.3 below).

There are some "cultural cities" that are major city break destinations such as Paris (that receives over 75% of city breaks in France), London, Berlin, Rome, Florence, Venice, Madrid, Barcelona, Amsterdam and Vienna. As summarised by the ATLAS Cultural Tourism Project:

"In terms of the cities that cultural tourists consider being attractive cultural destinations, there have been few changes in the major destinations in recent years. Paris, Rome and London are always present in the top three (...). A fairly consistent group of cities contests the second rung on the ladder, including Athens, Florence and Barcelona. These cities in fact compete more fiercely with each other than they do with London or Paris." (ATLAS Cultural Tourism Project 2002)

Such a competition will also be the rule for better known small and medium-size historic towns (e.g. European historic towns on the World Heritage List).

### *Importance of the domestic market*

It should also be noted that for most cultural tourism destinations, including historic towns, domestic tourists – national/regional, in Europe also from regions of neighbouring countries – will be far more important than foreign tourists: "An important point to make about cultural tourism is that not all visitors to cultural sites are tourists. About 36% of the 2002 ATLAS survey respondents lived in the

local area. Less than one third were foreign tourists. This emphasises the point that apart from a select few sites or events where the majority of visitors come from abroad, the domestic market is of vital importance for most cultural tourism attractions." (ATLAS Cultural Tourism Project 2002)

### *Spending on travel expenses*

It is understood that cultural tourists tend to spend more money while on vacation, e.g. they are more likely to stay at hotels, spend more time in an area while on vacation, buy local products, etc. The ATLAS Cultural Tourism Project provides data on this aspect:

"The attractiveness of cultural tourists for most tourist destinations lies in their high overall spend. The image of cultural tourists as relatively rich tourists is partially confirmed by the research. The average total spend in the destination for cultural tourist groups in 2002 was over €400 for foreign tourists and almost €300 for domestic tourist groups. The daily expenditure of cultural tourists (over €70) is higher than visitors on a touring holiday (€52), beach tourists (€48), those on a city break (€42) or engaged in rural tourism. However, it should also be noted that the average stay of cultural tourists also tends to be lower than beach tourists." (ATLAS Cultural Tourism Project 2002)

As should become clear from the overview of characteristics of cultural tourists, they are a very interesting tourism target segment. Consequently, ever more destinations will intensively address and invite cultural tourists. The key message therefore is that competition for cultural tourists will become fierce. This expectation is widely shared among professionals of the tourism sector. In a poll among such professionals for the study on "City Tourism & Culture" of 74 respondents 87% (totally) agreed to the statement "competition between cities in Europe in the area of cultural tourism will increase considerably". (WTO-ETC 2005, 37)

Hence, cultural cities will need to be very inventive to stand out among the many



competitors. Small and medium-size historic towns will be particularly challenged to enhance their cultural tourism offer and not only count on the attraction value of a well-preserved ensemble of built heritage.

#### **4. Shifts in purposeful cultural tourism**

As pointed out above, tourists for whom the primary motive is to visit a particular heritage site or museum exhibition, attend an opera or participate in a festival only represent a smaller group of cultural tourists. The larger part of tourists who show an interest in cultural offerings will look for a mixture of relaxation, entertainment and culture, and culture will often not only or foremost mean traditional “high culture” products. Many will also only enjoy the “atmosphere” and keep “sightseeing”, which is for free.

While historic towns will not completely disregard the sightseeing tourist, it will be particularly important to have a good understanding of the different motivations and interests of purposeful cultural tourists. Indeed, this segment is not homogeneous and since the 1980s considerable shifts in purposeful cultural tourism can be observed. The cultural orientations and behaviours are changing due to the fact that people relate to culture differently.

Below we distinguish two such shifts, but it is important to not understand them as a transformation of one form of cultural tourism into the next one. Each form is characterised by different cultural connotations, the tourists seek different things and meanings, and the types of learning and knowledge differ accordingly. Furthermore, all forms coexist, yet new generations of tourists will tend to substitute an older form by a new one.

##### **4.1. Heritage tourism**

Heritage tourism is driven by a search for historic depth and authenticity of culture, human continuity and universal cultural values. This orientation is strongly related to the notion of the educated and culturally

interested person who establishes his or her identity through the integration of authoritative historic and cultural knowledge.

Due to the fact that educational curricula still nourish this traditional paradigm of culture, visiting museums, monuments and other cultural sites continues to be an important activity when travelling to other countries or visiting cities and regions in one’s own country. However, heritage tourism in recent years has lost its lead as the paradigmatic form of cultural tourism.

Cultural heritage institutions are counter-acting this development through new forms of cultural learning, which abandon the authoritative approach of knowledge formation in favour of educational programmes that stimulate curiosity, interaction, discovery and active construction of cultural meaning.

##### **4.2. Culture tourism**

The last about ten years have seen a shift towards “culture tourism” which is confirmed by the representative survey results of the ATLAS Cultural Tourism Project. They found that “there is evidence of a trend towards greater dispersion of visitors among different cultural attraction types in the destination, and in particular a shift from ‘heritage’ attractions towards ‘arts’ attractions. The figures for 2001 show museums having no growth in the proportion of visitors since 1997 and monuments losing share. On the other hand art galleries, performing arts attractions and festivals have all increased their share of visitors in recent years.” (ATLAS Cultural Tourism Project 2002)

The observed greater dispersion of visitors in destinations is a result of the huge investments of many cities in cultural quarters, new attractions and a multitude of co-sponsored events. This attracts sightseeing as well as purposeful tourists, but the latter primarily come to attend and participate in certain cultural manifestations such as a major exhibition of modern art, an opera or performances at a dance festival. For them participation in, and a nuanced

understanding of, such “high culture” are part of their cultural habitus that is shared by like-minded cultural aficionados and acknowledged connoisseurs.

Still another segment of culture tourists, who will not necessarily be attracted by popular “cultural quarters” or “high culture” milieus, will want to experience and establish a meaningful relationship with places and communities that are felt to have an authentic lived culture. They seek locality, landscapes, towns and villages with character, specific rituals of social life, etc.

### **4.3. Lifestyle and cultural creative tourism**

Observers of the cultural tourism landscape see a further shift from established forms of culture tourism to lifestyle and creative tourism which is mainly driven by people’s growing thirst for self-fulfillment. Modern society has allowed people a higher degree of control over their own destiny, freedom of choice, and responsibility for one’s own life. This has also led to the notion of personal fulfillment which is legitimate for individuals to pursue. Increasingly the quest for personal fulfillment informs people’s leisure and travel activities. The consumer think-tank The Future Foundation has found that personal fulfillment was the top priority for 50% of British adults in 2004, compared with 25% in 1983.

Melanie Howard from The Future Foundation thinks: “There’s this emerging idea of ourselves as projects — we are no longer labelled by our education or gender, or born into a social situation that we then play out for the rest of our lives. We can do new things, pick up new skills, learn a new language. Because we’re living longer, we have more time to think about who we really want to be. We are all asking ourselves, ‘How can I get more out of my life?’” (quoted from Ahuja 2006)

In the process of individualisation that characterises modern Western societies individuals increasingly understand their life as a self-defined and self-managed project.

This can also be understood as a response to the perceived fragmentation and arbitrariness of (post-)modern life, which necessitates piecing together experiences into a coherent and meaningful narrative.

With respect to cultural aspects, this narrative becomes unlikely to draw on history and heritage (which adds to the decline of traditional forms of heritage tourism). Rather personal style and creativity become the cornerstones. Therefore, cultural places, communities and products are sought for that reinforce and enhance one’s own style of life and “cultural capital”. (cf. Richards/Wilson 2006)

Associated with this lifestyle formation is the growing interest in forms of travel that allow for creative development. (cf. Prentice 2001 and 2003) This interest is to a large degree motivated by a lack of work-life balance of many whose pressure of work seems to intensify each year. The European Travel Commission in a trend report expects: “The lack of time for creative development in many peoples’ lives will lead to an increase in ‘creative tourism’, with tourists developing their creative skills on holiday, and destinations vying to improve their creative offer.” (ETC 2006, 2)

Yet, creative tourism is not to be understood only as a backlash to time-poverty due to changes in working life. It is also often closely intertwined with these changes. The best example for this may be cultural creatives who become what has been termed “lifestyle entrepreneurs”. Instead of, or parallel to, working on temporary, project-based contracts they set up their own business in the fields they are interested in, for which many turn to tourism as a source of income. (cf. Ateljevic/Doorne 2000) Such small businesses will increasingly provide the base for creative tourism in destinations that seek to offer tourists opportunities for self-development and a closer relationship to places and communities. Also forms of “volunteer tourism” related to environmental and cultural issues (e.g. heritage restoration work) provide opportunities for such relationships.

## **5. Tourism and leisure offerings in the experience economy**

### **5.1. Experience economy: basic concept**

The key observation that informs the concept of an “experience economy” is that people are increasingly willing to spend their money not on consumer goods but on services that allow them to have personally enriching and memorable experiences. Since about 20 years or so the amount that people spend on retail goods as a proportion of consumer spending has gone down. Spending has shifted to services such as travel and other leisure activities, communications (e.g. mobile phone calls), restaurants, etc. The trend is to pay to do and experience something rather than have more or permanently upgrade things. “Rather than upgrading our car or television, we’ll spend the cash in coffee shops, hotels, restaurants, sports clubs and theme parks. We’ll splash out on European city breaks or walking the Inca trail. Experiences, in other words.” (Ahuja 2006)

The tourism and leisure sector is a major part of the “experience economy”. Whatever the motivation for a holiday or a day out with the family, everybody is looking for a good, memorable experience. After all, the only thing left after a holiday or day-trip is a memory; if the holiday or trip was not satisfactory it is not possible to take it back and get it replaced. Hence, tourism and leisure businesses must aim to provide customers with unique experiences, something extraordinary, something which stands out from everyday life and from all the competition for people’s spare time and disposable income.

However, the mass tourism industry builds on a standardisation of products and processes that allow for offering tourists travel packages (the typical combination of transport, accommodation and some extras) that are affordable for an as broad as possible customer base. This offer is increasingly felt to lose its appeal, and its attractiveness must be kept by ever lower prices – which

in the end means “best price guarantee” (i.e. cheaper than others) and “last minute” offers or travel auctions to sell off the overcapacity. In other words, mass tourism products have become completely commodified, i.e. easily replaceable, with selection primarily based on price.

A strategy to prevent the commodification of services has been proposed by the business consultants Joseph Pine and James H. Gilmore in their highly influential book “The Experience Economy” (1999). They argue that experiences are a distinct economic offering, as distinct from services as services are from goods: “Experiences have always been around, but consumers, businesses, and economists lumped them into the service sector along with such uneventful activities as dry cleaning, auto repair, wholesale distribution, and telephone access. When a person buys a service, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages – as in a theatrical play – to engage him in a personal way.” (Pine/Gilmore 2001)

Hence, companies and other organisations that want to flourish in today’s economy must offer experiences that stem from, or are related to, the products or services they offer to consumers. They will not offer goods or services alone but the resulting experience, rich with sensations, created within the customer. But, how can companies and other organisations increase the experiential value of their services, how to turn the mundane into a sensation for which customers will be willing to pay a premium? Pine and Gilmore posit that every business, including purely Web-based businesses, must treat their operation as a stage for engaging customers and orchestrate memorable experience that will remain with the individual for a long time.

But, to stand out and remain competitive in the marketplace they will also need to regularly redesign and enhance their stage, building a diverse and changing set of experiences, promotions and attractions

so that customers will want to return. In addition, the customers should become enthusiastic advocates for those experiences which they will want to repeat again and to recount to their friends and invite them into the community that often forms around experience-rich services. (cf. Schmitt 2003; Smith/Wheeler 2002)

## **5.2. Experience-rich travel and leisure offerings: some examples**

The increasing demand for travel experiences has not gone unnoticed by the tourism industry as well as there is a boom in leisure attractions that try to constantly update their experiential values. Some examples are:

### *Experience travel packages*

Many travel providers have started to develop and market experience travel packages. The following are but three illustrative examples of German travel providers:

Airtours in 2005 launched a new catalog “Perfect Days” that offered upmarket short distance trips within Europe. The catalog comprised a selection of 131 hotels and 244 wellness and 104 experience packages in categories such as gourmet, events, active leisure and lifestyle.

Marco Polo since Summer 2005 offers basic travel packages that can be combined with “Entdecker-Highlights” (highlights for discoverers). They distinguish between “Soft-Adventure”, “Looking Behind the Scene” and “Participating”. Examples include cave diving in Mexico, a visit to “Star-City” (the training camp of the Russian cosmonauts) or the Vesuv observatory, participating in archaeological digging or sheep-shearing in Chile.

Studiosus in 2006 started to theme their whole program which comprises city trips, educational journeys, cruises, hiking & biking and more under the label “Intensiverleben” (“1000 routes and one goal – intensive experiences”). Besides their city trips catalogue “CityLights”, which addresses the sightseeing tourist, they have also developed a

separate catalogue that targets the purposeful cultural tourist with upmarket offerings. This “kultimer” catalogue is issued six times a year with offerings such as visiting the Art Basel, Palaces and Gardens in St Petersburg or the Salzburg Festival.

A larger part of experience packages for short trips concentrate on “city breaks” which we will address in more detail in section 5.3 below.

### *Theme parks*

Theme parks attract ever more people who use such parks for a short break or a day trip while on a longer holiday. Such parks and similar attractions show a clear growth in visitor numbers and revenues. It is estimated that between 1990 and 2000 worldwide visitor numbers of such venues have grown by 80%, the turnover has doubled and the revenue per visitor increased by about 8.5%. In the USA the approximately 600 theme parks and similar attractions in 2005 had 335 million visits and revenues of \$11.2 billion, compared to 280 million visits and revenues of \$7.4 billion in 1995. (IAAP 2006) Visitors worldwide are estimated at 600 million of which the UK have 65 million and Germany 35 million. The Europapark Rust, the largest German theme park has 3.7 million visitors per year; 49% from Germany and about 20% from France and Switzerland respectively. Leisure experts think that in the future many people will stay for their whole holiday in such parks, because these artificial environments have a consistent design and take into account all the visitors needs and wants. Among the people who visit theme parks in Europe already 5% stay in a hotel on or nearby the theme park.

### *Shopping malls and themed retail centres*

Shopping malls are restyling themselves as places for a family day out. They are putting coffee shops, restaurants, bookshops and a cinema in their store, and visitors can browse, dine, have a coffee and take in a film, the shopping is optional. An example



is Bluewater who have over 330 stores and market themselves as “the leading shopping and leisure destination in Europe”. There are also many large shopping centres that theme themselves around a certain topic. One example is *Mondi. O* that opened in 2005 in Oberhausen (Germany) and concentrates on tourism products. The centre has 5,500 m<sup>2</sup> and hosts tourism agencies and travel shops, presents destinations and runs events that focus on culture and art, fashion, cuisine, etc. One reason for such enhancements of the shopping experience is the assumption that this can best distinguish shopping malls and centres from the competition by Internet shops that are open 24 hours 7 days a week.

#### *Brand tourism and science centres*

Strong tourist attractions also are customer centres of renowned brands of different industries such as automobiles (e.g. Autostadt Wolfsburg or Mercedes Welt in Stuttgart) or game producers (e.g. Legoland in Günzburg or Playmobil Funpark in Zirndorf). Also nature and science attract many people: Among the larger science centres in Germany are the Universum (Bremen), Phaeno Wolfsburg and the Cologne Science Center. The recent years have also seen many relaunches of zoos and museums.

#### *Holidays at film locations*

Many people want to make their holidays at locations of films or TV serials (so called “set jettlers”). Travel guides that present all locations of a film are produced and specialised tour operators offer round trips from location to location.

According to a Halifax Travel study in the UK particularly younger people in the age range of 15-24 years are inspired by audiovisual productions to visit certain places (45%). The interest decreases with the age of the respondents, but even of the already retired people 26% confirmed such an inspiration. Almost a third of all respondents said they were more interested in visiting New Zealand after watching *The Lord of the*

*Rings* trilogy and 16% claimed to have already visited Alnwick Castle in Northumberland (UK) because of its association with Harry Potter’s Hogwarts School of Magic. After the release of the first Harry Potter film in November 2001, the Alnwick Castle saw visitor numbers more than double, from 61,000 in 2001 to 139,000 in 2002; revenues from tourism increased to almost € 13 million per year. (cf. *The Age* 2005)

### **5.3. City breaks in large cultural cities**

Historic towns will need to develop their cultural tourism offering very carefully, because on the urban tourism market they face a strong competition from “city breaks” in larger cultural cities. Such cities represent the most critical competition for historic towns as they offer an attractive mix of sight-seeing, exhibitions, cultural events, shopping, nightlife, etc. in addition to the fact that most of them also have some historic urban areas and ensembles.

According to IPK International’s World Travel Monitor data, in 2004 Europeans have undertaken 356 million trips abroad of which 135 million (38%) can be classified “city tourism”. Such city trips have been the fastest growth sector of European outbound travel in recent years, more than doubling in volume from 1994 to 2004. In 2004 the motivations for such trips were: 60% holidays, 23% visits of friends and relatives, and 17% all types of business travel. Two thirds of European outbound city trips in 2004 originated from only five countries: Germany: 20%, UK: 18%, Italy: 11%, Spain: 9%, France 8%, other 31 European countries or origin: 34%. (Freitag 2005; for brief overviews on different city break markets see ECT 2007)

In 2005 among all forms of recreational travel the segment of city trips achieved the highest growth of 20% (in 2004 the increase in this segment was 12%). Interestingly, the next main growth segments were “winter (snow) holiday” with an increase of 12% and “holiday in the mountains” with a plus of 8%.

“Sun & beach” only gained 3%. (Freitag 2005; IPK International 2006a/b)

The growth in urban tourism is expected to continue, among other factors due to the trend that travelers move away from traditional annual summer holidays (two and more weeks) to shorter, more frequent trips. The main driver behind the city tourism boom, however, was an explosion of low cost carrier offers with many new flight connections. This explosion made it possible for many people to travel both more frequently and further away.

The massive growth of city breaks also has much to do with the fact that larger cities have a rich, concentrated range of things to offer which appeals to people’s desire for multi-optionality. During a shortbreak, visitors are able to enjoy only a fraction of what a city has to offer; it may seem that the tourist could just as well visit a much smaller place. Yet, the point is not to see everything but to have the option of enjoying a huge range of experiences. (cf. Angel/Hansen 2006, 22)

Lowcostflightsandfastertrainconnections also allow more people to take short trips that are motivated by shopping in another, most often larger city. A study on shopping tourism carried out by Econ Consult in 2005 found that in Germany this form of tourism was gaining in volume and was increasingly marketed by specialised shopping centres or large factory outlet centres. In 2004, 12.5 billion (3.4% of total retail spending) were spent by shopping tourists of which 2.5 million (20%) came from foreign tourists. Econ Consult estimated that until 2010 the share of foreign guests in the German shopping tourism segment could increase by one billion Euro (40%). (cf. Econ Consult 2005)

Low-cost flight connections also have a considerable impact on the relative market position of destinations. Generally large destinations with such connections are getting even better opportunities to grow more than smaller ones, and destinations that do not have low-cost flight connections are losing market shares. In order to be of interest to low-cost airlines, a destination

must demonstrate that there are already traveller streams and that there is a potential of growth due to available and newly developed attractions and capacity (e.g. hotels, leisure opportunities, major culture or sports events, etc.)

Low-cost flight connections have shown to create new tourist streams to cities and regions, and there are also examples of smaller destinations that have benefited considerably from such connections, e.g. Košice (Slovakia) or Poznan (Poland), not to speak of the many additional connections to secondary airports in France, Italy and Spain. (cf. ELFAA 2004, 26-28) It should also be noted that if low-cost air transport is available, people will often prefer flying to taking the car. This may have the consequence that travel is geographically more concentrated to one place.

## **6. Challenges for historic towns in developing cultural tourism**

Historic town face several challenges in developing a unique cultural tourism offer. They will need to overcome the typical consumption patterns of heritage tourism, for example, through developing a creative cultural tourism offer. They should also consider how to better stage and foster memorable cultural tourism experiences as well as use ICT to enhance the visibility, attractiveness and experiential value of the town. Finally, in the last chapter we will address the issue of sustainability of the civic, cultural and socio-economic life of historic towns that attract larger volumes of visitors.

### **6.1. Overcoming typical heritage tourism consumption patterns**

Cultural heritage tourism is one of the most important options of historic towns to strengthen their economic basis. However, there are some difficult points in heritage tourism:

In comparison to tourism products such as beach resorts, heritage tourism destinations are rather rapidly consumed. Whereas the average length of stay of beach resort holiday

makers is around 10 days, even major heritage-rich urban destinations (e.g. Venice) will rarely see an average stay of tourists of more than two days. The situation of smaller heritage towns is even worse as most of them will primarily receive day-trip visitors, whose stay is better measured in hours; e.g. a 4-6-hour stay of holiday excursionists in Valetta or an average of 2.5 hours in Delft. (cf. Ashworth 2004)

Another major problem is that heritage attractions tend not to generate return visits. As Gregory Ashworth writes, “much heritage tourism could be labelled Michelin/Baedeker collecting. Tourists have pre-marked sites and artefacts that must be visited if the place is to be authentically experienced. Once ‘collected’ a repeat is superfluous and the collection must be expanded elsewhere. Ironically the more unique the heritage experience, the less likely it is to be repeated. (...) Equally the more renowned and unique the heritage product, the more difficult it is to renew and extend the range of heritage products on offer. Sites can become imprisoned in the immutable uniqueness of the site and the unvarying but stringent expectations of visitors.” (Ashworth 2004, 5)

Like culture consumption in general, heritage tourism is also prone to shifts in people’s interests, life styles and aspirations as well as new opportunities offered by the travel market such as low cost flights. Whether or not historic towns will benefit from such shifts in the next ten years is far from clear. But, in order to shape their own future they will need to consider the available options and work pro-actively to make important shifts work for them.

What they certainly should avoid is becoming “well-maintained ghettos” or “frozen, mummified historical centres”. (cf. Robert/Pharès/Sauvage 2003, 86 and 93) While historic towns will need to preserve, revitalise and promote their built cultural heritage, this strategy alone is unlikely to ensure a successful cultural tourism development. They should also create opportunities for meaningful cultural experiences beyond the

attraction value of a well-preserved historic environment.

Historic towns particularly will need to attract purposeful cultural tourists. But this means, that they also must provide for other experiential values than “sightseeing”, cultural experiences which may make visitors want to stay longer in the town than typical day-trip tourists.

## **6.2. Developing creative cultural tourism experiences**

Experiences have become a core value of consumption because people want to lead more intensive and meaningful lives, they seek after emotions and meanings, and want to participate in events in a more individual way rather than as a member of a passive audience (with respect to cultural participation in museums cf. Kotler 2003, 12-14). This means that leisure time tends to be used in a more active and conscious manner and the results should be successful and personally rewarding. The boundaries between work and leisure are blurring, though the criteria of success for leisure activities are somewhat different from those of work life. In particular, they are hedonistic in nature and relate to personal experiences.

Criteria for successful leisure and travel experiences comprise:

- to learn about and appreciate a destination on more than a superficial level, including to feel a positive interaction with a community’s cultural and social life,
- to explore something off the beaten tracks of mass tourism and/or try out new and unconventional activities,
- to reach a greater mastery of existing personal interests or develop new interests and acquire related skills, e.g. through attending a course of a summer school,
- to gain new insights in oneself, e.g. through some form of “spiritual travel” or a stay at places such as a monastery; also some advanced “wellness” offerings can allow for such insights.

These criteria are strongly related to people’s growing thirst for self-development

and personal fulfillment that, among other options, drives the interest in creative tourism programmes. Such programmes offer visitors “the opportunity to develop their creative potential through active participation in courses and learning experiences which are characteristic of the holiday destination where they are undertaken”. (Richards/ Raymond 2000, 18)

Historic towns should consider enriching their cultural tourism offer with creative opportunities such as courses in restoration work, music, cooking & culinary culture and handcraft workshops that are led by local “personal guides”. The slow pace and reassuring environment of a historic town and its surrounding may fit particularly well with such courses. Yet, as emphasised in the above definition by Richards and Raymond, it is critical that creative tourism programmes take into account and strengthen local cultural themes. There should be specific reasons for the visitors to engage in specific creative activities in the town.

Furthermore, a creative cultural programme will allow tourists or, rather, guests to change their role, become learners in search of self-fulfillment, and develop a deeper relationship with members of the host community and other guests (e.g. in informal, hands-on workshops and conversations).

Put in economic terms, creative cultural tourists will stay longer in the town, an extended weekend, whole week or even longer, depending on the courses and other activities offered. Moreover, creative cultural programmes do not require much investment in infrastructures (e.g. building and maintaining a new museum). Rather the investment will be in creative competences and skills of local people which will give them “more of a stake in tourism, becoming active producers of tourism experiences, rather than extras in a show of staged authenticity”. (Richards/Wilson 2006, 1216)

For illustrative examples of creative tourism offerings see: <http://www.creativebreaks.co.uk> and <http://www.creativetourism.co.nz>.

### **6.3. Staging memorable cultural tourism experiences**

The concept of “staging” experiences as developed by Joseph Pine and James H. Gilmore, the authors of “The Experience Economy” (1999), has a high affinity with what entertainment and leisure industries are offering their customers. In fact, Walt Disney is one of their favourite examples: in the Walt Disney theme parks the workers are called “actors”, the visitors are the “guests” and the theme park is the “stage” for the visitors’ experiences. However, will it be feasible or, even, desirable for historic towns and cultural heritage institutions to adopt this concept and acquire the skills and talents that are required to be successful in a competition with such tourism and leisure businesses?

First of all they will need to acknowledge that there already exists such a competition and that consumers’ measures with respect to experiences are set by professionally created leisure and entertainment offerings. Today, the cultural heritage sector’s offerings will often rank considerably below the current level of what the various players of the leisure and entertainment industries with their large development budgets have achieved so far and are heading for.

As BRC Imagination Arts, an entertainment development company that also works with heritage organisations, write on their website: “While your guests expect historical and anthropological accuracy, their measure of entertainment value has been set by theme parks, film and television. As unfair as this is, less public money is also available for cultural venues. This is forcing you to compete for guests’ leisure-time and money to supplement funding.”

Dexter Gail Lord thinks that the search for meaning is “one of the key things that differentiates cultural activities from ‘theme park’ type of activities”. Yet, cultural tourism providers should also note: “At the same time, the success of theme parks has created high expectations for cultural tourism. Tourists expect and demand good service,



convenience, an impressive experience, safety and, yes, predictability in terms of what is offered.” (Lord 1999, 6) Hence, it is a true challenge to understand, but even more to design cultural tourism offerings that respond to the customer’s desire for meaningful experiences.

The development agenda for historic towns and other heritage sites will need to strongly concentrate on offering cultural experiences and imparting cultural knowledge in novel ways that involve the visitors. This is not an argument for turning cultural heritage sites into entertainment venues but a warning that offerings that do not invite, inspire, engage or immerse will not find a wider appeal.

An impression of what others are offering can be acquired by scanning the programmes of the recent TiLE conferences ([www.tileweb.org](http://www.tileweb.org)). TiLE is a major forum for leisure venues and visitor attractions. This includes theme parks, science centres, planetariums, aquariums, museums and other cultural institutions. Some technical on-site applications include audiovisual technologies, multimedia, animatronics, simulation and virtual reality, for example.

At present the focus of historic towns primarily seems to be on enhancing the urban environment, improving the “urban stage”, rather than considering appealing “plays”. Among the more common approaches are illumination schemes for buildings, walls, streets, bridges, etc. that sometimes have a “dramatical” aspect. Another important area in which much work is done are improvements of the town’s legibility such as state-of-the-art signage systems.

Understandably towns see themselves primarily responsible for such infrastructural components and leave it to other tourism stakeholders (e.g. local association of retailers, hotels and restaurants, cultural institutions, etc.) to think about what other means could be used to enhance the experiences of the visitors. But it is well known that the mostly small businesses of the tourism sector often lack time and budgets to consider novel approaches, and

that establishing collaborations among such businesses is not easy.

Therefore, development departments of historic towns and regions will need to ensure that the owners and managers of such businesses participate in the development of the town’s experiential positioning and contribute to the realisation of the experiential values that allow historic towns to compete with other travel and leisure attractions.

Basically the town will need to create a “stage” or a series of stages for the experiences, employ dramaturgical scripts and realise events that involve and engage the guests.

Such approaches will comprise

- appealing themes that are rooted in the town’s history,
- storytelling and opportunities to interact with local people,
- special access and behind-the-scenes components (that allow for experiencing “the real thing”) as well as high quality interpretation,
- “hands on” and other activities that involve all senses, and
- an authentic and emotional character of the activities.

Hence, typically stages, activities and events for experiences in historic towns will focus on experiential benefits such as learning about and appreciating the town on more than a superficial level, including feeling a positive interaction with a community’s cultural and social life.

By developing and combining experiential components, a “menu of experience options” can be developed. For example, with respect to “hands on” experiences a creative cultural course programme can be developed. With respect to “special access and behind-the-scenes”, discovery and even adventure-like ways of learning about the town, its history and unique features may be considered.

#### **6.4. Making use of information and communication technologies**

Information and communication technologies (ICT) can play an important supportive role in the promotion and communication

of historic towns and cultural heritage experiences to visitors and residents alike. Among other opportunities, ICT can provide a (virtual) stage for presenting an attractive brand image of the historic town, improving its legibility, and telling stories about its tangible and intangible cultural riches. The following brief overview should illustrate that ICT can make a difference, if historic towns strategically use them in ways that enhance the visibility, attractiveness and experiential value of the town.

### *High challenge of communicating experiences*

Communicating the experiences offered by a town (or any other travel destination) is not easy, because, the potential visitors will only gain them when actually visiting the town. Therefore, the town together with individual service providers (e.g. visitor centre, museums and galleries, hotels, restaurants, etc.) must communicate the unique experiences they provide in a way that allows the visitor to recognise and anticipate these experiences beforehand. Customers today want to have “success guaranteed” before they actually buy a product or service. This is relatively easy with standardised and primarily functional products or services, but not with products and services that are marketed based on their experiential value.

