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ICT and Heritage

SUMMARY

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Presentation

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"We are all very ignorant, but not all ignorant of the same things."

Albert Einstein

For some years now, information and communication technologies (ICT) have formed part of our lives, and, for this reason, the "new technologies" tag has fallen out of use to be replaced by ICT. These technologies have slowly been introduced, with greater or lesser success, into a range of professional fields and our lives in general. Thus, now that we have overcome the first stage of complete ignorance, we can see how these technologies allow us to improve the tasks being carried out, whilst also highlighting those tasks we would like them to do in the future.

These first steps for ICT have been seen in a range of professional fields, with greater or lesser levels of intensity, as well as in terms of culture and cultural institutions. Over the last decade a great number of technological applications have been applied and assessed by memory institutions (museums, libraries and archives), with, in some cases, spectacular results in terms of communicating with the public or managing content.

Evolution in Catalonia has been slower, and we are still at the stage where we are taking the first steps, where institution managers have yet to decide to use information and communication technologies actively. To gain an idea, currently only 40% of Catalan museums have a website and the majority of those existing have been born out of initiatives by the administrations or companies that own them, and not the museums themselves. There is a preliminary report entitled *Situació de les tecnologies de la informació a les institucions de la memòria a Catalunya* ['State of Affairs of Information Technologies in Memory Institutions in Catalonia'][www1] produced by the Òliba group in December 2004, which shows the current situation here in terms of technological applications.

In order to overcome the possible lack of awareness of the subject, it was decided that the journal DIGITHUM focus on ICT and heritage. This issue includes work from **Kim H. Veltman**, scien-

[www1]: http://oliba.uoc.edu/oliba/reports/museus_tic_catalunya_2004.pdf

tific director of the McLuhan Institute at the University of Maastricht and one of Europe's leading figures in digital cultural heritage networks. The article highlights all that that ICT currently contribute to cultural institutions, whilst also suggesting which lines should be prioritised in the future – which will, no doubt, require changes in the cultural models.

As ICT applications in the world of culture have been around for some time in neighbouring countries, it was felt that it would be interesting to investigate, thanks to the article by **Margarida Loran**, the experience of putting content online at the British national museums. Thus, by comparing the cultural policies of other European countries, we can get a better idea of the potential offered by these information technologies.

Finally, the latest contribution from **Cèsar Carreras** looks to show, through two case studies, how small-sized institutions' cultural portals evolve, without the recognised brand of a national museum or any related virtual community. The aim is to see how the internet provides a showcase for cultural activities and content that could not be easily accessed through any other form of communication media.

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Challenges for ICT/UCT Applications in Cultural Heritage*

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Abstract

While a precise forecast for the next decades is clearly impossible, some major challenges that need to be addressed in the next 10-20 years can be identified. Technologically there will be a shift from Information and Communication Technologies (ICT) to Universal Convergence Technologies (UCT). In the cultural realm, these challenges include problems of repositories, the changing scope of cultural heritage; new links between national, regional and local; between culture, knowledge and scholarship; approaches to intellectual property and to models of culture. Five dangers are outlined, namely, over-zealous commercialism; anti-technology among scholars; anti-universal narratives; forgetting the past, and a systematic destruction of memory. The need for a permanent E-Culture Net is outlined which would a) address these challenges; b) develop critical methods; c) create new models of culture that transcend Euro-Centric visions, and d) focus on a Distributed European Electronic Resource (DEER).

The American vision of the Internet remains focussed largely on uni-lingual e-commerce.[1] By contrast, the European vision, through its links with tourism, clearly has financial dimensions, and at the same time is developing a multi-lingual approach to cultural heritage that includes historical and cultural dimensions. This vision extends beyond culture to new definitions of knowledge. While the rhetoric of the day may focus on profit schedules for the next quarter, it is important to recall that major changes in new media have much longer cycles entailing decades and even centuries before their full effects are appreciated.

Keywords

e-culture, cultural heritage, intellectual property, digital media

* Seville: Instituto Andaluz del Patrimonio Histórico, 2004 (in press).

Notes: One of the great problems with websites is that they often move and sometimes disappear altogether. All the websites were checked as working in June 2004. Those which are inactive are noted in brackets as formerly. Every effort has been made to give the original title such that this can be entered in Google should the address change at a future date.

1. *Cf.* Global Reach: World E-Commerce Growth (based on Forrester Research).
See: http://glreach.com/eng/ed/art/2004.ecommerce.php3

Resum

Tot i que es fa evident la impossibilitat de preveure amb precisió les pròximes dècades, sí que es poden identificar, per contra, alguns dels desafiaments que caldrà abordar en els pròxims deu o vint anys. En el camp tecnològic hi haurà el pas de les tecnologies de la informació i la comunicació (TIC) a les tecnologies de convergència universal (TCU). En l'àmbit de la cultura, aquests desafiaments comportaran problemes d'emmagatzemament, un canvi de polítiques sobre el patrimoni cultural, nous vincles entre expressions nacionals, regionals i locals, i també entre la cultura, el coneixement i l'erudició, sense oblidar acostaments a la propietat intel·lectual i als models de cultura. Es perfilen cinc tipus de perills: un comercialisme excessivament entusiasta, una actitud tecnòfoba per part dels erudits, narratives contràries a la universalitat, l'oblit del passat i, finalment, una destrucció sistemàtica de la memòria. Es defineix igualment la necessitat d'una E-Culture Net permanent, que serviria per a fer front a aquests reptes, desenvolupar mètodes crítics, crear nous models de cultura que ultrapassin les visions eurocèntriques i prioritzar un arxiu europeu electrònic distribuït (DEER, Distributed European Electronic Resource). La visió nord-americana d'Internet es basa sobretot en el comerç electrònic unilingüe. Per contra, la visió europea, per mitjà dels vincles que té amb el turisme, presenta una clara dimensió econòmica, alhora que fa una proposta multilingüe sobre el patrimoni cultural que engloba les dimensions històrica i cultural. Aquesta visió s'estén més enllà de la cultura i abraça noves definicions de coneixement. Encara que la retòrica d'avui es pugui centrar en els objectius de beneficis per a cada trimestre, és important recordar que els principals canvis en els nous mitjans van acompanyats de cicles molt més llargs, els efectes dels quals s'acaben reconeixent plenament només al cap de dècades i, fins i tot, segles.

Paraules clau

cultura digital, patrimoni cultural, propietat intel·lectual, mitjans digitals

Introduction

There are adages that the only problem with predictions is that they concern the future.[2] The past decades have brought so many changes on such scales that any attempt to predict precisely the impact of the new Information and Communication Technologies (ICT) with respect to cultural heritage is doomed to future failure and/or retrospective mockery. Nonetheless, as an historian, it is useful to survey past developments in order to discern which of these are likely to have an impact on the decade to come.

The Internet is changing rapidly and is changing quickly what is possible. In 1995, there were 5 million users of the Internet. In 2000, there were 200 million. In March 2004, despite complaints of a dot.com bust, the Internet has grown to 804 million. In 1995, over 95% of the Internet was in English. In 2004, English represents 35% of the Internet and European languages also represent about 30% of the Internet.[3] In the next years there will be more Internet users in China than in the United States, and it is predicted that Chinese will become the most used language.[4]

Technologically, while convergence was a buzzword throughout the 1990s, there will soon be convergence at a new level whereby telephony, television and Internet systems become interdependent and then fully interchangeable. There is disagreement exactly when it will happen. In Japan, there are predictions that this convergence will be in place by 2010.[5] According to the Siemens Corporation this convergence will occur by 2015.[6] While this shift, which we have called a shift from Information and Communication Technologies (ICT) to Universal Convergence Technologies (UCT), is predictable, many details remain open: precisely how it will happen, whether a single global solution will be agreed upon, what the consequences will be. A unified solution on this front is certain to be one major technological challenge of the next decades. A second technological challenge pertains to the implementation and implications of nanotechnology especially for interfaces. Will direct brain interfaces and brain implants become an everyday reality?

Elsewhere, we have suggested that the new media have technological, material, organisational, intellectual and philosophical consequences, namely, invisibility, virtuality, systemicity, contextuality and spirituality.[7] These consequences change if one is aiming at an Information Highway (United States), an Information Society (Europe) or a Knowledge Society (Japan). The US quest for an information highway has highlighted technological, material and organisational consequences. The deeper potentials of networked computers lie in intellectual and philosophical consequences, which include dynamic, augmented knowledge and culture and different ways of knowing.

McLuhan proposed that each new medium uses the previous medium as its content and used oppositions (hot-cold) to characterize differences. Digital media and UCT create bridges that allow interchange across media and senses. This creates a digital bridge, whereby even illiterate persons can benefit from new media, which deserves even more attention than the digital divide.

In the cultural domain, key areas for development include problems of repositories, the changing scope of cultural heritage; new links between national, regional and local; between culture, knowledge and scholarship; European approaches to intellectual property and needs for new models of culture. There are also unexpected dangers including forgetting the past and a more systematic destruction of memory. The need for a Distributed European Electronic Resource (DEER) and later a World Network of Distributed Electronic Resources (WONDER) to answer these challenges is outlined.

Distributed Repositories

In the past fifty years, the challenge of digital culture first arose in the domain of memory institutions, namely, libraries, museums and archives. A first step lay in creating electronic catalogues. Then it turned to content which initially appeared to be a simple problem: if one created digital versions of existing books and images then one could share these without harm to the originals. In the meantime, a number of unexpected challenges have come into focus:

- Scans of historical materials are much larger than one originally thought: hundreds of megabytes (up to 767 MB) for a single page of text and many Gigabytes (up to 30 GB) for a single image. Thus storage is a much greater problem than originally imagined.
- Major digital reconstructions of sites, cities now range from 1-10 terabytes (TB).
- Software continues to change so rapidly that there are serious problems of continued access to digital versions because it is difficult to keep these materials in an up-to-date form.

2. For a recent assessment of the current state of digital culture see the author's: "Europe's Cultural Heritage in the Digital Age," Closing Plenary: *Digital Resources in the Humanities (DRH) Conference, 2003, University of Gloucestershire, Cheltenham Campus*, September 2003.
3. Global Reach: Global Internet Statistics. See: http://www.glreach.com/globstats/
4. Ibid. See: http://www.glreach.com/globstats/
5. *The State of the Japanese Internet Market 2000 Digest*, Tokyo: Impress, 2000, p. 59. *Cf.* Ken Ichiriki, *Study Group on the Next Generation Internet Policy, e-Japan Initiative for the IT Revolution*, June 2000.
6. Arthur F. Pease, Siemens, "Building the Unlimited Expressway."
See: http://w4.siemens.de/FuI/en/archiv/pof/heft2_02/artikel11/index.html
7. For a fuller discussion see the author's *Understanding New Media: Augmented Knowledge and Culture,* Calgary: University of Calgary Press, (Autumn 2004, in press).

- Many born-digital objects, especially in the form of new multi-medial and multi-modal art pose special problems of conservation and preservation.

The cumulative effect of these developments has been a gradual shift in perceptions of the needs of culture and of the humanities as a whole. From the early days of programmable computing in the 1940s there was often a tacit assumption that the number crunching of computers was a domain almost exclusively needed by and for the "hard sciences." The rise of computational linguistics, of corpora and especially national corpora[8] of language usage began to change this perception. The rise of high-level images of cultural objects and complex reconstructions of sites and cities means that the human sciences and cultural communities now have needs that entail petabytes and exobytes of digital materials if they are networked.

Indeed, whereas the sciences are concerned primarily with recording the latest findings in their fields, culture has a cumulative mandate to save not only artistic expressions from earlier eras but also the cumulative theories, commentaries, reflections and criticisms concerning these expressions. Science is concerned with establishing laws and principles that apply globally. By contrast, culture is concerned with recording expressions, which are unique at the national, regional, local and ultimately the individual levels (*cf.* section Heritage as National Policy below). As a result the long-term computational needs of culture and the humanities are far greater than those of the sciences. Quests for e-science and scientific grids need to be complemented by grids for e-culture.

One of the paradoxes in these developments is the enormous chasm between rhetoric and reality. On the one hand, the rhetoric of computer and ICT sales personnel would have us believe that the latest machines have more speed and memory than we might ever have imagined necessary. On the other hand, there is the simple reality that the world's fastest machines are not even remotely capable of accomplishing the computing challenges of either science or culture. The large Hadron Collider at CERN is one example. Radio astronomy is another: researchers can use only about 1% of the information, which comes to them from space in real time because computer connections today are still much too slow.[9] Similarly, cultural networks are able to share less than 1% of the materials which they have available locally.[10] Surprisingly there is very little discussion of this gap between the rhetoric of everything has been solved and the reality of so much that needs to be done.

The idea of distributed repositories, that integrate a number of these challenges, offers an interim and probably a long-term solution. Discussions in the context of MINERVA (Ministerial NEtwoRk for Valorising Activities in digitisation)[11] and with respect to the Lund meeting have brought into focus the problem of preservation of digital memory and led specifically to the idea of an European Digital Memory. One of the important actions of MINERVA has been to identify national libraries, archives and other memory institutions as competence centres for digitisation.[12] Meanwhile the EPOCH Network promises to integrate research in "processing open cultural heritage."[13]

In December 2002, in the context of E-Culture Net,[14] Christian Lahanier (C2RMF) outlined "the need for a European Open Source System based in a European Computer Centre for data Repository" in order to create "a prototype of the future European Mirrored Repository." This idea was pursued and introduced to the highest levels of Unesco, where it resulted in an initial twelve-year plan for a project entitled: EU-Unesco Digital Centre of Memory of Culture (DCMC) in the context of major European museums and art galleries.[15] In the United Kingdom, the Joint Information Systems Committee (JISC) is working towards a Digital Curation Centre (DCC)[16] which is due to open formally in the fourth quarter of 2004.[17] Meanwhile, the BRICKS IP (Building Resources for Intelligent Cultural-Knowledge Sharing Integrated Project in the

8. Uses of the British National Corpus. *Cf.* http://www.natcorp.ox.ac.uk/using/
9. It is estimated that they would need to have a throughput of at least 60 Gigabits/second in order to achieve a practical solution. See the work of the SERENATE group for more details. See: http://www.cordis.lu/ist/rn/serenate.htm
10. Without gigabit connections it is not possible to share most large image collections let alone reconstructions of sites. For interesting experiments using 200GB maps by E-Culture Net, See: http://www.eculturenet.org/FP5/publicPDF/deliverable10c.pdf
11. See: http://www.minervaeurope.org/ (*Cf.* formerly: http://www.minervaeurope.org/publications/globalreporthtm/france-fr.htm)
12. MINERVA Competence Centres for Digitisation. See: http://www.minervaeurope.org/competencentre.htm
13. Excellence in Processing Open Cultural Heritage (EPOCH). See: http://www.epoch-net.org/. *Cf.* the CORDIS website. See: http://www.cordis.lu/ist/directorate_e/digicult/epoch.htm
14. E-Culture Net Thematic network in FP5. See: http://www.eculturenet.org/FP5/
15. This initiative became the basis for the storage module of the Distributed European Electronic Resource (DEER) prototype in E-Culture Net which was not funded in the first round of FP6.
16. JISC Requirements and Feasibility Study on preservation of e-prints. See: http://www.jisc.ac.uk/index.cfm?name=funding_7_02. The Digital Curation Centre (DCC) has: the University of Edinburgh (lead partner) and the University of Glasgow, which together host the NeSC; UKOLN, at the University of Bath; the Council for the Central Laboratory of the Research Councils (which operate the Rutherford and Daresbury Laboratories). See: http://www.dcc.ac.uk/
17. The Digital Preservation Coalition in conjunction with ERPANET made a bid for this tender. See: http://www.developmentgateway.org/node/130667/browser/?&page_no=45. ERPANET will bring together memory organisations (museums, libraries and archives), ICT and software industry, research institutions, government organisations (including local ones), entertainment and creative industries, and commercial sectors (including for example pharmaceuticals, petrochemical, and financial). The dominant feature of ERPANET will be the provision of a virtual clearinghouse and knowledge-base on state-of-the-art developments in digital preservation and the transfer of that expertise among individuals and institutions.