Consequently, there is a high challenge regarding the communication of the experiences the tourists will gain when actually visiting the town and consuming particular services (e.g. a boutique hotel, creative course, museum, festival, etc.). Producing print and online information that communicates experiences is not only a matter of carefully choosing images, messages or testimonials of people who have already visited the town, the whole communication approach must follow principles of experience design. For example, Deborah Hayes and Nicola MacLeod (2007) analysed heritage trails brochures and leaflets against a set of such principles. They found that while such material starts positioning trails as experiences (rather than

products) there is still considerable scope for improvement.

### *Use of state-of-the-art information channels*

Purposeful cultural tourists are more likely to arrange their travel independently rather than through tour operators or holiday packages. Historic towns will need to employ state-of-the-art information and communication media such as compelling, highly interactive websites and creatively designed catalogs, brochures or leaflets. The ATLAS Cultural Tourism Project provides a summary on the information sources cultural tourists used around 2002: “The main source of information for cultural tourists is personal recommendation from friends or family (46%). Guide books are the most important source of published information (27%), but the Internet is rapidly becoming a major factor, already being consulted by 17% of tourists in 2002, the same proportion as those using tour operator brochures and more than tourist board information (14%). More people are also booking their travel or accommodation via Internet (8% in 2002).”

In the last years the use of online information resources for preparing a travel has more than doubled due on the one hand to the growth in access to the Internet and, on the other hand, the availability of more in-depth information on destinations and products. As cultural tourists on average have a higher income and educational level, they will more often have access to the Internet and use online information resources for arranging their travels.

With respect to mediating a distinct brand image of the town, an online portal with carefully chosen visuals and messages will be of prime importance. This portal will integrate websites of individual historic buildings and monuments, events, creative cultural courses, local producers, quality retailers, gastronomy, etc. While this provides a gateway to a virtual visit of the historic town, care must be taken that people do not get lost in a multitude of sub-pages. Logging data can provide some information on which

pages are consulted how long as well as points where visitor get lost.

### *Participation of local people and institutions*

Historic towns may find it difficult to communicate the cultural richness and regional importance of the town beyond its function as an “attraction value” or “brand asset”. For attracting purposeful cultural tourists, websites that allow visitors to find and explore convincing experiential value propositions (e.g. authenticity, convenience, etc.) may be better suited than a product-driven approach focused on the typical travel package.

Rather than a typical marketing strategy, a distinct approach is to involve local people, archives that hold unique content and site managers to communicate cultural experiences, historic depth and regional contexts of the town. Personal voices of people who live and work in the town are much more likely to communicate to potential visitors the specificity of the town, particular places and activities such as local events. This may create an emotional resonance and first personal attachment of visitors with the town, its people and places.

### *People's own images and stories*

Strongly related to people's quest for experiences and self-fulfillment is the increasing use of new digital tools for documenting their own way of life. Ever more people capture images (photographs and videos) of leisure and travel activities using digital cameras. Many place them on online content websites and sharing services such as Flickr or YouTube which have seen tremendous growth in user-generated content. Ever more people also express their own ideas using Web-based tools such as Weblogs. (cf. Pew Internet 2006)

Historic towns and other cultural heritage sites may benefit from fostering online communities of people who share an interest in the town and region. Stories and images of

visitors could greatly enhance the vibrancy of a historic town's online portal or, more likely, a related website. But, for most towns and cultural heritage sites the challenge will first be to embrace the idea of co-operating with a (non-professional) online community, and then to nurture an evolving and thriving community that crosses the virtual as well as physical space.

### *Cultural routes and other marketing platforms*

Cultural routes have been developed by many European regions as well as in cross-regional and international collaborative efforts (see for example the routes that have been selected by the European Institute of Cultural Routes as “[Major] Cultural Routes of the Council of Europe”; in February 2007 “The Transromanica – Routes of Romanesque art in Europe” and “The Via Carolingia” have been awarded this title).

Yet, it seems unlikely that a route of historic towns in a region or country will have a real impact in terms of drawing visitors to different towns. For example, in the Netherlands five historic towns - Haarlem, Leiden, Delft, Dordrecht and Schiedam - were linked in a promotional campaign *Het geheim van Holland* (The Secret of Holland). This project was stopped after four years. Due to the perceived resemblance between the towns it was not interesting enough for tourists to visit more than one or two of the towns. Interestingly, Delft has subsequently linked their promotion with the nearby larger city Rotterdam that has a totally different cultural product (modern architecture, design and visual arts, multi-cultural quarters, etc.). (cf. WTO-ETC 2005, 48)

But, cooperation of historic towns can make sense if the goal is simply to share the costs of some additional online and other marketing activities. An example of such a cooperation of larger historic towns is “Historic Highlights of Germany” (<http://www.historicgermany.com>) that has 13 participants: Augsburg, Erfurt, Freiburg, Heidelberg, Koblenz, Lübeck, Münster, Potsdam, Regensburg,

Rostock, Trier, Wiesbaden and Würzburg. In Austria, “Kleine historische Städte” is a marketing platform of 18 small historic towns (<http://www.khs.info>).

There are also other marketing platforms historic towns can use, if they have implemented certain products or services. For example, [Europeancitycards.com](http://Europeancitycards.com) is a website where one can buy city cards from 43 cities in Europe; among the smaller cities, for example, are Dubrovnik, Innsbruck, Nürnberg, Salzburg and York. [Europeancitycards.com](http://Europeancitycards.com) works in association with European Cities Tourism, the network of European Tourist Boards.

### *Online booking facilities*

According to the Centre for Regional and Tourism Research (Denmark) of all sales of travel services on the European market online sales have grown from 7.9% in 2004 to 10.3% in 2005, which is an increase of 34%. For 2006 a share of 12.6% was expected, i.e. a further increase of 25%. The direct sellers accounted for 66% of online sales, intermediaries for 34%. In 2005 the breakdown of the market by type of service was as follows: airtravel 56%, hotels 16%, package tours 16%, rail 10% and rental cars 2%. (Marcussen 2006)

If the historic town’s online portal or websites of individual service providers also offer the opportunity to book services, a look-to-book ratio may be calculated. Such a ratio can provide a general indicator for the attractiveness of the offer in terms of presentation, prize, etc. On the market for standardised travel packages very different look-to-book ratios are reported. A realistic ratio for bookings of travel agencies on websites of travel providers is 12:1 (8%), whereas if customers themselves book travel packages a rate of 67:1 (1.5%) may be obtained. (cf. Starkov 2001; Rossmann/Donner 2007; TravelOne 2004)

### *Electronic tour guides*

Electronic tour guides are an interesting opportunity to explore for historic towns. (Ross et al. 2004 and 2005 provide an

overview on the application of mobile and location-based systems in the cultural heritage sector) Electronic guides typically offer visitors different thematic entry points and suggestions for walking tours around the town with information about places and objects, what to look for specifically, etc. But electronic tour guides will also, or even more so, be important if historic towns integrate in their tourism programme attractions and routes in the wider area. For many smaller historic towns it is critical to emphasise their regional embeddedness and provide visitors intending to stay longer with suggestions on what to explore in the surroundings of the town. For over-crowded historic towns linking up with interesting cultural and other leisure places in the surroundings may also help in achieving a better distribution of tourists.

### *IT-based applications for on-site presentation and interaction*

There is a large body of evidence that IT-based applications for on-site presentation and interaction (e.g. in museums, visitor centres of heritage sites, monuments, etc.) can greatly enhance the cultural experiences and knowledge acquisitions of visitors. Yet, such applications often only have the role of an “add on” which is not fully used by visitor (in contrast, for example, to science centres, where virtual reality and simulations have become a core element of presentation and visitor interaction). Unfortunately, very little is known of the total cost of ownership of such applications for the institutions compared to their attraction value and benefits for visitors.

An exploratory visitor survey at five outstanding UK heritage sites, museums, monuments and archaeological sites that have implemented different IT applications, concluded that all of the applications “were found to be underutilised”. However, visitors who had been at the site before showed a higher use of applications than those who were on their first visit; e.g. for a computer game this was 16% in comparison to 4% of



respondents. “This suggests additional uses for technology: to entice the visitor back to the site and to enhance the repeat visit experience by exploring the technology on offer.” (Owen/Buhalis/Pletinckx 2005)

## **7. Tourism development and sustainability of historic towns**

There are a number of charters and declarations on cultural tourism and sustainable development. Among the most important are the “Global Code of Ethics for Tourism” of the World Tourism Organisation (WTO 1999) and the ICOMOS “International Cultural Tourism Charter”. (ICOMOS 1999) Recently several declarations have been issued, which may indicate an increasing unease regarding the commercialisation and loss of local cultural heritage through tourism activities.

The pan-European federation for cultural heritage Europa Nostra on the occasion of their annual congress in May 2006 published the “Malta Declaration”. Europa Nostra urges to strike a better balance between tourism development and heritage conservation. (Europa Nostra 2006a-c) Another example is the “Dubrovnik Declaration” that was issued by the Culture and Education Committee of the Council of Europe’s Congress of Local and Regional Authorities together with the European Association of Historic Towns and Regions on the occasion of the symposium “Cultural Tourism – Economic Benefit or Loss of Identity?”, held 28-29 September 2006 in Dubrovnik. (Council of Europe / EAHTR 2006)

In fact, forced tourism development in historic towns can lead to particularly negative cases of the tourist area life-cycle (TALC) model. Because, due to their limited space and other characteristics their tourist carrying capacity – i.e. ability to absorb visitors and required tourist infrastructure – is rather low (Butler 2006a/b provide a rich collection of contributions on theoretical and conceptual issues, applications and modifications of the TALC model).

Antonio P. Russo thinks that “it is in heritage cities that the full developments of

the cycle assume the most significant tracts”. (Russo 2000; see also Russo 2006) The typical conflict in developing cultural tourism may be unavoidable: the unique character of a living historic environment, which is marketed to potential visitors, should be preserved. Yet, tourism development can bring crowds of visitors (often day-trip visitors brought to the town by coaches), tourist shops that sell products which are often far from being of local origin, a theatrical illumination of monuments is installed, “folkloric” entertainment is offered, etc.

Graham Brooks, Chairman of the ICOMOS International Cultural Tourism Committee, points out many potential impacts from the resident’s perspective: “However it is the public spaces of a city where the highest negative impacts from tourism are usually experienced. Congestion from crowds of visitors, increased levels of traffic and parking congestion from tourist buses and motor vehicles, and the resulting disruption to normal daily life, can be a major source of irritation and frustration for local residents. They can feel excluded from their own special places by large crowds, long queues or thoughtless behaviour by visitors who do not understand the local culture or cultural practices, or by inequitable entry prices. Tourists often arrive in large groups or at peak periods, heavily impacting on the capacity of public spaces that may have traditionally served a relatively small population. Day-trip visitors from cruise ships or nearby recreational destinations often place extraordinary pressures on local resources. As tourists explore the quieter streets and spaces, local people can feel as though they have been reduced to objects of curiosity, with their privacy invaded, almost like animals in a zoo. Late night noise and other inappropriate behaviour can arise when large numbers of tourists congregate in relatively restricted sections of the city. Active tourism management by the local authorities is essential to protect the quality of life for the residents.” (Brooks 2005)

Tourism demands a specific infrastructure which the daily life in a small town would not require, and there also often occurs a

gradual displacement of economic functions. For example, the higher rents that can be earned from the tourist trade can force out of the historic centre traditional retailers and small-scale workshops, so that the residents can no longer find there the assortment of goods or particular services they are looking for. (cf. Brooks 2005; Drdácký 2002; Russo 2000)

Tourism is largely a private-sector activity that uses public resources for private gain. This can lead to situations that exemplify the so called tragedy of the commons, i.e. public spaces and other resources that are exploited by mass tourism are lost for everybody, the locals as well as the tourists who can no more appreciate the place. The tourist area life-cycle certainly has reached a critical stage if the residents start resenting the fact that they always must compete with tourists for space, local services and opportunities to enjoy their life in the town. In short, the residents should be understood to be the most important stakeholders in cultural tourism development, and local authorities must understand that protecting the quality of life of the residents is vital to sustain tourism in the longer term.

In order to ensure sustainability, many historic towns and other cultural heritage sites will over the coming years need to implement a rigorous tourism planning and management. According to a study of the United Nations Environment Programme (UNEP) in cooperation with the International Council for Local Environmental Initiatives (ICLEI), historic towns receiving high tourist numbers are already among the three main types of destinations that are most active in developing sustainable tourism strategies. The other two types of destinations are islands on which tourism dominates the economy and tourist resorts in coastal areas. (UNEP/ICLEI 2003a/b)

Finally, it must be emphasised that heritage resources are not available “for free”. However, as Gregory Ashworth (Professor of Heritage Management and Urban Tourism at the University of Groningen) writes, there are “attitudes of many within the tourism

industry who view heritage as a zero-cost, freely accessible public good. Simply heritage costs money for its preservation, continuing maintenance, management and presentation. Heritage tourism is too often seen as a marginal use of already existing resources whose demands can be accommodated without extra cost or the displacement of other users.” (Ashworth 2004, 7)

## **8. Concluding remarks**

The experience economy puts a premium on the experiential value of goods and services that allow consumers to gain enriching and memorable experiences. This is particularly evident with respect to tourism and leisure offerings. There is an enormous growth in such offerings like experience travel packages, theme parks, new types of shopping malls and themed retail centres, visitor centres of renowned consumer product brands, etc. Yet, the most critical competition for historic towns are “city breaks” in larger cultural cities that have shown high growth rates for several years, particularly due to the impact of low-cost flight connections. Historic towns should be aware of this competition and define, develop and market distinct experiential values.

For historic towns cultural tourism is one of the most important options for strengthening their economic basis. Therefore it is very important to understand the motivations and characteristics of cultural tourists. Historic towns particularly will want to attract purposeful cultural tourists. But this means that they also must provide for other experiential values than “sightseeing”, which may make visitors want to stay longer in the town than typical day-trip tourists.

Historic towns cannot solely count on the attraction value of their built cultural heritage and specific atmosphere. They should develop a distinct experiential positioning that also builds on other unique features and existing regional strengths as well as innovative elements, e.g. the strategic development of key events such as festivals, creative cultural course programmes, cultural and creative

businesses, quality retail, accommodation and gastronomy, etc. (a detailed overview and discussion of such strategies is provided in Salzburg Research's study in the Hist. Urban project which will become available on <http://www.histurban.net>).

Such strategies provide an important basis for cultural tourism offerings, but it is important to emphasise that in an integrated framework of urban revitalisation they should benefit cultural tourists and residents alike. For example, revitalisation of historic city centres should not focus only or mainly on making them attractive for cultural tourism. It is also important that such centres remain or again become vital places for residents and small local businesses. Other strategies such as fostering the development of cultural and creative business and locally owned quality retail shops are also important to leverage the confidence of stakeholders and investors in the town's future and help retain talented people.

Developing a high-quality cultural tourism environment can help historic towns to prevent being exploited by mass tourism which devalues heritage sites, public spaces and other resources of the town. This requires fostering local businesses and skilled creative people who share a common understanding and responsibility for a sustainable tourism development that focuses on a high-quality cultural tourism offer that does not reduce but adds to the quality of life and work in the town.

## 9. References

Ahuja, Anjana (2006): Are you experienced? In: *The Times*, February 17, 2006, <http://www.timesonline.co.uk/article/0,,7-2043534,00.html>

Angel, Sofia / Hansen, Peter J. (2006): In search of the experience economy. Nordic Innovation Centre, [http://www.nordicinnovation.net/\\_img/experience\\_economy\\_final\\_report\\_w\\_cover.pdf](http://www.nordicinnovation.net/_img/experience_economy_final_report_w_cover.pdf)

Ashworth, G. J. (2004): The blue - grey transition: heritage in the reinvention of the tourism resort. *The Best in Heritage*

Conference, Dubrovnik, 16-18 September 2004, [http://www.thebestinheritage.com/library/the\\_blue-grey\\_transition.rtf](http://www.thebestinheritage.com/library/the_blue-grey_transition.rtf)

Ateljevic, Irina / Doorne, Stephen (2000): 'Staying Within the Fence': Lifestyle Entrepreneurship in Tourism. In: *Journal of Sustainable Tourism* 8(5), 378–392, <http://www.multilingual-matters.net/jost/008/0378/jost0080378.pdf>

ATLAS – Association for Tourism and Leisure Education (2002): ATLAS Cultural Tourism Project: Summary of Previous Research, <http://www.tram-research.com/atlas/previous.htm>

BRC Imagination Arts (2007): Cultural heritage attractions, <http://www.brcweb.com/cultural-heritage-attractions.htm>

Brooks, Graham (2005): Hosting Tourists in World Heritage Cities: How to reconcile the needs of residents. Organization of World Heritage Cities, <http://urbo.ovpm.org/index.php?module=pagesetter&func=viewpub&tid=4&pid=29>

Butler, Richard W. (ed., 2006a): *The Tourism Area Life Cycle – Volume 1: Applications and Modifications*. Clevedon: Multilingual Matters Limited

Butler, Richard W. (ed., 2006b): *Tourism Area Life Cycle – Volume 2: Conceptual and Theoretical Issues*. Clevedon: Multilingual Matters Limited

Council of Europe / European Association of Historic Towns and Regions (2006): "Dubrovnik Declaration", International Symposium "Cultural Tourism – Economic Benefit or Loss of Identity?", Dubrovnik, 28-29 September 2006, <http://www.historic-towns.org/documents/downloads/DubrovnikFinalDeclaration.doc>

Council of Europe Cultural Routes, [http://www.coe.int/t/e/cultural\\_co-operation/heritage/european\\_cultural\\_routes/\\_Summary.asp](http://www.coe.int/t/e/cultural_co-operation/heritage/european_cultural_routes/_Summary.asp)

Drdácký, M. F. (2002): Impact and Risks of Tourism in Cultural Heritage Environment. In: Proceedings of the CIVVIH ICOMOS Scientific Conference "Preservation, Development and Monitoring of Historic Cities in the 21st Century". Sofia Avgerinou-Kolonias, Corfu, April 18-21, <http://www>.

- itam.cas.cz/static-presentation/contents/pdf/drdacky/drdacky\_Corfu%20CIVVIH%20paper%20abbreviated\_edito1\_D09.pdf
- Econ Consult (2005): Shoppingtourismus im internationalen Vergleich. Wachstumsimpulse für Tourismus und Einzelhandel in Deutschland. Untersuchung im Auftrag des Bundesministeriums für Wirtschaft und Arbeit, <http://www.isg-institut.de/download/Shoppingtourismus.pdf>
- ECT – European Cities Tourism (2007): City Break 2006 - Reflecting the shifting trends in European tourism, <http://www.europeancities tourism.com/templates/page.aspx?id=4241>
- EICR – European Institute of Cultural Routes (2007): Pro-active management of the Impact of Cultural Tourism upon Urban Resources and Economies (PICTURE project), information on urban tourism, [http://www.culture-routes.lu/php/fo\\_index.php?lng=en&dest=bd\\_pa\\_det&rub=69](http://www.culture-routes.lu/php/fo_index.php?lng=en&dest=bd_pa_det&rub=69)
- ELFAA - European Low Fares Airline Association (2004): Liberalisation of European Air Transport: The Benefits of Low Fares Airlines to Consumers, Airports, Regions and the Environment. Brussels, 2004, [http://www.elfaa.com/documents/ELFAABenefitsofLFAs2004\\_000.pdf](http://www.elfaa.com/documents/ELFAABenefitsofLFAs2004_000.pdf)
- ETC – European Travel Commission (2006): Tourism trends for Europe. Brussels, September 2006, [http://www.etc-corporate.org//DWL/ETC\\_Tourism\\_Trends\\_for\\_Europe\\_09-2006\\_ENG.pdf](http://www.etc-corporate.org//DWL/ETC_Tourism_Trends_for_Europe_09-2006_ENG.pdf)
- Eurobarometer (1998): The Europeans on Holidays 1997-1998. A Eurobarometer survey carried out on behalf of the European Commission, Directorate General XXIII. Executive Summary, February 1998, [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_117\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_117_en.pdf)
- Europa Nostra (2006a): The Malta Declaration on Cultural Tourism: Its Encouragement and Control, [http://www.europanostra.org/lang\\_en/index.html](http://www.europanostra.org/lang_en/index.html)
- Europa Nostra (2006b): Europe needs to strike right balance between tourism development and heritage conservation. Europa Nostra adopts “Malta Declaration” (19 May 2006), [http://www.europanostra.org/lang\\_en/index.html](http://www.europanostra.org/lang_en/index.html)
- Europa Nostra (2006c): Position Paper on the Encouragement of Cultural Tourism and the Mitigation of its Effects. Paris, November 2006, [http://www.europanostra.org/downloads/documents/EN\\_position\\_paper\\_cultural\\_tourism.pdf](http://www.europanostra.org/downloads/documents/EN_position_paper_cultural_tourism.pdf)
- European Commission, DG Enterprise (2004): The European Tourism Industry. A multi-sector with dynamic markets. Structures, developments and importance for Europe’s economy. Study prepared by Rüdiger Leidner. March 2004, [http://ec.europa.eu/enterprise/services/tourism/doc/studies/european\\_tourism\\_industry\\_2004/european\\_tourism\\_industry\\_2004\\_en.pdf](http://ec.europa.eu/enterprise/services/tourism/doc/studies/european_tourism_industry_2004/european_tourism_industry_2004_en.pdf)
- European Commission, DG Research (2004): New technologies for the future of our past: EU Research for sustainable urban development and land use - Cultural heritage. Luxembourg: Office for Official Publications of the European Communities, [http://ec.europa.eu/research/environment/pdf/her\\_tech\\_en.pdf](http://ec.europa.eu/research/environment/pdf/her_tech_en.pdf)
- European Territorial Cooperation 2007 – 2013. Central Europe. Operational Programme, Draft 3.7 / May 2007, [http://www.cadses.net/media/files/New\\_Programmes/op\\_central\\_europe\\_draft\\_3-7\\_clean.pdf](http://www.cadses.net/media/files/New_Programmes/op_central_europe_draft_3-7_clean.pdf)
- Eurostat (2002): Verbraucher in Europa: Zahlen, Daten und Fakten. Luxemburg: Amt für amtliche Veröffentlichungen der Europäischen Gemeinschaften
- Freitag, Rolf (2005): European city tourism 2004: Outbound trends and opportunities. IPK International, 1 June 2005, <http://www.world-tourism.org/destination/turkey/Freitag.pdf>
- GfK – Gesellschaft für Konsumforschung (2002): 50 Plus 2002. Studie zum Verbraucher im dritten Lebensabschnitt. Nürnberg: GfK Marktforschung



- Hayes, Deborah / MacLeod, Nicola (2007): Packaging places: Designing heritage trails using an experience economy perspective to maximize visitor engagement. In: *Journal of Vacation Marketing*, Vol. 13, No. 1, 45-58
- IAAP – International Association of Amusement Parks and Attractions (2006): U.S. Amusement/Theme Parks & Attractions Industry – Attendances & Revenues, <http://www.iaapa.org/modules/MediaNews/index.cfm?fuseaction=Details&mtid=3&iid=1051>
- ICOMOS – International Council on Monuments and Sites (1999): International Cultural Tourism Charter (Managing Tourism at Places of Heritage Significance, 1999). Adopted by ICOMOS at the 12th General Assembly in Mexico, October 1999, [http://www.international.icomos.org/charters/tourism\\_e.htm](http://www.international.icomos.org/charters/tourism_e.htm)
- ICOMOS-ICTC – International Council on Monuments and Sites / International Cultural Tourism Committee (2002): International Cultural Tourism Charter. Principles and Guidelines for Managing Tourism at Places of Cultural and Heritage Significance. December 2002, [http://www.icomos.org/australia/images/pdf/ICOMOS%20International%20Cultural%20Tourism%20Charter%20\(English\).pdf](http://www.icomos.org/australia/images/pdf/ICOMOS%20International%20Cultural%20Tourism%20Charter%20(English).pdf)
- IPK International (2002): European Travel Monitor Results. Munich: IPK 2002
- IPK International (2006a): ITB convention – Market Trends and Innovations (9 January 2006), [http://www.ipkinternational.com/fileadmin/Media/documents/news/ITB\\_IPK\\_Berlin\\_Message.pdf](http://www.ipkinternational.com/fileadmin/Media/documents/news/ITB_IPK_Berlin_Message.pdf)
- IPK International (2006b): Preliminary World Travel Monitor Results: Global Travel Trends 2005, ITB Berlin Message, 03/10/06, <http://www.hospitalitynet.org/file/152002499.pdf>
- Kotler, Neil (2003): Creativity and interactivity: new ways to experience, market and manage museums (27 March 2003), [http://www.deakin.edu.au/buslaw/bowater/clmr/fellows/kotler\\_lecture.pdf](http://www.deakin.edu.au/buslaw/bowater/clmr/fellows/kotler_lecture.pdf)
- Linty, Paolo (2005): European Cultural Tourism Network, 2<sup>nd</sup> Annual Conference, Cardiff 6-8 July 2005, <http://www.cultural-tourism.net/cardiff2005/ECTNPaolo2.pdf>
- Lohmann, Martin / Mundt, Jörn W. (2002): Maturing Markets for Cultural Tourism: Germany and the Demand for the “Cultural” Destination. In: Voase, Richard (Ed.): CAB International 2002. *Tourism in Western Europe. A Collection of Case Histories*. Wallingford and New York: CAB International 2002, pp. 213-225, <http://www.ba-ravensburg.de/~mundt/cultural%20tourism.pdf>
- Lord, Gail Dexter (1999): The power of cultural tourism. Keynote presentation at Wisconsin Heritage Tourism Conference, September 17, 1999, [http://www.lord.ca/Media/Artcl\\_PowerCulturalTourism-GL.pdf](http://www.lord.ca/Media/Artcl_PowerCulturalTourism-GL.pdf)
- Marcussen, Carl H. (2006): Trends in European Internet Distribution of Travel and Tourism Services (26 April 2006). Centre for Regional and Tourism Research, Denmark, <http://www.crt.dk/uk/staff/chm/trends.htm>
- McKercher, Robert / du Cros, Hilary (2002): *Cultural tourism: The partnership between tourism and cultural tourism management*. Binghamton, NY: The Haworth Hospitality Press
- Owen, Ruth / Buhalis, Dimitrios / Pletinckx, Daniel (2005): Visitors’ evaluation of ICTs used in cultural Heritage. In: Mudge, M. / Ryan, N. / Scopingno, R. (eds.): *Proceedings of VAST 2005 - 6th International Symposium on Virtual Reality, Archaeology and Cultural Heritage*, pp. 129-136, [http://www.enamecenter.org/downloads/resources/2005/VastProceedings\\_129\\_136.pdf](http://www.enamecenter.org/downloads/resources/2005/VastProceedings_129_136.pdf)
- Pew Internet & American Life Project – Lenhart, A. / Fox, S. (2006): Bloggers. A portrait of the internet’s new storytellers (19 July 2006), <http://www.pewinternet.org/pdfs/PIP%20Bloggers%20Report%20July%2019%202006.pdf>

- Pine, B. Joseph / Gilmore, James H. (1999): *The Experience Economy*. Boston: Harvard Business School
- Pine, B. Joseph / Gilmore, James H. (2001): *All the World's a Stage!* In: *FUTURE - The Aventis Magazine*, January 2001 <http://www.tresser.com/All%20The%20World's%20A%20Stage.pdf>
- Prentice, Richard (2001): *Journeys for experiences*. In: *AIEST Tourism Growth and Global Competition*. International Association of Scientific Experts in Tourism, St. Gallen, pp. 263-276
- Prentice, Richard (2003): *Conceptualising cultural tourism*. Conference on developing cultural tourism, University of Nottingham, 16 December 2003, <http://www.nottingham.ac.uk/ttri/pdf/conference/richard%2oprentice.pdf>
- Prentice, Richard (2004): *Tourist motivation and typologies*. In Lew, A. / Hall, M. / Williams, A. M. (eds.): *A companion to tourism*. Oxford: Blackwell, 261-279
- Richards, Greg / Raymond, Crispin (2000): *Creative tourism*. In: *ATLAS news* (23), 16-20.
- Richards, Greg / Wilson, Julie (2006): *Developing creativity in tourist experiences: A solution to the serial reproduction of culture?* In: *Tourism Management* 27 (2006), pp. 1209-1223, <http://www.atlas-euro.org/pages/pdf/WinterUni2007/WU2007%20article%20fernandes%201.pdf>
- Robert, Emmanuelle / Pharès, Jehanne / Sauvage, Alexandra (2003): *Discussion Highlights*. In: *UNESCO World Heritage Centre: Partnerships for World Heritage Cities. Culture as a Vector for Sustainable Urban Development*. World Heritage Papers n°9, pp. 86-96, [http://whc.unesco.org/documents/publi\\_wh\\_papers\\_09\\_en.pdf](http://whc.unesco.org/documents/publi_wh_papers_09_en.pdf)
- Ross, S. / Donnelly, M. / Dobрева, M. (2004): *Emerging Technologies for the Cultural and Scientific Heritage Sector*. DigiCULT Technology Watch Report 2, February 2004, Chapter: *Mobile Access to Cultural Information Resources*, pp. 91-118, <http://www.digicult.info/pages/techwatch.php>
- Ross, S. / Donnelly, M. / Dobрева, M. / Abbott, D. / McHugh, A. / Rusbridge, A. (2005): *Core Technologies for the Cultural and Scientific Heritage Sector*. DigiCULT Technology Watch Report 3, January 2005, Chapter: *Location-Based Systems*, pp. 153-182, <http://www.digicult.info/pages/techwatch.php>
- Rossmann, Dominik / Donner, Rainer (2007): *Erfolg im Tourismus durch das Internet*. München: Ulysses Management Web-Tourismus, Mai 2007
- Russo, Antonio P. (2002): *The "Vicious Circle" of Tourism Development in Heritage Cities*. In: *Annals of Tourism Research*, 29(1) pp 165-182, (2002), <http://www.ersa.org/ersaconfs/ersa00/pdf-ersa/pdf/34.pdf>
- Russo, Antonio P. (2006): *A Re-foundation of the TALC for Heritage Cities*. In: Butler, R. W. (ed., 2006a): *Tourism Area Life Cycle: Conceptual and Theoretical Issues*. Clevedon: Multilingual Matters Limited, pp. 139-161
- Ryan, N. / Cinotti, T.S. / Raffa, G. (eds., 2005): *Smart Environments and their Applications to Cultural Heritage*. Proceedings of a workshop held in conjunction with UbiComp'05, Tokyo, Japan, September 11, 2005. EPOCH Publication. Budapest: Archaeolingua, [http://www.epoch-net.org/index.php?option=com\\_content&task=view&id=139&Itemid=225](http://www.epoch-net.org/index.php?option=com_content&task=view&id=139&Itemid=225)
- Schmitt, Bernd H. (2003): *Customer Experience Management: A Revolutionary Approach to Connecting with Your Customers*. New York: Wiley
- Smith, Shawn / Wheeler, Joe (2002): *Managing the Customer Experience: Turn Customers into Advocates*. Pearson, October 2002
- Starkov, Max (2001): *How to Turn Lookers into Bookers. Recommendation Technology in Travel and Hospitality* (August 2001), [http://www.eyefortravel.com/papers/Recommendation\\_Technology\\_in\\_Travel.doc](http://www.eyefortravel.com/papers/Recommendation_Technology_in_Travel.doc)
- TheAge.com (2005): *Action follows movie cameras* (11 September 2005) <http://www.theage.com.au/news/>

world/action-follows-movie-cameras/2005/09/10/1125772731959.html

TravelOne (2004): Vernetzte Portale. Travel One – Das Magazin für Reiseprofis, 10. November 2004, 14-15, <http://www.travel-one.net/bilder/ausgaben/to0446.pdf>

UNEP / ICLEI – United Nations Environment Programme and International Council for Local Environmental Initiatives (2003a): Tourism and Local Agenda 21 - The Role of Local Authorities in Sustainable Tourism. Paris: UNEP, <http://www.uneptie.org/pc/tourism/library/local-agenda21.htm>

UNEP / ICLEI – United Nations Environment Programme and International Council for Local Environmental Initiatives (2003b): Tourism and Local Agenda 21 - The Role of Local Authorities in Sustainable Tourism. Case Studies: Bournemouth, Dorset, U.K.;

Calvià, Majorca, Spain; Winchester, U.K.; [http://www.uneptie.org/pc/tourism/documents/Tourism%20and%20LA21/la21\\_part3.pdf](http://www.uneptie.org/pc/tourism/documents/Tourism%20and%20LA21/la21_part3.pdf)

WTO - World Tourism Organization (1999): Global Code of Ethics for Tourism, [http://www.world-tourism.org/code\\_ethics/pdf/languages/Codigo%20Etico%20Ing.pdf](http://www.world-tourism.org/code_ethics/pdf/languages/Codigo%20Etico%20Ing.pdf)

WTO – World Tourism Organization (2006): Tourism Highlights - Edition 2006. Madrid: WTO, <http://www.unwto.org/facts/menu.html>

WTO-ETC – World Tourism Organization and European Travel Commission (2005): City Tourism & Culture - The European Experience. WTO: Madrid, [http://www.etc-corporate.org//DWL/ETC\\_CityTourism&Culture\\_LR.pdf](http://www.etc-corporate.org//DWL/ETC_CityTourism&Culture_LR.pdf)







# VALUING EUROPEAN CULTURAL HERITAGE SITES

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## Abstract

The following review looks at non-market valuation studies of cultural heritage sites that have been conducted in Europe. The most widely used non-market valuation technique in the cultural heritage sector is contingent valuation. This 'stated preference' methodology has been widely used in the field of environmental economics since the 1960s, but the adoption of the technique in the cultural heritage field has been much more recent. Revealed preference techniques have been used far less as a means to value heritage sites but there is evidence that this is beginning to change with increased use of the Travel Cost Method at heritage sites.