6th Framework Programme)[18] explicitly "aims at establishing the organisational and technological foundations of a digital library at the level of a European Digital Memory."[19]

Implicit in these developments are serious questions about the future roles and competences of memory institutions in which we can discern two competing trends.[20] On the one hand,[21] major libraries such as the Bibliothèque Nationale de la France and institutions such as the Centre Pompidou (which have a joint committee on the problem), as well as networks,[22] are exploring joint solutions to questions of digital preservation, especially in the case of born digital objects.

At libraries such as the Koninklijke Bibliotheek (The Hague) there are plans[23] to extend the traditional concept of deposit libraries (whereby national libraries automatically receive one free version of every copyrighted book) to include electronic copies of everything that is born digital as well as things that are born analog. One example of what is possible is offered by the Moving Images Collection (MIC) that claims to be "the first centralised online catalog of film, television and digital video images culled from libraries, national archives, museums and broadcasting companies accessible to anyone via the Web."[24]

On the other hand, there is a temptation for major institutions to rely on newly arrived experts such as ERPANET (*Electronic Resource Preservation and Access Network*) to solve these problems. There is also a temptation to outsource their sources to Application Service Providers (ASPs) and Service Centres as envisioned by some of the large computer and ICT companies. A fundamental choice for the next decade(s) thus remains whether a) traditional analog memory institutions expand their scope to become analog plus digital memory institutions or whether b) a new category of digital memory institutions arises. In our view, the first of these options is preferable.

While these initiatives might at first glance seem to be in competition with one another, they are all expressions of a larger *Zeitgeist* that needs integration. Distributed repositories leading to a Distributed European Electronic Repository (DEER) offer a vision that integrates these fragmented efforts into a coherent action plan, which can be further solidified through national policies. Such a DEER can make the cumulative contents of these collections permanently accessible (*cf.* section Need for a Distributed European Electronic Repository below) and play a central role in the future of e-learning.[25] This assumes major growth in the high-speed connectivity offered by infrastructure frameworks such as GEANT,[26] the Trans-European Research and Education Networking Association (TERENA)[27] and national high-speed networks. Great progress has been made in terms of the big picture. The problems of the last mile, the last kilometer, the last hundred yards, or even the last 10 meters linking the specific building and a given individual to the network remains a major challenge for the next decades.

Changing Scope of Cultural Heritage

One of the reasons why storage has become so central an issue is because the scope of digital cultural heritage has continued to expand. In the 1970s, initial efforts were on remote access to references to cultural objects largely through library and museum catalogues. During the 1980s and 1990s, the quest expanded to include images of those contents, i.e. digital versions of paintings, full texts of manuscripts and books, monuments, sites and in some cases even whole cities. Even so, the emphasis remained focused on tangible heritage. During the 1990s, the efforts of Unesco drew attention to the importance of intangible heritage in the form of oral traditions, language, music, dance, and customs.[28]

The initial emphasis was on digitizing the expressions of culture as if they were simple products or objects. These expressions were products of theories, some aesthetic, others philosophical, sociological, and psychological. Nineteenth century scholars such

18. BRICKS. See: http://eoi.cordis.lu/dsp_details.cfm?ID=32324. *Cf.* http://www.cordis.lu/ist/directorate_e/digicult/bricks.htm
19. Projects such as BRICKS reflect a trend that is coming from the technological community to create distributed, modular software in the form of grid middleware. In this context pioneers in the field claim that even languages such as C++ will be obsolete within a decade. *Cf.* the work of Denis Caromel, INRIA and specifically his keynote at REUNA in Santiago (May 2004). See: http://www-sop.inria.fr/oasis/personnel/Denis.Caromel/
20. Gail M. Hodge, "Digital Preservation. Overview of Current Developments", *Information Services and Use*, volume 22, 2002, pp. 73-82. See: http://www.arch.usyd.edu.au/~adong/courses/deco3002/assets/hodge-digitalpreservation.pdf
21. OCLC Public Affairs Information Service. Cultural Protection, December 2002/January 2003. See: http://www.pais.org/hottopics/2003/DecJan/resources/web.stm
22. E.g. European Commission on Preservation and Access.
See: http://www.knaw.nl/ecpa/ and the International Network for the Conservation of Contemporary Art (INCCA).
See: http://www.incca.org/. *Cf.* Casus Multimedia — VU 2003
See: http://www.cs.vu.nl/~eliens/onderwijs/multimedia/mmc/incca.html
At a national level the French Archives have articulated an approach.
See: http://www.archivesdefrance.culture.gouv.fr/fr/archivistique/index.html
23. There has been a European Commission project on a Networked European Deposit Library. See: http://www.clir.org/pubs/reports/pub116/sec4.html
24 Kate Evans-Correia, "Linux powers building of online digital images catalog," *SearchEnterpriseLinux.com*, 05 Sep 2003.
See: http://searchenterpriselinux.techtarget.com/originalContent/0,289142,sid39_gci924222,00.html
25. *Cf.* INSPIRAL Project. See: http://inspiral.cdlr.strath.ac.uk/about/about.html
26. GEANT. See: http://www.dante.net/geant/about-geant.html
27. TERENA. See: http://www.terena.nl/
28. UNESCO Intangible Heritage. See: http://www.unesco.org/culture/heritage/intangible/html_eng/index_en.shtml

as Rudolf Eitelberger von Edelberg,[29] who had the first chair of art history in Vienna (1851), began to collect these materials in their *Sources of Art History* (1879-1908)[30], an effort that was continued by Julius von Schlosser's *Literature of Art*[31] (1924, 1935, 1985).[32] These primary theories were complemented by a secondary literature that assessed the significance of both the theories and the expressions they inspired and have become the literature of art history. One of the challenges of the next decades will be to make such contextual materials available in digital form and to relate them to cultural objects and expressions. A related challenge is to make visible changing interpretations of these sources.

In the nineteenth century, neo-Kantians such as Cohen at Marburg assumed that theory arising from a spirit of the times (*Zeitgeist*) determined a worldview (*Weltanschauung*) which led in turn to cultural and other expressions. This inspired the work of Ernst Cassirer, Erwin Panofsky and the Warburg school.[33] Aby Warburg (1866-1929), first in Hamburg then in London, set out to complement the *Word* and *Image* sections of his library with sections on *Orientation* (Religion, Science, Philosophy), and *Action* (Political and Cultural History).[34]

Over a century of scholarship has gradually revealed a more complex and nuanced picture of relationships between theory, expression and awareness. The development of Renaissance perspective, which some have called the most important invention of Western culture, offers an interesting case in point. Empirical examples of three-dimensional spatial effects gradually evolved from the 1280s through to the early 1400s. Brunelleschi's first demonstration of the principles of perspective (c. 1418-1424) preceded Alberti's first treatise on perspective (1434). Although Vasari (1550) was aware of perspectival practice and theory, he mentioned no specific manuscripts or editions. In simple terms there was no written awareness of perspective in the form of bibliographies during the first two centuries of its existence.

Awareness of such texts in the form of bibliographies on perspective began with Lomazzo (1590 with 7 titles) and only grew slowly in the course of the next centuries.[35] Awareness of the links between theory and practice only became a serious object of study in the second half of the nineteenth century, with more studies in the twentieth century than the first four centuries of perspective's existence. In other words, if perspective can be seen as a typical case, the equations of world-view, theory, practice and awareness assumed by nineteenth and early twentieth German theorists and historians of art were misleading at best.

The realm of digital culture is thus much more than the expressions of tangible and intangible culture. As Ernst Cassirer noted in the *Logic of the Cultural Sciences* (1942) it entails myth, language, art and knowledge.[36] Precisely how they relate remains an open question. Hence, one of the larger challenges facing digital culture in the next generation is to re-examine the evidence more systematically in order to re-assess the complex interplays of theory and practice in cultural expressions.

Related to these quests to re-contextualise cultural expressions has been a growing mastery of and fascination with architectural and spatial information. The NUME (*Nuovo Museo Elettronico*) project demonstrates the potentials of showing developments in a city such as Bologna in the course of the millennium. The Terravision demonstration by Art+Com (1994)[37] and the SANTI (*Sistema Avanzado de Navegación sobre Terrenos Interactivo*) project (1999)[38] have shown how such an approach can be related to the surrounding landscape and at various scales including satellite images from space. Related also to these attempts to reconstruct physical environments are a growing number of projects which attempt to reconstruct technological processes (e.g. silk production in Bologna,[39] olive oil machines in Andalusia and copper production in the famous mine at Falun).[40] In Italy, a reconstruction

29. Brief Bios of Eitelberger von Edelberg, Rudolph. See: http://www.lib.duke.edu/lilly/artlibry/dah/eitelbergerr.htm *Cf.*:http://www.stadtbibliothek.wien.at/ma09/cgi-bin/embed-wo.pl?lang=-de&l=4&doc=http://www.stadtbibliothek.wien.at/sammlungen/handschriften/nachlass-verzeichnis/e/eitelberger-rudolf-de.htm
30. Original: *Quellenschriften für Kunstgeschichte und Kunsttechnik des Mittelalters und der Neuzeit.*
31. *Die Kunstliteratur,* Vienna, Schroll, 1924.
32. For a list of such Basic Art History Resources at UNC Chapel Hill.
See: http://www.lib.unc.edu/art/graduate/essential_resources.html
33. *Cf.* the author's: "Panofsky's Perspective: a Half Century Later," *Atti del convegno internazionale di studi: la prospettiva rinascimentale*, Milan 1977, ed. Marisa Dalai-Emiliani (Florence: Centro Di, 1980), pp. 565-584. For another discussion of recent trends see the author's: "Learning and Communication with Old and New Media", *UNESCO Conference: Das Verbindende der Kulturen. SEKTION: Integrales, lebendiges, gemeinsames Lernen, Orientierungs- und Sinnfragen, Mehrsprachigkeit und Kulturnavigation, Vienna, December 2003*, Vienna, 2004 (in press).
34. Warburg Institute Library Classification Scheme.
See: http://www.sas.ac.uk/warburg/mnemosyne/SUBJECTS.htm
35. *Cf.* the heading of earlier bibliographies in the author's bibliography.
See: http://mmilinux.unimaas.nl/sums/develop/ with username *sums* and password *summa*.
36. Ernst Cassirer, *The Logic of the Cultural Sciences*, New Haven: Yale University Press, 2000, p. 25. Translated from: "Zur Logik der Kulturwissenschaften," *Göteborgs Hogskolas Anskrift*, 1942.
37. ART+COM. See: http://www.artcom.de/ under Projekte and under Terravision.
38. VideaLAB. See: http://videalab.udc.es/ under Representación del Territorio under SANTI (Sistema Avanzado de Navegación sobre Terrenos Interactivo).
39. Patrizia Coluccia, Francesca Garofalo, Maria Chiara Liguori, Silvia Monfardini and Francesco Serafini, "A Survey of Virtual Reality in the VIS.I.T. Theatre: from Research to Divulgation," *Cultivate Interactive*, October 2001.
See: http://www.cultivate-int.org/issue5/cineca/
40. Center for Digital Interpretation, Falun, Sweden. See: http://www.cdisweden.com/eng/projekt/index.html

of the ancient city of Pompeii is being used to simulate theories about economics and sociology in the first century A.D.

Recent developments in car navigation systems and informed mobility by Navteq[41] point to emerging possibilities. Complete maps of all roads in Europe are already available at 10 and 50 meter scales including perspectival bird's eye views. Such maps allow one to plan journeys using the fastest or the most scenic routes. They also provide information about petrol stations and hospitals. This could readily be extended to include cultural sites.

Given sufficient random memory and high-speed connections one can readily imagine how such a system could be linked to the approaches explored in Terravision, SANTI and NUME such that one could link these virtual trips with satellite views, virtual museums and other memory institutions. Besides their interest to drivers of automobiles, such systems could provide students with new ways of studying geography whereby they can make virtual visits to any sequence of cities and places. One could use the geographical approach while zooming down to a city, a museum, a wall and a specific painting and then switch seamlessly to a library approach to gain further information and knowledge about the painting, sculpture or other cultural artefact.

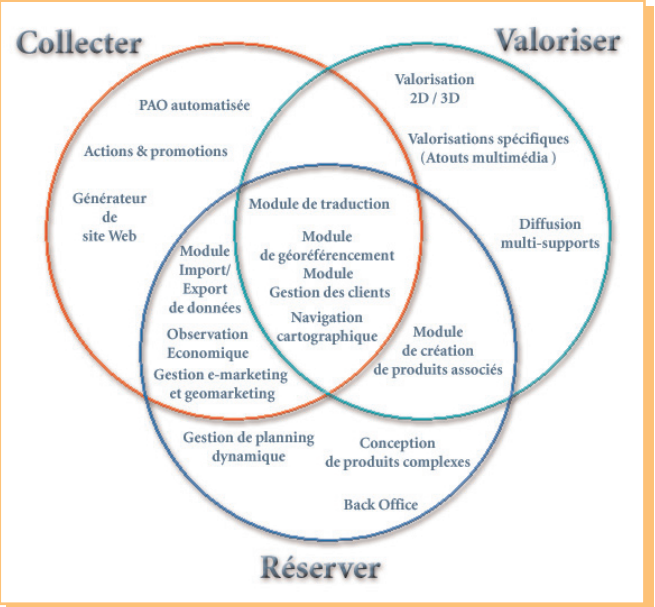

Figure 1. A global approach of the French Hypercarta system which links collection, value added materials and reservation as part of a tourism system.[45]

Tourism

Such an approach would also allow travelers to plan visits in new ways. Indeed, such developments in Geographical Information Systems (GIS) and Geographical Positioning Systems (GPS) have obvious implications for tourism, which now accounts for 12% of the world's Gross Domestic Product (GDP), and is the single most important source of income in the G7 countries.[42] A system sponsored by the French Ministry of Culture[43] called Hypercarta[44] already points the way to such potentials (figure 1). There have of course been numerous IT and ICT projects aimed at tourism. What is important in the French example, however, is a vision that links collection, value-added materials (valorization as MINERVA would say for cases where an earlier generation would have spoken of notes, commentaries and reconstructions) and reservation methods as part of a single tourism system. In this vision, access to cultural heritage remains largely free of charge while at the same time inspiring tourism with considerable economic consequences.

One of the challenges of the next decade will be to integrate such national solutions in a European and ultimately a global system such that we can move seamlessly between different countries and languages. The advent of Europe's Galileo satellite system for global positioning (2008) will introduce new possibilities, which are already being considered.[46] A next step will be to develop the approach developed in NUME such that spatial navigation can be complemented by temporal navigation. Eventually one will wish to have reconstructions not just of archaeological sites but also of buildings such as temples, churches and town halls such that one can trace how their interiors changed over the centuries as periods such as the Romanesque, Gothic, Renaissance and the Baroque imposed their imprint on both interiors and exteriors.

The Italian Centre for supercomputing (CINECA), working with the Italian RAI television, has already demonstrated how the concept of blue rooms can be extended to such virtual reconstructions of archaeological sites.[47] If truly high-speed connections

41. Navteq. See: http://www.navteq.com
42. Tourism now represents over 12% of the world economy. *Cf.* Tourist.com: Travel & Tourism Key Facts and Figures. See: http://www.tours.com/travelstats.php
43. Système d'Informations Touristiques Géolocalisées pour l'Internet Fixe et Mobile. See: http://www.cetir.net/prog_r&d/hypercarta/hypercarta.htm
44. Hypercarta. Un support cartographique 2D/3D. See: http://www.cetir.net/image/plaquette/hypercarta_01.pdf
45. Hypercarta System. See: http://www.franck.michaux.net/. For a glimpse how this fits into the French National Policy *Cf.* the MINERVA by France. See: http://www.minervaeurope.org/publications/globalreport/globalrephtm02/france-e.htm
46. For an introduction to GALILEO. See: http://europa.eu.int/comm/dgs/energy_transport/galileo/index_en.htm. For applications to leisure. See: http://europa.eu.int/comm/dgs/energy_transport/galileo/applications/leisure_en.htm. *Cf.* the proposed EPISTAGE Network of Excellence and the SCIGAL Integrated project. See: http://eoi.cordis.lu/dsp_details.cfm?ID=36245
47. CINECA Vis.I.T. RVM4VSet. See: http://www.cineca.it/HPSystems/Vis.I.T/Researches/rvm4vset.html

as envisioned by GEANT and grid computing evolve as planned, this approach could be extended to classrooms such that, instead of just reading about sites such as Pompeii, teachers and students could find themselves within virtual reconstructions of such sites, able to compare contemporary ruins with various attempts to rebuild them.

Connected with this one would also wish to see how scholars from different countries have imposed different interpretations on the same monuments and sites depending on their schools of thought. Whereas 19th century thinkers such as Ranke believed that their goal was to reconstruct history as it really was (*wie es eigentlich gewesen*), and late 20th century thinkers protested that no objective reconstruction is possible, the goal of 21st century historians may increasingly be to represent fairly and systematically, various, often fully conflicting interpretations, concerning any given building, monument or site (*cf.* Dynamic Knowledge in section Culture, Knowledge and Scholarship below).

Need for New Methodologies and Permanent Networks

In the realm of print we have a series of methods and procedures to ensure the quality and reliability of an article or book: e.g. footnotes, bibliographies, peer review. In the digital realm such clearly articulated methods are missing. We have many reconstructions but no framework for their comparison, no critical methods to determine which example is better than another. E-Culture Net drew attention to some of the problems entailed in this domain, which loom as an enormous challenge for the next decades.

Connected with this are institutional and organizational problems. In Europe, technological problems are typically dealt with in the Framework Programmes (e.g. FP5, FP6, etc.). These five-year programmes typically generate 1-4 year projects. The EU assumption is that after that time there must be a product which then generates sufficient money that the project can proceed on its own. In the case of technological innovations this is a reasonable proviso to ensure a reality check. In the case of networks concerned with developing agreement on new methods this approach is insufficient. The best way is usually not the most economically attractive, i.e. the cheapest, nor is it always the most expensive.

Moreover, the methodological problems noted above cannot be solved in such time frames. To be sure it is possible to provide a tentative working solution within the time frame of a project with its typical Work-Packages (WPs). Needed, however, is a small community of scholars who trust each other sufficiently to share work in progress, to share notes and to develop critical methods together. This requires both a reliable, permanent, high-speed network, and funding that may be modest but is sustained.

Heritage as National Policy

From at least the time of the Renaissance rulers and politicians have recognised that collections of cultural objects constitute much more than simple objects of prestige. In the latter seventeenth century, Louis XIV demonstrated how Versailles could help to shape cultural politics and affect politics in other spheres. Versailles became not only a building that was imitated in direct copies such as Salzdahlum[48] and adaptations such as Schönbrunn and Charlottenburg. Jacob Burckhardt in his classic *Civilisation of the Renaissance* considered both this tradition of art as a way of strengthening the state and the state as a work of art.[49]

More recently countries are using their cultural institutes (e.g. Istituto Italiano di Cultura,[50] British Council,[51] Goethe House[52]) to reflect and spread their culture in digital form. While there is some danger that such bodies become starting points for a new wave of cultural imperialism, there is a more obvious challenge of sharing national achievements while at the same time recognizing the interrelatedness and interdependence of all cultures. Ideally, co-ordinated national policies as foreseen in projects such as MINERVA can assure that efforts in individual countries can be linked and compared with those elsewhere in ways that increase mutual appreciation and understanding. The Council of Europe's European Heritage Network (HEREIN)[53] and the creation of an European Culture Portal (by the EU Directorate General on Education and Culture) are useful steps in this direction.[54] Lacking thus far is a permanent network linking memory institutions and educational institutions to share content and develop new critical methods as foreseen by E-Culture Net. In addition there is a challenge of creating something more than portals and centres that simply spread Western values: centres should also learn to be aware of cultures in the countries where they are stationed.

48. Salzdahlum. See: http://salzdahlum.com/Geschichte/Uebersicht/content/
49. *The Civilization of the Renaissance in Italy* by Jacob Burckhardt. See: http://www.boisestate.edu/courses/hy309/docs/burckhardt/burckhardt.html
50. *Cf.* Italian Culture on the Net (ICON). See: http://www.italicon.it/
51. British Council. See: http://www.britishcouncil.org/
52. Goethe Institute. See: http://www.goethe.de/
53. European Heritage Network (HEREIN). See: http://www.coe.int/T/E/Cultural_Co-operation/Heritage/European_Heritage_Network_(HEREIN)/
54. European Culture Portal. See: http://europa.eu.int/comm/culture/index_en.htm

Links between National, Regional and Local

In the 19th century, the rise of national governments led to an emphasis on national cultures often to the detriment or even exclusion of regional or local cultures. One major exception was Germany where culture remained the responsibility of individual states (*Länder*). The advent of the European Commission posed these problems at a new level and led to an initial "solution" in the form of the principle of "subsidiarity."

The past decades have seen a slow transformation in this approach. Although the principle of non-interference with local and regional cultures remains sacrosanct, there is a growing recognition that if the Commission represents only national and international trends then the inherent value of these regional and local dimensions will be obscured or simply forgotten. This has led to a new vision of a unity of diversities (Ruffolo).[55]

Parallel with this political problem of access to local, regional, as well as national levels, have been very practical problems of access. The nineteenth century vision was to impose a single standard. While theoretically attractive, such centralised visions ignored how local and regional groups naturally resist outsiders who wish to impose national and international systems on their collections.

As a result there is an emerging policy of accepting the local and regional variant systems and creating bridging and mapping methods to national and international collections. One strategy is via the new Digital Autonomous Cultural Object (DACO) protocol.[56] Another is via Autonomous Content Entities (ACE).[57] The goal is simple. Instead of trying to replace local and regional diversity we need to make it accessible so that we eventually have not just international and national versions but also regional and local versions of histories and stories.

The nineteenth and twentieth centuries rightly emphasised the importance of authority files for names. Using handwritten and later typewritten card catalogues this meant that all references to a given person needed to be written in a standard way. Alternative spellings in the form of a *see also* meant that one had to go to a different point in a large catalogue. With electronic media this problem effectively disappears. One can add as many local and regional variants of the name as one wishes, as long as there is an unequivocal accepted version that serves as an anchor for the rest. This challenge extends beyond everyday spelling in a single language to include multilingual problems. With a properly structured database, a French person can type in the city of *Liège*, a Flemish person can type in *Luik*, a German can type in *Lüttich* and all will arrive at information concerning the same city in Belgium. This approach can extend beyond languages to include dialects.

Such complete equivalences are more often the exception rather than the rule. In major languages, even words that look the same such as the terms culture and civilization, have very different connotations in English, French, German and other languages. Hence, once again, the challenge becomes one of mapping and bridging between meanings in order to keep intact their cultural and historical differences, rather than seeking to impose a uniform template for translation that threatens or destroys entirely their cultural diversity.

This challenge has been noted by Accès Multilingue au Patrimoine (AMP) Consortium.[58] A challenge for the next decade will be to find a larger context whereby what began as a preliminary project within France, can be extended to include the whole of Europe and at some point become an international effort. One solution would be a permanent form of E-Culture Net, which includes the AMP Consortium and has the DEER as a practical goal. Under discussion are plans to move E-Culture Net to a new European University of Culture with campuses in Berlin (Aesthetics), Florence (Humanities); Madrid (Languages and Literature) and Paris (Philosophy and Internet). This could serve as an ideal starting point for a more permanent structure which would explore and foster European cultural diversity.

Culture, Knowledge and Scholarship

Implicit in these developments is a subtle but fundamental shift in the role of standardised names and standards. Library systems typically record the standard title of a book and yet library catalogues have traditionally continued to list all the variant titles in different languages. In the National Union Catalogue, for instance, this means that multilingual records of a given title are usually spread over many pages among other titles. Using electronic lists, the standard title can serve as a bridge among these variations such that

55. Giorgio Ruffolo, *The Unity of Diversities - Cultural Co-operation in the European Union*. Edited by the Parliamentary Group of the PSE, European Parliament, Firenze, Angelo Pontecorboli Editore, 2001, 112 pp, ISBN 88 85207 94 4.
56. Suzanne Keene and Francesca Monti, E-Culture Net. WP6. Foundation for a Distributed European Electronic Resource (DEER). See: http://www.eculturenet.org/FP5/publicPDF/deliverable11b.pdf
57. ACEMEDIA (FP6 project 001765) *Cf.* IST Evaluation Summary Report, p. 165. See: http://www.eculturenet.org/internal/evalreport.pdf
58. France, Ministère de la Culture, Actualités under Revues et Lettres. See: http://www.culture.gouv.fr/culture/mrt/numerisation/fr/f_01.htm#Autres

one can choose to see all titles in one language or all titles in various languages without distraction from a given language.[59]

On the surface this shift could appear to be a new triumph of relativism whereby truth no longer matters. On closer reflection this shift is more complex. Instead of fighting about which common form is accepted as an absolute authority, one accepts one common form as the working authority, and uses other documented variants as alternative means of reaching this common form. Truth and precision in reflecting only documented variants remain of paramount importance.

From a larger historical perspective, major advances in scholarly forms[60] have a much slower rhythm than might be expected. The advent of printing with Gutenberg (c.1454) focused almost exclusively on primary literature. Indeed, it was not until the mid-seventeenth century that secondary literature began through publications such as the *Journal des Savants* (1665)[61] and not until the efforts of Otlet and Lafontaine[62] in the late nineteenth century that international bibliographies of secondary literature became a reality.

Today many reference works as well as catalogues of primary and secondary literature, including reviews, abstracts and citation indexes are available in electronic form, yet a systematic correlation of these resources is still lacking. European projects such as IMASS[63] have begun to explore how the concept of virtual reference rooms might address these challenges, which are destined to become more urgent in the coming decades. As a result, access to any author should provide a simultaneous survey of their primary works, the secondary literature on those primary works as well as reviews, abstracts and citations.

In terms of the larger historical perspective, electronic media are leading to a need for further differentiation in our notions of secondary literature. In the 20th century the efforts of new criticism (Leavis, Empson etc.) focused on analyzing the layers of a text as if nothing else existed (internal analyses). Others focused on comparative studies of one text with others leading to new forms of multi-, inter- and trans-disciplinary studies (external analyses). Meanwhile, from the 1850s onwards, a third group has developed restoration (and conservation) from a general concern into new disciplines. Finally, the notion of reconstructions, which became a conscious activity in the 15th century Renaissance has been enormously stimulated by the rise of electronic Computer Aided Design (CAD) and Virtual Reality programmes. We all recognize such differences between internal analyses, external analyses, restorations and reconstructions and yet they are not yet reflected either in the way we organize library shelves or in our electronic retrieval systems. To achieve this is one of the larger challenges of the next decades.

Dynamic Knowledge

As McLuhan noted long ago, there is inevitably a danger of approaching the past through a rear view mirror, such that one shackles the possibilities of a new medium by applying to it the limitations of an earlier medium. Hence, in the past decades many of the early experiments in digital culture have done little more than render in digital form the limitations imposed by earlier analog methods. Analog print culture required that knowledge was presented in a static, linear form. This meant that any attempt to record knowledge tended to capture only the state of knowledge at a given time. Accordingly a list of Rembrandt's paintings in 1650 was different than a list in 1750, 1850 or 1950. All lists of an artist's or author's drawings, paintings, manuscripts, books, indeed all lists of artistic and cultural production were subjected to the same limitation. They were effectively frozen snapshots of knowledge at a given time, usually reflecting also the personal interpretations of a given individual.

Digital culture need not have these limitations.[64] Because digital records can effectively take the form of databases, various lists and interpretations can all be integrated into dynamic lists whereby one can see how paintings by or attributed to Rembrandt or other artists change over time. Implicit in this development are new possibilities of surveying changes in scholarship temporally and spatially. Whereas print culture focused on one interpretation often to the exclusion of others, digital culture allows new surveys of multiple interpretations and new understanding of how

59. Meanwhile there are interesting developments in the library world whereby bibliographical relations and access records are replacing authority files. *Cf.* Sherry Vellucci, "Bibliographic Relationships," *International Conference on the Principles and Future Development of AACR,* Toronto, 25-27 October 1997. See: http://collection.nlc-bnc.ca/100/200/300/jsc_aacr/bib_rel/r-bibrel.pdf.
60. For another discussion of this theme see the author's: "Four Ways that Digital Communications are Transforming Scholarship: Sources, Names, Claims and Scope," Unpublished Paper, Maastricht, 2002. See: http://www.mmi.unimaas.nl/people/Veltman/publications.htm
61. See: http://classes.bnf.fr/dossitsm/gc189-35.htm *Cf.* also the *Göttingische Gelehrten Anzeigen* (GGA), 1739 – 1892. See: http://gdz.sub.uni-goettingen.de/de-old/projects/gga/gga_de.html
62. Mundaneum. See: http://www.mundaneum.be/content/mundaneum/qqsmots.html
63. I-Mass Project. See: http://www.i-massweb.org/
64. For a fuller discussion of this topic see the author's: "Cultural and Historical Meta-data: MEMECS (Metadonnées et Mémoire Collective Systématique)," *WWW9*, Amsterdam, 2000 (in press), pp. 1-13. Published electronically as: "Cultural and Historical Metadata, MEMECS (Metadonnées et Mémoire Collective Systématique)," *Cultivate Interactive*, Issue 1, July 2000. See: http://www.cultivate-int.org/issue1/memecs/

these interpretations shift over time. Instead of complaining that many interpretations of a text are possible, we are now in a position to make these alternative interpretations visible, as a first step towards a new synthesis.

With respect to chronology, a number of individual software programmes already exist to translate Jewish, Arabic, or Chinese calendars into Christian (Julian and/or Gregorian) calendars. Needed are new integrations whereby such translations become a basic feature of all research.

In the case of cartography, the new technologies can do much more than provide access to the latest maps as outlined above. They can help us to visualise how the boundaries of countries change over time: for instance, how the boundaries of Poland change from a small country in the year 1000 to Europe's largest country around 1440 and then become smaller again. Ultimately, the new technologies can go further to show how Poland's maps of its own country may differ considerably from Russian and German maps of Poland. This applies equally, of course, to all contested areas around the world.