## 1 Introduction

When assessing the heritage sector, it is clear that a wide range of values can be attributed to cultural heritage sites. These can be precise values, such as the cost of admission to a site, or the cost of a book in the gift shop. These sorts of values are easily accessible to traditional economic modelling techniques. There is also a class of more amorphous values (non-market or non-monetary values), such as the 'satisfaction' derived from visiting a cultural heritage site, or the aesthetic value of a cultural heritage site to a local community.

It is therefore possible to apply two types of economic valuation analysis to cultural heritage sites – market and non-market. Market analyses are the traditional analyses carried out by economists which identify

direct and indirect expenditure effects. While these techniques can determine the more easily measurable economic impacts of a cultural heritage site, they do not reveal the full range of values produced by a site. Non-market analyses try to capture the values and benefits that are not picked up by the market valuations.

Because cultural heritage goods and services are not usually traded in conventional markets, the benefits derived from these goods and services are 'external' to the market. The economic valuation of non-market cultural heritage goods and services attempts to 'measure' individual's preferences for non-market goods and services. If monetary estimates are made of an individual's preferences for such goods and services, these can be integrated into an economic format comparable to conventional economic costs and benefits. This will enable impacts generated in the sector to be accounted for in policy and decision making processes.

Non-market valuations can be separated into two techniques: revealed and stated preference.

- Revealed preference techniques are based on an individual's actual purchasing decisions.
- Stated preference techniques are based on how people say they would react to changes in the market.

## 2 Revealed preference methods

The revealed preference methods of non-market valuation comprise two principal techniques. Travel cost analysis and the hedonic price analysis. These non-market valuation techniques, have seen fewer applications in the field of cultural heritage compared to stated preference methodologies, despite having much more widely-accepted economic principles.

### 2.1 Travel Cost Analysis

The underlying assumption of the travel cost methodology is that the amount individuals are prepared to pay to travel to a cultural heritage site is a reflection of the value of the goods and services provided by that heritage site. Using this framework, the expenses that individuals incur in order to visit a site, in terms of time and travel costs, are a proxy for the 'price' of access to the site. This data can be used to estimate willingness to pay.

Because travel costs increase with distance, the further away people live from a site, the less often they will visit. The number of visits to a site can be affected by other factors. The greater the choice of alternative sites, the fewer visits will be made to a site. Higher income earners will on average make more trips. Personal interest will also impact on the number of visitors. Statistical modelling should try to take these factors into account.

Travel cost methodology determines the number of visits from different distances from the site, and the travel cost from each zone. This is used to create an aggregate demand curve for visits to the site. The demand curve is used to determine how many visits individuals would make at various travel cost prices. This can then be used to provide an estimate of willingness to pay for site visitors. This applies if they are charged an admission fee or not. The most controversial aspects of the travel cost method include accounting for the opportunity cost of travel time, how to handle multi-purpose and multi-destination trips.

As with the hedonic price methodology, travel cost has not been widely applied to the valuation of cultural heritage sites. European studies using travel cost methods are rare. The only exception is the work of Bedate *et al.* (2004), which uses the travel cost method to estimate the demand curve for a historic village, a museum in the provincial capital, and a historic cathedral in the Castilla y León region of Spain. Travel cost is more widely used in North America (i.e. Martin 1994, Poor and Smith 2004), where the technique originated, although a recent study from Armenia (Alberini and Longo 2006) suggests the application of the method is becoming more widespread.

### Castilla y León

The study by Bedate *et al.* (2004), uses a zonal travel cost model to estimate the demand curve for a historic village (Uruena), a museum in the provincial capital (Museum of Burgos), and a historic cathedral (Cathedral of Palencia) in the Castilla y León region in northern Spain<sup>1</sup>.

A zonal travel cost model was constructed, with zones based upon bordering regions, regions not bordering in central Spain, peripheral regions in Spain, and regions outside of the Iberian peninsular. Surveys conducted mainly in the summer of 1998 were face-to-face interviews with tourists.

The research attempted to provide an estimate of the consumer surplus (use value) obtained from visits to the heritage sites. The study used transport costs (entry charges were considered to be zero), but not other expenses incurred during the journey. Using this data visits per capita were extrapolated for each zone, allowing the creation of a demand curve.

The walled town of Uruena revealed a total consumer surplus of €272.26 based on 130 valid responses, the Cathedral of Palencia had a total consumer surplus of €712.20 (based on 190 valid responses) and the total consumer surplus for the Museum of Burgos

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<sup>1</sup> A cultural music festival was also valued.

was €1171.97 (based on 294 responses). The researchers note that the longer the distance traveled the lower the number of visits. In the cases where this was not true the state of the road and transport network provides a credible explanation for the results.

### **Application to valuing ICT at cultural heritage sites**

The travel cost methodology has not yet been widely applied to cultural heritage sites, although there does appear to be a recent renewed interest in its use. As with the hedonic pricing method, it seems unlikely that the technique has the flexibility to determine the impact of ICT at cultural heritage sites. However, it is conceivable that in some cases travel cost could be used to determine the value of a specific IT-oriented exhibition or event.

## **2.2 Hedonic Price Method**

The hedonic price method continues to be the most underused of the non-market valuation methodologies in the European context. As with the Travel Cost Method this is a revealed preference methodology, but this technique uses the increase, or decrease, in property values of buildings around a heritage site as the surrogate value. Hedonic pricing has been used even less frequently as an evaluation technique (Clark and Herrin 1997, Deodhar 2004).

The hedonic pricing method has been used in the field of environmental economics to provide an estimate of the value of environmental amenities and urban goods that affect prices of marketed goods. Hedonic price analysis was first used by Andrew Court in 1939, although the technique gained widespread popularity with the work of Zvi Griliches in the early 1960s (Goodman 1998). Although the technique is not widely used to determine values for cultural heritage sites, it has been applied to cultural heritage in both the United States and Australia.

House prices are the most common vehicle for estimating the value of environmental

amenities, although other vehicles such as wages can be used (e.g. Smith 1983). Hedonic valuations assume that individuals place a value on the characteristics of a good, rather than the good itself. In this way the price will be a surrogate for the value of a set of characteristics, including cultural heritage characteristics that people consider important when purchasing the good.

The rationale of hedonic property price analysis is that property prices are determined not only by the characteristics of the property, but by the environmental attributes of the locality such as the neighbourhood and community, and other local environmental characteristics. In this scenario, if the factors not related to cultural heritage are controlled for, then the remaining price differences can be ascribed to differences in the quality and value cultural heritage. The higher price will be a reflection of the perceived value of cultural heritage to people who buy houses in the area.

### **Application to valuing ICT at cultural heritage sites**

Although the hedonic pricing method has been applied to a limited number of cultural heritage sites, it seems unlikely that the technique could be used to determine the impact of ICT at such sites. The method is limited by its relationship to the property, or similar markets.

## **3 Stated preference methods**

There are a number of issues with the application of revealed preference methodologies to cultural heritage assets (Bennett 2000):

- Revealed preference techniques are retrospective. They rely on future changes being extensions of the past and therefore do not work well if the future scenarios are significantly different to the past.
- Marketed goods may not always neatly relate to cultural heritage (i.e. existence benefits). It is unlikely that these benefits will be adequately determined using revealed preference techniques.

These kinds of limitations have led to the development of stated preference techniques. These methodologies can be applied to a wide range of circumstances where no marketed goods exist. However, the techniques and methodologies for measurement are not equally well developed in the different areas. Traditional economic analysis has a long history, but the measurement of indirect user benefits and societal benefits are less well developed.

Stated preference methodologies comprise two principal types of technique. Contingent valuation and the contingent choice family of techniques. Contingent valuation is by far the most commonly used method for site evaluation.

### 3.1 Contingent valuation

The contingent valuation method (CVM) is a non-market valuation technique based on stated preference, which tries to extract an estimation of the 'willingness to pay' for a good or service from users and non-users. Contingent valuation is the only accepted way of determining a financial value for non-use values in cultural heritage. These 'passive use' values that do not involve a market and may not even involve direct participation are extremely difficult to quantify otherwise. They include amongst others option, existence, and bequest benefits. In the current climate of diminishing funds for the cultural heritage sector, there is increasing urgency in assigning a financial value to non-use and passive use at cultural heritage sites. Individuals are obviously willing to pay for non-use, or passive use, but traditional economic analyses tend to treat these benefits as zero. Since people do not reveal their willingness to pay for them through their purchases or by their behaviour, the only option for estimating a value is by asking them questions.

The contingent valuation method was first proposed in 1947 and applied in a Harvard Ph.D. dissertation on the economic value of recreation in woodlands in Maine. Numerous applications of the method to various public goods and studies of its methodological

properties were conducted in the 1970s and 1980s. These studies are mainly from the environmental arena but also cover the fields of transport, health, education, and the arts, and have been conducted across the globe.

The contingent valuation method requires respondents to provide values based on hypothetical scenarios. Contingent valuations' reliance on what respondents say they will do, rather than their actions, is paradoxically one of the method's greatest attributes, and its most controversial feature.

As Noonan (2003: 172) states the non-market nature of many cultural resources makes the use of methods like contingent valuation a "regrettable necessity". Although the method has many advantages and disadvantages it does hold "the promise of improving our knowledge of cultural resources' role in society"

The earliest application of non-market analysis in the 'cultural' field was the contingent valuation study undertaken in Australia to determine the value of support for the Australian arts, using increased taxes as a payment vehicle. The success of this early study was an impetus to the use of contingent valuation techniques in the cultural arena. The technique was used increasingly for other cultural valuation studies throughout the 1980s, including a referendum on a Swiss municipal theatre, the value of performing arts and culture in Ontario, cultural attractions in Britain, and the purchase of two Picasso paintings by a Swiss city (Noonan 2002).

However, it was not until the early 1990s that non-market analyses began to be applied to cultural heritage sites<sup>2</sup>. The earliest published study was a contingent valuation survey undertaken at Nidaros Cathedral, Norway (Navrud 1992, and Navrud and Strand 2002). This was followed by a blossoming of site valuations in 1994, including a valuation of the damage caused by air pollution at Durham Cathedral, UK (Willis 1994), the value of maintaining 16 historic buildings

<sup>2</sup> This review refers to published studies only. A number of additional studies are contained in unpublished papers and Ph.D. dissertations.



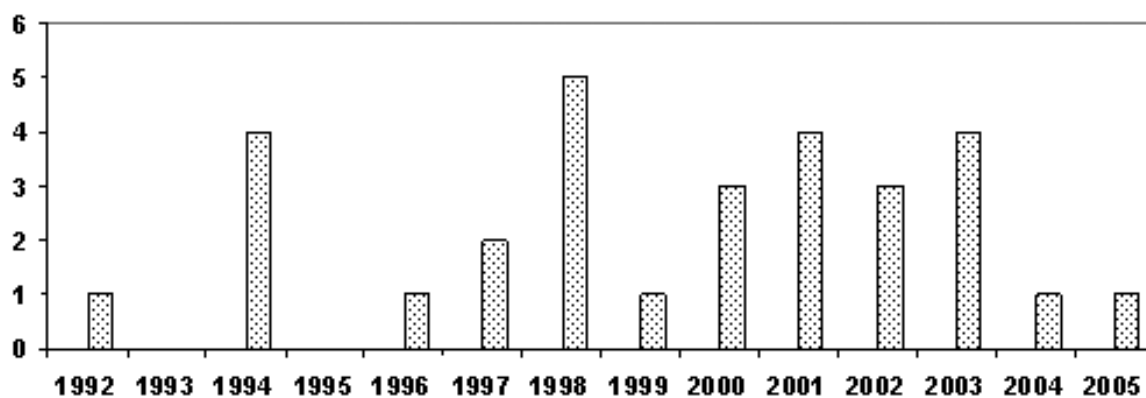


Figure 1: The publication of stated preference surveys conducted on cultural heritage sites in Europe

in Neuchatel, Switzerland (Grosclaude and Soguel 1994), and a valuation of three historic sites in Italy.

1996 saw studies of the renovation of buildings in Grainger Town, Newcastle, UK (Garrod *et al.* 1996), and the WTP to gain entry to Warkworth Castle, UK (Powe and Willis 1996). It also saw the first publication of what was to become an extensive and sophisticated series of reports on the Royal Theatre in Copenhagen (1996).

The first valuation of an archaeological site was conducted in 1997, with the study of the archaeological complex at Campi Flegrei in Naples, Italy (Riganti 1997). The nineties closed with an evaluation of alternative road options for Stonehenge, UK (Mourato and Maddison 1999, Maddison and Mourato 2002).

Recently, contingent valuation has been used to determine WTP values for cleaning Lincoln Cathedral, UK (Pollicino and Maddison 2001), and retaining cultural services at various Italian museums (Bravi *et al.* 2002). The value of Italian heritage assets was assessed at Napoli Musei Aperti, Naples, Italy (Santagata and Signorello 2000, 2002), the baroque city of Noto, the Bosco di Capodimonte, and museum services in the Galleria Borghese museum, in Rome. Museums and archives have also been intensively studied, including the Surrey History Centre, UK (Özdemiroğlu and Mourato 2002), congestion at the British Museum (Maddison and Foster 2001), and the National Museum of sculpture in Valladolid, Spain (Sanz *et al.* 2003).

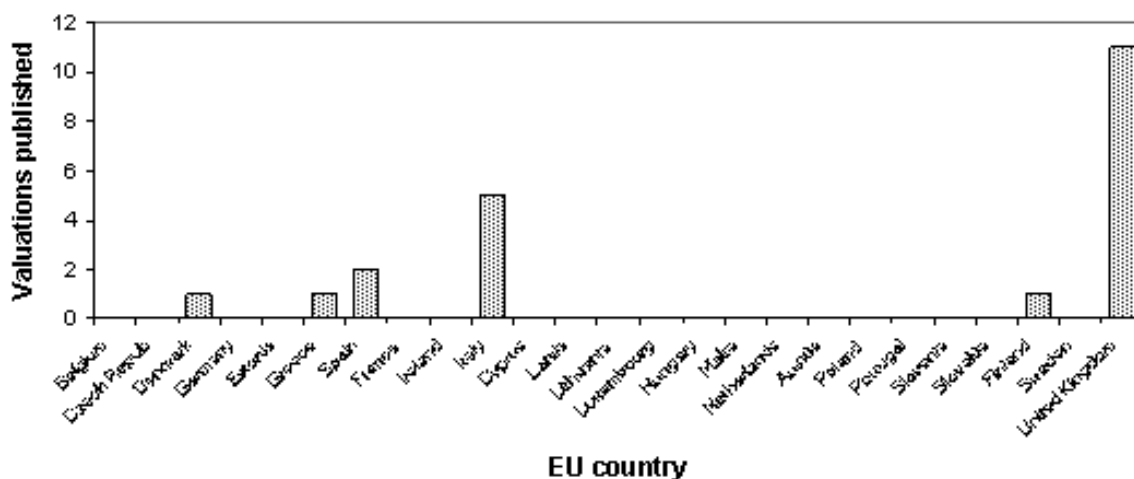


Figure 2: The distribution of non-market valuation studies that have been conducted across the EU<sup>3</sup>

3 The number of valuations in the graph relates to the number of published articles rather than the number of actual valuations of individual heritage sites.

It is apparent that the application of non-market valuation studies of heritage sites is not evenly distributed across Europe. By far the greatest proportion of such studies have been conducted in the UK where the methods are officially recognised by the government, followed closely by Italy. With the exception of Denmark, Greece, and Finland, in the EU and Switzerland and Norway most European countries have not published non-market valuations for their heritage assets.

It is apparent that most types of cultural heritage asset have been valued using stated preference non-market valuation methods. These include:

### **Cathedrals**

Some of the earliest applications of contingent valuation in the cultural heritage sector were carried out at cathedrals.

#### **Nidaros Cathedral (Norway)**

The first evaluation of a cultural heritage site using the contingent valuation method took place at Nidaros Cathedral, Trondheim, Norway (Navrud 1992, and Navrud and Strand 2002). Nidaros Cathedral is the oldest surviving medieval building in Scandinavia, which is built over the grave of St. Olav, the patron saint of Norway, and holds the Norwegian crown jewels. Navrud (1992) used contingent valuation to estimate visitor's WTP values for reducing the deterioration of the building caused by air pollution. This was achieved using two different lines of questioning:

Individuals were asked exactly how much they would be willing to pay to reduce air pollution. As this was the cause of the degradation of the cathedral this method would solve the issue at its root. Individuals were also asked how much they would be willing to pay to restore the damage caused by air pollution to the cathedral.

Face-to-face interviews were conducted with individuals outside the cathedral between June and August 1991. An open-

ended question format was used, and the payment vehicle was a one-off payment.

It was found that respondent's willingness to pay for the reduction of air pollution required to preserve the cathedral was 318 NOK, but the WTP for the repair of pollution damage to the cathedral was 278 NOK. It was noted that 65% of the respondents felt that the original structure of the cathedral had a greater meaning to them than a restored structure.

In order to test for whole-part bias, the study compared the WTP for reducing damage to all Norwegian cultural heritage sites with the willingness to pay for reduced damages to Nidaros Cathedral.

Using the cathedral's 165,000 visitors in 1991 as a base, the aggregated benefits of these results were calculated. Applying the mean WTP values provided estimations for visitors of 52.5 million NOK for preservation and 48.9 million NOK for restoration and repair. Approximately, 41,000 foreigners visited the cathedral in 1991, providing an average WTP attributed to foreigners of 238 NOK and 174 NOK respectively. The value of preserving and restoring the cathedral was 10 million and 7 million NOK (Navrud and Strand 2002: 38-9).

It has been suggested by Pollicino and Maddison (1999: 4) that because the study samples only the views of the cathedral's visitors rather than all Norwegians, it represents an underestimate of the willingness to pay. They also note it is unclear if the respondents were valuing other benefits deriving from the reduction of air pollution in addition to the decrease in damage to the Cathedral.

#### **Durham Cathedral (UK)**

This study by Willis (1994) was used to determine WTP for access to Durham Cathedral in the UK. The survey was undertaken ascertain if visitors could be charged an entrance fee in order to obtain revenue for building restoration. The analysis was used to determine what the change in visitor numbers would be at different price

levels. The survey was also used to find out about visitor motivations (for example, 71% of those surveyed were engaged in sight-seeing). At the time of the survey, Durham Cathedral had free access, although donation boxes with a picture of a one pound coin were located near all entrances and exits. Ninety-two visitors were questioned when leaving the cathedral. The individuals were asked if they had already given a donation voluntarily. It was found that 51% of respondents had made no contribution, and only 12% had contributed more than the suggested amount of a pound.

A payment-card format was used to determine the WTP for access to the cathedral. When asked for a maximum WTP, 31% suggested that they would give more than the suggested donation. Furthermore, 49% said that they were willing to pay over £0.76. The optimum access fee calculated by Willis was £0.875. It was therefore evident that the maximum annual revenue that could be achieved from entrance fees was slightly lower than the revenue then obtained from annual donations. The reason that an entry charge would not raise significantly more than the donations was because many of the visitors who contributed less than the entrance charge would either cease to visit or visit less frequently. It should be noted that in this context, the benefit most visitors to the cathedral gain exceeds the revenue from donations. Therefore, a consumer surplus accrues to most visitors.

### **Lincoln Cathedral (UK)**

This contingent valuation study by Pollicino and Maddison (2001, 2002) was used to determine a WTP valuation for a masonry cleaning program at Lincoln Cathedral. Air pollution had caused much soiling on the cathedral's stonework. The mechanism used was a hypothetical increase in the cleaning cycle from 40 years to 10 years, and the payment vehicle was a rise in annual household tax. Face-to-face interviews were conducted with 328 Lincolnshire residents. The survey instrument was designed to

comply with the NOAA recommendations for contingent valuation design and use.

Photographs were presented to respondents to show the cathedral as it could look with 15 years of accumulated grime and pollution on the façade, and after the stonework had been cleaned. Respondents were therefore valuing the change of appearance that followed the cleaning cycle.

A double-bounded dichotomous-choice method was used and found evidence of a starting point bias. The research concluded that respondents living in the region of Lincoln did place a high value on the preservation of the cathedral's appearance and supported a higher WTP for the increased cleaning cycle. Households in Lincoln had a mean WTP of £49.77 and an aggregate WTP of £1.8 million. Households outside of the city had a mean WTP of £26.77 and an aggregate of £5.5 million. The geographical extent of the WTP was estimated to extend to 40-53 miles from the cathedral.

### **Historic areas and buildings**

Historic buildings, groups of buildings and localities have been widely studied using the contingent valuation technique.

#### **Historic buildings in Neuchatel (Switzerland)**

This research by Grosclaude and Soguel (1994) attempts to determine the WTP for restoration of damage, caused by traffic pollution, to historic buildings in Neuchatel, Switzerland. Sixteen buildings were included in the survey. Two hundred residents were surveyed. Those interviewed were told that the local authority could no longer afford to undertake all the restoration and maintenance required and so the residents would be required to contribute to a fund for the maintenance work. Each was shown photographs of the 16 buildings in order to ascertain which buildings respondents wanted restored. The survey used an open-ended question format to determine residents WTP an annual sum to maintain the buildings. A number of individuals could

not provide a precise WTP and so iterative bidding was instigated by the interviewer. A multiple regression analysis using a Box-Cox transformation was used to identify the variables that affected individuals' willingness to pay. The mean WTP for the sample was 14.3 Swiss Francs and the median WTP was 5.0 Swiss Francs. Twenty-two individuals were unconcerned about the protection of the buildings. If these individuals were removed from the analysis the values for mean and median WTP increase to 16.0 and 7.5.

The authors estimated annual WTP for six buildings was 108 Swiss francs per household. The external aggregated cost for the whole town was SFr. 1.5 million or SFr. 250,000 per building.

### **Grainger Town, Newcastle (UK)**

This study by Garrod *et al.* (1996) determined whether a sample of 202 taxpayers in Newcastle were willing to pay increased taxes for the restoration of historic buildings in Newcastle's Grainger Town. Those interviewed were presented with an open-ended WTP question. The study found a median WTP of £10.00. The bid values were seen as a function of use, demographic, and other variables. Respondents were also asked to allocate financial resources to different areas of Grainger Town. It was found that precedence was given to parts of Grainger Town that had the highest levels of dereliction (Garrod and Willis 2002).

### **Napoli Musei Aperti (Italy)**

This contingent valuation survey by Santagata and Signorello (2000, 2002) was used to determine WTP values for a group of historic and cultural monuments, the Napoli Musei Aperti (NMA), in central Naples. 468 residents of Naples were questioned for the survey. Individuals were asked if they would contribute voluntarily to a non-profit organisation running the NMA heritage sites rather than relying solely on government support.

The survey was also used to obtain an estimate of individuals' annual expenditure on cultural goods and services. Respondents were reminded of this figure before being asked a dichotomous-choice WTP bid. An open-ended question was then asked in order to elicit WTP. This form of questioning identified an anchoring bias.

The study estimated mean WTP values of 17,000 lire derived from the open-ended questions and 30000 lire from and dichotomous-choice questions. The average user WTP was 24,000 lire, compared to 8,000 lire for non-users. This was despite the city spending only 4800 lire per capita on the NMA. Various funding mechanisms were considered in light of these results.

### **Warkworth Castle (UK)**

This study by Powe and Willis (1996) was used to determine visitor's WTP to enter Warkworth Castle, Northumbria. In this research 201 individuals were surveyed on leaving the castle. At the time of the survey the entrance fee for adults was £1.80, pensioners £1.35 and members of English Heritage gained free admission. The mean WTP for all visitors was £2.53, and the median £2.34. Of the sample groups, paying visitors had a WTP of £2.62, pensioners £2.55, and surprisingly English Heritage members £2.30.

When questioned further, over 90% of the respondents stated that they expected that some percentage of their entrance fee was used for preservation of the castle. In these circumstances, the visitor's mean WTP for entrance if the fee was not to be used for preservation of the site dropped to £1.62 and the median WTP to £1.50. The visitors were asked for their WTP if the funds were used exclusively for preservation of the fabric of the castle, assuming that they had already paid their stated WTP for entrance to the castle. The mean WTP for preservation was £0.50. It was concluded that visitors to Warkworth Castle have a mean WTP for preservation of £1.41 and a median of £1.84 (Garrod and Willis 2002). The total benefits provided to visitors at Warkworth Castle were estimated



to be more than 2.5 times the revenue gained from the entry fees. The authors suggest that if “funding for heritage sites were to be purely determined by financial revenue, generated from entrance charges, then this would lead to less preservation of heritage than would be optimal or best for society.” (Garrod and Willis 2002: 274)

### **The historic town centre of Noto (Italy)**

This study by Signorello and Cuccia (2002) considers the preservation of the historic centre of the town of Noto in southern Sicily. Before being superseded by Syracuse in 1817 Noto was a provincial capital. This historic town centre is built in the Baroque style after a devastating earthquake in 1693. Noto in conjunction with seven other towns in the region comprise a UNESCO World Heritage Site.

The authors used a contingent valuation survey using both double-bounded dichotomous choice and open-ended question formats. The questionnaire was applied using face-to-face interviews with tourists. The scenario used was the respondents' WTP for a potential entrance fee for tourists to the historic quarter of Noto. The fee would be devoted to the conservation and maintenance of the historic buildings.

The authors identified protest bids using a question which asked for reasons for a zero response to the open-ended willingness to pay question. It was found that protest bids accounted for 16% of the sample. The principal reasons for protest bids was that some thought an entry fee to the historic centre was unfair, and some considered that the Local Authority should pay.

Mean WTP for all the tourists sampled was 11,500 ITL. A demand curve was constructed from the WTP data and a revenue maximising entrance fee was estimated to be 10,000 ITL. Both Italian and foreign tourists provided the same mean WTP which indicates that the respondents were valuing the access to the good rather than any non-use value connected with the maintenance or

restoration work, which would be expected to be higher amongst Italians.

### **The Bosco di Capodimonte (Italy)**

This study by Willis (2002) considers the Bosco di Capodimonte north of Naples in Italy. The research attempted to establish a revenue maximising entry fee for admission to the Bosco park, which at the time of study had free entry. However, the maintenance and conservation costs of the park led the managing body to consider options for charging an entry fee.