In the early days of computing text, lists and databases were very separate categories. The advent of Standard Generalised Markup Language (SGML)[65] introduced the idea of separating the encoding of texts from the ways they were displayed. This created new bridges between the categories of texts, lists and databases but remained difficult to master. The rise of eXtensible Markup Language (XML) removes many of these earlier difficulties such that texts can increasingly function as if they were databases that can be queried from a number of viewpoints. This implicitly opens many new avenues for dynamic treatment of knowledge. Indeed as scientific and knowledge visualization methods mature, it is possible to foresee how knowledge in lists, which in printed form were either alphabetical, chronological or geographical, will be accessible interchangeably in multiple formats and also as graphs and other visualizations. These are challenges which should become part of efforts for a Semantic Web. We need to be able to move seamlessly between different display methods, different levels of knowledge, map between different meanings and even between different kinds of knowledge.

European Approaches to Intellectual Property

Europe was one of the pioneers in establishing principles for intellectual property in the form of copyright, patents and other legal agreements and conventions in order to protect the rights of authors, artists and other creative individuals. Even so one of the secrets to European creativity lies in not trying to copyright everything. As such it is in contrast to countries such as the United States where there is now a quest not only to copyright images of famous actors but also all possible actions of virtual thespians, which simulate the themes and actions of an actor. Such an approach would have made many achievements of the Renaissance impossible.

In Europe, complete texts of books are copyrighted to prevent simple plagiarism, but citations in the form of references are allowed and even encouraged. Indeed this approach has been one of the secrets of European creativity. Although there is copyright on *the Bible*, Ovid's *Metamorphoses* and other classics, there is no copyright on their chief stories, themes and figures. This freedom has inspired much of the art and cultural expressions since the Renaissance and a veritable plethora of quotes, citations, references, and allusions not just in terms of snippets of texts but also in terms of topoi, themes, images, figures, motifs, symbols, emblems and other visual expressions.

Paradoxically, while citation indexes have become very much the fashion in the past decades, it is striking that retrospective citation indexes have not yet been forthcoming. The earlier quest of institutes such as the Warburg to trace the continuity of images by following the inheritance of symbols from Antiquity (*das Nachleben der Antike*) has not been systematically continued. Were such a repertoire to be developed it could serve both as a check against plagiarism and as a stimulus catalogue for new creativity. While discouraging simple copies one could thus use earlier examples as an incentive for new expressions: the old as a springboard for the new rather than a land where nothing is so old as the new. Open source is looming as more than a cheap alternative. It offers new dimensions for sharing through open theory[66] and perhaps even open design.

New Global Models of Culture

From the time of the voyages of discovery in the fifteenth century and onwards there was an implicit assumption that Europe's answers were applicable in other countries. In the eighteenth and nineteenth centuries with the rise of colonialism and imperialism there was an implicit and sometimes explicit belief that Europe's models were applicable everywhere.

Critics such as Said[67] and proponents of post-colonialism[68] have eloquently and rightly pointed to the shortcomings and excess-

65. OASIS. SGML: General Introductions and Overviews. See: http://www.oasis-open.org/cover/general.html
66. Open Theory. See: http://www.opentheory.org/
67. Edward Said, *Orientalism*, New York: Random House, 1979. Said's description of the Austrian school of orientalism was more subtle.
68. Postcolonialism, Nation and Gender. See: http://www.eng.fju.edu.tw/Literary_Criticism/postcolonism/#theorists

es of this approach. However, in their enthusiasm to criticise, they have often forgotten to note that this approach also led to a systematic study of languages, which had not been recorded by their inventors and which would have been long forgotten were it not for European intervention and interest. From early studies especially by Jesuit missionaries and subsequent studies by archaeologists, historians, anthropologists, ethnologists, ethnographers, sociologists, ethno-botanists and many others, Europe has frequently shed light on cultures with forgotten languages such as Egypt (e.g. Champollion)[69] and Cambodia (*cf.* Pelliot).[70] Through remarkable scholars such as Max Mueller, Europe has inspired systematic study of other religions and cultures not undertaken by those cultures on their own. In the process, Europe has lost not only its imperialist zeal but has begun to explore models of cultural understanding which are no longer Eurocentric.[71] This is part of a worldwide trend. In the United States there is growing interest in comparative cultural studies.[72] In Australia and Canada, largely through interaction with aboriginal peoples, there is a growing interest in alternative ways of knowing.[73]

Philippe Quéau (Unesco, Moscow) has linked such different ways of knowing specifically with different languages. For instance, whereas the English word *knowledge* is etymologically linked with the verb *can* (*cf.* German *können*), the French word for knowledge, *savoir* is etymologically linked with *taste* (*cf. sap*, *sapienza*), whereas the Sanscrit word for knowledge is linked with *creation* and *generation*.[74] This points to a need for much more than multilingual databanks, namely, the challenge of being able to search using very different models of knowledge and ways of knowing.

Thanks particularly to the work of Unesco, there is a general acceptance that culture is both tangible and intangible, with high and low dimensions. Even so, finding models that acknowledge the value of nomadic[75] as well as settled cultures, the importance of pre- and non-literate cultures as well as literate cultures, while at the same time giving due recognition to complex, ancient cultures such as China and India remains one of the most important challenges of the next decade(s) and beyond. A challenge lies in relating intangible theories, which Warburg classed under Orientation (Religion, Science, Philosophy), to their tangible and intangible cultural expressions.

One way forward lies in using the idea of cultural activities as an approach in moving towards a new model. Such a model acknowledges the intrinsic worth of all persons, while accepting the reality that pre-literate cultures typically have less cultural creations and "products" which become part of an accumulative, collective memory than those in literate or print literate or new media societies. Their goals, beyond those of mere survival, tend to focus on creating some kind of meaning or connecting, which links them with a world beyond them and with ordering via pattern and ornament that makes more manifest this process of connecting.

The advent of literacy adds imitating to basic goals. The advent of print literacy expands these goals to include matching, mixing and later exploring. Such basic goals can be linked with a small number of basic cultural activities (figure 2). In this approach, many basic goals are there from the outset. This is our common humanity at its deepest and most primordial level. While "technological" advances such as literacy, print and new media affect the quantity and often quality of cultural production and expression, a deeper change lies in the targets and audiences of these expressions. In pre-literate cultures, the purpose is to express common goals, insights and values of a group or tribe which leads via myths and legends to some form of religion, a word which is etymologically linked with the verb *to bind*, to bring together.

In literate society, this sense making, which had largely been oral–verbal evolves into (epic) poetry, song and other expressions, and becomes increasingly linked with individuals who begin as shamans and bards and become poetic, literary and artistic figures. In print societies, the individuation of these individuals gradually becomes

69. "The Egyptologists" by Jimmy Dunn.
See: http://www.touregypt.net/featurestories/egyptologists.htm
70. Angkor Wat. The largest religious Monument in the World.
See: http://www.angkorwat.org/
71. *Cf.* the author's "Goals of Culture and Art," Lecture to the IIC, Kuala Lumpur, September 1999. See: http://www.mmi.unimaas.nl also on the site of the International Institute of Communications, http://www.iicom.org). Published electronically in *TRANS. Internet-Zeitschrift für Kulturwissenschaften,* vol. 1, Vienna.
See: http://www.adis.at/arlt/institut/trans/0Nr/veltman1.htm
72. E.g. Ohio State University (OSU). Comparative Studies.
See: http://comparativestudies.osu.edu/
Cf. OSU Comparative Studies. Library Resources.
See: http://www.lib.ohio-state.edu/ghumweb/comparative/
73. Reg Crowshoe and Sybille Maaneschmodt, *Akak'stimen. A Blackfoot Framework for Decision Making and Mediation Processes*, Calgary: University of Calgary Press, 2002.
74. Philippe Quéau, "Information Policies for Knowledge Societies," *EVA Moscow*, 1-5 December 2003. See: http://evarussia.ru/upload/doklad/dokladEn_1080.doc
75. Commission on Nomadic Peoples. See: http://users.ox.ac.uk/%7Ecnpc/

Cultural Goal	Technology	Means
1. Connecting	Pre-literacy	1. Thinking, Mental Sense Making Mythology Religion Philosophy
2. Ordering		2. Doing, Physical Sense Making Building Making
		3. Expressing Literature Art Mathematics
3. Imitating 4. Matching	Literacy Print	3. Representing 4. Expressing Directly via Written
5. Mixing 6. Exploring		5. Translating Media 6. Transforming Media
7. Spreading	New Media	7. Publishing with Tolerance 8. Sharing 9. Helping

Figure 2. Seven goals and nine means as ingredients for a new model of culture.

more pronounced to the point that the quest for individual expression may parry with, compete with and sometimes even threaten the binding themes of society and culture in a larger sense. So the artist as a cohesive force becomes a partial outcast to the extent they are more partial, becomes the rebel, the weirdo, even the madman, excluded from the norm, while challenging the norm to expand its horizons of inclusion.

The advent of new media radically increase the potential range of diffusion and dissemination of cultural products but also introduce new parameters for the purposes of such activities. On the surface, it means that marketing and sponsoring become inextricably linked with cultural processes. At a deeper level the commercialization of culture misses the point about its deepest dimensions. Granted paintings can be bought and sold just as some weaker representatives of the faith are available for a price. Even so, one cannot buy creativity, just as one cannot buy true faith. Dissemination should at some point increase tolerance and be helpful. In this approach, cultures are not simply about what they produce but also how they go about sharing their cultural products and creations. Dictators may build great buildings and enormous monuments, but this does not make them scions of great cultures. Great expressions may always be of interest, but they are of greater interest if they benefit others rather than coming at the expense of human suffering and death.[76]

The profound advantage of this approach is that it acknowledges the intrinsic contributions of pre-literate, literate, print and new media cultures, while simultaneously allowing for development in the direction of complexity without imposing simplistic linear frameworks of bigger is better. Precisely how one can develop such a model in a multi-lingual, multi-cultural framework, that accepts parallel world-views and belief systems without trying to remove or destroy them is one of the larger challenges of the next decades. Closely linked with this will be new interface challenges. How can we create interfaces that allow non-literate and literate persons to communicate? How can we create interfaces that reflect different amounts of aesthetic distance in cultural systems? Indeed how can we help persons in different cultures to distinguish contexts which are intended as serious from those which are intended to be playful, humorous or ironic? Indeed intention and intentionality pose enormous challenges for future digital databases in the cultural realm.

Dangers

While the new media bring many potential advantages, they also bring dangers. Some of these dangers are obvious and as might be expected these are being addressed on many fronts: e.g. the challenges of permanent storage using new media; challenges of authenticity and veracity. More subtle are those dangers which are not yet clearly recognised. For the purposes of this essay five such dangers are outlined here: 1) over zealous commercialism; 2) an anti-technology stance of some intellectuals; 3) a trend against universal narratives; 4) a tendency to perceive the past only in terms of the present; 5) a tendency to destroy systematically the evidence and collective memory of the past.

76. In these insights may lie unexpected answers to the provocative questions posed by Kishore Mahbubani's recent book: *Can Asians Think*? (1998). In the year 1000 as the author points out, Asia was the leading civilization and Europe was only just beginning to recover from barbarian invasions. A millennium later, in the year 2000, the West rather than the East appears to be the leading civilization. Does this mean, asks the author rhetorically, that Asians are less intelligent and cannot think? Obviously not. Standing back, however, we can see that for the past millennium the West has increasingly opened itself to learning about other cultures, whereas the East has frequently created physical and metaphysical walls to keep out other cultures.
This is hardly to say that all the actions in the name of Christianity were always Christian in the deepest sense of the word. Significantly, Western efforts to resort to raw power have proved and are proving as powerless as such efforts elsewhere. The British Empire was defeated metaphysically by a Gandhi who refused to fight physically. Those who seek to be imperial powers today would do well to remember that example. The quest to understand, to publish with tolerance, to share and to help has triumphed over contrary methods. Intelligence is everywhere. What counts is how we use intelligence and subject it to a greater, common good.

Over Zealous Commercialism

The role of cultural institutions as one of the major dimensions in tourism is well recognised.[77] The enormous popularity of shops in major museums and galleries such as the Louvre or National Gallery point to the considerable potentials not just of postcards and posters but a whole range of reproductions, souvenirs, scholarly books, documentaries, videos and even games. All this is legitimate and deserves to be further developed. To be sure there are tendencies towards a Disneyfication of culture, but this again is a danger that is recognised and hence not our concern at this point.

Our concerns in this respect concern three less obvious trends. One trend is within the publishing industry to make the domain of reference works and standard works into a sector for profit making. In the past, a serious scholar bought their physical copy of a standard dictionary such as the Oxford English Dictionary (OED) and this one-time investment remained for life. Today a one-year licence to the OED even via national bodies such as the Joint Information Systems Committee costs well over 200 pounds, such that the cost of using this dictionary in a typical career of 30-40 years would range from 6,000-8,000 pounds. A scholar working in 5 languages would thus need to reckon with 30,000-40,000 pounds just for access to five standard dictionaries. This trend is evident not just in reference works such as classification systems, dictionaries and encyclopedias but also in the realm of classic literature in a given language. The costs of access to such collections exceed the budgets of scholars who are not independently wealthy.

Some will rightly note that these costs are usually covered by universities and that those who belong to those universities thus have automatic access to such materials. Hence for them the problem does not exist. Here two points need to be made. First, the extent to which universities subscribe to such reference materials varies enormously. A particular scholar is thus entirely dependent on the resources that happen to be available at their local university. Second, and much more significantly: only a small percentage of the population has formal links with a university. What provisions will be made to ensure that access to materials extends beyond a small elite at the universities? Will the computer revolution truly benefit only a clique or all citizens?

A second trend, not much publicised, entails a tendency to privatise cultural heritage. This trend has important precedents. Sir Henry Wellcome (1856-1936) through his "will established the Wellcome Trust, whereby five Trustees ensured the profits of his company were to be used for medical research. This was the first time in Britain that a bequest was made whereby trading profits were dedicated to the advancement of knowledge for the benefit of mankind."[78] In the 1970s, the trustees effectively rewrote the will and dispersed what was possibly the greatest medical, anthropological and ethnological collection in the world. Some have claimed that the reason was political. A Labour government did not want such clear evidence that the extraordinary efforts of a single individual could achieve so much.

Since the 1970s, there have been a number of cases around the world where museums have sold pieces, which were bequeathed to them on the assumption that the museum would look after them in perpetuity. In most cases, these sales used pragmatic arguments of survival: better to sell one or two masterpieces and have money to continue, rather than needing to close the entire collection. Even so, they opened the possibility of scenarios whereby major collections could potentially be put up for sale and dispersed.

This danger is now becoming a reality. In Italy, for example, Mr. Berlusconi has set up a corporation that uses cultural heritage as mortgage collateral for other business ventures. Patrimonio Spa[79] has already mortgaged Italian Cultural Heritage worth more than 1 billion euros. As a result, major monuments such as the Trevi fountains could suddenly find themselves in the hands of entrepreneurs. Culture, which traditionally serves the awareness of a country, with added potentials for tourism, could find itself being used for very different ends.

Such developments are the more frightening when seen in the context of a third international trend. In October 1998, the World Bank, in conjunction with the Government of Italy organised the conference "Culture Counts"[80] which aimed to "sharpen the economic, social, and political reasons to invest in the cultural dimension of development." At the time this was presented as an excellent example of the generous ways in which the World Bank was looking beyond purely financial gain.

In retrospect, the World Bank's concern may need to be seen as part of a larger trend whereby the World Trade Organization (WTO) is trying to renegotiate the earlier notion of cultural exception[81] and claim that all cultural activities and products should be seen purely as commercial ventures. Individuals such as the for-

77. Organisations such as UNESCO have also pointed to dangers especially in developing countries when such cultural sites draw enormous crowds that may in fact upset the balance of the local culture.
78. *Cf.* University of Wales, Swansea. Sir Henry Wellcome.
See: http://www.swan.ac.uk/egypt/infosheet/Wellcome.htm
79. Senato della Reppublica. Gruppo Democratici di Sinistra - L'Ulivo, "Patrimonio SPA e Salvadeficit: La Grande Truffa di Tremonte e Berlusconi.
See: http://www.parlamento.it/dsulivo/dossier/patrimonio%20spa.doc
80. Dev News Media Center. "World Bank and Italy Partnering to ensure 'Culture Counts.'"See: http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20019043~menuPK:34457~pagePK:34370~piPK:42768~theSitePK:4607,00.html
81. UNESCO. Culture Trade and Organisation.
See: http://www.unesco.org/culture/industries/trade/html_eng/question17.shtml

mer French Minister of Culture, Catherine Trautmann[82] have expressed very eloquently why they oppose this trend. A growing number of individuals have pointed to the dangers that such an approach would pose[83] especially qua cultural diversity,[84] and yet the quest to reduce culture to commercialism continues.

As a result of the above one of the greatest challenges of the next decade(s) will be to ensure that we hold intact and foster the unique role of culture as a cumulative corpus of collective memory. If we fail to do through an over-zealous emphasis on short-term commercialism, we risk losing one of the pillars of our tourist industry. More significantly we shall undermine our cultural diversity, which is a key to our present and future cultural identity.

Anti-Technology

The enormous potentials of ICT and UCT outlined above have inspired many innovations and are leading to emerging fields such as humanities computing, new developments in textual and hypertextual analysis and many new methodological discussions concerning sources, authenticity, veracity and reliability, a range of questions which were previously sparked by the introduction of manuscript and later print culture.

At the same time, a number of intellectuals are intuitively against all technology as if this posed a threat to their humanist aims.[85] Instead of seeing the new technologies as extensions of man, as did McLuhan,[86] they perceive technologies simply as a threat to independent thought and insight. Instead of seeing technology as a tool to help in their critical analysis, reflection and synthesis, they see technology as something simply to be opposed.

In the past, it was the scholarly world, which helped to articulate and uphold a set of values that rose above the greed and short-sightedness of the everyday to open larger vistas of comprehension and understanding. Ironically, in a world where it is ever more difficult to attain viewpoints that reflect sufficiently developments at a global level, a significant number of scholars are rejecting the very tools that could help them to achieve such comprehensive viewpoints. Without such electronic tools, it may well prove impossible to develop new universal narratives of a tolerant type to sustain and foster values of democracy and freedom of speech. Meanwhile those with purely commercial and political agendas are using the new technologies to their more narrow ends.

Anti-Universal Narratives

Parallel with this rejection of the past, there are claims that universal narratives are also a thing of the past and thus no longer relevant. The protagonists of the -isms and the post- -isms rightly point to the multiple possibilities of interpreting texts, passages and even words. This insight is hardly new. Problems of interpretation are well known in other great languages and cultures of the world such as Sanskrit, Chinese or Arabic. The founders of new criticism such as Richards[87] and Empson[88] expounded such ideas over seventy years ago and biblical scholars have wrestled with challenges of interpretation for over two millennia.[89]

82. Catherine Trautmann, "The cultural exception is not negotiable," *Le Monde,* Paris, October 11th 1999. See: http://www.culture.fr/culture/actualites/politique/diversite/wto-en2.htm
Cf. Verane Castelnau, "France's diplomacy in international economic organizations," *Weltpolitik.net*, 18 January, 2002.
See: http://www.weltpolitik.net/regionen/europa/frankreich/952.html
83. Patrick Boylan, "Culture and World Trade," Focus*, ICOM News*, no. 1, 2002.
See: http://icom.museum/pdf/GB_04.pdf
84. Joost Smiers, *Arts under pressure. Promoting Cultural Diversity in the Age of Globalization*, London: Zed Books, 2003. *Cf.* José Álvaro Moisés, "The 'Cultural Exception', the WTO and Brazil," May 2002.
See: http://www9.cultura.gov.br/textos/ja22.htm. *Cf.* Sasha Costanza-Chock, "[CRIS - AL]. The 'Cultural Exception', the WTO and Brazil," *Wed, 16 Jul 2003.*
See: http://www.comunica.org/pipermail/crisal_comunica.org/2003-July/000662.html
85. Ronald Bailey, "Rebels Against the Future. Witnessing the birth of the global anti-technology movement," *Reason Online,* 28 February 2001.
See: http://reason.com/rb/rb022801.shtml
Cf. Richard Terra, "Anti Technology Movement Targets Nano-Technology, *NaNoDot, News and Discussion of Coming Technologies.* Foresight Institute, 19 March 2001.
See: http://nanodot.org/article.pl?sid=01/03/19/1818205
86. Marshall McLuhan, *Understanding Media: The Extensions of Man*, New York: McGraw Hill, 1964.
87. C. K. Ogden and I. A. Richards. *The Meaning of Meaning: A Study of the Influence of Language Upon Thought and of the Science of Symbolism*. 1923. New York: Harcourt Brace, 1930.
88. William Empson, *Seven Types of Ambiguity*, London: Chatto and Windus, 1930. *Cf.* "Frank Asked: What are the Seven Categories of Ambiguity? Who is it that created the construct, and when? Does the concept still have validity today?" See: http://www.philosophos.com/knowledge_base/archives_10/philosophy_questions_1092.html
89. The term *interpret* or *interpretation* occurs at least 63 times in the King James version of the Bible. See: http://www.biblegateway.com/cgi-bin/bible using the word "*interpret*" for the *King* James bible. *Cf.* bin/bible?search=interpret&SearchType=AND&version=KJV&restrict=&StartRestrict=&EndRestrict=&rpp=25&language=english&searchpage=0&x=13&y=4

Pointing to problems of interpretation is clearly a good thing, to the extent that an overemphasis on some elements of Hegelian and Kantian world views that led to oppressive Fascism, Marxism, Communism and other -isms in the twentieth century, brought much human suffering. On the other hand, in a world where democratic procedures are becoming an ever-smaller minority, there is an equally greater need for new models and explanations that go beyond the comfortable security of a small group of highly industrialised nations. As outlined in section New Global Models of Culture above, in contrast to earlier colonial and imperialist frameworks, these new models need to acknowledge the values and contributions of other major cultures. Lacking such models, Europe, which only represents about 5% of the world-population, is in danger of being dismissed as a force that is no longer relevant in the modern world.

While the existence of competing and sometimes conflicting interpretations is obvious, the real challenge is how to find new ways of representing differences fairly in narratives that go beyond a single school or faction. If we cannot achieve new narratives that go beyond these factions and are universal in their aim, the larger world is destined to dismiss cultural studies and related efforts as merely another faction in what is already a tiny minority. Some thinkers have rightly begun to complain,[90] but to complain that models are lacking is not enough: we need new, embracing models.

Present without a Past

The personal narrative navel gazing of -isms gurus is often in a context that overlooks the past. Many of the recent -isms such as de-construction-ism, post-modern-ism, and post-colonial-ism, are so much focussed on the present that they often overlook many dimensions of the past.[91] Indeed, some systematically ignore or even deny the continued value of the past, thus denying a collective memory over time and the cumulative nature of culture.

Others speak of the end of history. One of the most striking examples of this trend is Francis Fukuyama's *End of History* (1992),[92] which claimed that the fall of the Berlin Wall signified the complete triumph of western capitalism over all other societal models such that historical "development" and by implication study of the past were no longer relevant. Various commentaries by Huntingdon,[93] Baudrillard [94] and Derrida[95] have taken issue with details of the claim but have not yet come to terms with larger questions implicit in Fukuyama's approach.

Although the Berlin Wall has been taken as a symbol of the fall of communism and the triumph of capitalism, communism continues to be the dominant ideology in China and North Korea and has not disappeared from Russia. The Chinese influence in Tibet, the rise of the Maoists in Nepal, the resurgence of leftist and authoritarian governments in Africa, South America, and significant parts of the South East Asia, the difficulties of fostering democratic tendencies in Afghanistan, Iraq, Iran and elsewhere suggest that notions of an unequivocal triumph of capitalism are overstated at best if not blatantly misleading.

China, India, Malaysia, Burma (Myanmar), Cambodia and Thailand cannot really be seen as full democracies in the Western sense. Indeed, with their age-old respect for the wisdom of elders, can such cultures ever function in the same way as countries where persons are elected independently of their age? In a world where considerably more than half, some would say more than 75% of the globe's populations do not follow straightforward principles of free elections, to speak of the triumph of capitalism is more than premature.

Indeed, in the 14 years since the fall of the Berlin Wall (09 November 1989), the world looks considerably less democratic than it

90. See, for instance, Terry Eagleton, *The Illusions of Postmodernism*, Oxford: Blackwell Publishers, December 1996; Roger Kimball, *Experiments against reality: The fate of culture in the postmodern age*, Chicago: I.R. Dee, 2000; Hilton Kramer, Roger Kimball, eds., *The Survival of Culture: Permanent Values in a Virtual Age*, 2003; Keith Windschuttle, *The Killing of History: How Literary Critics and Social Theorists are Murdering Our Past*, Paddington, NSW, Australia: Macleay Press, 1996. 1st paperback ed. San Francisco: Encounter Books, 2000; David Stove, *Anything Goes: Scientific irrationalism: origins of a postmodern cult*, New Brunswick, NJ: Transaction Publishers, 2001. *Cf.* Howard Bloom, *The Closing of the American Mind,* New York: Simon and Schuster, c1987.
91. Some postmodernist intellectuals are interested in a Disneyfication of history. *Cf.* Jamie McKenzie, "The Disneyfication of History: Why Books, Libraries and Librarians Remain Essential," *fno.org*, vol. 6, no. 3, November-December, 1996.
See: http://www.fno.org/nov96/thanks.html
92. *The End of History and the Last Man*, by Francis Fukuyama; Free Press, 1992. *Cf.* Roger Kimball, "Francis Fukuyama & the end of history," *The New Criterion,* vol. 10, no. 6, February 1992.
See: http://www.newcriterion.com/archive/10/feb92/fukuyama.htm#back1
93. Samuel P. Huntingdon, Huntingdon, *The Clash of Civilizations and the Remaking of World Order*, New York: Simon & Shuster, 1993. *Cf.* Compiled by Steve Muhlberger, Nipissing University for the *World History of Democracy* site, "Chronology of Modern Democracy. Five Different Views." Originally posted December 8, 1999; updated March 16, 2000 and September 23, 2003.
Cf. http://www.nipissingu.ca/department/history/muhlberger/histdem/chronpag.htm
94. European Graduate School: Jean Baudrillard. Reversion of History. Translated by Charles Dudas. *L'Illusion de la fin: ou La greve des evenements*, Galilee: Paris, 1992.
See: http://www.egs.edu/faculty/baudrillard/baudrillard-reversion-of-history.html; *Cf.* Jean Baudrillard. French Theorist and Philosopher. From The Illusion of the End, 1992. See: http://grids.jonmattox.com/people/baudrillard.html; *Cf.* Jean Baudrillard. "Paroxysm: The End of the Millennium or the Countdown," *Economy and Society*, 26/4, November 1997, pp. 447-455.
See: http://www.egs.edu/faculty/baudrillard/baudrillard-the-end-of-the-millennium-or-the-countdown.html
95. Stuart Sims, *Derrida and the End of History*, Kallista: Totem Books, 1999.

Year	Domain	Country
1992	Libraries	Bosnia [96]
1997	Built Heritage, Monuments	Tibet [97]
1999	Churches, Monuments	Serbia[98]
2000	Built Heritage	Malaysia [99]
2000	Built Heritage, Archaeology	Belize[100]
2001	Museums, Libraries	Afghanistan[101]
2002	Libraries, Archives	Palestine[102]
2003	Museums, Libraries	Iraq[103]

Figure 3. Recent examples of destroyed heritage both in war and in peacetime.

did then. The scare of September 11, 2001; problems with the World Trade Organization (WTO), uncertainty of the economy, increasing unemployment even in the richest countries such as Germany are shaking confidence in capitalism so thoroughly that any abandonment of history seems more than premature. Perhaps more than ever before, we need awareness of the larger rhythms of historical realities to buffer us from the modish predictions of fashionable -isms. Meanwhile, other disturbing developments make such concerns even more urgent. While some intellectuals are consciously ignoring the past, some non-intellectuals are consciously destroying memory of the past so that it cannot be studied even if one wished to do so.

Systematic Destruction of the Past

Traditionally there has been a long history of destruction of cultural heritage. Among the most famous examples is the Library of Alexandria which was destroyed by Julius Caesar (47 A.D.), by Christians (391 A.D.) and by the Arabs (641 A.D.),[104] although it was but one of many examples.[105] The twentieth century saw a dramatic rise in lost collective memory[106] through conscious destruction of heritage especially by the Nazis[107] and by Communist Russia in countries such

96. András Riedlmayer, "Erasing the Past: The Destruction of Libraries and Archives in Bosnia-Herzegovina," *Middle East Studies Association Bulletin*, July 1995. See: http://fp.arizona.edu/mesassoc/Bulletin/bosnia.htm. *Cf.* Andras Riedlmayer, "Libraries Are Not for Burning: International Librarianship and the Recovery of the Destroyed Heritage of Bosnia and Herzegovina," *61st IFLA General Conference - Conference Proceedings*, August 20-25, 1995. See: http://www.fh-potsdam.de/~IFLA/INSPEL/61-riea.htm
Cf. Harbour Fraser Hodder, "Bibliocide," *Harvard magazine*. See: http://www.harvard-magazine.com/issues/nd96/right.biblio.html
97. Historic Lhasa Palace Demolition," *Tibet Information Network (TIN)*, 19 June 1997. See: http://www.tibetinfo.net/news-updates/nu190697.htm "Further demolitions of historic buildings in Lhasa," *Tibet Information Network (TIN)*, 29 April 2002. See: http://www.tibetinfo.net/news-updates/2002/2904.htm
98. Serbian Orthodox Diocese of Raska and Prizren, "Destruction of the Serbian Orthodox Churches in Kosovo and Metohija." See: http://www.kosovo.com/destruction.html
99. MGG Pillai to Sang Kancil, "[sangkancil] [MGG] One More Heritage Building in Kuala Lumpur Destroyed," 24 August 2000. See: http://www.malaysia.net/lists/sangkancil/2000-08/msg00187.html
100. Belize Development Trust, "The Belizean Priceless Archeological Heritage is to be Destroyed by Townies Planning, So Says the Rumor Mill! Belize Will Lose All It's Historical Treasure Worth hundreds of Millions, *Report #285*, May 2000. See: http://www.ambergriscaye.com/BzLibrary/trust285.html
101. Afghanistan –Behind the Headlines. Moesgard Museum Exhibition, December 1st 2001- February 1st 2004: Under Taliban Rule. Cultural Heritage Destroyed. See: http://moesgaard.hum.au.dk/afghanistan/ie050101.html. *Cf.* UNESCO launches drive to save Cultural Heritage in Afghanistan, 28-06-2002. See: http://portal.unesco.org/en/ev.php@URL_ID=2659&URL_DO=DO_TOPIC&URL_SECTION=201.html
Cf. Enemies of the Afghan heritage. See: http://www.rawa.org/museum.html
Luke Harding, "Battle to save Afghanistan's shattered heritage," *The Guardian,* June 19, 2003. See: http://www.guardian.co.uk/international/story/0,3604,980214,00.html
Nadeem Iqbal, "Afghanistan's rich cultural heritage in ruins," *Asia Times*, 6 February 2002. See: http://www.atimes.com/c-asia/DB06Ag01.html
102. International Responsibilities Task Force of the American Library Association's Social Responsibilities Round Table. "Damage to Palestinian Libraries and Archives during the Spring of 2002." Compiled by Tom Twiss, Government Information Librarian, University of Pittsburgh, August 2, 2002. See: http://www.pitt.edu/~ttwiss/irtf/palestinlibsdmg.html
103. The threat to world heritage in Iraq: heritage destroyed See: http://users.ox.ac.uk/~wolf0126/bombed.html
Cf. George Mason University. History Network. See: http://hnn.us/articles/1400.html
(*Cf.* formerly: http://www.onlinejournal.com/Commentary/041503Conover/041503conover.html)
104. San Jose State University, "Who Destroyed Alexandria's Famous Library?" See: http://www.mediahistory.umn.edu/indextext/Alexandria.html
105. "Library of Alexandria," *Wikipedia.* See: http://en.wikipedia.org/wiki/Library_of_Alexandria
106. Hans van der Hoeven on behalf of Joan van Albada, "Lost Memory –Libraries and Archives Destroyed in the Twentieth Century," prepared for UNESCO on behalf of IFLA, Paris: UNESCO. See: http://www.unesco.org/webworld/mdm/administ/pdf/LOSTMEMO.PDF
107. The Nizkor Project. The Trial of German Major War Criminals Sitting at Nuremberg, Germany, 14th February to 26th February, 1946. Sixty-Fourth Day: Thursday, 21st February, 1946 (Part 8 of 8). See: http://www.nizkor.org/hweb/imt/tgmwc/tgmwc-07/tgmwc-07-64-08.shtml