The Bosco park comprises 143 hectares of woodland bordering the Capodimonte Palace and gardens. These were built in the mid-eighteenth century as a royal hunting ground by Charles III, King of Naples. The Bosco contains a number of historic buildings, including the Royal China factory which made Capodimonte porcelain, the Royal Shooting Lodge, the Royal Stables, the Hermitage, and the church of St. Gennaro. The parkland consists of three principal types, formal avenues of trees, irregular areas with trees separated by open space, and 10 hectares of lawns with an eighteenth century irrigation system. Willis notes that the Bosco is both a cultural good (a park with both historical buildings and landscapes) and an environmental good. The park can be used as an environmental good independently of its cultural heritage nature.

A contingent valuation survey (based on iterative bidding) was conducted during the summer of 1999, during which time 494 questionnaires completed. The respondents were presented with one of three iterative bidding cards with prices which ranged from 1,500-4,000 lira on Card 1, 2,000-8,000 lira on Card 2, and 4,000-16,000 lira on Card 3. The iterative bidding question format permits a demand curve to be created using the bid amount and the proportion of respondents willing to accept that bid amount. This would be the basis for establishing the revenue maximising entry price.

A demand curve was estimated from the sample data from which a mean revenue maximising price of 5,131 lira per visit was estimated. If everyone were to pay this amount for entry the gross revenue would be 534.8 million lira per annum. However, the number of visits would decrease from 283,313 to 104,225 per annum.

## **Archaeological sites**

Archaeological sites have been poorly represented in non-market valuations in the cultural heritage sector. Two principal studies have been undertaken:

### **Stonehenge (UK)**

Stonehenge is managed by English Heritage and is a UNESCO World Heritage Site. Constructed during the Neolithic and Bronze Ages (between 5,000 and 3,500 years ago) Stonehenge is a circular henge monument (bank and ditch) containing the stone circle. It is located in a well-preserved remnant prehistoric landscape containing 450 archaeological sites, mainly burial mounds, on Salisbury Plain, Wiltshire. However, two roads (the A303 and A344) pass very close to Stonehenge, causing noise pollution to the visitors, and breaking up access to the prehistoric landscape complex.

This survey by Maddison and Mourato (2002, and Mourato and Maddison 1999, Maddison and Mourato 2001) was used to determine if UK residents preferred the current road layout near Stonehenge or a tunnel option that would route the roads out of site from the monument. In total 129 UK visitors to the site and 228 UK households were surveyed to determine WTP values for the alternative road options. Those surveyed were shown photographs of the current road and a representation of what the new tunnel would look like. After the respondent stated a preference regarding the alternatives they were asked for a WTP value using a payment ladder format for a two-year tax increase to support their road preference.

The mean WTP per household for the tunnel option was £12.80 and £4.80 for retaining the current road layout (giving rise to an aggregate value of £265 million for the tunnel and £116 million for the current road). There was a fairly even split between respondents on which option they would prefer (144 preferred a tunnel and 126 wanted to retain the current road layout). Using the median WTP approach, the authors found the aggregate benefit of the tunnel to be essentially zero. Despite this result the UK government is planning to build a 2km tunnel to route traffic past the Stonehenge environs.

### **Campi Flegrei archaeological park (Italy)**

This study by Riganti (1997) and later Riganti and Willis (2002) looks at the Campi Flegrei Archaeological Park in the city of Naples. The archaeological park is on the site of the first-century-AD summer residence of the Roman emperors, and contains extensive examples of Imperial Roman remains. The authors attempted to determine the maximum monthly amount that individuals were willing to pay to preserve the heritage site. The payment vehicle chosen was a monthly payment to an independent conservation body.

Two sets of interviews were conducted. 448 interviews were conducted in March 1995 with visitors to the site and residents of Naples (Riganti 1997), while a second survey was conducted in July 1997 which collected 497 interviews. In 1997, a double-bounded question survey format was used to retest the single-bounded format used in the 1995 survey. The samples were split into two equally-sized groups, where one group was given more background information.

The survey elicited five different WTP responses for the following scenarios: conserving the entire area of Campi Flegrei allowing the restrictions on urban development to continue; conservation of parts of Campi Flegrei that were not yet publicly available; conserving Campi Flegrei

for use by future generations, conserving the Bagnoli area only; and conserving the Bagnoli area for use by future generations.

The aim of the papers is to study the methodological issues associated with nested values associated with respondents' total value for conserving the area. When different tests were used to test the internal consistency, the results suggested that the respondents did not recognize the different scopes involved with the scenarios, but greater information did help them understand the goods being studied. The average WTP per household was 420,000 lira per annum.

## **Theatres**

Theatres have been widely studied using non-market valuations in the cultural sector. A few such sites can be considered historical entities such as the Royal Theatre, Copenhagen founded in 1748.

### **The Royal Theatre (Denmark)**

A number of sophisticated econometric contingent valuation reports have been produced by Bille (1996, 1997, 2002) regarding the aggregate WTP for the Royal Theatre, Copenhagen.

1,843 Danes were surveyed by telephone about their willingness to pay for the Royal Theatre in Copenhagen using tax as the payment vehicle. An open-ended WTP question was used in conjunction with a "too much, too little" question about government financial support for the Royal Theatre. Furthermore, in order to study the effect of information on WTP, a split sample was used to determine the effect on individual's WTP of being told what a Dane actually pays on average in tax for the Royal Theatre each year. The WTP difference between users and non-users of the Royal Theatre was also studied; it was found that theatre users were willing to pay at least three times as much as non-users.

The survey found that there was a mean WTP of 154 Danish Kroners (DKK). The

median WTP was DKK 60. The median was found to be equal to the per capita tax expenditure on the Royal Theatre, regardless of the information that the individuals received. However, it was found that the provision of information to individuals led to an anchoring bias (45% of WTP responses equalled DKK 60). A sophisticated model is forwarded to explain the WTP, taking into account the selection issues resulting from theatre visitation (Bille 2002: 219-28).

Bille concludes that the Royal Theatre would be unable to exist if visitor income alone had to pay for operating costs. More interestingly, non-user WTP is the largest part of the total WTP. In this way Bille argues that it is possible to economically justify the public grant received by the Royal Theatre using the taxpayer's (non-user) WTP as the basis. Billie (1996) notes that "This valuation method is far preferable to economic impact studies, which have often been used as an argument for public support of cultural activities. The Danish taxpayers value the Royal Theatre and are willing to pay the price."

## **Museums**

Museums across Europe have been widely studied using non-market valuation techniques.

### **The National Museum of sculpture (Spain)**

This research by Sanz *et al.* (2003) used two different contingent valuation surveys to estimate the economic value of the National Museum of Sculpture in Valladolid, Spain. One survey was used to determine the direct use value of the museum and was presented to visitors to the museum; and the other was used to try to capture the passive use value and was presented to potential users in the town of Valladolid.

Both surveys made use of a double-bounded dichotomous choice format for the valuation question, followed by an open-ended question. The payment vehicle was a contribution to a special fund for preservation

and running of the museum. The contingent valuation survey for estimating use value was a self-completing survey, so that visitors themselves were the ones who filled it in when they decided to collaborate. 1,147 surveys were conducted, of which 1,108 were considered valid. The passive use value of the museum was estimated using a telephone survey of the people of Valladolid. 1,014 usable surveys were obtained.

The mean WTP of direct users of the museum ranged between €25 and €30 using a conservative scenario, and between €33 and €40 using a more optimistic scenario; the value assigned by potential users of the museum (passive use values) was approximately €27 and €36 for each of these scenarios. It also showed that there was a degree of acceptance of the payment vehicle chosen. Importantly, it was found that when parametric, non-parametric and semi-parametric valuation methods were compared in a single study (using the double-bounded dichotomous choice survey), there was no statistically-significant variation in the demand function for the analysed cultural good and its expected WTP, no matter what approach was used.

### **The Museum of Central Finland**

This study by Tohmo (2004) aimed to determine the WTP for the Museum of Central Finland in Jyväskylä. The research also looked at the factors that could affect the resident's willingness to pay for the museum. A contingent valuation questionnaire was sent by post to a random sample of 800 Jyväskylä residents aged 18 and over in November and December 1997.

The individual willingness to pay varied from zero to 1000 Finnish Markkas (FIM). The average WTP to retain the museum was FIM 103 (with a median of FIM 50). Almost 30% of the respondents provided a zero bid for their WTP for the Museum of Central Finland. It was hypothesised that this was a function of the fact that 46% of the respondents had never visited the Museum, and these non-users would tend to feel that

they gained no benefit from the site. In fact, the author suggests that based on this percentage of non-users, the proportion of zero bids could have been expected to be even higher.

Unsurprisingly, the average WTP of non-users was only FIM 56 (median FIM 5). For non-users the average WTP was FIM 56. Although a large percentage of the respondents had not visited the museum very often, they did report some willingness to pay for its continued existence and for the possibility of making a future visit. The author argues that this non-use value of the museum can be used to further legitimize public support.

It was found that for each citizen (in 1996) FIM 78 in tax revenue was transferred to the Museum of Central Finland. It is apparent that the residents actually contribute less in taxes to the upkeep of the museum than they report that they are willing to pay to keep the Museum open (FIM 103). The resident's willingness to pay is used to legitimise the upkeep of the museum, suggesting that at the very least the present amount of tax revenue can be directed towards the support of the museum.

### **Bolton Museum (UK)**

Following the success of the contingent valuation of the British Library in 2003 (see below) Bolton Metropolitan Borough Council (BMBC) and the MLA (Museums, Libraries and Archive Council) commissioned a valuation of Bolton's three museums, 15 libraries and central archive. At the time of the survey the museum, art gallery and aquarium had 249,179 visits per annum.

The survey used WTP and WTA questions to ascertain value. Face-to-face questionnaires were conducted in 2005 with Bolton residents providing 325 usable surveys. The WTP question elicited a monthly mean value of £2.77 for users and £1.14 for non users, this compares to £1.16 which is contributed in tax each month per council tax payer.

The WTA question was only asked to users of the museum and provided revealed a



valuation of £2,584,000. Interestingly WTA usually provides a higher value compared to WTP, the decision to exclude non-users gave a lower value than the WTP for the museum service. However, the WTA figures for the Libraries gave a total figure for Bolton of £6,431,000 compared to a WTP of 4,500,000 and the archive was valued at £889,000 compared to £250,000.

The cost of providing the museum service in Bolton was £1,800,000. The contingent valuation survey found that the total mean WTP value of users was £2,753,000 while with non-users it was £1,713,000, providing a total value of £4,466,000. This resulted in a cost benefit ratio of 2.48:1.

Overall the survey found that the cost of providing the museums, libraries and archives for Bolton was £6,550,000 while the total mean user value was £7,391,000 and the non-user value was £2,954,000. The total value placed on the services by users and non-users was therefore £10,345,000. The cost benefit ratio for all three services was therefore 1.6:1 (BMRC and MLA 2005).

## **Archives**

Interest in archives has been a relatively recent phenomenon. The only non-market valuation that has been conducted is the pilot case study at the Surrey History Centre (UK).

### **Surrey History Centre (UK)**

This research by Özdemiroğlu and Mourato (2001) studied the Surrey History Centre, a local authority archive in Woking, UK. The History Service collects and preserves archives and printed material of relevance to the history of Surrey, and makes them available for reference. The archives include county and government records, newspapers, magazines, journals, books, manuscripts, prints, drawings, letters, sound archives, oral histories, music collections, photographic collections, film, microfilm, maps, and collections in electronic format.

A pilot study of sixty interviews was conducted with 'users' and 'non-users' of the

site in May 2000. Thirty-eight interviews were conducted with 'users' of the centre, and 22 interviews were conducted with 'non-users' who had never visited the centre in the local town of Woking. The intention was to determine if use and non-use values could be determined for the recorded heritage conserved at the Surrey History Centre. The authors stress that this was a pilot study with a correspondingly small sample size (60), and that a properly-conducted contingent valuation study would require between 500-1000 interviews rather than 60. As a consequence these values should not be considered as final results.

Two valuation scenarios were studied: the WTP to prevent the closure and dispersal of the collections and WTP to prevent the closure of the site to users but the retention of the collections. A payment ladder format was used to elicit WTP. In line with NOAA recommendations of best practice respondents were also reminded of their budget constraints. Respondents who were not willing to pay for the preservation scenarios were questioned as to their reasons.

It was found that no respondents felt that they did not benefit from the recorded heritage, while the majority indicated that they 'strongly' or 'almost strongly' benefit. The authors found that in order to prevent the closure of Surrey History Centre and the loss of its collection users were willing to pay on average £34 per annum, and in order to prevent the closure of access £24 per person per annum. On average 'non users' were willing to pay £13 per annum, for both scenarios (Özdemiroğlu and Mourato 2001: Table 11). The median of was approximately £20 for 'users' and £10 for 'non-users', because the median was lower than the mean, this was seen as an indicating that the responses are skewed towards the lower end of the willingness to pay distribution.

The authors concluded that recorded heritage is a complex good that provides multiple benefits. People are willing to pay significant amounts to preserve the recorded heritage; and, access to recorded heritage

assets (or the information contained within) is crucial. The preservation of recorded heritage assets for future generations (bequest value) seems to be the dominant benefit; the WTP for access (use value) exceeds willingness to pay for preservation (existence value).

### **Bolton central archive (UK)**

A contingent valuation survey was conducted as part of the wider economic valuation of the Bolton museums, libraries and archives service commissioned by Bolton Metropolitan Borough Council (BMBC) and the MLA (see above). Bolton's central archive had 9,293 visits per annum at the time of the survey. The cost of providing the Central archive service in Bolton was £250,000.

The contingent valuation survey found that the total mean WTP value of users was £204,000 while with non-users it was £76,000, providing a total value of £280,000. The cost benefit ratio of the service was therefore 1.12:1.

Overall the survey found that the cost of providing the museums, libraries and archives for Bolton was £6,550,000 while the total mean user value was £7,391,000 and the non-user value was £2,954,000. The total value placed on the services by users and non-users was therefore £10,345,000. The cost benefit ratio for all three services was therefore 1.6:1 (BMRC and MLA 2005).

### **Libraries**

Although libraries technically fall outside of the definition of pure cultural heritage sites, some institutions can make a case for inclusion. One such example is the British Library, London, which contains books and manuscripts dating back to the ninth century.

### **The British Library (UK)**

This study by Pung *et al.* (2004) uses contingent valuation to measure the economic impact of the British Library, London on the UK economy. The research was undertaken

between August and October 2003. Three principal attributes of the library were valued. These were:

- The reading room services
- The document supply services, and
- Public exhibitions.

Recent digital and Web initiatives were not evaluated so as not to bias the results, and non-UK library users were excluded from the survey.

In total 2,359 individuals were interviewed for the study including, 229 reading room users, 100 remote users, in addition to 2,030 members of the general public who did not make use of British Library services.

The author's found that the questions attempting to determine 'willingness to pay' gave lower value estimates compared to questions attempting to determine 'willingness to accept'. This is a function of the fact that willingness to pay estimates are constrained by respondent's disposable income.

For non-users general public a random sample of the population of all regions of the UK was conducted. 84% of respondents felt that the British Library had value for society as a whole. Individuals were willing to pay on average £6.30 in taxes, which is double the current average contribution of approximately £3.00. The willingness to pay was found to be strongly linked to income and region with the southeast having the highest WTP, although all regions were willing to pay more on average than they currently pay through taxes (Pung *et al.* 2004: 88).

Overall the study revealed that the British Library generates £363 million worth of value per annum, both in direct value to the library's users (£59 million) and the indirect value to society (£304 million). This is 4.4 times the annual government funding of £83 million. This study is the first example of the use of contingent valuation to provide a figure for the total economic value of a major national research library.

## **Application to valuing ICT at cultural heritage sites**

Stated preference methodologies such as contingent valuation have been widely applied to the cultural heritage sector. Although contingent valuation is not without its limitations, if applied properly it could be used to determine willingness to pay for some customer-facing IT applications at cultural heritage sites. No such studies have been undertaken so far.

### **Contingent choice**

Contingent choice modelling was originally developed for marketing research and transport to measure preferences for different characteristics or attributes of a multi-attribute choice (Bateman *et al.* 2002). Choice modelling is similar to contingent valuation, in that it can be used to estimate both economic and non-use values for cultural heritage sites. Like contingent valuation, it is a hypothetical method, which requires individuals to make choices based on a hypothetical scenario. Unlike contingent valuation, it does not directly ask respondents to state their values in financial terms, rather the respondents are asked which scenario they prefer. Values are inferred from the hypothetical choices that the respondents make. Choice modelling comprises a family of techniques including choice experiments, contingent ranking, contingent rating and paired comparisons.

Contingent choice is particularly valuable for the evaluation of the outcomes of several policy options, where non-use values are important. Contingent choice can be used to rank options as well as estimate financial values.

### **The British Museum (UK)**

This study by Maddison and Foster (2003) reports on work conducted to value the reduction of congestion at the British Museum. The British Museum in London is a heavily visited national attraction with

5.4 million visitors recorded in 1999. This level of visitation can affect the quality of the experience that is provided because of queuing, noise, and inability to view the exhibits. The research attempted to determine a value for the congestion costs imposed by visitors to the British Museum on other visitors. A number of potential solutions are forwarded to try to solve the issue of congestion. The possibility of charging was forwarded, and so was putting more artefacts on display. Interestingly, however, so was the use of an Internet-based virtual tour of the museum. The authors considered that this would not eliminate congestion, because a virtual tour would not provide the same levels of satisfaction as an actual visit to the site. There was also a concern that the cost of technology might outweigh the benefits of reduced congestion.

A choice experiment was conducted on 400 visitors to the museum in August 2000. The visitors were shown photographs of three exhibits at their most crowded, and photos of the same exhibits when less crowded. The survey implied that the crowded photos were associated with free admission, and the less-crowded photos with an admission charge (these were randomly chosen at £3, £6, £12, and £20). The respondents then indicated a preferred option.

The authors suggest that there is an estimated congestion cost of £5.99 imposed by the marginal visitor (i.e. the individual's assessment of the congestion cost imposed by an additional visitor was estimated to be 0.04 pence, this was then multiplied by the number of visitors to obtain the aggregate congestion cost imposed by the marginal visitor on all other visitors). The marginal congestion cost does not, however, relate to the optimal charge, because if a charge were imposed, then the visitor numbers would fall and the congestion externality would change. The authors consider that the methodology used could be applied to other sites struggling with issues of mass visitation.

## **St. Anne's Cathedral Square, Belfast (UK)**

This study by Alberini, *et al.* (2003) focuses on St. Anne's Cathedral Square, in Belfast Northern Ireland. The square in the Cathedral Quarter is located in one of the oldest areas of Belfast city. Much of the architecture dates to the nineteenth and early twentieth Century. The square is part of a conservation area and as such the height of buildings is not permitted to exceed six stories high.

The St Anne's Square historic area is showing signs of deterioration because of long-term neglect and a lack of investment. A choice experiment was conducted in which respondents were asked to choose between pairs of regeneration projects for St. Anne's Square or a hypothetical square that was computer generated and designed to similar to St. Anne's in all details except for the historical and cultural aspects.

Four attributes were chosen for analysis: the building height, the comparative amount of open space and built space, the relative retail and residential usage, and the cost of the regeneration project. There were in total 72 alternative regeneration options. Of which respondents were presented with the choice of two alternatives, which were randomly selected at.

The valuation survey design is noteworthy for its omission of a *status quo* option in the choice sets, where the existing state of the square may be chosen by the respondents. Methodologically the researchers considered that the *status quo* for the hypothetical square would be poorly defined, suggesting that in order for a comparison St. Anne's must also be treated similarly. Furthermore, the analysis was not designed to estimate willingness to pay, but to assess how the preferences of respondents are influenced by the architectural and land use attributes of public spaces. Face-to-face interviews with 254 respondents were conducted Belfast City centre in December 2001. A total of 244 usable responses were obtained.

The analysis suggested that respondents favoured regeneration projects for St. Anne's

that involved more open space. While in the hypothetical square, the proportion of open space is found not to be statistically significant. The respondents also favoured projects which preserved the current six story height of buildings and increased the residential use of buildings. While in the hypothetical square, respondents higher proportions of residential buildings were favoured less. In the hypothetical square the higher the cost of a project, the less likely respondents were to choose them. In contrast in St. Anne's Square the higher the cost of a regeneration project, the more likely it was to be favoured by respondents. The study found that the implicit marginal prices for the hypothetical square were as follows. A 50% increase in open space equated to £3.00, a single percent increase in retail space at expense of residential space equated to £0.40, and respondents WTP to avoid an increase in building height on the square was £7.20.

## **Galleria Borghes museum (Italy)**

One of the first studies to measure the WTP associated with ICT (specifically multimedia services) at a cultural heritage site was conducted by Mazzanti (2003a, 2003b) at the Galleria Borghese museum, in Rome. The Galleria Borghese museum, located within the Villa Borghese Park in Rome, is considered by the author to be one of the most important of the state-owned cultural heritage sites in Italy. The site was refurbished between 1984 and 1997, and this research was the first major survey carried out since the restoration project.

The study was based on a survey carried out at the site in the summer of 2000, which collected 185 valid questionnaires (92% of the total conducted) after on-site interviews with visitors. The questionnaire was composed of three sections: the first looked at the subject of the study, the second contained a contingent valuation questionnaire, and the final was a choice experiment followed by a request for socio-economic information.



The survey actually valued a variety of elements, of which multimedia services was one. The author used a choice experiment in which the various attributes of the site were broken down so that visitors could provide willingness to pay for various hypothetical changes in the attributes. The two contingent valuation studies (using a payment ladder format) were carried out in order familiarise visitors with monetary valuation and to get information on (monetary) values attached to the current offerings for visit length and site conservation.

### **The various services offered by the Galleria Borghese museum were described to users including:**

- The entry fee
- The level of conservation activity at the site.

The visitors were asked to make choices about:

- Increasing the level of conservation and restoration
- Increasing visit hours
- The addition of multimedia services
- The addition of multimedia services, plus a temporary exhibition.

It was found that visitors expressed a preference for an increase in spending on conservation, for an increase in the level of multimedia services and a possible temporary additional exhibition complementary to the main one. The visitors questioned were, on average, not prepared to pay for increasing the time of the average two hour visit.

Using the figures from 2000 for paying visitors and from WTP values, the author calculated the increase in economic surplus, which could be derived from a supply increase (i.e. and additional temporary exhibition and multimedia services and a conservation earmarked fund). The contingent valuation experiment revealed that the gross economic surplus, which could theoretically be captured by introducing new services and conservation funds, ranged between 21-121% of the direct revenue raised by fee charges, and between 15-88% of the total yearly economic surplus.

### **Knossos Palace and the Heraklion Archaeological Museum (Crete)**

This study conducted by Apostolakis and Jaffry (2005) used choice modelling to value visitors' preferences and their willingness to pay for hypothetical developments to Knossos Palace and the Heraklion Archaeological Museum in Crete. Six attributes were studied: advertising, congestion, promotion, eating and drinking facilities, and other attributes which included the "use of A/V material for the interpretation of the exhibits" as well as kindergarten facilities.

To study these a choice experiment surveys was conducted for each site. Three hundred self-administered questionnaires were distributed for each site. The questionnaires were distributed randomly in hotels across Crete. The survey targeted visitors as well as non-visitors to the two heritage attractions. In total 253 usable responses were obtained, giving a response rate for the Heraklion Archaeological Museum of 42.7%, whereas the response rate for the Knossos Palace was 41.7% (Apostolakis and Jaffry 2005: 312).

Analysis of the results revealed that three factors of the hypothetical developments had a strong influence on potential visitation rates – congestion, kindergarten facilities and A/V interpretation. At both attractions tourists with young children felt that the provision of kindergarten facilities increase the probability of visitation. A 50% deterioration in congestion levels in both sites would reduce of tourists' satisfaction levels and lead to a potential reduction in visitation. Middle-aged tourists exhibited positive preferences for the provision of A/V interpretation at the Heraklion Archaeological Museum, but not Knossos Palace. As Apostolakis and Jaffry (2005: 315) note, "given that more than half of tourists in Crete (52%) fall in the 31-50 age category. This result suggests that the majority of tourists belonging in this age group who responded to the museum survey prefer the introduction of A/V material in the form of video and 3-dimensional representations of the museum and its exhibits."

The researchers translated tourists' preferences into monetary units using marginal willingness to pay estimates. From these it was found that tourists with children younger than 10 years old reported that they would be willing to pay €4 for the introduction of kindergarten facilities in the Knossos Palace and an extra € 4.7 at the Heraklion Archaeological Museum. At the Heraklion Archaeological Museum middle aged tourists were willing to pay €2.67 for the provision of better A/V interpretation facilities. These results make it clear that tourists are prepared to pay extra in order to find out more about heritage sites through better interpretation.

## Application to valuing ICT at cultural heritage sites

It is becoming apparent that of the stated preference methodologies the contingent choice family of techniques could have a direct application to the study of ICT at cultural heritage sites. Contingent choice is being increasingly used for the study of cultural heritage assets including ICT at those sites. Although contingent choice has had less methodological study compared to contingent valuation it does seem to be a strong contender for the study of ICT.

Site	Study	Publications	Survey type	Survey date	Number surveyed	Breakdown	Survey method
Nidaros Cathedral (Norway)	WTP for air pollution damage to Nidaros Cathedral	Navrud (1992), Navrud and Strand (2002).	Contingent valuation	June-August 1991	163	Individuals outside the cathedral	Face-to-face interview
Durham Cathedral (UK)	WTP for entry to Durham Cathedral	Willis (1994)	Contingent valuation	1993	92	Cathedral visitors (users)	Face-to-face interview
Royal Theatre, Copenhagen (Denmark)	WTP for current services at the Royal Theatre	Bille (1996, 1997, 2002)	Contingent valuation	Autumn 1993	1,843	Danish households (users and non-users)	Telephone and some face-to-face interview
Neuchatel (Switzerland)	Damages caused by air pollution to 16 buildings in Neuchatel	Grosclaude and Soguel (1993, 1994)	Contingent valuation	1992	200	Neuchatel residents	Face-to-face interview
Warkworth Castle (UK)	WTP for entry to Warkworth Castle	Powe and Willis (1996)	Contingent valuation	June-September 1994	201	Potential site visitors	Face-to-face interview
Grainger Town, Newcastle (UK)	WTP for restoration of buildings at Grainger Town, Newcastle	Garrod <i>et al.</i> (1996)	Contingent valuation	1995	202	Newcastle taxpayers	Face-to-face interview
Campi Flegrei (Italy)	WTP for the conservation of the archaeological park	Riganti (1997), Riganti and Willis (2002)	Contingent valuation	March 1995, July 1997	448 + 497	Site visitors (users) and Naples residents	Face-to-face interview
Napoli Musei Aperti (Italy)	WTP for the preservation of the Napoli Musei Aperti	Santagata and Signorello (2000, 2002)	Contingent valuation	Autumn 1997	468	Naples residents	Face-to-face interview
Museum of Central Finland	WTP for current services at the museum	Tohomo (2004)	Contingent valuation	November-December 1997	800	Local residents (users and non-users)	Postal survey
Stonehenge (UK)	WTP for routing nearby roads through a tunnel or retaining the <i>status quo</i> .	Maddison and Mourato (2002)	Contingent valuation	March 1998	357	129 on-site users 228 UK residents	Face-to-face interview
Lincoln Cathedral (UK)	WTP for cleaning air pollution damage to Lincoln Cathedral	Pollicino and Maddison (1999, 2001, 2002)	Contingent valuation	April-July 1998	328	220 Lincoln residents, 108 residents of surrounding towns	Face-to-face interview
Surrey History Centre (UK)	WTP to prevent the closure of the Surrey History Centre	Özdemiroğlu and Mourato (2001)	Contingent valuation	May 2000	60 (pilot)	Site users and local residents (non-users)	Face-to-face interview
British Museum (UK)	WTP to reduce congestion in the museum	Maddison and Foster (2003)	Choice experiment	August 2000	400	Museum visitors (users)	Face-to-face interview
National Museum of Sculpture, Valladolid (Spain)	WTP for current services at the museum	Sanz <i>et al.</i> (2003)	Contingent valuation	December 2000-May 2001	1,147 (total)	Museum visitors (users)	Self-completing survey in museum (users), telephone
Galleria Borghese Museum (Italy)	WTP for entry to the Galleria, and additional services	Mazzanti (2003a, 2003b)	Contingent valuation, choice experiment	Summer and autumn 2000	185 (valid)	Museum visitors (users)	Face-to-face interview
British Library (UK)	WTP for current services at the library	Pung <i>et al.</i> (2004)	Contingent valuation	August-October 2003	2,359	Reading room users and UK residents	Telephone (users), face-to-face (public)
Bolton Museums (UK)	WTP and WTA for the museum services	BMBC and MLA (2005)	Contingent valuation	Summer 2005	325	Bolton residents	Face-to-face (public)

Table 1: European non-market valuations conducted at cultural heritage sites

Site	Study	Currency	Mean WTP	Mean WTP (Euro equivalent) <sup>4</sup>	WTP	Method	Payment vehicle
Nidaros Cathedral (Norway)	WTP for preventing or repairing air pollution damage to Nidaros Cathedral	Norwegian Kroner (NOK)	318 NOK (preservation) 278 NOK (restoration)	39.64 ECU (preservation) 34.66 ECU (restoration)	Individual	Open-ended question	Tax, donation to fund
Durham Cathedral (UK)	WTP for entry to Durham Cathedral	Pounds Sterling (£)	£0.77	0.99 ECU	Individual	Open-ended question	Entry fee
Royal Theatre, Copenhagen (Denmark)	WTP for current services at the Royal Theatre	Danish Kroners (DKK)	DKK 104	13.74 ECU	Individual	Open-ended question	Tax
Neuchatel (Switzerland)	Damages caused by air pollution to 16 buildings in Neuchatel	Swiss Francs (SFr)	108 SFr for 6 buildings	59.55 ECU	Individual	Open-ended question	Donation to fund
Warkworth Castle (UK)	WTP for entry to Warkworth Castle	Pounds Sterling (£)	£2.53 (entry) £1.41 (preservation)	3.27 ECU (entry) 1.82 ECU (preservation)	Individual	Open-ended question	Entry fee
Grainger Town, Newcastle (UK)	WTP for restoration of buildings at Grainger Town, Newcastle	Pounds Sterling (£)	£13.76	16.80 ECU	Household	Open-ended question	Tax
Campi Flegrei (Italy)	WTP for the conservation of the archaeological park	Italian Lire (L)	\$28.81 (to conserve CF) \$10.18 (conserving parts of CF not open to the public)	n.a.	Individual	Single bounded dichotomous choice + double bounded dichotomous choice	Donation to fund
Napoli Musei Aperti (Italy)	WTP for the preservation of the Napoli Musei Aperti	Italian Lire (L)	17,000 ITL	8.84 ECU	Household	Single bounded dichotomous choice + open ended question	Donation to fund
Museum of Central Finland	WTP for current services at the museum	Finnish Markkas (FIM)	FIM 103	18.24 ECU	Individual		Tax
Stonehenge (UK)	WTP for routing nearby roads through a tunnel or retaining the <i>status quo</i> .	Pounds Sterling (£)	£12.80 for the tunnel £4.80 for the current road	18.92 ECU for the tunnel 7.10 ECU for the current road	Household	Payment card / conjoint analysis	Tax, entry fee for non-UK nationals
Lincoln Cathedral (UK)	WTP for cleaning air pollution damage to Lincoln Cathedral	Pounds Sterling (£)	£49.77 Lincoln residents £26.77 Lincolnshire residents outside Lincoln	€ 73.58 Lincoln residents € 39.57 Lincolnshire residents outside Lincoln	Household	Double-bounded dichotomous choice	Tax
Surrey History Centre (UK)	WTP to prevent the closure of the Surrey History Centre	Pounds Sterling (£)	£34 for loss of collections (users) £24 for loss of access (users) £13 both scenarios (non-users)	€ 55.85 for loss of collections (users) € 25.64 for loss of access (users) € 21.35 both scenarios	Individual	Payment card	Tax
British Museum (UK)	WTP to reduce congestion in the museum	Pounds Sterling (£)	£5.99 congestion cost imposed by the marginal visitor	€ 9.84 congestion cost imposed by the marginal visitor	Individual	Conjoint analysis	Entrance fee
National Museum of Sculpture, Valladolid (Spain)	WTP for current services at the museum	Euros (€)	€ 25-40 (direct use) € 27-36 (passive use)	€ 25-40 (direct use) € 27-36 (passive use)	Individual	Double bounded dichotomous choice + open ended question	Donation to fund
Galleria Borghese Museum (Italy)	WTP for entry to the Galleria (CV), and additional services (CE)	Euros (€)	€ 1.47-4.03 (conservation) € 0.46-0.75 (multimedia) € 1.14-2.55 (multimedia + exhibition) Total € 8.7	€ 1.47-4.03 (conservation) € 0.46-0.75 (multimedia) € 1.14-2.55 (multimedia + exhibition) Total € 8.7	Individual	Payment ladder, choice experiment	Entry fee
British Library (UK)	WTP for current services at the library	Pounds Sterling (£)	£116 for reading room users £6.30 UK residents	€ 167.75 for reading room users € 9.11 UK residents	Individual	Open-ended question	Donation
Bolton Museums (UK)	WTP and WTA for the museum services	Pounds Sterling (£)	£2.77 per user, £1.14 per non-user per month	€ 4.07 per user, € 1.68 per non-user per month	Individual	Open-ended question	Donation to fund

Table 2: Values derived from European studies<sup>4</sup>

4 A tabular format is not the ideal mechanism for displaying the results of such non-market analyses. By necessity the data has to be simplified, it is strongly recommended that the original sources are consulted in all cases.