as Lithuania.[108] Notwithstanding Unesco's efforts to the contrary, such willful destruction is increasing. While the press made a great noise about the Taliban's destruction of the Bamiyan Buddhas[109] in Northern Afghanistan in 2001, almost nothing was said of the hundreds of painted caves which were destroyed by U.S. bombs in the ostensible hunt for Osama bin Laden. Such actions are disturbing examples of a global trend (figure 3).[110] A report from Lhasa in Tibet (1997) gives some indication of the scale of this destruction:

> "The demolition is part of a five-year wave of modernisation in Lhasa which by the end of last year had led to the demolition of 350 of the 600 historic buildings which stood in the Old City when the Chinese arrived four decades ago. Twenty-eight historic buildings in the area are reported to have been demolished since January, 15 of them in the last month."[111]

While the destruction of heritage with its "bibliocide" and "monumento-cide," is not obviously linked with ICT, the new media clearly offer incentives for extremists such as the Taliban to destroy the Buddhas. More importantly the new media allow those with an agenda of killing memory a context for rewriting the histories of persons who no longer have an official written past. In the absence of documentary evidence it becomes possible to assert the stories that match one's own agendas through propaganda.

In this context, intellectuals who are consciously against history and speak of the death of history[112] are more than slightly disturbing. Willful destruction of sources fits perfectly into a political agenda that poses major dangers because those whose history is eradicated will be at the mercy of those who claim or simply enforce the right to write history as they see fit. Those who argue for purely contemporary cultural studies thus become consciously or unwittingly threats to historical traditions of cultural diversity.

Need for a Distributed European Electronic Repository

Independent of the role played by memory institutions in the development of national or larger repositories (*cf.* Distributed Repositories above), there is thus a fundamental need for new links between distributed repositories such that users can gain access to the big picture offered by networked digital knowledge and culture. First steps in this direction are already evident through the rise of virtual national union catalogues[113] and the emergence of networks such E-Culture Net.[114] In a networked world we need to share examples in order to develop and share new critical methods.

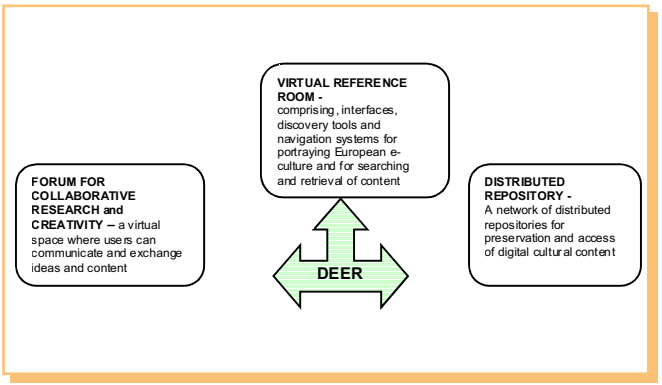

Figure 4. Main elements of an initial Distributed European Electronic Resource (DEER) as outlined by Suzanne Keene and Francesca Monti.[115]

108 *Cf.* Republic of Lithuania - Lietuvos Respublika. Content of data base: Banned literature and newspapers Specific period: The first year of the Soviet occupation 15.6.1940-21.6.1941 of Lithuania. Censoring body: GLAVIT (The Supreme Board of Publishing and Literature, Council of Ministers of the Lithuanian SSR). Cited by: Beacon for Freedom of Expression.
See: http://www.beaconforfreedom.org/about_database/Lithuania.html

109. It needs to be remembered that iconoclasm has a long-standing tradition even in the West (e.g. 305, 692 A.D., in the 8th and 9th centuries. *Cf.* "iconoclasm, Christianity, General," AllRefer.com. See: http://reference.allrefer.com/encyclopedia/I/iconocla.html (Formerly: http://www.1upinfo.com/encyclopedia/I/iconocla.html) and during the so-called Beeldenstorm in 1557).

110. This is reflected also in the 260,000 hits under heritage destroyed using the Google search engine in September 2003.

111. "Historic Lhasa Palace Demolition," *Tibet Information Network (TIN) News,* Updates, 19 June 1997. See: http://www.tibetinfo.net/news-updates/nu190697.htm

112. Keith Windschuttle, *The Killing of History: How a Discipline is Being Murdered By Literary Critics and Social Theorists*, Macleay Press, 298 pages, Review by: Roger Kimball, "'The Killing of History': why relativism is wrong," *The New Criterion,* vol. 15, no. 1, September 1996. See: http://www.mrbauld.com/relatkram.html
Cf. J. Christoph Amberger, "The Death of History: Historic European fighting arts in the Mis-information Age," *Fencers Quarterly Magazine*.
See: http://www.swordhistory.com/excerpts/masters.html
Anil Chawla, "The Death of History." See: http://www.samarthbharat.com/history.htm
(*Cf.* formerly: http://anilchawla.homestead.com/history.html)
"The Death of History", The Black Hole of Conservation, The East Rouge Greenway Association. See: http://www.blackhole.on.ca/foreward_right_bottom3.htm
The Death of History. Campus Follies Lesson Four, *Yggdrasil Library.* See: http://home.ddc.net/ygg/cf/cf-04.htm
Cf. Fred Kaplan, "The end of history. How e-mail is wrecking our national archive," Slate, June 4, 2003. See: http://slate.msn.com/id/2083920/

113. An excellent example is Canada: Virtual Canadian Union Catalogue Project (VCUC) (See: http://www.nlc-bnc.ca/resource/vcuc/), which is developing a parallel site for distributed virtual museums: Virtual Museum of Canada.
See: http://www.virtualmuseum.ca/English/Museum/index_flash.html

114. E-Culture Net. See: www.eculturenet.org

115. Ibid.

Networks are already increasingly radically the scope of materials to which we have access. In 1630, the largest libraries of the world such as the Vatican and the Herzog August Bibliothek had around 130,000 books. In 1950, the largest libraries (e.g. Bibliothèque Nationale, British Library and Library of Congress) had between 10 and 15 million books. National union catalogues in Germany now have over 40 million items. The network of the Research Libraries Group now has access to over 115 million titles.

If various union catalogues and networks were systematically combined, we would have access to hundreds of millions of books. Access to such numbers would be more than a simple increase in scale. We could begin to automate efforts begun over a half century ago with projects such as the Union Catalogue of Incunables[116] whereby we gain insight into the numbers of extant copies of books and their locations: elements of which are essential for the still emerging field of reception history.

Such a distributed repository of titles must become a starting point for a distributed repository of the full texts to which they point. To make such texts fully accessible, the development of 1) a distributed repository will require: 2) the development of virtual reference rooms which incorporate the dimensions of dynamic knowledge outlined above and 3) a forum for collaborative research and creativity (figure 4). Together these elements will lead to a Distributed European Electronic Resource (DEER). While such a project can be seriously underway within a decade, it is necessary to accept a far longer time-frame for so fundamental a change in our access to culture and knowledge as a whole. It may well take at least a century before the enormous challenges of creating a World Online Distributed Electronic Resource (WONDER) becomes a reality.

Conclusions

The new media entail something much more profound than the advent of new technologies in our offices and homes. They are transforming the way we store our collective memory, the ways we access this memory and even our definitions of knowledge. Potentially they can transform our learning, work and leisure activities.

One of the most obvious challenges of the next decade entails the creation of reliable, permanent, distributed repositories, to complement the existing roles of analog memory institutions. A second challenge entails increasing the scope of digital cultural heritage to include not only tangible and intangible heritage but also the theories underlying these expressions and the commentaries arising from them, thereby contextualising many materials which are becoming accessible online. This process will be further helped through new links between national, regional and local expressions whereby multiple interpretations of events become accessible and the full range of multi-lingual, multi-cultural diversity will become visible.

The new technologies offer much more than digital access to existing analog objects and records of culture. Whereas analog media were limited to static, linear lists of knowledge, which were either alphabetical, chronological or geographical, digital media permit dynamic lists that can generate all these alternatives on demand. Indeed, digital media introduce various possibilities of dynamic knowledge that provide more systematic surveys of existing claims. Digital media thus open new avenues for scholarship and potentials for the re-organisation of knowledge. These potentials are increased through European approaches to intellectual property that protect the full contents of cultural products and expressions while encouraging citations, references, and allusions that foster cultural continuity and cumulative, collective memory.

At the same time, the advent of the new technologies is not without dangers. Five such areas were identified: 1) an overzealous commercialism that undermines scholarship, tourism, cultural diversity and potentially even our cultural identity; 2) an intuitive opposition to all technological tools; 3) assumptions that universal narratives are no longer possible; 4) assumptions that history is no longer relevant and 5) willful destruction of historical sources.

Ultimately culture is something much more than expressions in isolation. It is a cumulative combination of expressions, linked with theories and commentaries, reflections, and criticisms that requires permanent, multi-lingual, multi-cultural, multi-valent access to be fully creative. This requires a combination of 1) distributed repositories; 2) virtual reference rooms and 3) a forum for collaborative research and creativity functioning as a virtual agora in the form of a Distributed European Electronic Resource (DEER) as a first step to a global equivalent (WONDER). A permanent network such as E-Culture Net could address the challenges outlined above; help to develop critical methods; create new models for culture that transcend Euro-centrism and help to make the DEER and WONDER a reality.

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116. The *Gesamt Katalog der Wiegendrücke* is headquartered in Rostock.

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DOSSIER "ICT and Heritage"

Use of Websites to Increase Access and Develop Audiences in Museums: Experiences in British National Museums*

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Abstract
Many authors argue that digital technologies, and particularly the World Wide Web, have great potential to serve the challenges faced by museums in relation to access and audience development, which involves reaching and nurturing both existing and new audiences. But what initiatives are there, and how effective are they? What strategies and actions are museums undertaking to take advantage of this potential? What is it being done to establish closer ties with core audiences or to attract new audiences? And what is the audience response to the museums' efforts? The British experience in this field is of particular interest because it shows a political context favourable to the development of this emerging area of museum work, and it provides some remarkable and exemplary cases from which to learn good practices.

Keywords
museum, United Kingdom, lifelong learning

Resum
S'ha parlat molt en els darrers anys sobre el potencial dels webs per a incrementar l'accés als museus i obrir-los a nous públics. Però, en concret, què s'està fent en aquesta línia i amb quina efectivitat? Quines estratègies i accions emprenen els museus per a aprofitar el potencial del web? Què s'està fent per a establir lligams més estrets amb els públics habituals o per a atraure nous públics? Quina és la resposta del públic a aquests esforços? L'autora mira de respondre aquests interrogants en el context del Regne Unit, a partir de les entrevistes fetes a set museus nacionals i de l'anàlisi d'algunes experiències exemplars, tot plegat en un context polític favorable al desenvolupament d'aquesta nova àrea de treball.

Paraules clau
museu, Regne Unit, aprenentatge continu

*Contents reported in this paper are part of a wider research study carried out in London in 2002: Loran, M. (2002). *Online Museums And Audiences: Contribution Of Museum Websites To Access And Audience Development.* Master's dissertation presented at the MA in Heritage Management at the University of Greenwich Business School.

In the last decade, the world of museums has placed renewed emphasis on education and access, with the goal to make museums more relevant, inclusive and valuable to society; places for debate and lifelong learning resources for communities. In this context, Information and Communication Technologies (ICT), and especially the internet, have a vital role to play. They provide museums with new opportunities to achieve their goals by increasing access to museum collections and knowledge in an unprecedented way; by broadening and diversifying audiences; and by enabling visitors to participate in and enhance the museum experience.

Many authors argue that digital technologies, and particularly the World Wide Web, have great potential to serve the challenges faced by museums in relation to access and audience development, which involves reaching and nurturing both existing and new audiences. But what initiatives are there, and how effective are they? What strategies and actions are museums undertaking to take advantage of this potential? What is being done to establish closer ties with core audiences or to attract new audiences? And what is the audience's response to the efforts of museums?

This article presents a summary of the main rationales from the literature review, and key findings and a selection of examples from primary research: an exploration of current practices among a group of British museums with a strong online presence. The research reported is part of a wider study (Loran, 2002).

Unprecedented access to collections and knowledge

MacDonald and Alsford (1997) discuss the opportunities that digital technologies present for the dissemination of knowledge on a scale never before possible, and see this capacity as a key factor in transforming museums. Their vision for a virtual museum goes beyond the digitisation of resources in individual museums, to the collaboration of multiple institutions (museums, libraries, archives, historic sites, scholarly societies, etc.) combining their digital resources: the "meta-museum".

The idea of making collections more accessible and disseminating knowledge to the widest possible audience is clearly a positive one. However, several authors warn of the dangers of museums just providing "more information to more people" and not really taking advantage of the interactive capacities of ICT. Donovan (1997) warns museums not to think that simply providing access to museum collection databases (and object-centric information) would be enough. He encourages them to provide context, storytelling, and stimulate curiosity, exploration and serendipity, if they want to create compelling online experiences and be of interest to a broad range of users. Likewise, Dierking and Falk (1998) emphasise how the capacity of new technology to offer visitors learning options, interactivity and various degrees of depth of information will help museums ensure better understanding in visitors with varying backgrounds, interests, and knowledge levels, therefore increasing conceptual accessibility. Anderson (1999) proposes a "learning model" for creating digital content, rather than an "information provision" model.