## Conclusions

The use of revealed preference non-market valuation techniques, such as the travel cost and hedonic pricing studies have had fewer applications in the field of cultural heritage, despite having widely-accepted economic principles. European studies using travel cost methods are rare. An exception is the work of Bedate *et al.* (2004), which uses the travel cost method to estimate the demand curve for a historic village, a museum in the provincial capital, and a historic cathedral in the Castilla y León region of Spain. Travel cost appears to be more widely used in North America (i.e. Martin 1994, Poor and Smith 2004). Hedonic pricing has been used even less frequently as an evaluation technique (Clark and Herrin 1997, Deodhar 2004).

The use of contingent valuation is now widely accepted as a non-market valuation technique in the cultural heritage sphere. The methodology is highly attractive because of its potential to capture both use and non-use values, and has been used across all domains of cultural heritage, from archaeological and historical sites to museums and archives. In contrast because choice experiments are the most recent innovation in valuation techniques they are still rare in their application to heritage sites. However, these techniques show the most promise for the evaluation of potential ICT installations at heritage sites.

Research by Maddison and Foster (2003) used a choice experiment at the British Museum (UK) to determine the WTP to reduce congestion in the museum. This was followed by a study conducted at the Galleria Borghese Museum (Italy), which combined a contingent valuation survey with a choice experiment. This was used to determine the WTP for entry to the Galleria, and the provision of additional (multimedia) services, and exhibitions (Mazzanti 2003a, 2003b). This is the first attempt to value ICT at cultural heritage sites.

At the present we can conclude that the potential for benefit transfer (i.e. transfer of values derived from study sites to new

policy cases) is limited because of, the comparatively low number of evaluations, and their orientation towards both site- and project specific values which would not transfer well.

## References

- Alberini, A. and Longo, A. (2006) *The value of cultural heritage sites in Armenia: evidence from a travel cost method study*. FEEM Working Paper No. 112.05.
- Alberini, A., Riganti, P. and Longo, A. (2003) Can people value the aesthetic and use services of urban sites? evidence from a survey of Belfast residents, *Journal of cultural economics* 27(3-4), 193-213.
- Apostolakis, A. and Jaffry, S. (2005) A choice modeling application for Greek heritage attractions, *Journal of travel research* 43, 309-318.
- Bedate, A., Herrero, L. C. and Sanz, J. Á. (2004) Economic valuation of the cultural heritage: application to four case studies in Spain. *Journal of cultural heritage* 5(1), 101-111.
- Bille, T. (1996) *The Danish population's valuation of the Royal Theatre in Copenhagen*. AKF: Institute for Local Government Studies, Denmark: <http://www.akf.dk/eng/kgl.htm>
- Bille, T. (1997) The willingness to pay for the Royal Theatre in Copenhagen as a public good. *Journal of cultural economics* 21(1), 1-28.
- Bille, T. (2002) A contingent valuation study of the Royal Theatre in Copenhagen, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 200-237.
- BMRC and MLA (2005) *Bolton's museum, library and archive services*, Scotinform: Edinburgh.
- Bravi, M., Scarpa, R. and Sirchia, G. (2002) Valuing cultural services in Italian museums: a contingent valuation study, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental*



- valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 184-199.
- Clark, D. E. and Herrin, W. E. (1997) Historical preservation districts and home sale prices: evidence from the Sacramento housing market, *Review of regional studies* 27(1), 29-48.
- Deodhar, V. (2004) Does the housing market value heritage? Some empirical evidence, *Macquarie economics research papers* 3: <http://www.econ.mq.edu.au/research/rdp2004.htm>.
- English Heritage (2003) *Heritage Counts 2003*. English Heritage: London.
- Garrod, G. D., Willis, K. G., Bjarnadottir, H. and Cockbain, P. (1996) The non-priced benefits of renovating historic buildings: a case study of Newcastle's Grainger Tow. *Cities* 13(6), 423-430.
- Garrod, G. D. and Willis, K. G. (2002) Northumbria: castles, cathedrals and towns, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 40-52.
- Goodman, A. C. (1998) Andrew Court and the invention of hedonic price analysis, *Journal of urban economics* 44(2), 291-98.
- Grosclaude, P. and Soguel, N. C. (1993) *Contingent valuation of damages to historic buildings: a case study of road traffic externalities*. CSERGE working paper GEC-1993-03, University of East Anglia: Norwich.
- Maddison, D. and Foster, T. (2003) Valuing congestion costs in the British Museum, *Oxford Economic Papers* 55, 173-190.
- Maddison, D. and Mourato, S. (2001) Valuing different road options for Stonehenge', *Conservation and management of archaeological sites* 4(4), 203-212.
- Maddison, D. and Mourato, S. (2002) Valuing different road options for Stonehenge, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 87-104.
- Martin, F. (1994) Determining the size of museum subsidies. *Journal of cultural economics* 18, 255-70.
- Mazzanti, M. (2003a) Discrete choice models and valuation experiments, *Journal of economic studies* 30(6), 584-604.
- Mazzanti, M. (2003b) Valuing cultural heritage in a multi-attribute framework: microeconomic perspectives and policy implications. *Journal of socio-economics* 32, 549-569.
- Mourato, S. and Maddison, D. (1999) *Valuing different road options for the A303: a contingent ranking analysis*, CSERGE working paper, University of East Anglia: Norwich.
- Navrud, S. and Strand, J. (2002) Social costs and benefits of preserving and restoring the Nidaros Cathedral, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 31-39.
- Noonan, D. S. (2002) Contingent valuation studies in the arts and culture: an annotated bibliography, *Cultural Policy Centre working paper*. University of Chicago: Chicago.
- Noonan, D. S. (2003) Contingent valuation and cultural resources: a meta-analytic review of the literature, *Journal of cultural economics* 27: 159-176.
- Özdemiroğlu, E. and Mourato, S. (2001) *Valuing our recorded heritage*, CCEM working paper, <http://www.uni-hamburg.de/Wiss/FB/15/Sustainability/CCEMpaper.pdf>
- Pollicino, M. and Maddison, D. (1999) *Valuing the impacts of air pollution on Lincoln Cathedral*, CSERGE Working Paper GEC 99-03, University of East Anglia: Norwich.
- Pollicino, M. and Maddison, D. (2001) Valuing the benefits of cleaning Lincoln Cathedral. *Journal of cultural economics* 25(2), 131-148.

- Pollicino, M. and Maddison, D. (2002) Valuing the impacts of air pollution on Lincoln Cathedral, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 53-67.
- Poor, J. P. and Smith, J. M. (2004) Travel cost analysis of a cultural heritage site: the case of historic St. Mary's City of Maryland. *Journal of cultural economics* 28(3), 217-229.
- Pollicino, M. and Maddison, D. (2002) Valuing the impacts of air pollution on Lincoln Cathedral, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 53-67.
- Powe, N. A. and Willis K. G. (1996) Benefits received by visitors to heritage sites: a case study of Warkworth Castle. *Leisure studies* 15: 259-275.
- Pung, C., Clarke, A., and Patten, L. (2004) Measuring the economic impact of the British Library, *New review of academic librarianship* 10(1), 79-102.
- Riganti, P. (1997) Valuing cultural heritage: a contingent valuation study of the archaeological park at Campri Flegri. *Discussion papers in urban and regional economics* 9, University of Reading: Reading.
- Riganti, P. and Willis, K. G. (2002) Component and temporal value reliability in cultural goods: the case of Roman imperial remains near Naples, in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 142-158.
- Santagata, W. and Signorello, G. (2000) Contingent valuation of a cultural public good and policy design: the case of Napoli Musei Aperti. *Journal of cultural economics* 24(3), 181-204.
- Santagata, W. and Signorello, G. (2002) Individual preferences and allocation mechanisms for a cultural public good: 'Napoli Musei Aperti', in Navrud, S. and Ready, R. C. (eds.) *Valuing cultural heritage: applying environmental valuation techniques to historic building, monuments and artefacts*. Edward Elgar: Cheltenham, 238-256.
- Sanz, J. A., Herrero, L. C. and Bedate, A. M. (2003) Contingent valuation and semiparametric methods: a case study of the National Museum of Sculpture in Valladolid, Spain, *Journal of cultural economics* 27, 241-257.
- Signorello, G. and Cuccia, T. (2002), Estimating and Capturing Non-market Use Value of Heritage Cities: The Case of Noto, in Rizzo, I. and Towse, R. (eds.) *The economics of heritage: a study in the political economy of culture in Sicily*, Edward Elgar: Cheltenham.
- Tohmo, T. (2004) Economic value of a local museum: factors of willingness to pay, *Journal of socio-economics* 33, 229-240.
- Willis, K. G. (1994) Paying for heritage: what price for Durham Cathedral? *Journal of environmental planning and management* 37(3), 267-278.
- Willis, K. G. (2002) Iterative bid design in contingent valuation with an application to the Bosco di Capodimonte Park in Naples, *Journal of cultural economics* 26(3-4), 307-324.

The Euro equivalent exchange rate has been calculated using the average annual exchange rate (Interbank rate) for the year of the *survey*. The ECU rate has been used between 1991 and 1998, and the Euro rate from January 1, 1999 to the present.

# THE ECONOMICS OF CONSERVATION: THE ROLE OF GOVERNMENT AND POLICY ISSUES

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## 1. Introduction

Cultural economics is a well established, though relatively ‘young’ area in economics, covering many different fields. A classical distinction is drawn between heritage, arts and cultural industries. As far as heritage is concerned, the literature spans the economics of museums, the markets for art and collectibles and, with less, though increasing interest, built heritage. Even built heritage is a wide concept, including archaeological remains, monuments, historical buildings, cities of arts as well as contemporary architectural masterpieces; in this paper, attention is concentrated on ‘past’ built cultural heritage, with special emphasis on conservation policies. The paper builds upon the previous work of the author and offers an overview of the main economic issues involved in heritage conservation, exploring the role of government and the main policy implications. In this perspective, attention will be devoted to investigating some economic issues such as:

- i) the analysis of the benefits and costs generated by the different types of conservation in combination with the different types of heritage;
- ii) the identification of public and private actors involved in the decisions of conservation;
- iii) the role of consumers / users.

National as well as international dimensions of the above topics will be highlighted.

## 2. Cultural heritage: some economic issues

### 2.1. Definition of cultural heritage

When we think about a definition of built heritage the first reference is the Unesco concept of ‘tangible heritage’, e.g. buildings, monuments or sites of historical, aesthetic, archeological, scientific, ethnological or anthropological value (*Convention for the Protection of the World Cultural and Natural Heritage, 1972*). Such a concept, however, though apparently straightforward, needs further investigation for a better understanding of its scope and of its implications.

In the economic literature the issue of cultural heritage definition has been addressed to stress that its boundaries are not well identifiable, i.e. there is no precise specification of how restricted or extensive the concept should be. Two particular features need to be pointed out: scope and value. According to Koboldt (1997), heritage identifies a set of goods which belong to the past and are socially relevant because they are an expression of the cultural development of a society; as a consequence, as Benhamou (2003, p. 255) outlines, “*heritage is a social construction where boundaries are unstable and blurred*”. On the other hand, Peacock (1997, p. 195) points out that heritage is “*an intangible service increasing the utility of consumers, in which historic buildings and artefacts are inputs*” and Throsby (2001) defines heritage as *cultural capital*, an asset that embodies a store of cultural value, which

can be separated from its economic value, producing a flow of goods and services over time which may also have cultural value (i.e. which are themselves cultural goods and services).

Though very briefly, this overview shows a feature of cultural heritage which is interesting from an economic point of view. It is a complex and unstable concept which changes over time: not all the old buildings or sites deserve to be considered as “heritage” and such a decision is mostly left to experts (art historians, archaeologists, architects) working within government departments or advising them. Of course, economists are not entitled to define what ‘heritage’ is but economics can be useful to analyze how resources are to be allocated to different means, how trade offs are established between competing objectives and what are the effects of different decisions regarding the extension of heritage, the central question being to make compatible the scarcity of available resources and unlimited wants.

Such an issue is highly debated in industrialized Western countries where the scope of cultural heritage has expanded through time and some trends are identifiable: on the one hand, the value of cultural diversity is increasingly stressed, on the other hand, the formal recognition of places, as part of the cultural heritage, has expanded to embrace historic parks, gardens, battle fields as well as shops and industrial heritage, just to quote some of the new “entries”. Moreover, emphasis is usually placed on the value and potential of the historic environment as a whole and not only on the officially designated and protected specific parts of it. Such progressive enlargement enhances the competition over the use of resources and the need for the economic valuation of the conservation choices. As a consequence, the benefits of cultural heritage have to be assessed and evaluated.

## 2.2. Benefits of cultural heritage

As it was outlined before, cultural heritage has a physical dimension – it is a stock – which requires resources for maintenance and for preventing deterioration and at the same time it provides a flow of services. There is an extensive literature on cultural heritage benefits and on their classification; a widely used approach is based on the distinction between use value and non-use value (Klamer –Throsby, 2000).

The former refers to the benefits deriving from the fruition or possession of cultural heritage. A direct use value derives when heritage is consumed (for instance when a monument is visited) or is used for production purposes (for instance, if an ancient theatre is used for performances).<sup>1</sup> Non-use value is generated regardless of whether cultural heritage is used or not. The conservation of cultural heritage can be considered important for national cohesion and prestige, for the education and the social improvement of the community, for the preservation of its cultural identity and as a creativity-enhancing instrument.<sup>2</sup> Economists have attempted to systematize these ‘elusive’ concepts and ‘existence value’ and ‘bequest value’ are usually taken as examples: people may derive benefits from the very existence of heritage and, therefore, may be interested in maintaining the option of consuming it in the future as well as protecting it for future generations.<sup>3</sup> People’s evaluation of these benefits is likely to evolve since it is affected by the cumulative process of education; at the same time it depends on the overall economic, social and political conditions of the country. In general terms,

1 Use value can be also indirect and pertains to the benefits generated by the external appearance of the heritage, which do not imply direct use of the heritage.

2 The social function of culture and its relevance in heritage projects is explored by Galvani (2002).

3 Economists have developed methods to evaluate such non-private or social benefits, since they are not marketable. The analysis of these methods is outside the scope of this paper; for an overview, see Navrud, S. – Ready, R. (2002) and the issue n.27 of the Journal of Cultural Economics in 2003.



according to Navrud, S. – Ready, R. (2002) the empirical findings suggest that people attribute a significantly positive value to the conservation or restoration of cultural assets and that values are higher for users (visitors or residents) than for non-users.

The flows of benefits are affected by the *type* of heritage as well as by its *location* and *quality*. The physical features of different *types* of heritage (archaeological site, monument, building, historical centre, church, etc.) affect the degree of “publicness” or “privatness” of the benefits produced. The ‘consumption’ of a public good such as the façade of a monument is non-rival<sup>4</sup> and non-excludable<sup>5</sup> and, therefore, no price can be charged; the visit of an archaeological site, though excludable, offers non-rival benefits unless congestion occurs and, as a consequence, a risk of degradation, when overcrowded. At the same time, some buildings or sites can offer joint products, combining fruition with economic activities, such as performances, commercial activities, receptions and so on.

Moreover, *location* (whether cultural heritage is part of the urban environment or it is located outside cities) affects the range of benefits/costs deriving from its use and, therefore, its economic evaluation as well as the need for public intervention. A good example is offered by old buildings within historical districts which are increasingly used as natural incubators of small businesses; evidence of this tendency ranges from Pioneer Square in Seattle to the Souq al Saghir in Damascus, the Fan Center in Ningbo, China or the Macao heritage conservation zone, all exerting stimulus for new businesses and more activity from existing businesses (Rypkema, 2005).

Not only the physical dimension of heritage but also its *quality* is relevant. Cultural heritage shows a high degree of quality variability,

ranging from heritage which is known worldwide, such as the heritage included in the Unesco World Heritage List, to regional or local heritage which is known only within limited boundaries. The scope of benefits stemming out from heritage of different *quality* is different: everybody in the world cares about Venice or the Egyptian pyramids while this is not the case for minor buildings, though they might produce relevant benefits to the regional or local communities involved because of the close links existing with their history and identity. This implies that different actors are likely to be involved as well as different tools are needed<sup>6</sup> for the conservation of different types of heritage.

### 2.3. Sustainability

Cultural heritage, like natural capital, raises sustainability issues because once destroyed, it is lost forever. As Rizzo-Throsby (2006) outline, a peculiar feature of cultural capital is that the deterioration or destruction of heritage is not compensated by the creation of new cultural capital, such as contemporary artistic items; therefore, conservation is needed so that present needs can be met without compromising the satisfaction of future needs.

When the proportion of cultural heritage is huge relative to Gross Domestic Product, a sustainability issue arises since a relevant amount of financial resources is required to ensure the maintenance of the cultural stock,<sup>7</sup> such a problem being extremely severe for most developing countries. On the other hand, the extent of the sustainability problems depends also on the size of benefits that cultural heritage is able to produce and, therefore, on the overall economic effects deriving from its conservation. Indeed, heritage, and more generally the arts, are increasingly recognised as a strategic factor to

4 Non-rivalness means that two (or more) individuals can enjoy (consume) the good at the same time without interfering with each other's enjoyment.

5 Unlike the case of private goods, which are exchanged in the market, it is technically unfeasible to prevent users from enjoying the non-excludable good through the price mechanism.

6 See below, section 3.

7 Netzer (1998) offers an emblematic example comparing the USA and Italy with respect to the ratio of annual heritage capital consumption to GDP, reaching the conclusion that in Italy the costs to be borne to maintain the cultural capital stock are unaffordable.

promote social and economic development, and several methodologies have been developed to assess their economic effects.<sup>8</sup> Impact studies try to demonstrate that heritage projects generate large economic benefits to induce the decision maker to allocate resources in such a direction, a major weakness of their conclusions<sup>9</sup> being the lack of attention for the opportunity costs of public resources which are diverted from other profitable investments. In these studies cultural tourism is usually advocated as a strategic factor in developing the local economy and generating jobs. However, as Bonnet (2003) outlines, caution should be used in evaluating the economic role of cultural tourism. Data are usually unclear so that it is difficult to distinguish between 'solely cultural-motivated' visitors (or tourists) and those who are 'combined motivated'; at the same time, the complementary expenses related to the consumption of the cultural goods are likely to be exaggerated.<sup>10</sup>

Apart from the above mentioned methodological problems, it should be also mentioned that the benefits of conservation depend on the specific heritage as well as on the characteristics of the conservation activity put in practice. For instance, a much debated issue is the use of historical or archaeological sites or buildings for cultural events such as concerts or theatrical performances or even fashion shows: these uses of heritage are, in some cases, prohibited by the public decision makers because they are perceived as not being compatible with the heritage (state of conservation, prestige, etc.) regardless of their important economic benefits. Thus, *how* conservation is carried out and *who* is involved is an open and crucial question to assess the overall benefits of cultural heritage conservation. These issues will be addressed

8 For a recent survey, see Mason (2005).

9 The methodological perspective of impact studies is criticized by economists (Seaman, 2003).

10 Moreover, the relationship between heritage and tourism is dynamic and may involve conflicting values; for instance, the commercialization of cultural identities should not be disregarded as well as the costs imposed on residents by congestion.

in the following section, where the role of Government is explored.

### **3. Cultural heritage conservation: role of Government and policy implications**

#### **3.1. Government tools**

In all the industrialized countries the public sector plays an important role in the conservation of cultural heritage, even if with different quantitative and qualitative characteristics. The analysis of the normative rationale for Government intervention is outside the scope of this paper and the related efficiency and equity arguments are taken for granted;<sup>11</sup> in what follows the attention will be concentrated on the features of public action and on its effects. In fact, though market failure provides a rationale for Government intervention, this is not to say that Government action is efficient<sup>12</sup> in providing conservation nor that there is only one way to intervene. Heritage benefits and the features of Government action cannot be considered as independent, since Government policy affects the scope of direct use values benefits as well as the combination of public/private intervention and, as a consequence, the sustainability of conservation policies, too. At the same time, also the level of government which is involved makes a difference.

In the heritage field Government intervention can be direct or indirect and uses monetary or non-monetary instruments. Public spending and tax-expenditures are,

11 A general overview of the pros and cons of the normative justifications for government intervention in the cultural field is provided by Frey (2003).

12 Public intervention does not necessarily ensure efficiency, e.g. the maximization of society's well being, because it is not carried out by a fully informed and far-sighted planner pursuing the public interest. According with the positive analysis, public choices are, in fact, the outcome of a decision making process involving self-utility maximizer 'agents', e.g. elected representatives and bureaucrats. The theoretical issues of the positive analysis of public choices are explored by Mazza (2003).

the direct and indirect monetary tools respectively, while regulation is the non-monetary one, usually adopted to promote heritage conservation.<sup>13</sup> Monetary and non-monetary tools raise very different economic issues: in what follows, after a brief overview of the former, attention will be concentrated on the latter.

### 3.2. Monetary tools

Direct public expenditure ranges from the purchasing of goods and services<sup>14</sup> as well as of buildings of artistic interest to the subsidies and/or loans to cultural public or private institutions as well to private owners of historic buildings. Public spending is financed through the tax revenue but in most countries lottery funds are becoming an important source of financing.

Government support is also provided indirectly, through tax-expenditures, in the form of tax allowances, to incentive private financing, such as, for instance, donations/sponsorships aimed at supporting heritage conservation and private actions that preserve buildings of historic-artistic value. The cost born in terms of the tax revenue foregone as well as the decisions regarding the size and the composition of heritage support – e.g. which monument should be restored – are outside Government control, since they depend upon the donors / sponsors' private decisions. In most western countries there is a great interest toward indirect support because it is believed that it increases the amount of resources devoted to cultural heritage; however, as Rizzo–Throsby (2006) point out, such a tool has not the same effects everywhere because private decisions are affected by many factors and social norms, such as the public recognition of the relevance of the arts, which are specific to each country.

13 Other wider instruments, such as education, can be used to spread information and improve citizens' awareness of heritage.

14 For example, the salaries for Government experts and staff involved in heritage conservation, the purchasing of consumption goods, equipment for diagnosis, etc. for the restoration activity.

The size and the features of monetary public intervention differ across countries: Anglo-Saxon countries exhibit lower direct public expenditure, coupled with larger private support, while most continental European countries, show wider public intervention, with a larger role for central government in France and Italy than in Germany or Denmark. Institutional features are different, too; for instance, state-driven, bureaucratic systems<sup>15</sup> prevail in France and Italy; a decentralized system characterizes Germany while the arms-length approach<sup>16</sup> is implemented in the UK, Netherlands and Scandinavia (Ploeg van der, 2005).

Caution is needed when comparing countries since cross-national data are not reliable, also because of the methodological problems deriving from the lack of harmonization of data collection.<sup>17</sup> However, empirical evidence shows that differences exist among countries and that, anyway, direct spending for culture is negligible in term of GDP, ranging between 0.4 and 2%, according with the Organisation for Economic Cooperation and Development (OECD) estimates.<sup>18</sup> However, the small size of public cultural spending should not induce to believe that Government role is negligible in the cultural heritage field; indeed, non-monetary tools, such as regulation, which are not accounted for by statistics, affect the allocation of resources in a relevant way.

15 Such a system is state-driven and top-down; bureaucrats and politicians decide how to distribute public funds.

16 In the UK funds are allocated to Non-Departmental Public Bodies which distribute them among various projects and applicants while in the Netherlands, funds are allocated by the Minister with the recommendations of independent Arts Council.

17 The methodological and practical difficulties of cross-national comparative analysis are outlined by Belfiore (2004).

18 These estimates are based on a very wide definition of Government expenditure including administration of sport, recreation and cultural affairs as well as the maintenance of zoos, botanical gardens, public beaches and parks, support to broadcasting services and, in some countries, support for religious services. Also included are grants to artists, performers, orchestras and opera companies.

### 3.3. Regulation

Regulation is a non monetary tool aimed at restricting or modifying the activities of public as well as private actors – firms and individuals – to control the stock of heritage. Regulation constrains the exercise of property rights in many different ways: for instance, listing historical and archaeological sites, as well as individual buildings, preventing the demolition of a building or a group of buildings; imposing restrictions on the uses to which the building can be put, on its appearance and the way restoration or re-use is carried out; imposing limitations on the use of land affecting heritage buildings. Regulated subjects must comply and penalties are provided for non-compliance.

In addition to these forms of regulation, which Throsby (1997) defines as *hard regulations*, there are also non-enforceable forms of regulation, i.e. *soft regulations*, mainly applied at international level: Charters, Codes of Practice, Guidelines, etc., as well as listing, such as the Unesco World Heritage List, belong to this type of regulation, which are implemented by agreement and do not involve penalties.

Regulation is a flexible tool, which satisfies the need for quick decisions characterizing the heritage field, and at the same time leaves many degrees of freedom to the decision maker. Elsewhere (Rizzo, 2003) such an issue has been dealt with in more detail; here, it is enough to stress that the identification of the scope and the range of regulation is highly discretionary, especially when minor heritage is involved; therefore, the features of the decision making process and of the actors involved are important in determining the stock of cultural heritage, both in quantitative and qualitative terms, and its capability of becoming a ‘resource’ for local development. In fact, as Montemagno (2002) outlines the allocation of resources in heritage conservation is likely to be biased by the scholastic and academic training of managers and civil servants involved in the decision making process; for example, in Sicily, a widespread cultural education from

archaeological schools tends to undervalue medieval relics when compared to relics of classical antiquity and, therefore, the supply of heritage, including that for tourist purposes, is also affected, the city of Syracuse being an interesting case study in this respect.

### 3.4. Focus on conservation

A good example of the above mentioned issues raised by regulation is offered by focusing attention upon the concept of conservation itself. Indeed, different meanings can be assigned to the word ‘conservation’ with different economic implications. The principles of cultural heritage conservation internationally recognized have been established through time among conservation professionals and may be found in a great number of international,<sup>19</sup> regional, national, and thematic documents on a variety of topics, such as historic towns, training and education, popular architecture etc.

Among the various possible definitions, it might be useful to recall here that according to the definition provided by English Heritage (2006), conservation is “*the process of managing change in ways that will best sustain the values of a place in its contexts, and which recognises opportunities to reveal and reinforce those values*”. In such a definition the concept of conservation seems to aim not only at keeping heritage safe from harm but also at enhancing it through a positive change. Somehow different emphasis is placed by the Icomos 1999 Burra Charter,<sup>20</sup> since “*conservation is based on a respect for the existing fabric, use, associations and meanings. It requires a cautious approach of changing as much as necessary but as little as*

19 The list of international documents is almost endless ranging from Icomos documents, such as the Venice Chart (1964) or the Nara Document on Authenticity (1999) to the Unesco Vienna Memorandum on Historic Urban Landscapes (2005) or to the 2000 Charter of Krakow (produced by the cooperation of 6 European countries).