Reaching broader and more diverse audiences

Many authors stress the power of ICT to attract new audiences. Certainly, the internet allows museums to reach global audiences, even in their own homes. It can reach people who are not able to visit the museum, or who are not inclined to do so. And the interactivity of the media is known to appeal children and young audiences. As stated by MacDonald and Alsford (1997), "…museums cannot remain aloof from technological trends if they wish to attract 21st century audiences. Tomorrow's museum visitors will be people for whom computers and multimedia have already played a prominent part in their lives through schooling, recreation, and work experience."

However, beyond expanding the geographical and age group reach of museums, will the internet also affect the socioeconomic, educational or cultural background of museum audiences? Museum audiences for digital resources are growing fast, but the demographic information about web users indicate a similar profile to that of the traditional museum-visiting audience in terms of income and education (MacDonald and Alsford, 1997; Keene, 1998).

In some countries this is starting to change. Ross (2001) indicates that more than 70% of UK population now has access to web technologies, from their homes, schools or offices. And soon, he reports, thanks to current developments in technology (such as mobile phones that enable surfing the internet and interactive digital television), and national initiatives that will connect all schools and libraries, a broader spectrum of society will gain access.

Creating new relationships with audiences

By helping to change and strengthen relationships with audiences, ICT also have an important role to play in creating the audience-centred museum that current trends in museology propose. Specific audience-centred interpretative strategies where ICT may contribute, as suggested by Morrisson and Worts (1998), include: bringing the visitors' story into the interpretive process; connecting the content of the activities to the visitors' life; connecting objects to people, places and purposes; connecting people to people, and people to resources; facilitating and encouraging playfulness;

personalising the message through stories and narrative; involving visitors in making decisions, choices and judgements; providing multiple perspectives and viewpoints; creating responsive environments; and providing relevant information.

Jackson's (1998) vision for using ICT puts people first, encouraging applications that are user-driven, to create social relationships, and promote participation with the incorporation of users' expertise and views. He supports the idea of "collaborative knowledge creation" or "open documentation", which stresses the value of developing knowledge about collections collaboratively with the public (by making specific areas of collection databases open to public contribution). Anderson (2000) emphasises the need to help people learn how to use digital cultural resources creatively, and to ensure that this opportunity is open to groups that the market alone cannot reach.

The potential of web media to change museums' communication with users in a fundamental way is summarised succinctly by Walsh (1997). He argues that the tone of institutional authority characteristic of museums does not work well on the web, since its interactive characteristics have great potential to change the museum voice into "an infinitely richer and truer dialogue with the world".

The British experience:

Museums in the UK offer an interesting field to explore this emerging area of museum work. They operate in a policy context with a clear national agenda to foster lifelong learning, access and social inclusion. The Department of Culture, Media and Sport (DCMS) requires all government-funded museums, and the national museums in particular, to adopt access and audience development policies and to make the best use of ICT.

Several DCMS policy documents (such as the *Learning Power of Museums*, 2000; and *Centres for Social Change: Museums, Galleries and Archives for All*, 2000) encourage the use of ICT as an important way of increasing accessibility to museums – with the belief that it can help not only to overcome geographical, economic, intellectual and attitudinal barriers to access, but also to reach, involve, and develop long-term and quality relationships with audiences.

To develop this potential, the UK government is committed to the provision, and funding, of digital learning networks, the creation of digital cultural content, and universal ICT access (internet in 2005 and digital TV in 2010 as targets), establishing the necessary conditions for the development of the digital dimensions of museums.

Networks and projects such as the *National Grid for Learning* (providing quality digital learning resources for schools and other learning institutions); the *People's Network* (connecting all public libraries to the internet by 2002 and providing access to educational content in libraries, museums, archives and learning networks); the *24 Hour Museum* (the internet gateway for UK museums, and the first national museum on the web); or *Culture Online* (aiming to give both school children and lifelong learners online access to high quality and truly interactive cultural resources). As Anderson (1999) points out, there is great potential for museums to distribute digital learning resources over these networks.

The sector's demand for investment in ICT has been clearly articulated in reports such as *The Netful of Jewels* (1999), *Building the Digital Museum* (2000) and *Renaissance in the Regions* (2001). As of 2002, the most important funding initiatives that, directly or indirectly, benefited museums were:

- *New Opportunities Fund (NOF) Digitisation Programme:* £50m to create learning content on a large scale.
- *DCMS/Resource ICT Challenge Fund:* £500,000 (2 years) to encourage smaller museums to make innovative use of ICT.
- *People's Network:* £170m to connect all UK public libraries to the internet, including content, infrastructure and training.
- DCMS funding of £13m to develop projects for *Culture Online* (2002-2004)

National museums developing their online presence

With the goal to explore current practices among museums with a strong online presence, a series of semi-structured interviews were conducted with key staff at seven national museums: the Natural History Museum (NHM), the National Maritime Museum (NMM), the Victoria and Albert Museum (V&A), the Imperial War Museum (IWM), the National Gallery (NG), the National Portrait Gallery (NPG), and the Tate Gallery (TG) (Loran, 2002).

The museums interviewed have had an online presence since the mid-90s (the Natural History Museum was the first in 1994, followed by the National Maritime Museum in 1996, and the National Gallery and the Tate Gallery in 1998). Since then, all have redesigned and re-launched their websites at least once. Websites have evolved quickly, from providing little more than visitor information and collection highlights to becoming large and complex sites that present a museum's scope of activity, provide online collection databases, online exhibitions, and learning resources; and, increasingly, building communities of interest with targeted programming.

The number of website visits reported is very high (and growing), in many cases higher than physical visitor figures. Here are some figures from the financial year 2000/01:

Museum	Physical visitors 00-01	Web visits 00-01
IWM	1.6 m*	3.2 m*
NHM	1.6 m	3.1 m
NMM	800.000*	1.5 m*
NG	4.8 m	1.1 m

* Figures include visitors to museum's branches and web visits to branches' sites or sub-sites.

Museum	Web visits 00-01	Web visits 01-02	Growth
NG	1.1 m	2.1 m	91%
IWM	3.2 m*	5.3 m*	66%
NHM	3.1 m	4.7 m	51%
NMM	1.5 m*	2 m*	33%

* Figures include web visits to museum's branches' sites or sub-sites.

What are museums doing to achieve such growth in web development and such a positive response from visitors? Research interviews revealed some key factors. The museums studied show a very strong commitment to web development among the direction and senior managers; they have web strategy groups in place to make sure that policy and strategy for the website is managed in a cross-divisional way and involve all museum departments; and report a very good integration of websites into museum mission, goals and policies. The following comments illustrate the vision and interest in an important online presence:

> "One of the museum's central roles is to make information about the natural world accessible to a growing audience. Its pioneering website provides scientific data, educational programmes and resource materials to millions of internet users across the globe."
>
> Natural History Museum Annual Report 1999

> "I see our overriding challenges as reinforcing the academic base and ensuring the widest access for visitors of all ages, both for research and for leisure, and I envisage greater use of digital technology as our key strategy."
>
> Roy Clare, September 2000, recently appointed Director, National Maritime Museum, press release

Another key factor is the existence of dedicated departments supporting the websites – with teams of five or six staff with very specific skills in some museums such as the Tate Gallery, the V&A and the National Gallery. Less widespread was the existence of specific website strategy documents or programming frameworks with clearly defined objectives and activities to guide web development – still at an early stage of development at the time of the interviews.

It is clear among the group of British national museums studied, that websites are becoming central to museum activity. A sign and example of websites' increasing importance and centrality can be found at the Tate Gallery, an institution made up of a group of galleries. In addition to serving and representing the institution's areas of activity, the website is seen as a new group location (the fifth, after the Tate Britain, the Tate Modern, the Tate Liverpool and the Tate St. Ives), with its own personality and featuring a distinct programme appropriate to the medium.

The museums' aspirations for websites are ambitious. Funding is therefore a major issue if they are to fulfil them. Website development and web teams at the museums interviewed are generally funded by core museum budget. These funds are expected to be complemented with sponsorship and government funding initiatives for specific projects. An interesting and different approach can be found at the Tate Gallery, where a sponsorship package with BT funds the Digital Programmes Department (the staff creating content), contributes cash towards specific web projects, provides help in-kind (hosting the site and the webcasting streaming media service) and secures marketing for the site (adverts and media coverage).

An important and common challenge is to secure major investment, so as to be able to embark on large-scale projects such as providing electronic access to museum collections, and developing interpretive and learning resources, which can be very labour intensive to produce. Government funding initiatives such as the New Opportunities Fund and Culture Online play an important role here, making it possible to digitise materials and develop educational content for websites, at a level that probably would not happen otherwise.

Some museums have already secured important government funding, such as the NMM, which was awarded a 1.6m NOF grant for its Port Cities Project (enabling it to make about 2m items of the museum's holdings accessible electronically and to create an internet-based learning resource combining the collections of several maritime museums and archives from around the UK).

Approaches to web content and audience development: a few examples

The museums studied reported focusing web content development mainly on increasing access and understanding of the collections, and broadening participation among traditional museum audiences. A great deal of effort is being put into making collections available online and developing interactive resources for learning and exploration – serving the needs of the general visitor and the specialist alike. More recently, online programming is becoming more targeted, serving a diversity of audiences with projects aimed at specific groups – not only core audiences, but also those usually underrepresented at museums.

Museums with art collections have been the first to digitise collections and make them available online, but all the museums interviewed recognised the importance of making collections accessible through online databases, and all of them are working or planning to work towards this goal in the near future – well aware of the crucial need of first working on properly documenting and cataloguing the collections. The nature and size of collections are certainly key determining factors. The National Gallery collection is entirely online but it is a small collection of about 2,400 works, whereas the Natural History Museum's collection, for instance, has 70m specimens.

The National Gallery, the National Portrait Gallery and the Tate Gallery websites have invested in extensive and exemplary online collection databases. New data, features and search tools are continually being added to improve the service provided. These websites offer a range of tools to aid searching and exploration of collections, accommodating different needs, interests and levels of knowledge. They all report high levels of usage of collection information, demonstrating a good public response to this approach.

Education is becoming another key factor for web content development at the museums interviewed, with plans to increase the provision in coming years. Online learning resources aim to provide rich contextual information, with different layers of interpretation and entry points, and to encourage people's active involvement in learning. The Victoria and Albert Museum web projects, for instance, focus on interpretative and learning materials for non-specialist audiences. A major development in this direction has been the transfer of all of the British Galleries' interactive elements to the website.

For school audiences, new materials related to the National Curriculum (targeted to specific ages and educational levels), and new resources for teachers are being created. Good examples are two highly targeted educational interactive elements offered by the Imperial War Museum for children aged 8-10 years old: *Children of the Second World War* and *What was life like in the Second World War*, which provide images, oral recordings of people talking about their experiences and downloadable resources for teachers.

An interesting case in the trend to provide learning experiences for lifelong learning, beyond formal education, is the Tate Gallery website, which has recently expanded to offer an e-learning area. An example of material on this portal offering digital learning resources is a learning package about Damien Hirst's "Pharmacy", the first of a series of online projects in which contemporary artists explore and provide information on their works in the Tate Gallery collection. It includes a 360º panorama of the installation; a biography of the artist, with photos and suggestions for further reading; activities and fact sheets for schools and families to help explore the work in more detail; and a discussion area, with different views about "Pharmacy" from the artist and other commentators, in text and audio.

There are also some very interesting initiatives seeking to build on special interest and research communities around the world. At the Natural History Museum, for instance, the website fulfils an important role in providing content for professionals and enthusiasts, an audience that is not well cared for in the galleries (which are more targeted to tourists and families). It includes a portal to a comprehensive index of natural history information resources on the web; and the "Museum Data Locator", a facility that allows for searches of many of the museum's databases.

The National Maritime Museum also addresses the specialist audience through e-publishing (*The Journal of Maritime Research*, an academic publication available online on subscription) and a subject gateway (PORT, an associated website) offering access to comprehensive online resources on maritime studies selected in terms of their quality by subject specialists at the museum.

At the other end of the audience spectrum, some efforts are also taking place to reach and maintain relationships with non-traditional audiences, such as ethnic minorities or people from deprived areas. Existing web resources are usually an online component of social inclusion projects taking place in the "real world". They often present the project and showcase participants' stories, views, artwork or other contributions gathered or developed during outreach education programmes.

The V&A website provides interesting examples of web resources that support continued education work with ethnic groups, such as the *Shamiana* and the *Sikhs and Arts of the Panjab* projects. However, these experiences had not seen, at the time of the interview, much response, highlighting the difficulties involved in attracting these groups to the website and the need to take into account issues of intellectual accessibility.

In relation to disabled audiences, all interviewees reported initiatives and efforts to improve the websites' accessibility for people with physical and mental disabilities, an issue clearly gaining importance and recognition. At the IWM, a complete redesign of the website was underway at the time of the interview so that it would adhere strictly to W3C guidelines (from the World Wide Web Consortium). At the same time, the National Gallery was undertaking a comprehensive audit by the Royal National Institute for the Blind (RNIB) so that it could be included in the RNIB "See it Right" Accessible Website Initiative. The Tate Gallery is developing a groundbreaking project involving a digital educational resource for a visually impaired audience, to help them to explore some of the ideas, innovations and working methods of Matisse and Picasso.

Conclusions

In summary, the British experience is of particular interest as it shows a political context favourable to the development of this emerging area of museum work, and it provides some remarkable and

exemplary cases from which to learn good practices. The research findings show a clear vision and commitment at the museums interviewed to an important online presence, and to use websites to increase access and reach broader and more diverse audiences. The research reveals an intense content development activity that makes good use of the capacities of the medium, and programming increasingly targeted to address the needs and interests of different audience groups. The interviewees outlined a good number of initiatives that, together, provide an interesting range of approaches, aimed mainly at engaging core users more deeply in the museum experience, but aiming also to attract and serve new audiences.

The public response has been highly positive. All the museum websites studied reported high numbers of online visits and meaningful use of online content, but little research and evaluation has been carried out to date. Despite websites playing an increasingly important role in terms of access and audience development goals, the extent and effectiveness of their contribution is still not known. What patterns of use are emerging? Are websites changing the way audiences use the museum and its collections? Does the online experience improve the museum experience? Do websites really help to diversify the museum audience base? And to increase loyalty among core audiences? How do web audiences relate to or differ from the physical visitor profile? Online audience research and summative evaluation of usage have an important role to play if museums want to understand this impact.

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Related links

Natural History Museum:
www.nhm.ac.uk
National Maritime Museum:
www.nmm.ac.uk
Victoria and Albert Museum:
www.vam.ac.uk
Tate Gallery:
www.tate.org.uk
Imperial War Museum:
www.iwm.org.uk
National Portrait Gallery:
www.npg.org.uk
National Gallery:
www.nationalgallery.org.uk

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[www1]: www.adoptart.com

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DOSSIER "ICT and Heritage"

Narrowcasting of Virtual Cultural Portals: the Cases of Barcelona's Botanic Gardens and the Boí Valley

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Abstract
This article aims to explain the reasons behind the success of a cultural resource on the internet. It is not always the number of hits that determines this success, instead they need to be used by specialist groups and in the context of cultural dissemination, education and research. The aim in defining the key concepts of cybermetrics, the discipline that studies the quantitative description of the content and communication processes seen on the internet, is to show how the narrowcasting of cultural resources to groups of interest is more important than general broadcast over the internet.

Keywords
cybermetrics, virtual portal, narrowcasting

Resum
Aquest article mira d'explicar les raons que hi ha al darrere de l'èxit d'un recurs cultural a Internet. No sempre el volum d'accessos resulta determinant en aquest èxit, sinó que calen col·lectius especialitzats que el facin servir i contextos de difusió cultural, educació i recerca. Per mitjà de la definició dels conceptes clau de la cibermetria, la disciplina que estudia la descripció quantitativa dels continguts i els processos de comunicació que s'esdevenen a Internet, es mostra que la difusió selectiva a grups d'interès dels recursos culturals té més importància que la divulgació general a Internet.