20 The Burra Charter was adopted by Australia Icomos on 19 August 1979 at Burra, South Australia. Revisions were adopted on 23 February 1981, 23 April 1988 and 26 November 1999.



possible. The traces of additions, alterations and earlier treatments to the fabric of a place are evidence of its history and uses which may be part of its significance. Conservation action should assist and not impede their understanding". Going into more operational details, the World Bank (1994) outlines that conservation "encompasses all aspects of protecting a site or remains so as to retain its cultural significance. It includes maintenance and may, depending on the importance of the cultural artifact and related circumstances, involve preservation, restoration, reconstruction or adaptation, or any combination of these".

Different types of conservation may have a relevant impact on the economic benefits stemming from conservation, namely those related to use value. For instance, *preservation* is an intervention which does not allow for compatible uses.<sup>21</sup> If heritage is simply preserved, in order to guarantee its conditions at its original state, though its non-use value is preserved, a considerable amount of benefits might be lost. Alternatively, *adaptation* implies that an historical place is modified for compatible uses, to meet modern standards of comfort and safety without harming its physical structure or its architectural character. In such a case, the benefits related to its use value can be generated because of its utilization for consumption and/or for production purposes but, at the same time, the cultural value might be harmed if the proposed change is not balanced.

Moreover, even if the terms *preservation* or *adaptation* are apparently straightforward, in practice their content varies according to the ways conservation is put in practice. The choice whether simply *preserving* heritage or *adapting* it to a new state and, eventually, a new use, is clearly linked to the heritage features. In principle, the artistic and architectural characteristics of heritage should affect such a choice, suggesting also

the ways to put it in practice, e.g. techniques of diagnosis and restoration, methods for the study and conservation of different objects, materials to be used in restoration, etc. In practice, such a choice cannot be considered a 'neutral' decision, relying only objective technical grounds but it is influenced by experts knowledge, experience and professional training.

The concept of restoration itself is controversial and so is definition of what is the former state. Should accretions be removed though they are representative of an historical period or of a technique? Another good example of how controversial conservation choices can be is offered by the debate on the adoption of standards for conservation. Among experts there is wide agreement that each piece of heritage is unique and that conservation should be carried out case-by-case, since real conservation cases require a mix of approaches and principles, suitable to grasp the mixed values of complex sites<sup>22</sup>; at the same time, increasing attention is also paid in the public opinion to the definition of standards of intervention. Such a debate is more developed in some fields, for instance museums,<sup>23</sup> than in the conservation of built heritage. To what extent standards in conservation should be considered compulsory or simply voluntary, as benchmarks of best practices to orientate practitioners and professionals in the heritage field? While there is consensus on the mandatory nature of the standards connected to health and safety regulation the same consensus does not apply to other types of standards. On the other hand, the high variability among technical standards dealing with the same objects<sup>24</sup> shows how difficult it is to find the specialists' agreement on this topic and, therefore, stresses the highly subjective judgement underlying conservation choices.

Somehow similar issues occur at international level whenever conservation prin-

21 The differences between preservation, restoration or reconstruction refer to the artistic, historic and architectural considerations which are outside the scope of this paper.

22 For instance, see the 1996 Canadian Federal Heritage Buildings Review Office (FHBRO) Code of Practices.

23 The issue is explored in Alcantara (2002).

24 *Ibidem*.

ciples built on Western culture and experience are applied in a different context. For this reason, for instance, the appropriateness of the application of the Burra Charter policy to places of cultural significance to Aboriginal people is questioned. "A recent example is the Kimberley repainting case in Western Australia where traditional Aboriginal people 'restored' an important work of rock art by using modern materials, namely plastic paint, rather than the traditional clay and mud. It was a practical solution to the people charged with the care of the site. But the non-traditional process of 'restoration' caused great offence to the European conservationists and the rights and wrongs of this case are still being hotly disputed by experts. To try and impose these precepts on Aboriginal peoples in relation to places of significance only to them, or to try and impose restrictions designed for bricks and mortar to the growing and ever-changing natural environment can do nothing but debase the reputation of the current document". (James, 1996).

### 3.5. The costs of regulation

As the above analysis shows, conservation choices can exert relevant economic effects because they impinge upon property rights and may also generate a distributional impact.

If a conservationist stance is adopted and heritage is simply preserved, its full enjoyment and utilization might be prevented and, therefore, its potential benefits cannot be fully generated. As Rizzo (2002) outlines, restrictions on the use of buildings, their appearance and the way in which restoration and reuse is carried out might undermine the possibility of restoring and revitalising historical centres which is usually one objective on the political agenda of local authorities. Any historical centre is considered a cultural good *per se*, apart from the importance of each building within it – a "polar" case being the so-called "heritage cities" – and, therefore, every activity within it is constrained by the need to ensure the conservation of such a public good. Indeed, this is in keeping with

the objective of revitalising historical centres and transforming them into a "resource" for the local community; however, in many cases, a 'conservationist' approach impinges not only on private interests but also on the ability to pursue public interests. This is the case when major urban renovation is carried out by public institutions and the planned reuse is considered by the decision maker to be incompatible with the features of the building, for instance because it would imply major changes to the interiors, even if they are considered compatible with local zoning prescriptions. The costs of regulation, therefore, depend on the stance adopted by the regulator: apart from the administrative and bureaucratic ones, some of these costs can be foreseen in advance because they are closely connected to the conservation (for example, the requirement to use special materials, qualified operators, etc. to ensure quality) while others are subject to a high degree of uncertainty, as a consequence of an undue 'conservationist' approach to the fabric, well beyond what is justified by the costs-benefits comparison (Pignataro-Rizzo, 1997). At the same time, the indirect costs imposed on any activity that interferes with heritage regulation should not be undervalued.

The above mentioned issues are extremely relevant for the minor cultural heritage located in the urban context; a 'conservationist' stance is likely to discourage private investment which might be directed toward this type of heritage: however, the extent of such an effect, which can be represented by the increases or decreases in the economic value of the listed or registered properties depends on whether regulation is coupled with direct or indirect public spending. If the negative effects prevail the 'conservationist' approach is likely to undermine the sustainability of the related conservation programs because it generates a considerable pressure on public expenditure. As a consequence, the objective of the public policy, i.e. conservation of heritage, can actually be endangered by the excessive expansion of the regulation itself and the demand for conservation may be not met by the public policy.

From the above considerations, a very tentative argument, then, is that the larger the size of heritage stock the less conservationist public policy should be.<sup>25</sup> It might be argued that a conservationist stance might be perceived as a 'signal' of quality, therefore stimulating other potential sources of support for heritage, such as forms of supra-national intervention or of international philanthropy.<sup>26</sup> However, the extent of such an effect, in reality, does not seem strong enough to orientate policies.

The above mentioned problems mainly arise when the decision making process is supply-oriented, e.g. mainly driven by the preferences of the experts rather than by society and when the public decision maker has no incentives to take into account society's preferences.

### 3.6. Public participation

The above analysis points out that there is a need to develop a multidisciplinary approach to address heritage conservation issues, economics being involved to stress the opportunity cost carried out by any conservation decisions. The issue is *how*, since it will not arise spontaneously as the endogenous result of the decision making process. Indeed, while it is widely agreed in most international as well as official documents that conservation is an interdisciplinary process, it is interesting to point out that usually only planners, engineers, architects, archaeologists, arts historians, heritage recorders, those executing projects and, very recently, ICT experts are mentioned as the professionals to be involved, while economists are very rarely mentioned. Peacock's analysis (2004) of economic advice in culture offers illuminating hints in this respect.

What can be done to improve the decision making process underlying conservation to make it more demand oriented? A better

distribution of information is needed to reduce the asymmetrical information enjoyed by the experts; at the same time, public participation has to be improved, information about the general public's preferences being a useful complement to expert judgement. To what extent, in practice, the public decision making process is able to represent individuals' preferences is another question and depends on the institutional features of such a process.

The introduction in decision making of a systematic assessment of the economic impact of regulation could help to reduce asymmetrical information and offer evidence to improve public scrutiny of public decisions. This might make it easier, for instance, to adopt at local level Codes of Practice or Guidelines agreed between the regulator and those involved in conservation activities (architects, building firms, engineers, cultural associations, etc) in order to make prior commitments and reduce the uncertainty related to investments in heritage conservation.

An interesting example of good practice is offered by the two stages consultation programme, recently launched by English Heritage to develop *Conservation Principles, Policies and Guidance*. The Principles are intended primarily for use by English Heritage, for the management of its own estate and for offering its advice to others. "The Principles are designed to spell out in one place and in a comprehensive fashion the fundamental beliefs and policies that should underpin standards of practice in the broad field of conservation". "The Principles will be supported by a suite of detailed policies and guidance on how to reach decisions on a wide range of problems". Professionals as well as the general public are invited to contribute and respond to the consultation questions contained in the Conservation Principles Feedback form. It might not be by chance, however, that such a consultation takes place within a system based on the arms' length approach<sup>27</sup> – where Government influence

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25 Such an argument might rely also on the decreasing marginal utility principle though it does not apply to the heritage field.

26 The international dimension is explored by Netzer (1998).

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27 See above, par. 3.2.

on the cultural sector is lower – and not within a bureaucratic system. As far as this latter system is concerned, in fact, Italy offers completely different examples: there is no evidence of serious concern to set guidelines against which to make funding decisions nor to set priorities to orientate institutions. This is demonstrated by the lack of any systematic information about the activity and the results of the funded subjects (museums, archaeological sites, historical buildings); most of them are considered just “heritage” and not accountable institutions in the sense that most of them are merely branches of the Heritage Ministry and do not have an autonomous administrative identity.

Moreover, devolution is usually indicated as another means of increasing the accountability of government; because of the very close links between regional/local communities and heritage, the positive effects of devolution seem to be even stronger in such a field than it is usually claimed. (Rizzo, 2004). Devolution might improve citizens’ information because of the possibility of comparing a variety of solutions and criteria of intervention and, at the same time, would allow also for the possibility of using direct democracy tools, such as referenda, to assess public evaluation of heritage policies.<sup>28</sup> However, the findings of recent research (Rizzo and Towse, 2002) show that devolution as such is not enough to provide a framework of rules enhancing the accountability and responsiveness of heritage regulators to public opinion if no adequate incentive system is introduced in the regulatory decision making process. Attention, therefore, has to be concentrated on that process.

Forms of greater public participation in decision making as well as compulsory assessment consultation or review procedures might be included in the regulatory process, though the benefits should be weighed up taking into account the likely increase in

<sup>28</sup> Swiss referenda offer interesting evidence on public attitudes toward the arts. Frey (1997) examines the arguments for extending the use of such a method in cultural decisions.

administrative costs and decrease in the speed of the process which would derive from such devices. The use of direct democracy tools, such as referenda, has been advocated to assess public evaluation of heritage policies but, again, the costs should not be underestimated. At the same time, the role that voluntary associations and groups expressing society’s interests can play in the decision making process might be enhanced<sup>29</sup>. They can carry out information activities and/or promotional campaigns both to raise funds and/or to influence the authorities, representing a plurality of interests on a decentralised level.

#### 4. Concluding remarks

In this paper, some economic issues related to cultural heritage conservation have been outlined and the role of Government in conservation has been explored. The positive analysis of conservation has stressed that, far from being technical and ‘neutral’ decisions, conservation choices not only depend on the different types of heritage and on its features but are also affected by the institutional features of the decision making process and by the experts’ identity.

The introduction of the opportunity cost concept, to drive the conservation decisions, is advisable to prevent experts from adopting ‘conservationist’ approaches which might lead to unsustainable conservation policies. It will not arise as the endogenous result of the decision making process but can be facilitated by good institutional design, leaving room for public participation.

#### References

- Alcántara, R. (2002), *Standards in preventive conservation: meaning and applications*, ICCROM.
- Belfiore, E. (2004), *The Methodological Challenge of Cross-National Research: comparing cultural policy in Britain and*

<sup>29</sup> The extent of this form of participation varies across countries, being very well developed in Great Britain.



- Italy*, University of Warwick, Centre for Cultural Policy Studies, Research paper n.8.
- Benhamou F. (2003), Heritage, in R. Towse (ed.), *A Handbook of Cultural Economics*, Edward Elgar, pp. 255-292
- Bonnet Lluís (2003), Cultural tourism, in R. Towse (ed.), *A Handbook of Cultural Economics*, Edward Elgar, pp. 187-193.
- English Heritage (2006), *Conservation Principles. For the sustainable management of the historic environment*, London.
- Frey, B. (1997), The evaluation of cultural heritage: some critical issues, in M. Hutter and I. Rizzo (eds), *Economic Perspectives of Cultural Heritage*, London: Mcmillan, 31-49.
- Frey B. (2003), Public support, in R. Towse (ed.), *A Handbook of Cultural Economics*, Edward Elgar, pp. 389-398
- Galvani (2002), *Arguments for IADB's involvement in the preservation and development of heritage*, IADB, Washington D.C.
- James, P. C. (1996), The Burra Charter at Work in Australia, in *CRM*, n.3, pp. 49-51 ([http://sres.anu.edu.au/people/richard\\_baker/EPP2004/Topic%208.htm](http://sres.anu.edu.au/people/richard_baker/EPP2004/Topic%208.htm))
- Klamer, A. – Throsby, D. (2000), Paying for the Past: The Economics of Cultural Heritage, in Unesco, *World Culture Report 2000; Cultural Diversity, Conflict and Pluralism*, Paris, pp. 130-145.
- Koboldt, C. (1997) 'Optimising the Use of Cultural Heritage', in M.Hutter-I.Rizzo (eds.), *Economic Perspectives of Cultural Heritage*, Mcmillan, pp. 50-73.
- Mason, R. (2005), *Economics and historic preservation: a guide and review of the literature*, The Brookings Institution, Metropolitan Policy Program Discussion paper.
- Mazza, I (2003), Public choice, in R. Towse (ed.), *A Handbook of Cultural Economics*, Edward Elgar, pp 379-388
- Montemagno, G. (2002), Heritage and Tourism, in Rizzo, I. and R. Towse (eds.), *The Economics of Heritage: A Study in the Political Economy of Culture in Sicily*, Edward Elgar, Cheltenham, pp. 79-87.
- Navrud, S. – Ready, R. (2002), *Valuing cultural heritage. Applying environmental valuation techniques to historic buildings, monuments and artefacts*, Edward Elgar, Cheltenham.
- Netzer, D. (1998), International aspects of heritage policies, in A. T. Peacock (ed.), *Does the Past Have a Future? The Political Economy of Heritage*, IEA, pp. 135-154.
- Peacock, A. (2004), The Credibility of Cultural Economist's advice to Governments, in V. A. Ginsburg (ed.), *Economics of Art and Culture*, Elsevier, pp. 165-178.
- Peacock, A.T. (1997), 'A Future for the Past: the Political Economy of Heritage', in R. Towse (ed.), *Cultural Economics: the Arts, the Heritage and the Media Industries*, vol.1, Cheltenham, UK and Lyme, US: Edward Elgar, pp.189-243.
- Pignataro, G. and I. Rizzo (1997), The Political Economy of Rehabilitation: the Case of the Benedettini Monastery, in M. Hutter and I. Rizzo (eds.), *Economic Perspectives of Cultural Heritage*, Macmillan, pp. 91-106.
- Ploeg, F. van der (2006), "The making of cultural policy: a European perspective", in V. Ginsburgh – D. Throsby (eds.), *Handbook of the economics of the arts and culture*, *CESifo Working Paper*, No. 1524, August.
- Rizzo, I (2002), Heritage Conservation: the Role of Heritage Authorities, in Rizzo, I. and R. Towse (eds.), *The Economics of Heritage: A Study in the Political Economy of Culture in Sicily*, Edward Elgar, Cheltenham, pp. 31-47.
- Rizzo, I. (2003), Regulation, in R. Towse (ed.), *A Handbook of Cultural Economics*, Edward Elgar, pp. 408-414.
- Rizzo, I. (2004), The Relationship between Regional and National Policies in the Arts, in V. A. Ginsburg (ed.), *Economics of Art and Culture*, Elsevier, 2004, pp. 203-219.
- Rizzo, I – Throsby, D. (2006), Cultural heritage: economic analysis and public policy, in V. Ginsburgh – D. Throsby (eds.), *Handbook of the economics of the arts and culture*, Elsevier, ch. 28, pp. 983-1015.





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### **Facing the Grand Challenges and Structural Transformations of the 21<sup>st</sup> Century**

The Epoch Network of Excellence in Processing Open Cultural Heritage has set for itself a grand challenge, in its primary objective of providing “a clear organisational and disciplinary framework for increasing the effectiveness of work at the interface between technology and the cultural heritage of human experience represented in monuments, sites and museums.” (EPOCH 2007) More specifically, this framework is intended to “encompass all the various work processes and flows of information from archaeological discovery to education and dissemination” seeking to identify obstacles to smooth integration and flow of information and thereby to establish overall research priorities.

The natural focus of EPOCH’s evolving Joint Programme of Activities is thus the design of a wide range of practical applications and actions to address the existing challenges to effective and efficient integration of cultural heritage and information technology. Yet these are not engineering challenges alone. In accordance with the larger social and economic objectives of IST in FP6, EPOCH must also help to “increase innovation and competitiveness in European businesses and industry” connected with the heritage sector and to “contribute to greater benefits for all European citizens.” (CORDIS 2007)

Indeed, over the last few decades, the potential of CH ICT for providing such



economic and social benefits has already been demonstrated, particularly in the fields of data collection and analysis; in management and monitoring of cultural heritage resources; and in public presentation activities at museums and sites. The development of a wide variety of networked digital field recording techniques and databases has added efficiency, cost-effectiveness, and power to the task of accurately documenting and analyzing monitoring the physical state of sites and standing historical monuments. Management and spatial planning of heritage resources by local authorities and heritage administrations have been made more effective and flexible through the use of Geographical Information Systems, database design, and new networking technologies.

Digital visualisations have now begun to rival linear narrative as a main method of historical documentation and interpretation for both scholarly and educational audiences. Public presentation and educational programmes have now come to include immersive environments, multimodal interfaces and haptic applications for the study of sites and objects. The use of virtual human figures as avatars and dynamic elements in virtual historical environments have offered unprecedented opportunities to link the visitor experience with vast amounts of well-researched information about past societies.

These developments in data processing, visualisation, and methods of public presentation are important foci for EPOCH’s research agenda, but the longer-term relevance of that agenda—and above all, the long-term



usefulness of its research results—must also take into account the current transformations and emerging structural trends in the field of Cultural Heritage itself. For the interface of culture and technology on which EPOCH focuses its efforts is not a static boundary but a hazy border area, where institutions in *both* the ICT and CH sectors face challenges from shifting economic conditions and changing government policies. Integration must be an ongoing process, not a one-time accomplishment.

This paper will therefore concentrate on the following four main areas of special concern in the CH sector that will likely exert a significant structural impact on working practices (and the potential for ICT integration) over the coming 10-15 years:

- ***Intensifying Physical Threats*** to heritage of all types from natural deterioration, urban and industrial development, deliberate destruction, and climate change, all on an unprecedented scale.
- ***Competing CH Research Paradigms***, making the sharing of information across and within the present disciplinary boundaries increasingly difficult.
- ***Marketisation of Culture***, forcing cultural heritage organizations and institutions to become increasingly dependent for their very survival on independent sources and methods of income generation.
- ***Questions of Heritage and Identity in an age of increasing ethnic and cultural diversity***, posing challenges to traditional definitions of “national patrimony” and transforming the role of heritage in contemporary society.

EPOCH’s success or failure in recognizing and facing these challenges may well determine the future of its ICT integration efforts and may arguably influence the evolution of heritage itself in the coming decades.

## **Conservation Challenges: Material Heritage in Danger**

The physical conservation of material heritage resources is perhaps the central task of the CH sector. It represents the material basis on which all scholarly and public understandings of heritage lie. Ever since the adoption of the Venice Charter (ICOMOS 2001), the overriding concern for the conservation of authentic physical fabric has been the foundation of all accepted international heritage standards and policies. And in the past two decades enormous strides have been made within the CH sector by such international institutions as the Getty Conservation Institute, the Institute for Conservation, and ICCROM to address specific problems in the physical conservation of various types of ancient materials, monuments, and artifacts. (GCI 2007, ICON 2007, ICCROM 2007)

In this challenge as in the others that will be mentioned in the following pages, some important achievements have already been made through the use of information technology. Indeed, the initial surveys of EPOCH’s Sector Watch have highlighted CH stakeholders’ concern with more effective ICT tools for 1.) detailed, and in some cases, three-dimensional documentation of the physical state of objects and structures, 2.) accurate monitoring of progressive change or deterioration, 3.) visualisation and modelling of original, anticipated, or desired future states. The EPOCH Research Agenda has, in turn, underlined the importance of this realm of activity and has identified a wide range of applications with direct relevance for physical conservation activities (Arnold and Geser 2007: 32).

Yet even the briefest glance at the World Monument Fund’s “Watch List” (WMF 2007) or the ICOMOS “Heritage @ Risk” reports (ICOMOS 2005) indicates the enormous scale of conservation threats to all types of material heritage. In growing, already congested urban areas, the physical deterioration of standing historic structures and archaeological sites is due not only



to the natural processes of exposure and physical deterioration, but is exacerbated in many cases by their vulnerability to pollution, vibration, and vandalism. Social and economic developments, rather than purely chemical and mechanical processes are now primary factors in the increasing scale of conservation work. Rapid industrial development in formerly rural areas and regions endangers sites and monuments whose remoteness from population centers once protected them.

Widespread looting of tombs and sites in developing areas feeds the thriving antiquities market in the more developed ones. In regions where cultures and religions are in conflict, the conscious destruction of archaeological sites has become a part of contemporary inter-communal warfare. Most ominous of all, global warming is also taking its toll with the rise of sea and ground water levels in some places and increasing aridification in others. Unique frozen deposits (for example, the frozen mummies of the Mongolian steppe (Gheyle 2006) and the delicate heritage of polar areas (Chaplin and Barr 2007) are thawing, with the consequent destruction of their uniquely preserved remains.

The scale of each of these threats is unprecedented and growing. Taken together, they represent a level of antiquities destruction that is itself of historic proportions, from which no region of the world is immune. Both in the cases of protected antiquities in developed countries and uninvestigated remains in developing regions, this limited and non-renewable resource is rapidly shrinking, offering a grim prospect of a future with a badly depleted communal resource of cultural heritage and the vanishing possibility of documentation of the architectural and archaeological record. An increasing number of international appeals and statements of scholarly concern have been distributed to highlight particular cases of dramatic conservation emergencies. Likewise, some innovative fund-raising methods have been attempted in the US through the use of private philanthropy and in the UK, through the Heritage Lottery Fund. Televised con-

tests to select heritage sites for thorough conservation and publicity campaigns to “save” endangered universal heritage (as in the notable cases of Machu Picchu in Peru, the Mostar Bridge in Sarajevo, the Buddhas of Bamiyan in Afghanistan, and the looted sites and museums of Iraq). But beyond such high-visibility projects, chosen on a case-by-case basis, the wider problem of global heritage ecology has yet to be addressed in an adequately systematic or uniform way.

It is increasingly obvious that a new, regional and worldwide approach to heritage conservation is needed that can grasp the true dimensions of the problem we now face (Lozny 2006). At a time when the budgets of antiquities and monuments services are already stretched to the limit, and with an ever-widening definition of cultural heritage coming to include vernacular architecture, industrial installations, cultural landscapes, battlefield remains and the countless forms and expressions of popular and folk culture (textiles, photographs, posters, and personal memorabilia), the challenge of heritage conservation requires the adoption of an environmental sensibility—rather than a selective connoisseur approach. The more effective use of limited conservation funds will depend on a clearer empirical understanding of the scale and nature of conservation threats.

ICT can play a crucial role in analysing particular types of conservation problems, prioritising their importance, and providing networked data that can assist in the formulation of overall policies in the CH sector. In addition to monitoring specific processes of decay and deterioration, interlinked ICT networks can offer detailed and regularly updated “snapshots” and trend forecasts about the physical state of the entire range of material remains in a particular state, region or locality. As in the case of environmental planning, the goal cannot only be to preserve a particular kind of monument or object as an “endangered species” without taking into consideration the changes occurring in the wider “eco-system” to which it belongs. For heritage, in its physical aspects, must

be considered to be more than our society's attic of antiques. The material remains of the past are a part of our living present; in their omnipresence and visibility they offer individuals and communities alike a sense of who they are and where they are in the history of humanity (Lowenthal 1985). Heritage conservation should thus not be just a matter of spot restoration and consolidation of particular buildings and objects. As a kind of cultural "biosphere," conserved cultural heritage offers society a sense of time and historical orientation (Zerubavel 2004). Its loss or significant degradation will have far-reaching socio-cultural, as well as scientific, consequences.

Thus, in the coming years, CH conservators (working on specific problems at specific sites) and planners (focusing on regional issues of urban and infrastructure threats to material heritage) will need to work ever more closely together within the information networks that can be provided by ICT. More than merely developing tools for specific conservation projects, ICT must help create a new information structure for new multidisciplinary teams of heritage ecologists, simultaneously addressing the challenges of conservation on local and regional scales. Just as the environmental movement merged the formerly fragmented scholarly focus on biology, botany, geology, and zoology toward a more practical ecological collaboration, a new concept of the ecology of material heritage will require the same kind of institutional and conceptual shift. The failure to make such a structural transformation—leaving the process of conservation to arbitrary (if high-tech) "triage" operations at specific sites—will almost certainly fail to halt or even lessen the intensifying deterioration, degradation, and destruction of cultural heritage resources all over the world.

## **Intellectual Challenges: Fragmentation of Historical Scholarship**

The assumption that "the cultural heritage of human experience represented in monuments, sites and museums" is a single, coherent undertaking is badly mistaken. Except for a common concern with the material remains of past societies, the differences of approach and intention are in many cases far more important than the commonalities. First of all the functional goals of various CH institutions differ. The approach of academic institutions is primarily *analytical*, seeking to stimulate and produce original research and formulate taxonomies, chronological sequences, and scholarly hypotheses about material remains. Although museums too may sponsor scholarly research and publish monographs and scholarly journals, their public function is primarily *communicative*: collecting, exhibiting, and conveying heritage significance to their visitors. And regarding monuments and sites services, their task is primarily *administrative*: documentation, conservation, and enforcement of laws that regulate the protection and conservation of moveable and immovable heritage resources.

This functional differentiation is further complicated by a wide variety of theoretical orientations within the entire range of historiographical and heritage disciplines (e.g. Trigger 2006, Wallerstein 2001, Johnson 1999). Alongside the traditional art-historical and culture-historical approaches to material culture (i.e. identifying and dating sequences of styles, artefacts, architecture, and larger arrangements of specific past cultures), are the anthropological approaches that seek cross-cultural typologies of the behaviour represented in the material remains. At the same time, processualists create dynamic models of ancient systems to test hypotheses about the mechanics of ancient societies. Structuralist and post-processual scholars, for their part, collect evidence to decode and deconstruct the unspoken "texts" that the material culture of every period is believed

to express. Each of these main intellectual streams represents a distinctive methodology of study, with particular preferences for certain kinds of data and distinctive and differing criteria for documenting and analyzing the evidence.

In addressing this issue of functional and intellectual fragmentation of CH data, ICT professionals—and in particular the EPOCH Network—have focused on the challenge of standardizing processes for data capture, networking, and interoperability as primary strategies for linking information throughout the entire CH sector (Arnold and Geser 2007). Through the development and use of CIDOC-CRM for encoding both newly captured and legacy data, the goal is to devise metadata standards “suitable to encode information about cultural artefacts and their history” (Arnold and Geser 2007: 74) and thus provide access to all researchers in an ever-growing repository of CH information in a digital form.

Yet the present fragmentation of data sources and collections is not merely a matter of inefficient or non-existent communication networks; it’s also a product of distinct and long-established disciplinary epistemologies. For example, the data systematically collected and used in art- or culture-historical research, is quite different from that collected and used by anthropologists, processualists, or post-processualists. Each CH research project can therefore be seen from an intellectual standpoint as the expression of a particular historiographical orientation, not merely the collection of objective material facts. And although there are many variants and combinations of the various CH research approaches, any attempt to provide a free information flow about the whole set of data about the past must directly and consciously contend with the fact that scholars dealing with material heritage in the range of specialized sub-fields see different types of data as significant. In a word, they are not all talking about the same thing.

Here too, the contribution of ICT can be something more than bridging a static interface between technology and culture.

The effort to establish interoperable digital tools for Data Collection, Structure, and Analysis can be the first step in creating innovative, new multidisciplinary forms of historiography. Widening access to new classes of networked data will encourage a deeper consideration of their commonalities and contrasts. No less important is the growing recognition of the importance of “Intangible Heritage.” By the terms of the UNESCO Convention on the Safeguarding of the Intangible Cultural Heritage, “Intangible Heritage” is defined as “the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage.” (UNESCO 2005)

Although the accepted methods of collecting about Intangible Heritage are still in the process of discussion and crystallization (Munjeri 2004), their relevance to the wider objectives of ICT-CH integration are clear. The explicit mention of the relationship of intangible ideas and traditions to material objects, artifacts, and cultural spaces suggests that it is not a separate category of cultural heritage knowledge, but part of an evolving concept in which the ideational and physical are becoming more closely intertwined. Thus traditional notions of data collection, structure, and analysis and metadata standards must also take account of non-physical as well as physical evidence.

Effective ICT research tools have the potential of not only producing meaningful bodies of interlinked data that has been collected within existing disciplinary frameworks, but can also help to reshape the wider intellectual strategies for the study CH information and production of knowledge in the years to come. The goal is certainly not to create a single, dominating heritage discourse that is simply the sum of all its presently fragmented parts. Through the serious collaboration of ICT and CH professionals it can be the first step in creating innovative, multidisciplinary forms of historiography.

## **Socio-economic Challenges: The Marketisation of Culture**

From the very inception of national European Heritage institutions in the 19<sup>th</sup> century, the stewardship and presentation of CH monuments and sites has been widely recognised as an official, public responsibility. But that responsibility is now undergoing a dramatic change. As with many other government functions throughout the European Union, the administration of CH resources is being gradually outsourced to private firms and private non-profit associations, in the belief that they can be more efficient and economical than centralized bureaucracies in the performance of certain well-defined tasks (Myerscough 2001). Thus in recent years, official CH heritage institutions have increasingly relied on outside contractors for management and personnel services, ICT training, salvage excavations and surveys, and conservation expertise—to the decidedly mixed reaction of CH professionals (for a basic discussion, see Canadian Heritage 2007).

Yet marketisation of culture has had another, even more sweeping effect on the practices of the CH sector: namely, the packaging, design and promotion of monuments, sites, and museums as income-generating “attractions,” structured and marketed with the same modes of tour booking, entrance fees, visitor services, restaurants, and gift shops, as other packaged visits of the modern mass tourist industry (Hewison 1987). In an era of steadily shrinking operating budgets, CH institutions such as sites and museums have in many cases had to rely for their independent existence and in some cases for their very survival, on visitor revenues, either generated directly or through franchise arrangements (Hall and McArthur 1998). With CH coming to be seen as a valuable and insufficiently developed asset in the context of Europe’s flourishing tourist industry, there is also a wider economic incentive for this trend. Governments at all levels have in recent years invested significant amounts to convert

modest archaeological and historical sites into “heritage attractions,” with the hope not only of supporting existing CH facilities, but also of stimulating the local economy with subsidiary services such as hotels, shops, and restaurants that can offer local employment opportunities. Public funding programs like those of the European Commission’s Interreg, EUROMED Heritage, Culture 2007 programmes, and the World Bank’s “Framework for Action in Cultural Heritage and Development” (Cernea 2001) have set standards — and offer substantial economic incentives — for public and private investment in ambitious heritage development projects.

ICT has played a key role in this process, providing powerful new digital tools for conveying heritage content to visitors and also in promoting more effective marketing of heritage sites (Owen et. al. 2004). The tools and approaches for public interpretation outlined in the EPOCH Research Agenda (Arnold and Geser 2007) include a wide range of visualization technologies, multi-modal interfaces, wireless PDA visitor guides, and augmented reality applications, designed to energise visitor interest and provide vivid heritage experiences. As such, the role of ICT in this new form of heritage presentation is prominent and visible, but it remains to be seen, from a strictly economic standpoint, whether it is a sustainable strategy for the integration of CH and ICT. The substantial costs of hardware purchase, installation, maintenance, and updating make it unlikely to be a dominant form of public interpretation — at least in the short- and medium-term in any but the most developed countries and in any but already well-visited sites. A general lack of detailed statistical data on investment-return rates and accurate estimations of hidden costs borne by the public in completed projects (such as roadbuilding and adjacent infrastructural improvements, traffic control, and waste disposal) makes useful generalisations about the specific economic contribution of CH to local economies impossible to rely on.

It is clear, however, that some sites, no matter how meticulously researched and



elaborately developed, will never attract large numbers of visitors, for the routes of tourism are exceptionally inflexible, based less on content than the convenience of nearby highways and airports, the pressures of itinerary planning, and the most comfortable facilities (Hamza 2004). Despite the attractive offers and funding, the likelihood of energizing local economies through heritage presentation must take into account the harsh calculus of investment costs vs. logically expected return (Briedenham and Wickens 2004). Although the academic tourism literature is filled with conceptual studies of new formulations like “co-opetition” among regional attractions (Buhalis 2003), the hard fact of the matter is that, in the absence of detailed market studies before initiating expensive heritage presentation projects, the decision of many local communities to embark on heritage presentation and valorisation projects may be risky from a strictly economic point of view (Rizzo and Throsby 2006).

New economic assessment methods are needed; the range of currently utilized valuation studies (detailed in Mason 2005) are the subject of discussion and development by both economists and CH professionals (Mourato and Mazzanti 2002). In addition the wisdom of the general movement toward the marketisation of CH properties and tasks has been questioned for its short-term economic orientation focussing on revenue-generation and cost effectiveness—and its relative neglect of such relatively longer-term CH priorities as sound conservation, preservation of site authenticity, and calculation of the hidden costs still borne by the government (Palumbo 2006).

As in the case of physical conservation, a long-term view needs to be taken and the role of ICT can be central. More than merely developing tools for specific presentation applications within marketed heritage attractions, ICT must help create new information structures for collecting, analyzing, and updating data about their performance for the effective shaping of future policies and development designs. Instead of taking the current economic trends for

granted, ICT can take the lead in monitoring the long-term economic dimensions of the cultural heritage field.

### **Cultural Challenges: The Function of Heritage in 21<sup>st</sup>-Century Society**

Beyond its conservation values, specific research interests, and economic dimensions, CH in Europe has always had the important social function of fostering a sense of collective identity. Recent work in sociology has focused precisely on this value of CH for maintaining and enhancing a shared historical consciousness that encompasses all members of society and strengthens their sense of social cohesion (e.g. Zerubbavel 2004, Misztal 2003, Connerton 1989). The issue has also been addressed in relation to EU expansion and the promotion of an evolving concept of pan-European identity (Eder and Spohn 2005).

Yet when we refer to the identity-value of European material heritage, where should the boundaries be drawn? The nation-state has until recently been the main point of reference; antiquities services and preservation agencies have been largely focused on presenting a recognised and formalized “national patrimony.” Yet today, the multiplicity of ethnic and socio-economical identities and cultures in Europe offer a more complex and less homogeneous reality. The historical mainstream must be widened to take into account and include the diversity of European identities and cultures in the field of cultural heritage. Consequently, awareness has risen of the importance of protecting the rights of ethnic minorities, immigrant communities, and regional cultures to be represented as part of a diverse European heritage (Pendlebury et. al. 2004, Hall 1999).

While social inclusion has often been seen primarily in terms of providing enhanced access to existing cultural heritage institutions and activities, it is crucial that the integration of ICT into CH not be restricted to “official” sites and institutions, but also create structures for individuals and groups within

society to express their own interest and pride in the traditions, monuments, landscapes and memories of particular significance to them. Some innovative experiments in the construction of web-based “memory communities” have been attempted and they represent a promising new arena for the creation of new forms of CH participation that acknowledges the importance of a bottom-up, rather than solely top-down approach to the presentation of heritage material (e.g. Giaccardi 2006). In this respect, one of the most pressing questions ICT integration faces is whether it will merely improve the efficiency of current heritage institutions, or it will help to build an evolving, more inclusive collective memory, combining the efforts both of official heritage administrations and the independent initiatives of a wide variety of individuals and community groups.

The integration of digital technologies into CH offers a unique opportunity for increasing the flexibility of interpretation activities — in their capacity both to collect and to structure large quantities of divergent data for selective retrieval both within and outside the formalized heritage institutions of museums and sites. They offer an independent channel — not only of one-way heritage communication — but also a forum for wide public discussion, reflection, and creativity. Within the CH sector, the communication of CH information is no longer seen solely as a process of distilling scientific results and presenting them to a largely passive public but encouraging their active participation in the documentation and discussion of the sites, objects, landscapes, and traditions in a variety of social contexts (Silberman 2006).

The EPOCH Research Agenda has already predicted that CH institutions, particularly local museums and site museums, “are going to move away from the static displays of artifacts and concentrate on establishing the structures for the creation of long-term, sustainable local memory institutions, in which the input of the public is central” (Arnold and Geser 2007: 49). Accordingly, ICT integration must also develop new applications for “user-generated content” and

create innovative web-based communication structures that will provide additional benefits to the general public in the preservation and inter-generational transmission of meaningful collective memories.

## **Conclusions and Prospect**

The success and lasting impact of the EPOCH network lies on two foundations: technological excellence and attention to the greatest needs and challenges of contemporary heritage. Without attention to both, the impact of the technology to solve heritage’s most pressing problems will remain in question. For as repeatedly noted, the CH sector is in the midst of far-reaching conceptual and structural changes that must be taken into account. The challenge of ICT integration should not be restricted to the improvement of digital recording, data processing, and communication technologies, but of helping to shape the meaning and direction of the entire enterprise. In concrete terms, that means encouraging a transition toward a more inclusive, supportable, meaningful activity of preserving and reflecting on the past that fits not only the information technologies but no less importantly, meshes well with the requirements and needs of the Information Age.

Constant assessment and reevaluation are essential and, to that end, the overall goal of ICT integration in CH should be the gradual dissolving of an interdisciplinary “interface.” With the passage of time and the close cooperation of the two sectors, new and sustainable organisational structures for CH can be created that will allow constant feedback between culture and technology, between past and present, and between the CH sector and wider society. Thus the task of the EPOCH network is indeed far more than an engineering challenge. Its goal should be to study the evolving technologies and techniques of heritage conservation, research, economics, and community participation and evaluate the potential of ICT to enrich scholarship and expertise in dealing with material culture and to heighten

public sensitivity to the universal values and particular modes of human expression embodied in our shared inheritance of cultural heritage objects, traditions, and sites.

## References

- Arnold, D. and Geser, G. 2007 *Research Agenda for the Applications of ICT to Cultural Heritage*. Budapest: Archeolingua.
- Briedenhann, J and Wickens, E. 2004 "Tourism routes for the development of rural areas—vibrant hope or impossible dream?", *Tourism Management* 25:71-79
- Buhalis, D (2003) *eTourism Information Technology for Strategic Tourism Management*. London: Pearson Educational
- Canadian Heritage 2007. Arts Policy Branch. *Discussion Paper on Outsourcing in Canadian Heritage Institutions*. [http://www.pch.gc.ca/progs/arts/pdf/outpap/tdm\\_e.cfm](http://www.pch.gc.ca/progs/arts/pdf/outpap/tdm_e.cfm)
- Cernea, M. 2001. *Cultural Heritage and Development: A Framework for Action*. Washington: World Bank
- Chaplin, P. and Barr S. 2007 <http://www.international.icomos.org/risk/2002/polar2002.htm>
- Connerton, P. 1989. *How Societies Remember*. Cambridge: Cambridge University Press.
- CORDIS 2007 [http://cordis.europa.eu/search/index.cfm?fuseaction=prog.simplesdocument&PG\\_RCN=5465040](http://cordis.europa.eu/search/index.cfm?fuseaction=prog.simplesdocument&PG_RCN=5465040) (accessed 29 April 2007).
- Eder, K. And Spohn, W. 2005. *Collective Memory and European Identity: The Effects of Integration and Enlargement*. Aldershot UK: Ashgate Publishing.
- EPOCH 2007 [http://www.epoch-net.org/index.php?option=com\\_content&task=view&id=54&Itemid=96](http://www.epoch-net.org/index.php?option=com_content&task=view&id=54&Itemid=96) (accessed 29 April 2007)
- GCI 2007 <http://www.getty.edu/conservation/>
- Gheyle, W. 2006. "Saviours from space for Siberia's frozen tombs." *UNESCO World of Science* 4: 19-22.
- Giaccardi, E. 2006. Collective Storytelling and Social Creativity in the Virtual Museum: A Case Study. *Design Issues* 22: 29-41
- Hall, C. M. and McArthur, S. 1998. *Integrated Heritage Management: Principles and Practice*. London: The Stationery Office
- Hall, S. 1999. Un-settling "the Heritage": Re-imagining the Post-nation.' Pp. 13-22 in *Who's Heritage: The Impact of Cultural Diversity on Britain's Living Heritage*, pp. 13-22. London: Arts Council of England.
- Hamza, M. 2004. "Tourism-related transport," *Indicators of Sustainable Development for Tourism Destinations A Guidebook*, Madrid: World Tourism Organization
- Hewison, R. 1987. *The Heritage Industry*. London: Methuen Publishing.
- ICCROM 2007 <http://www.iccrom.org/>
- ICOMOS 2001. *International Charters for Conservation and Restoration*. Paris: International Council for Monuments and Sites.
- ICOMOS 2005. *Heritage@Risk: Report on Monuments and Sites in Danger*. Munich: K.G. Sauer.
- ICON 2007 [http://www.icon.org.uk/index.php?option=com\\_frontpage&Itemid=1](http://www.icon.org.uk/index.php?option=com_frontpage&Itemid=1)
- Johnson, M. 1999. *Archaeological Theory*. London: Blackwell.
- Lowenthal, D. 1985. *The Past is a Foreign Country*. Cambridge: Cambridge University Press.
- Lozny, L. 2006. *Landscapes under Pressure: Theory and Practice of Cultural Heritage Research and Preservation*. New York: Springer.
- Mourato, S. and and Mazzanti, M. 2002. Economic Valuation of Cultural Heritage: Evidence and Prospects. Pp 51-76 in *Assessing the Values of Cultural Heritage: Research Report*. (de la Torre, Marta, ed.). Los Angeles: The Getty Conservation Institute.
- Misztal, B. 2003. *Theories of Social Remembering*. London: Open University Press.

- Munjeri, D. 2004 Tangible and Intangible Heritage: from difference to convergence. *Museum International* 56: 12–20.
- Myerscough 2001 *Transversal Reviews of National Cultural Policies: National Institutions in Transition: Désétatisation and Privatisation. Final Report*. Strasbourg: Council of Europe.
- Owen, R., Buhalis, D. and Pletinckx, D. 2004. Developing the Tourism Aspects of a Cultural Route. Pp. 75-84 in *VAST 2004 Proceedings* (Y. Chrysanthou, K. Cain, N. Silberman, and F. Niccolucci, eds.) Aire-la-Ville, Switzerland: Eurographics.
- Palumbo, G. 2006. Privatization of State-Owned Cultural Heritage: A Critique of Recent Trends in Europe. Pp. 35-39 in *Of the Past, for the Future: Integrating Archaeology and Conservation* (N. Agnew and J. Bridgland, eds.) Los Angeles: The Getty Conservation Institute.
- Pendlebury, J., Townshend, T. And Gilroy, R. 2004 The Conservation of English Cultural Built Heritage: A Force for Social Inclusion? *International Journal of Heritage Studies* 10: 11–31.
- Rizzo, I. and Throsby, D. 2006. Cultural Heritage: Economic Analysis and Public Policy. Pp. 983-1016 in *Handbook of the Economics of Culture* (V. Ginsburgh and D. Throsby, eds). Amsterdam: Elsevier.
- Silberman, N. 2006. The ICOMOS-Ename Charter Initiative: Rethinking the Role of Heritage Interpretation in the 21<sup>st</sup> Century. *The George Wright Forum* 23/1: 28-39.
- Trigger, B. 2006. *A History of Archaeological Thought*. Cambridge: Cambridge University Press.
- UNESCO 2005 <http://www.unesco.org/culture/ich/index.php?pg=00006>
- Wallerstein, I. 2001. *Unthinking Social Science: The Limits of 19<sup>th</sup> Century Paradigms*. Philadelphia: Temple University Press.
- WMF 2007 <http://www.wmf.org/watch.html> (accessed 29 April 2007)
- Zerubavel, E. 2004 *Time Maps: Collective Memory and the Social Shape of the Past*. Chicago: University of Chicago Press.



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## 1 Policies

### The role of cultural institutions

The cultural policies in Sweden are administered by The Swedish Ministry of Education, Research and Culture.

Under the ministry of Education and Culture there are several areas of responsibility and activities and a few of them drive the heritage policy in Sweden. This report focuses on the culture, research and education areas with a direct focus on cultural heritage and digital media.

The focus areas of this report are:

- Cultural environments
- Museums and exhibitions
- Research and development within the area of cultural heritage
- Education within the area of cultural heritage

Under these areas of responsibility lie several of authorities with goals and regulations set by the government. Below are a selection of these authorities with short texts of information.

### Cultural Environments

The two authorities under the Cultural Environments department are the National Heritage Board (Riksantikvarieämbetet, RAÄ) and the Cultural Heritage of the Industrial Society (Industrisamhällets Kulturarv, ISKA).

Through government subsidies to cultural environment these two give care, maintenance,

provide knowledge building and arrange spreading of information to ensure that the historic environment is preserved in the most effective manner. These efforts give a large part of the Swedish population a possibility to get in direct physical contact with cultural heritage. In the last few years investments in the cultural heritage of industrial heritage, as well as the policy work in the cultural heritage area within the large cities, have given increased understanding for the values of contemporary cultural environments.

### The National Heritage Board (Riksantikvarieämbetet, RAÄ)

<http://www.raa.se/>

The National Heritage Board is the agency of the Swedish government that is responsible for heritage and historic environment issues. Their mission is to play a proactive, coordinating role in heritage promotion efforts and to ensure that the historic environment is preserved in the most effective manner possible.

The following list contains the rules and regulations set by the government for the national Heritage Board.

The goal of the authority is to further develop the work with the cultural environments preservation and use. The aims of the National Heritage Board are:

- to work for a long-term and sustainable development,
- to strengthen the cultural heritage and the cultural environments position in the regional and local work and development

- to ensure that the cultural heritage and the cultural environments are taken care of in various social sectors,
- to develop the structure of knowledge and spreading of knowledge of cultural heritage and environment,
- to develop the research within the sector cultural heritage and ensure that the results are spread,

A further goal is to ensure that the authority of practice and the government subsidies should achieve the largest possible effect and benefit for the cultural environment.

### **The Cultural Heritage of Industrial Society (Industrisamhällets kulturarv, ISKA)**

<http://www.iska.nu/ipage.asp?id=119>

The framework programme ISKA in Västernorrland (a region in the north of Sweden) is an initiative based on broad regional collaboration, whose aim is to support development projects dealing with our cultural heritage. ISKA is built on the insight that cultural heritage can be a resource in regional development. It is their conviction that cultural heritage has the potential to provide improved quality of life and growth in our country.

ISKA's main directions and goals in their activity are:

- to influence attitudes on cultural heritage and environment.
- to increase the availability of historic materials in archives, museums and in the subject area.
- to increase the usage of cultural heritage as a resource in today's society.
- to make us all take a responsibility in our own cultural heritage.

#### **1.1 Museums and exhibitions**

Governmental efforts within the museum and exhibition field aim to preserve cultural heritage and to make it accessible, to develop and mediate the knowledge of cultural heritage and by that give a perspective on contemporary society.

Some of the authorities (museums) that have this area of responsibility are the following:

#### **National Historical Museums (SHMM)**

[http://www.shmm.se/default\\_160.aspx](http://www.shmm.se/default_160.aspx)

The National Historical Museums (SHMM) in Sweden is a central museums agency comprising the Museum of National Antiquities, the Royal Coin Cabinet and Tumba Papermill Museum. The agency administers cultural heritage and provides a perspective on our existence in order to strengthen the democratic development of society. All three museums are free to visit.

#### **The Museum of National Antiquities**

[<http://www.historiska.se/info/english.html>]

This museum is responsible for Swedish cultural history and art from the Stone Age to the 16th century.

#### **The Royal Coin Cabinet**

[<http://www.myntkabinettet.se/engl.htm>]

The Royal Coin Cabinet is a national museum with special responsibility for areas such as the history of money, the history of finance and the art of medals.

#### **Tumba bruksmuseum**

<http://www.tumbabruksmuseum.se/>

#### **The National Maritimes Museums**

<http://www.maritima.se/Home/Myndigheten%20SMM/Om.aspx>

The National Maritimes museums are three units that work for the preservation and revitalisation of Swedish marine cultural heritage come alive. Their ambition is to develop arenas for organisations, associations and individuals that are interested in their field of work. They are located in Stockholm and Karlskrona.

## **The Vasa Museum**

[<http://www.vasamuseet.se/Vasamuseet/Om.aspx?lang=en>]

The Vasa is the world's only surviving 17th-century ship and one of the foremost tourist sights in the world. The ship is displayed in a purpose-built museum in Stockholm.

## **The Maritime Museum**

[<http://www.sjohistoriska.se/Sjohistoriska%20museet/Om.aspx>]

The Maritime Museum reflects all sides of life at sea. Their permanent displays cover large subjects such as merchant shipping and shipbuilding techniques.

## **The Naval Museum**

<http://www.marinmuseum.se/Marinmuseum/Om/Museet.aspx>

The Naval Museum has a long tradition stretching back to 1752, when Adolf Fredrik, the then King of Sweden decreed that a Ship's Model Room be established in Karlskrona, and ever since the Museum has been charged with the collection and conservation of artefacts which would document the history and development of Sweden's Navy.

### **1.2 Research and development within the cultural heritage area**

Several institutions around Sweden are involved in research and development projects concerning access to cultural heritage. Today some of these universities carry out education in cultural heritage on a basic level but research on doctoral and on a postdoctoral level is of a more temporary character. But the trend on more theses written in the area is strong and increasing. The problem is to find these issues because of their broad area of interest from humanities and social studies to technical sciences. This report focuses on the involvement of digital media, therefore below is a list of research projects conducted by the main operators in the field.

There is a proposal to build an institute for research in cultural heritage in Sweden [<http://www.kulturarv.org>]. The proposal was ready in February 2006 and it was commissioned by the National Heritage Board (RAÄ) and National Historical Museums (SHMM).

## **TEMA Q**

<http://www.isak.liu.se/temaq>  
<http://www.historiebruk.net/>

There is a strong tradition at Linköping University of organising research and postgraduate studies in an interdisciplinary way and across faculty lines. At the Faculty of the Arts and Sciences, research is conducted in broad subject fields, so-called Tema ("themes"). Tema Q pursues five research directions that focus on different aspects of the part culture plays in society, but which also have many points in common:

1. Cultural Heritage and the Uses of History
2. Cultural Production and Cultural Policy
3. Cultural Patterns and Local Developments
4. Mediated Culture
5. Creative Processes in Culture and Media

## **The Museum Laboratory**

<http://www.tii.se/v4m/activities.htm>

During the year 2005, V4M, Svenska kulturfonden and Finlands Svenska Hembygdsförbund started a two year long research and development project called the Museum Laboratory. Three Finland-Swedish home district museums, Bjärgas, Kilen and Pargas are taking part in the project. It aims to enhance the attraction of museums, to inspire the participating museums with new pedagogical methods and to increase the museums' staff's knowledge and experience of new techniques in museums and cultural heritage environments sensitive to large changes.

## **Museums and Exhibitions**

[http://cid.nada.kth.se/cc/museum\\_exhibits.html](http://cid.nada.kth.se/cc/museum_exhibits.html)

Museums and Exhibitions is a multidisciplinary project that aims to bring together current research on museums, learning, technology and user-centred design. It has two main research goals. First, it aims to investigate how the expressed educational goals of museum exhibitions can be accomplished through the use of modern computer technologies. Second, it wants to involve end-users (i.e. visitors) throughout the entire exhibition production cycle and evaluate how their work influences the resulting exhibitions. The hypothesis is that such a design partnership will have similar positive effects to those that have been documented elsewhere in computer application design.

### **1.3 Education within the cultural heritage area**

As mentioned above there are several universities that run basic education in the cultural heritage area.

The efforts to conduct education within the area of digital media and cultural heritage are sporadic and short-term. For that reason we have divided them into; education, seminars and workshops.

#### **Education:**

IT-utbildning på arkiv- och kulturområdet  
<http://www.kks.se/templates/ProjectPage.aspx?id=3609>

Archives are the memory of society. With the help of IT archives can mediate these sources to researchers and the general public. When digitising the archives and material from the museums and libraries, these can complement each other.

This project is about the content of an education institution, specially designed for 100 handling officers. This education will make them more efficient in their jobs with the help of IT.

## **Exhibition visitors and new media**

<http://www.draminst.se/kurser/avslutadekurser/avslutadekurser/digitalamedierochutstallningar/>

A four-week study course “Exhibition visitors and new media,” 4 credits, was held by V4M at Dramatiska Institutet, the University College of Film, Radio, Television and Theatre, in Stockholm. 15 professionals – exhibition designers, museum employees and IT/multi media producers participated.

### **Mediated Culture: Medias, experience and culture production**

<http://www.isak.liu.se/pub/jsp/polopoly.jsp?d=5113&a=30529>

This course at Linköpings university intends to give theoretical and analytical tools to give a more profound understanding of mediated culture, culture production and experience tourism. Special attention is devoted to historic and contemporary mediation of society and everyday life, media techniques, intermediation and remediated processes.

### **Digital Historia**

<http://www.digitalhistoria.nu/utbildning.htm>

### **Seminars:**

<http://cid.nada.kth.se/seminarier/disputation2.html>

Participatory design in museums – visitor-oriented perspectives on exhibition design.

### **Workshops:**

V4M organizes workshops on account of Forum for exhibitioners(uställare) – A workshop with practical and concrete proposals on how to use interactivity in exhibitions. Hands-on exercises that give the participator a sense of how to connect different components to create interactivity.



## **1.4 Priorities for ICT applications to cultural heritage**

Within the rules and regulations given by the government for authorities to preserve cultural heritage, priorities lies on access for the disabled.

Some of the projects working on the availability to experience cultural heritage in Sweden are listed below.

### **LDB – The Centre of long-term digital preservation**

<http://www.ra.se/ra/dokument/kulturarv.htm>

By the initiative of the National Archives a new national competence center is created with an aim to develop and spread methods and in the long run secure the Swedish digital heritage. The work is going to be a cooperation between public authority, municipality, the county council and private organisations to preserve digital information for future generations. Two organisations are the National Library of Sweden and the Swedish National Archive of Recorded Sound and Moving Images.

### **KMM – Knowledge Management Systems in Museums**

[www.framtidenskultur.se/bev2004.htm](http://www.framtidenskultur.se/bev2004.htm)

The KMM-project is a concentrates on research within the area of knowledge management in museums and cultural heritage. The project emphasizes on soft infrastructure, intelligent user-centred learning environments, knowledge systems and knowledge organisation with museums as a speciality. The goal in five years is that the KMM-platform will be established as the leading research and development environment in museums and within the EU.

The project is financed by the organisation The Foundation for the Culture of the Future.

## **Image databases and digitalisation – a platform for ABM-coexistence**

<http://www.rj.se/37965.htm>

Lately several archives, libraries and museums have digitalized their collections and presented them in databases. The goal of this project is to have common standards, norms and regulations for digital image management.

### **The ACCESS-project**

<http://www.kulturradet.se/index.php?pid=2745>

The national Council of Cultural Affairs has additionally assigned 23,5 million Swedish crowns as governmental access-subsidies to create employment that aims to preserve and make cultural heritage, archives and museums more accessible for everybody.

### **Nordic Handscape**

[http://www.historiska.se/collections/research/dokument/FOU\\_200505\\_nordic\\_handscape.pdf](http://www.historiska.se/collections/research/dokument/FOU_200505_nordic_handscape.pdf)

Nordic Handscape is a project that aims to investigate and develop possibilities to convey the cultural heritage by mobile technology. The project is initiated and financed by the Nordic Council of Ministers. The project is coordinated by the Museum of National Antiquities in Stockholm and administrated by the Nordic Council of Ministers' Museum Committee.

### **The Swedish NetMuseum (Sveriges nätmuseum)**

[www.shmm.se/Documents/MN1\\_museer\\_pa\\_natet1.pdf](http://www.shmm.se/Documents/MN1_museer_pa_natet1.pdf)

The Swedish NetMuseum is a collaboration between Swedish museums where the goal is to have 10 percent of the museums' most important collections in a digital form on the internet within the next five years. The plan is to have the service established in one year and open for the public in three years.

## **24-hour museum/The internet window to Swedish museums (24-timmarsmuseum)**

<http://www.museifonstret.se/>

The 24-hour museum is a website/portal where schools can find information and learning material on Swedish museum webpages. The 24-hour museum is managed by the Swedish schoolnet and the the Museum of National Antiquities commissioned by the Swedish National Agency for School Improvement with a financial support by the Swedish National Council for Cultural Affairs.

## **ABM-centrum**

<http://www.abm-centrum.se/>

The ABM-centre is a common project for coordinating the collaboration between archives, libraries and museums. Its overall goals are the following:

- Promote understanding and cooperation between archives, libraries and museums.
- Stimulate and develop work to digitalize archives, libraries and museums.
- Promote the usage of new techniques to make the collections easier to access.
- Give subsidies to ABM-oriented development education.

## **Associations and networks**

Other interesting links:

[http://www.cdisweden.com/sve/om\\_cdi/index.html](http://www.cdisweden.com/sve/om_cdi/index.html)

<http://www.tii.se/v4m/>

<http://www.nodem.tii.se>

<http://www.forumforutstallare.se/>

<http://www.sverigesmuseer.se/modules/content/?id=1>

<http://www.digitalhistoria.nu/>

## **Conferences**

How to handle our cultural heritage in a time of globalization? (Hur hantera vårt kulturella arv i globaliseringstider?)

<http://www.vr.se/huvudmeny/forskningvistodjer/>

<http://humanioraochsamhallsvetenskap/slutfordaprojekt/hurhanteravartkulturellaarviglobaliseringstider.4.12d0b1b510b193dbac18000873.html>

In December 2004 an interdisciplinary conference was held in Norrköping. The topic of the conference was cultural heritage and cultural politics.

Scientists and experts from the Nordic countries met and discussed relevant issues. Their main purpose was to initiate research into cultural politics in each country from a democratic point of view.

## **Seminars**

A web seminar on the Swedish Museum of Architecture.

The Swedish Museum of Architecture presented their findings from their pedagogical work on their website. The Internet window to Swedish museums (Svenska museifönstret) and other media agencies presented their views perspectives on the matter of the future development and digital techniques.

## **1.5 Funding sources for IT projects and research within the area of cultural heritage**

Below are some of the organizations and main contributors to the research and development of the access to cultural heritage in Sweden.

## **The Knowledge Foundation (KK-stiftelsen)**

<http://www.kks.se/templates/StandardPage.aspx?id=84>

The Knowledge Foundation was established in 1994. The foundation has since invested almost five billion Swedish crowns in projects related to research, competence development in industry and IT development at schools. During this time, new working methods have been designed, with the foundation functioning as an initiator, financial support

and source of knowledge for research projects at new universities and university colleges.

### **The Bank of Sweden Tercentenary Fund (Riksbankens jubileumsfond)**

[http://www.rj.se/default.  
asp?ItemID=22770](http://www.rj.se/default.asp?ItemID=22770)

Riksbankens Jubileumsfond provides support for advanced research in the form of project grants to individual researchers or research groups that apply for funds. The foundation is actively engaged in broad fields of scientific research, which is reflected in the range of expertise among the researchers on the Board of Trustees and in the preparatory committees.

During the latter part of the 1990s, Riksbankens Jubileumsfond drew attention to the role of archives, libraries and museums and the work of scholars in research on our cultural heritage and the historical perspectives that stretch beyond contemporary history. Among other things, the foundation arranged conferences to discuss questions concerning research connected with these bodies and intends to follow up developments in these areas, partly through the new sector committee which is to focus on research on pre- and early modern times.

### **The Swedish Research Council (Vetenskapsrådet)**

[http://www.vr.se/  
2.69f66a93108e85f68d480000.html](http://www.vr.se/2.69f66a93108e85f68d480000.html)  
[http://www.vr.se/huvudmeny/  
forskningvistodjer/  
humanioraochsamhallsvetenskap/  
slutfordaprojekt/hurhanteravartkulturellaar  
viglobaliseringstider.4.12dob1b510b193dbac  
18000873.html](http://www.vr.se/huvudmeny/forskningvistodjer/humanioraochsamhallsvetenskap/slutfordaprojekt/hurhanteravartkulturellaarviglobaliseringstider.4.12dob1b510b193dbac18000873.html)

The Swedish Research Council provides support for basic research in all academic disciplines.

### **The Foundation for the Culture of the Future (Framtidens kultur)**

[http://www.framtidenskultur.se/engelska.  
htm](http://www.framtidenskultur.se/engelska.htm)

The Foundation for the Culture of the Future was established by the Swedish Government in 1994, and was allocated capital amounting to 529 million Swedish crowns.

The purpose of the Foundation is to financially support long-term and innovative cultural projects, thus stimulating regional culture in a broad sense. One of the underlying aims of this is to encourage economic growth and development in the regions.

### **The Royal Swedish Academy of Sciences**

[http://www.kva.se/KVA\\_Root/index\\_eng.asp](http://www.kva.se/KVA_Root/index_eng.asp)

The Royal Swedish Academy of Sciences has recently shown a strong commitment to engaging museums in research. They cooperate with Riksbankens Jubileumsfond in financing a doctoral program at the Nordiska Museet and establishing post doctoral posts/jobs at the central museums, authorities, archives and libraries in the cultural historical area.

### **The Swedish Foundation for Strategic Research (SSF)**

<http://www.stratresearch.se/eindex.html>

The Swedish Foundation for Strategic Research was founded in 1994 with a founding capital of 6 000 million Swedish crowns the former so-called wage-earner funds. The purpose of the Foundation is to support research in natural science, engineering and medicine that will strengthen Sweden's competitiveness. The Governing Board of 13 members is appointed by the Swedish government

## 2 Practices

### 2.1 Past projects

Projects that have become significant milestones in the history of digital media in Swedish cultural heritage are the following.

#### Installations

##### Avesta Verket

<http://www.verket.se/>

Verket i Avesta is a large scale immersive installation where the visitor uses a flashlight to experience how the iron works were used in the old days.

Verket i Avesta won 2005 the Best in heritage award from the European Heritage Association.

This representation of blasting iron works gives different visitors a phenomenal and attractive experience through pedagogical as well as narrative layers. The use of an augmented reality interface inside this old industrial iron plant creates an excellent contrast between the declining industrial society and the rising information society.

##### An interactive game in Gamla stan – The Dead Children

[http://www.nordichandscape.net/sverige/g\\_sspel.htm](http://www.nordichandscape.net/sverige/g_sspel.htm)

During five occasions in September 2005 the interactive story game was tested in the Old Town of Stockholm. In the game mobile phones turn into receivers of remembrances of feelings from the past. By the received feelings the participants were guided through the Old Town of Stockholm.

##### Historical Digital Theater

<http://www.cdisweden.com/eng/artiklar/uddateater.html>

DI collaborated during the summer of 2004 with Udda Joxx Kultur in a project exploring the use of digital media in a theatre

performance. They have seen digital technique being used in many cultural contexts and now wanted to find out which digital media could add an extra dimension to a theatre performance. The historical background to the project was the “Svinhuvud” dynasty, which has been important in the history of both Falun and Sweden.

Måns Nilsson Svinhuvud had a prominent role in Gustav Wasa’s assumption of power in Sweden in the 16th century.

#### Web Sites and On-Site Kiosks

##### Akvas bank of knowledge – an interactive learning method

<http://www.kks.se/templates/ProjectPage.aspx?id=4527>

<http://www.akva.net/>

[http://www.pite-havsbad.se/cgi-bin/pitehavsbad/meny/frameset.cgi?menu\\_top=menu\\_top\\_p.html&clickflik=6&meny=swe\\_vad\\_gora\\_privat.txt](http://www.pite-havsbad.se/cgi-bin/pitehavsbad/meny/frameset.cgi?menu_top=menu_top_p.html&clickflik=6&meny=swe_vad_gora_privat.txt)

The aim of the project is to search for new ways for IT and interactive media to develop and spread knowledge about the eco-system, history, culture and trade and industry around the area of Pite älv. A way to strengthen the identity and create a foundation of development in the area around Pite älv.

##### Address Fittja

<http://www.kks.se/templates/ProjectPage.aspx?id=4523>

<http://www.adressfittja.com>

Address Fittja is a site about cultural heritage and the spreading of knowledge in a village built up around a crossroad. There are nearly 7000 people in Fittja speaking 470 different languages. Fittja is an old settlement with an ancestry from different periods. With the help of interactive media Fittja wants to present its cultural heritage in a mix with the present and with the dreams of the future.



### **An interactive coffee table**

<http://www.tii.se/v4m/activities.htm>

The digital application “Dreams about living in Stockholm” aims to combine a social activity like having a coffee with the one of art exploration.

The prototype is under construction to be exposed at Stockholm’s City Museum as a part of the Interactive Salon.

### **Mobile guide in the footsteps of Arn**

<http://www.nordichandscape.net/sverige/arn-e.htm>

In cooperation with Skara Museum, Nordic Handscape runs the pilot project “In Arns Fotsteps, a mobile guide”. The tests will be held at different locations in Västergötland, Sweden, held together by the project “In Arns Fotsteps”. The concept for the mobile guide is that you call a phone number to a voice-server that tells you information about the place.

### **From the seal to the battery charger – Objects tell stories**

<http://www.stadsmuseum.stockholm.se/>

The first interactive exhibition of the Stockholm City Museum, “From the seal to the battery charger – objects tell stories”. With a handheld and a pair of earphones the city and the objects come alive. The handhelds visualize the parts of Stockholm that no longer exist.

### **The Maya-game at the Museum of National Antiquities**

<http://www.historiska.se/exhibitions/2006/maya/>

Students from schools can choose between different characters in the Maya-game when they come to the museum. With the help of fictitious interviews and other sound and image arrangements the student’s character guides him or her through the exhibition at the museum.

## **2.2 On-going projects**

### **Installations**

#### **Mobile guide in the Old Town of Stockholm**

[http://www.nordichandscape.net/sverige/gs\\_guide-e.htm](http://www.nordichandscape.net/sverige/guide-e.htm)

#### **Mobile guide at Ale stenar**

<http://www.nordichandscape.net/sverige/ales.htm>

#### **Digital guide at Birka**

<http://www.nordichandscape.net/sverige/birka.htm>

#### **E-guide for Falun World Heritage**

[http://www.cdisweden.com/eng/artiklar/e\\_guide.html](http://www.cdisweden.com/eng/artiklar/e_guide.html)

### **Web Sites and On-Site Kiosks**

#### **The Museum of National Antiquities’ own educational pages on their web site**

<http://www.historiska.se/learning/index.html>

#### **Gränge works II**

<http://www.iska.nu/ipage.asp?id=163>

#### **Projekt Digitalisering**

<http://www.iska.nu/ipage.asp?id=112&pid=85>

<http://www.sollefteamuseum.com/97.html>

## **2.3 Virtual heritage content providers**

### **Software Tools companies:**

<http://www.nordichandscape.net/sverige/index-e.htm>

## **2.4 Journals and links to sites of interest**

### **Links:**

<http://www.sics.se/>

<http://www.tii.se>

<http://www.verket.se>  
[www.hicira.org/swe/pdf/svedese.pdf](http://www.hicira.org/swe/pdf/svedese.pdf)  
[www.raa.se/publicerat/9172094109.pdf](http://www.raa.se/publicerat/9172094109.pdf)  
[www.vv.se/fud-resultat/Publikationer\\_000001\\_000100/Publikation\\_000086/VisaVag\\_projektrapport.pdf](http://www.vv.se/fud-resultat/Publikationer_000001_000100/Publikation_000086/VisaVag_projektrapport.pdf)

### **Books and essays:**

Alzén, A. and Hillström, M. (eds.) *Kulturarvet, museerna och forskning, Report from a conference 13th-14th of November 1997*. The Bank of Sweden Tercentenary Fund & Gidlunds Förlag.

Bolin, H. (ed.) (2001). *Kulturarvsvetenskap – utbildningar och sektorsbehov*. Röster från en konferens om kulturvetenskapliga utbildningar vid Riksantikvarieämbetet 12 oktober 2000.

Aronsson, P. and Hillström, M. (ed.) (2005). *Kulturarvens dynamik*. Det institutionaliserade kulturarvens förändringar. Linköpings universitet Grundberg, J. 2000.

Grundberg, J. (2004) *Historiebruk, Globalisering och Kulturförvaltning. Utveckling eller konflikt*. Göteborgs universitet, Institutionen för arkeologi, Gotarc Series B no. 28 & Etour. Riksantikvarieämbetet.

Snickars, F. (ed.) (2001). *Culture, Society and Market*. The Swedish research seminar held at Sigtuna, January 24-25, 2000. The Bank of Sweden Tercentenary Fund and the Swedish national Council for Cultural Affairs.

Gottlieb H., Geijer L. and Insulander E. (2005). *Det kändes som om man var där*. The Stockholm Institute of Education.

## Policies

### Institutional framework

The government implements its policy on preservation of tangible cultural heritage at both central and local level. But there is a need to mobilize a wide range of calls for the active support of the business world, private owners, the voluntary sector and society at large.

### National administrations

#### 1. The Ministry of Culture

The Ministry of Culture formulates, administers, coordinates and exercises control over the implementation of the government policy in the sphere of protection and promotion of cultural-historical heritage; it also allocates the subsidy from the state budget allotted for protection of cultural-historical heritage.

##### *1.1. The National Council for the Preservation of the Monuments of Culture*

The National Council for the Protection of the Monuments of Culture assists the Minister of Culture in his activities related to the preservation of immovable monuments of culture.

##### *1.2. The National Institute for the Monuments of Culture (NIMC)*

The National Institute for the Monuments of Culture (NIMC) is a body within the Ministry of Culture, assisting the Ministry in the implementation of state policy for the protection of immovable monuments of culture. According to its statute it provides among other issues

- Research, study, documentation, declaration and registration of immovable monuments of culture and their monitoring;
- Maintenance and administration of the National Archives Fund of immovable monuments of culture;
- Scientific research and training in the field of preservation of immovable cultural-historical heritage.

#### 2. The Ministry of Regional Development and Public Works

The Ministry of Regional Development and Public Works takes part in the activities to protect territories under the Monuments of Culture and Museums Act.

#### 3. The Ministry of Environment and Water

The Ministry of Environment and Water formulates and enforces the government policy in the sphere of the preservation of protected natural areas in compliance with the Protected Areas Act. This Ministry has units, at both regional and local level,

which monitor and exercise control over the conducting of environmental protection activities.

#### **4. The governmental tourist agency**

Among other tasks, this agency develops and enforces the national policy for the development of cultural tourism; it approves of thematic cultural routes related to cultural-historical heritage of national and European importance, as well as, with the involvement of the municipalities, local cultural routes.

#### **5. The Bulgarian Academy of Sciences**

The Bulgarian Academy of Sciences conducts activities in connection with the research and promotion of cultural-historical heritage in the following of its institutes:

- Archaeological Institute and Museum;
- Architectural Science Centre;
- *Science of Art Centre*.

#### **6. Governmental agency for information technology and communication**

This governmental agency implements the policy on effective use of information technologies and communications, aiming to build up information society for insuring quick socio-economic development of the country. It provides and enforces policy for integration with the European Union. One of the departments, called “Information society and information technology” elaborated strategies for the development of this sector, defines the priorities, and formulates the principles for services in information society, including e-government. The “Innovations and management of projects” department is responsible for funding, national and regional projects (including cultural topics) and updating of the infrastructure.

### **Regional and local government**

Heritage preservation is implemented at regional and local levels through the state structures and the local government bodies (i.e. municipalities).

#### **State structures**

*The Ministry of Culture* administers and supervises the preservation of immovable monuments of culture with the assistance of the district administration.

*The District Governors* enforce state policy for preservation of cultural-historical heritage on the territory of their district.

*The regional historical museums* facilitate the implementation of state policy for preservation at regional level. They take part in the preparation of the suggested allocation of funds from the state budget for restoration and conservation, exercise supervision over the preservation of cultural monuments, promote cultural heritage and assist the municipalities in the preparation of programs and projects for the preservation of monuments and for raising investments and funds.

#### **Local governmental bodies**

Municipal Councils, mayors of municipalities and mayors of regions as well as local governments take part in the preservation of immovable cultural-historical heritage within their territory by preparing suggestions for granting, exercising control over the condition of immovable monuments of culture, determining the subsidies from the municipal budget and the Municipal Culture Fund for preservation and promotion of cultural-historical heritage.

*Specialized municipal units* with specific functions in the running and preservation of monuments of culture operate in certain municipalities, where there are reserves, as well as in the municipalities of Sofia and Plovdiv (the two biggest cities in Bulgaria, having the largest number of monuments of



culture) and in the municipality of Nessebar (World Heritage).

*The municipal historical museums* also deal with such activities but at a lower level – only within the territory of their municipality.

## **Legal regulations**

### **1. Monuments of Culture and Museums Act**

This Act regulates the protection and promotion of the monuments on the territory of the country and the development of museum organization. The Act names the Ministry of Culture as the leader of state administration of the process in cultural-historical heritage protection.

#### **1.1. Some regulations by the Ministry of Culture,**

- Ordinance No. 6 on Usage and Presentation of Immovable Monuments of Culture
- Ordinance No. 26 on the Development, Usage and Management of the Automated Information System “Archaeological Map of Bulgaria” (The Official Gazette No. 34 of 1996)

### **2. Culture Protection and Development Act (The Official Gazette No. 50 of 1999)**

This Act stipulates the main principles and priorities of the national cultural policy for the protection of culture. The Act settles the establishment of the National Fund “Culture” and the municipal funds “Culture”, which support the development of culture by raising, managing and spending the funds destined for implementation of the national and municipal policy in the field of culture.

### **3. Territorial Development Act**

Regarding cultural heritage, this Act provides rules for the implementation of *integrated conservation* according to the

three Conventions – for architectural and archeological heritage and for cultural landscapes.

## **4. The importance of voluntary organisations**

The activities of voluntary and non-governmental organizations in Bulgaria are regulated by and in compliance with:

4.1 The Non-profit Legal Bodies Act (the Official Gazette No. 81 of 2000), enacted on 01.01.2001. According to this Act voluntary organizations – associations and foundations – should be registered as Legal Bodies whose activity for the benefit of society may be encouraged and assisted by the State by means of taxation and other financial and economic preferences.

4.2 The European Social Charter (revised) ratified pursuant to a law passed by the 38th National Assembly on 29th March 2000 (The Official Gazette No. 30 of 2000) and issued by the Ministry of Labour and Social Policy (The Official Gazette No. 43 of 2000)

## **Funding of ICT applications**

Reliable information about funding ICT applications is extremely hard to come by owing to the wide variety of budgets involved (central government, local authorities, public institutions or quasi-public agencies, etc). One thing that is true is that, in the years ahead, the public sector is going to be ever less capable of footing the heritage bill and its presentation, with the result that cross-funding, involving contributions from various sources, will become ever more essential in order to finance projects of any size.

Provisions for the use of ICT in cultural projects and special funds for ICT applications are at an initial state. Currently a law for implementation of ICT is in preparation.

Although the implementation of IT is very rapidly developing in the country, it is still focused on the business and administration sectors. The usage of new technologies, the training for personnel; the communication between the institutions and maintenance and

updating of the facilities are indispensable in the cultural field.

## Networks and associations

The dynamic times of transition from central to market economy and the near inclusion of the country in the European Union fostered numerous initiatives for the implementation of IT in the cultural field. The development of IH heritage is still at initial stage. but important steps forward have been made. The government issued the National Plan for Development for the period 2007-2013 and the National Strategy for the Development of Information Society. In these documents it is clearly stated that the key points towards information society and integration into the European Union are the development of education (through the usage of ICT), science and culture. Special attention is paid to cultural heritage and its best presentation, as a resource for cultural tourism industry.

At present the organisations supporting the development of IH through promoting and/or subsidising Programs and Projects are:

1. at international level:
  - The European Union
  - The UNESCO – through the Bulgarian Commission of the UNESCO
  - The British Council
  - The Japanese Government
2. at national level:
  - The Presidency
  - The Government
  - The Ministry of Culture
  - Governmental agency for information technology and communication
  - Bulgarian Academy of Science (BAS)
  - Universities
  - Professional NGOs in cultural domain
  - Private sector
3. at local level
  - Municipalities
  - Regional Districts

## 2. Funding of sources and projects

### Public sources

#### 1. Central government

The Republican Budget regarding heritage is submitted according to the following scheme:

- Through the annual budget of the Ministry of Culture (for monuments, sites, archives, museums, monitoring). A system has been established for controlled assignment of conservation activities (by means of regulated tenders)
- Through the budget of the Ministry of Finance (occasionally ensures loans for research and protection of the monuments discovered in the course of construction works)
- Through the Department of Ecclesiastical Matters with the Council of Ministers (ensuring funds if the site is a place of worship)

#### 2. Regional and local government

- Annual targeted subsidy from the Ministry of Culture
  - Municipal budgets
  - The Municipal Funds “Culture”,
- The amount of sums in point 2 vary depending on the heritage needs located at a certain municipality

### Private sources

- The owners of monuments - no officially published data exists
- Foundations, national and international non-governmental organizations:

Example: ICOMOS/Bulgaria ensured from:

- Japanese Government - \$1 000 000 – ongoing project
- “A.G. Leventis Foundation”, Cyprus – around \$ 200 000 for the last 3 years
- World Monument Fund – around \$ 120 000 for the last 3 years

There is no officially published statistics on private funding yet. Recently a law on

donations was passed, aiming to support social development and culture.

### 3. Practices

#### On-going and past projects

##### 1. *Virtual school of European cultural heritage*

Funded by EU Program Culture 2000,  
Open to 39 countries

Partners: Bulgaria (Foundation) Spain (CECE-Confederation of the Spanish Educational Centres), England (Norton Radstock College) Germany (BBS Technik ILudwigshafen)  
Prepared 2002

##### 2. *Cultural corridors of South-East Europe (2005, 2006).*

Supported by Bulgarian Presidency and UNESCO

Participants: all the countries from SE Europe

##### 3. *Digitization of the archives in the Ethnographic Institute and Museum, Bulgarian Academy of Science*

##### 4. *Repertorium of Old Bulgarian Literature and Letters:*

<http://clover.slavic.pitt.edu/~repertorium/index.html>

The **Repertorium of Old Bulgarian Literature and Letters** was conceived as an archival repository capable of encoding and preserving in SGML (and, subsequently, XML) format archeographic, palaeographic, codicological, textological, and literary-historical data concerning original and translated medieval texts represented in Balkan Cyrillic manuscripts. The files are intended to serve both as documentation (fulfilling the goals of traditional manuscript catalogues) and as direct input for computer-assisted philological research.

### 3 Good practices

Lately the e-government is functioning in Bulgaria, it refers not only to technological change, but also to the re-structuring of the public sphere itself. The information society (IS) has much deeper implications, including re-design of the power relations in society, re-consideration of the role of the state and the functions of the public administration. That definitely supports the implementation of ICT in the cultural heritage sphere.

### 4 Books, papers and essays

- A brochure named “Contemporary IT solutions in cultural heritage domain”, Institute on mathematic and informatics, Bulgarian Academy of Science.
- The electronic multi-topical “Journal of International Research Publications” is issued by Science Invest Ltd.- branch Bourgas with cooperation of the Scientists’ union in Bulgaria.

The main goal of the publisher is to extend the opportunities and to shorten the terms for publishing of scientific results by Bulgarian and foreign scientists and specialists.

The journal is issued in English. The journal is multi-topical, which means that there are articles from different branches of science published.

The journal is issued in two formats:

- **Online HTML & SWF format** of the virtual server: <http://www.ejournalnet.com>
- **In offline version on CD Rom** the content of the journal is published in the format: **eJournal Offline /HTML & SWF/**

The journal is financed by its own incomes and by sponsors.

### 5 Needs

The most relevant needs concerning IH (policies, funding, training, research, etc.) perceived referring to Bulgaria are:

- New law on Cultural heritage (with requirements for standardised collection of data,

management and presentation of heritage assets in modern ways)

- More funding and better mechanisms for attract sponsors
- Regular training of professionals and education of public in appropriate ways
- Development of research on IH and collaboration with research centres abroad

## 6 Final comments and notes

There are no statistics regarding the impact of the implementation of national and Community policies on ICT Applications to Cultural Heritage, but what I observe in

my practice as a professional is that it has been very well accepted, relatively rapidly implemented and needs to be enlarged.

Regarding training, at present attention is paid to the training of the professionals (<http://daskalo.com>)

The dissemination of projects is fairly well organised (web, publication, training courses, etc), but the projects are insufficient in number. In general, this field needs more rapid development and intensive exchange of expertise on a regional and European level. The richness of the cultural heritage in the country requires diverse instrumentation, a broad approach and high level of education.





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## 1. Background

Bulgaria has a rich cultural heritage represented by monuments both of local and European importance. The main collections of the cultural heritage belong to the state and their maintenance is totally dependent on the state budget. Collections differ in their nature like everywhere in the world – they are buildings, frescoes, icons, paintings, manuscripts, instruments, vessels, coins, etc. In this paper we will concentrate above all on written monuments, such as epigraphic inscriptions and palaeographic materials (medieval and more recent manuscripts), for example, the Latin and Greek epigraphic inscriptions from Late Antiquity, kept in Bulgarian repositories which form the third largest national collection in Europe after the collections in Italy and Greece. The repositories of Bulgarian libraries and museums house over 8,500 manuscripts, which are a major historical source casting light on medieval South-East European literature and history.

One would expect that the development of a national policy for digitisation would be an easy task when most collections of cultural heritage are state-owned. Unfortunately, there is no national strategy for digitisation of national cultural heritage collections, although there are specialists in Bulgaria who already have valuable experience in this field.

The difficult situation in the country is one of the reasons for the absence of a national strategy in the field of digitisation of cultural heritage. During the current transition period

the issues of preservation of cultural heritage collections have been neglected as the main concern of the state is economic stabilisation. Since libraries and the museums, the largest repositories of cultural heritage resources, are almost totally dependent on insufficient Government funding, difficult choices on allocation of resources for support of the current collections and traditional preservation have to be made. The applications of new information technologies which would contribute to the preservation and study of the collections is considered luxury the budget cannot afford.

## 2. Bulgarian Pilot Projects

### 2.1. Participating organisations

Five types of organisations are potentially interested in the digitisation of cultural heritage: government bodies, repositories, research and/or educational institutions, companies and foundations. These organisations with a different profile have significantly different approaches in the field of digitisation of cultural heritage due to their different aims and needs.

2.1.1. *Government bodies* (the Ministry of Culture) are entrusted with the supervision of such activities. A project on networking of the museums is currently underway, however it does not contain any official statement or plan for the digitisation of cultural heritage collections in the wide sense.

2.1.2. *Repositories* (libraries and museums), which seem the most natural

initiators of digitisation projects because of the close relationship between digitisation and preservation, are currently in the position of observers due to lack of funding on the one hand, and copyright issues for digital collections, on the other hand. The Union of Librarians and Information Services Officers produced in 1997 a National Program for the preservation of Library Collections, which was adopted by the Library Council at the Ministry of Culture. Unfortunately, this interesting program is adopted only formally, without any real work on its implementation into practice.

2.1.3. *Research and/or educational institutions* are the most active initiators of digitisation projects in Bulgaria as centres of study of cultural heritage and the impact which digitisation could have on:

- routine work
- potential for large-scale comparative studies
- application of new research methods.

2.1.4. *Companies* are interested in presenting sections of cultural heritage to the world which they believe will be easily realised on the market. Today it is rather difficult to establish customer interest. The Bulgarian market of such products is unsatisfactory. This is why their main market is abroad.

2.1.5. *Funding bodies* (foundations) supported practically all projects undertaken in the field of digitisation. However, the scale of their support cannot meet the real costs of serious digitisation projects.

## 2.2. Current work in the field

The first initiatives in this field were launched by research institutions and companies in the absence of a national strategy and funding for digitisation programmes. Libraries and museums basically provided access to their collections instead of launching their own programmes.

The work of specialists from research institutions is basically directed towards entering data on available resources. Actual work on digitisation has not yet been done on large-scale basis, because of the high costs of such projects. Amongst the projects

describing available resources we could mention:

- The Repertorium of Old Bulgarian Literature (co-ordinated by the Institute of Literature of the Bulgarian Academy of Sciences);
- The Corpus of Epigraphic Inscriptions in Greek and Latin (co-ordinated by the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences),
- The 'St Cyril and Methodius: Byzantium and Slavs in the 9<sup>th</sup> century AD' project (co-ordinated by the American University in Blagoevgrad) [Dobrev, Ivanov 98].

The basic work done by companies is oriented towards creating CD-ROMs (four CDROMs already exist, two of manuscripts from the National Library 'St. Cyril and Methodius', one of Macedonian coins and one of Bulgarian Iconography).

A most important problem in the field of digitisation is connected with the copyright on materials for digitisation.

Copyright issues in such a complex field have to be clearly defined for two different situations: a. when primarily sources are being digitised, and b. when publications of research of different specialists are being incorporated into the final product. The second case is very important and even more complicated than the first one, because scholarly annotations and commentaries are important components of any digitised collections. Since this work is done in teams, the contribution of each member of the team has to be clearly defined and protected.

## 3. Unresolved Problems

This situation has led to several important issues:

- The absence of a national strategy has resulted in the lack of co-ordination between separate local initiatives which usually do not interact.
- The work of separate teams in the same field has led to the application of many different *ad hoc* solutions, instead of a search for a general *ad modum* strategy.

- There is a clear need for international co-operation in the fields of Slavic and Balkan Studies, because of the wide spread of primarily sources throughout the whole of Europe. The lack of a national strategy does not support such co-operation in spite of its importance for real large-scale comparative studies.
- Ambiguity of legal copyright issues has lead to serious problems in persuading researchers to share their knowledge in digitisation projects affecting the level of presentation of materials, and restricting depth of presentation.
- In order not only to present materials, but also to support research work in the field of Ancient and Medieval Studies, all data should be properly organised and processed. It is not sufficient to have collections of digital images, or text corpora. The application of information technologies in the Humanities is complicated by the specificity of the models in the subject domain. If we consider the example of Slavic medieval studies, a commonly accepted model of which elements should be included in a formal model of the subject domain of knowledge cannot be decided. For this reason, the creation of a generally accepted model is more a wish than a reality even after having the experience of several projects and organising a wide scientific discussion [Birnbbaum et al. 95]. The creation of a specialised workbench for Slavic medieval studies which will be sufficiently flexible to support those views and materials, which serve the needs of the concrete specialist is one of the possible solutions for this problem. I would like to stress that existing workbenches for the study for example of Latin manuscripts [Calabretto, Rumpler 98], will not match the needs of specialists in Slavic studies because of the impressive variety in Medieval Slavic texts for which computer presentation is still a subject of wide discussion (see the papers presented at the International workshop on Text Variety modelling [Dobrevva 98]).

## 4. Conclusions

The paper deals with the initial Bulgarian experience in the field of developing electronic resources in the presentation of cultural heritage. The first projects in the field fall into two categories: research and commercial.

Bulgarian specialists encountered problems related to:

- The lack of a national strategy and co-ordination amongst institutions in the field of digitisation;
- Copyright issues (both for primarily sources and results of their scientific examination);
- Difficulties with the setting up of adequate workbenches for specific research tasks like medieval Slavic manuscript studies.

The solution to those problems will contribute significantly to the development of real digital resources in the field of cultural heritage which, its turn, will contribute to the processes of European integration. Probably the basic problem for countries in transition is whether they will be able to set-up their own programs and start work on them meeting the quality criteria of the European Union.

There are two strategies which can be followed under these conditions:

1. Waiting for better economic conditions and for guidance of more experienced countries in the field of cultural heritage digitisation. The dangers in this approach come from the poor conditions for the preservation of our cultural heritage.
2. Searching for *ad hoc* solutions, which will not lead to qualitative preservation of the whole cultural heritage, but at least will partially preserve it. The danger in this approach comes from the serious differences in the quality standards in the field of digitisation. Is it worth spending money on digitisation projects with insufficient budgets?

These decisions are very difficult. But they should be taken, and the sooner the better.

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## References

[Birnbaum et al. 95] D.J. Birnbaum, A.T. Bojadzhiev, M.P. Dobрева, A.L. Miltenova (eds.), Proceedings of the first Int. Conference "Computer Processing of Medieval Slavic Manuscripts", Blagoevgrad, 24-28 July 1995, 336 pp.

[Calabretto, Rumpler 98] S. Calabretto, B. Rumpler, *Distributed Multimedia*

*Workstation for Medieval Manuscripts*, In: F. Rowland and J. Smith (eds.), *Electronic Publishing'98: Towards the Information-Rich Society*, Proceedings of an ICC/IFIP Conference, Budapest, Hungary, 20-22 April 1998, pp. 166-178.

[Dobрева 98] M. Dobрева (ed.) Text variety in the Witnesses of Medieval Texts: Study from Co-operative Writing Perspective, Int. workshop proceedings, Sofia, 1998.

[Dobрева, Ivanov 98] M. Dobрева, S. Ivanov, *Issues in Electronic Publishing on the Medieval Slavic and Byzantine World*, In: F. Rowland and J. Smith (eds.), *Electronic Publishing'98: Towards the Information-Rich Society*, Proceedings of an ICC/IFIP Conference, Budapest, Hungary, 20-22 April 1998, pp. 55-64.

[NPPLC 97] National Program for the Preservation of Library Collections, Sofia, 1997.