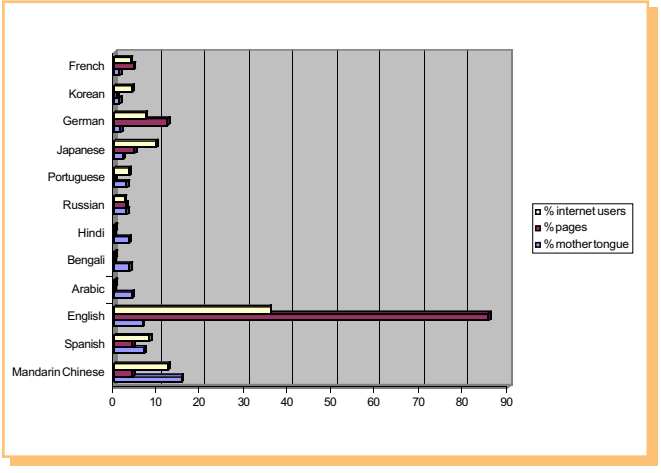
Paraules clau
cibermetria, portal virtual, difusió selectiva

Over the last few years, a new discipline has become increasingly important, known as *cybermetrics*, it "studies the quantitative description of the content and communication processes on the internet" (Aguilló, 2004). This new discipline covers any area of knowledge that can be applied to the web and, for this reason, has recently seen increased interest at educational and cultural institutions present on the internet. A sign of this is the recent holding of the *Jornadas de Posicionamiento.es* conference in Alicante (May 2004), where the key factors for positioning Spanish-language cultural institutions were analysed.

Some key aspects of cybermetrics

The importance of the discipline comes from the fact that it is assumed that it has been empirically proven that today's internet users have a standard behaviour when searching for information. It has been stated that 80% of web sessions use search engines, with Google being the favourite in 60% of these cases, and that users normally only access the first three or four results from each search (Aguilló, 2004). Thus, considering this to be a user's standard behaviour, if a heritage institution wants to publicise its cultural contents, it needs to take these criteria into account.

In any case, we need to bear in mind that the guidelines for current behaviour fit a specific internet situation, where general portals are to the fore and where it is difficult to access specialist fields quickly. As portals and search engines become more specialised, (ie the Semantic Web), a change in these guidelines for user behaviour should be seen.



Without doubt, another of the characteristics that needs to be taken into consideration is the language used on the internet. The graph showing the world's 12 most used languages shows the percentage of population in terms of each mother tongue, and allows for comparisons with the percentage of pages on the internet and the percentage of internet users using each language.[1] As can be seen, English is currently the *lingua franca* on the internet, both in terms of the amount of content (percentage of internet pages) and the number of internet users, despite the fact that only 6.48% of the world's population speaks English as their mother tongue.

Languages	% mother tongue	% pages	users 03 % internet
Mandarin Chinese	15.27	4.3	12.2
Spanish	6.94	4.3	8
English	6.48	85.3	35.6
Arabic	4.16	0.1	0.4
Bengali	3.7	0.06	0.5
Hindi	3.47	0.06	0.5
Russian	3	2.8	2.5
Portuguese	2.9	0.4	3.5
Japanese	2.08	4.6	9.6
German	1.62	12.1	7.3
Korean	1.29	0.7	4.1
French	1.24	4.5	3.8

This same situation, where internet presence outweighs actual numbers, is seen with languages such as French, German or Japanese, whereas other languages, including Spanish, Portuguese, Chinese, Russian and Korean need to produce more content in order to measure up to to the numbers of speakers and internet users. However, the situation of the Arabic, Hindi and Bengali languages on the internet is disproportionately poor when compared to the position they deserve. In line with this data then, cultural portals on the internet should use those languages required to make them accessible to potential audiences, taking into account that as more pages are published in each language, the competition between them will increase.

Another important factor when placing a resource on the internet is the amount of data or the number of individual pages, both directly visible and invisible – ie, generated dynamically from a database. Logically, the greater the amount of data, the more possibilities to increase the number of consultations of these resources.

As has been stated above, the key to the popularity of a resource is the fact that it appear in one of the top positions in

1. Data obtained from Linguasphere (http://www.linguasphere.org), for frequency of words on AlltheWeb, and Global Reach (http://global-reach.biz/globstats).

search engines, a concept that has been defined as *visibility*. A range of factors influence this by affecting the algorithms used by the search engines, above all Google, including the number of external links, the definition of keywords (*metatags*), the page's ranking (*PageRank*) and diversity. A website's impact depends on the relation between its visibility and the number of pages it has.

Finally, the evaluation of the results for access to a virtual resource requires indicators for its popularity (absolute number of visits, relative ranking of visits) and for the visitors (sessions, geography, itinerary, language, search words). Basically, the idea is to analyse the data provided by a range of access or log analysis programs, each with its own limitations. In this case, we have generally used the Webalizer, Webtrends and Awstats programs.

Virtual resource dissemination strategies

Optimising results, in quantitative terms, which requires the correct application of the concepts of cybermetrics, is the most common strategy for publicising a website. The site looks to offer universal access and the resource's success is measured in terms of the number of visitors, without taking into account whether visitors are satisfied or not with their visit or whether the site has a social or cultural function.[2]

It has already been mentioned that, in terms of culture, the popularity of a virtual resource is not necessarily a reflection of its quality nor does it ensure its success in providing a specialised audience with specific materials or content. For heritage and cultural resources, broadcasting and narrowcasting to specialised audiences are equally important (Carreras, 2004). When we talk about specialised audiences, we are referring to potential users of a resource with an interest in the specific subject, and to their links to the institution and the use they make of the resource for education or cultural dissemination (such as tourism). In all these cases, it is necessary to publicise the resource through portals or virtual communities linked to these specialised audiences.

At times these virtual communities or portals can be easily identified, but in the majority of cases they do not exist or are so atomised that great efforts are required in order to reach the specialised audience. Whereas broadcasting strategies are well characterised, those for narrowcasting have still to be developed and need the internet to adapt.

An initial phase of publicising can be carried out using the large internet portals specialising in cultural subjects, such as Clio, Cervantes Virtual or Monografias.com, which generate high levels of access during the first few weeks of the introduction of the resource. In Spain, there are virtually no monographic portals for museums: there is the Virtual Museum de España web space, which has yet to work, and some private initiatives, such as the Musealia portal,[www1] which have a limited geographical reach. Whereas, in some countries there are already monographic museum portals (such as http://www.24hourmuseum.org.uk), which aid wide-ranging raising of awareness for all those interested in the activities of cultural institutions (Carreras *et al*, 2003).

Following this initial phase of broadcasting on specialised monographic portals, the narrowcasting can focus on a specific audience. The aim is to find groups that might be interested in the resource, such as museum users, educators, journalists, students and groups linked to the subject in question.

A second phase consists of publicising the resource within the educational community. In our case, the Òliba group[www2] contacted the administrators of the Xarxa Telemàtica Educativa de Catalunya portal (Catalonia's Educational Telematic Network, XTEC),[www3] a web space for the exchange of virtual resources for the teaching community in Catalonia. Many of the virtual resources, which were highlighted on the homepage and in the portal's telematic sections, raised a great deal of interest. The majority of the digital resources for heritage centres need to provide an informal educational function and, thus, need to reach educational communities so as to be used in the classroom or as part of visits to these centres.

The final phase in the dissemination, but by no means less important, looks to define a series of metadata, ie, keywords that serve to aid both the subject indexing of the website by search engines and access from possible users interested in the subject. Firstly, this metadata needs to be carefully defined, in line with the Dublin Core protocol, which has been expanded for cultural resources with contributions from other institutions, including the Canadian Heritage Information Network (CHIN).[www4] All the keywords defining the website's contents are vitally important: in this case it is advisable to use a large number of specific words, rather than a small number of generic words.[3]

There is still a lack of studies into website dissemination strategies on the internet. The empirical experience from the Òliba group suggests that more specialised words, ie, those that are unlikely

2. Some of the cases of greatest success on the internet in terms of levels of access are the digital press (immediacy of news in real time) and distance education universities, such as the UOC (large virtual communities).
3. As we have statistics for access to our websites and know which words are used to find the resource, we can expand the search keyword metadata with any new words that appear on these lists.

[www1]: http://www.musealia.com
[www2]: http://oliba.uoc.edu
[www3]: http://www.xtec.es
[www4]: http://www.chin.gc.ca

to appear as metadata on other websites, ensure improved access to the resources. Thus, instead of searching for words like *heritage* or *culture*, which may well appear in many other resources on the internet, it is a much better idea to target expressions such as *computational linguistics* or *opus vermiculatum*.

Once these keywords have been defined in the different languages, programs such as AddWeb 6.0 can be used, which provide forms to define virtual resources. Once the corresponding data has been entered, all this documentation can then be sent to the world's leading search engines to aid their indexing. And what are the results?

Below are the results from the assessment of two portals created by the Òliba group for Barcelona's Botanic Gardens[www5] and the Boí valley,[www6] based on the study of the logs, reviews of the links from search engines and web crawlers, and comments from users.

The portal for Barcelona's Botanic Gardens[www7]

The portal for Barcelona's Botanic Gardens is a project that was carried out during the spring of 2001 and which went online in December of the same year. The order came from the Science Museum and work was carried out in collaboration with the Gardens' managers, under the direction of Núria Membrives.

The project for Barcelona's Botanic Gardens is not the only work carried out together with Barcelona's Science Museum, as there had been earlier collaboration on the virtual exhibition "Nature's Treasures". The excellent results from this initial collaboration were one of the main reasons for participating in this second project, which was set up in May 2001. There were to be two phases for introduction: the first was to allow for the presentation of a prototype at the ICOM Conference held in the first week of July and the second definitive version was to be produced for December 2001.

The aim of this project was to widely publicise what people could find when visiting the Botanic Gardens, a facility that is little known to the inhabitants of Barcelona and those visiting the city. The reason people do not know about this facility is due to its only recently having opened, in 1998, and, thus, it has yet to consolidate its position in terms of the city's educational and leisure activities.

Likewise, the Gardens' managers also wanted to offer a taste of the things people could see if they visited the gardens and, above all, to try to raise interest amongst the young or those interested in botany and gardening. In line with the models defined by the Òliba group (Carreras, 2002), the type of website needed by the Botanic Gardens corresponded to the **connection model**, in which only part of the contents from the physical space are represented on the internet and which aims to have the real and virtual exhibitions complement each other.

Thus, the aim was to present some of the species of plants and ecosystems at the Botanic Gardens virtually, which correspond to the different Mediterranean landscapes around the world, in the format of a printable file that would act as a guide for a subsequent visit to the gardens themselves. There are eight sections in the Gardens corresponding to different Mediterranean landscapes, including California and Chile or the Iberian Peninsula. Thus, the idea is to show these landscapes using photographs, maps and related images and to link them to their location in the Gardens.

The website has four main sections: one with **information**, one for **exhibitions**, one about **art and nature** and, finally, one with **games for children**. In terms of the presentation, an animation has been created in Flash which shows some of the plants that form part of the exhibition. It has been proven that a good quality dynamic presentation in Flash makes sites more attractive, leading to users finding the content more interesting. Although they do cause a number of problems for search engines trying to index the contents. The structural design, and the definition of the transversal sections, was carried out through dialogue with the Gardens' managers – and without copying an existing portal or website model, instead looking to define a web space tailored to the interests and needs of those responsible.

It should be pointed out that a year after the inauguration of the web space, these same managers of the Gardens realised the potential of the resource and came up with a new design for a second phase, in which new functions could be incorporated. The new developments are to aid greater communication between the users and managers, above all for one-off activities (such as conferences, congresses and other events), and the introduction of educational materials by teachers. Likewise, the research carried out by the institution is also to be included.

To aid a wide-ranging dissemination, not only in the local audience, but internationally, the web space was designed in three languages (Spanish, Catalan and English), and the same strategy for broadcasting used for any other Òliba group exhibition was employed. The physical and virtual exhibitions take place at the same time, which means that they have to complement each other.

In defining the metadata, the name of the geographical areas were used, as were generic terms such as *flower* or *plant*, which caused problems for search engines indexing the site. Currently, there are plans to update the metadata with the specific species names of the plants in the Gardens. This is sure to greatly improve the narrowcasting via search engines.

[www5] http://oliba.uoc.edu/jardi_botanic
[www6]: http://oliba.uoc.edu/boi/portal
[www7]: http://www.jardibotanic.bcn.es

As has been seen with other web spaces, the Gardens' site has taken around 6 months to consolidate itself as a resource and, currently, it has an average of 75 visits per day from some 35 countries. The users are predominantly local, accessing the site via educational resource portals that use the site (XTEC), but there are others coming from different botanical gardens. In both cases, narrowcasting has been carried out, which, over time, has provided results.

Currently, there are around 2,000 visits to the resource each month, with between 60 and 80 visitors a day. It has also been seen that it is a "seasonal" resource, ie, it is visited more often in the months of March, April and May, dates which register peaks in visits, which must be related to the greater number of physical visits in the springtime.

Another fact that deserves highlighting is the increasing number of repeat visitors, who return to the website, despite the fact that one of the frequent comments from visitors was that the contents were not updated regularly – a factor that needs to be addressed in the future. As a sign of the evolution in visits over the last few months, the following table offers a series of figures (source Webalizer):

Evolution	Number of visitors
December 2003	1107
January 2004	1565
February 2004	1810
March 2004	2138
April 2004	2392
May 2004	2292
June 2004	1790
July 2004	1721
August 2004	1786
September 2004	2279

Proportionally, over 50% of visitors to the resource navigate the site in Catalan, which means that they are likely to be locals; 40% use Spanish, national and Latin American, and just 10% navigate in English. Likewise, it has been seen that an important number of virtual visits are very short, lasting less than a minute.

In terms of where visitors come from, the majority are Spanish, but there is also a wide variety in the countries from which the site is accessed, as reflected in the following map interpolating the data from March 2003. The distribution has not varied greatly over the last year, which means this map is representative for other months.

Access from abroad is generally American (USA) and European, where the preferred language is English. It is slightly surprising that, by comparison, access from Latin American countries does not match that seen for other resources created by the Òliba group. According to our analysis, this is due to the fact that the metadata has not been taken advantage of sufficiently. More specialised words are needed to allow for narrowcasting to Latin American groups interested in the subject, who could access the site via general search engines.

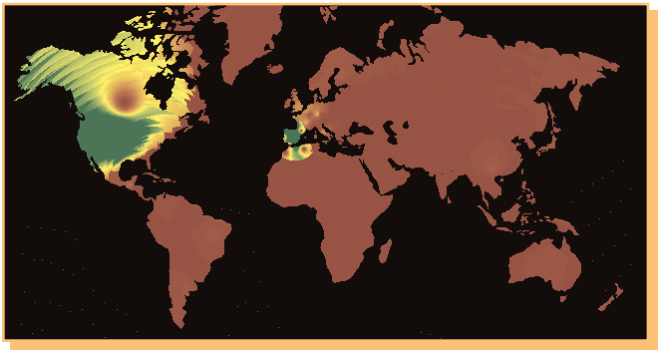


Fig 1. Distribution of access to the Botanic Gardens portal (March 2003), interpolation in Idrisi 4.1.

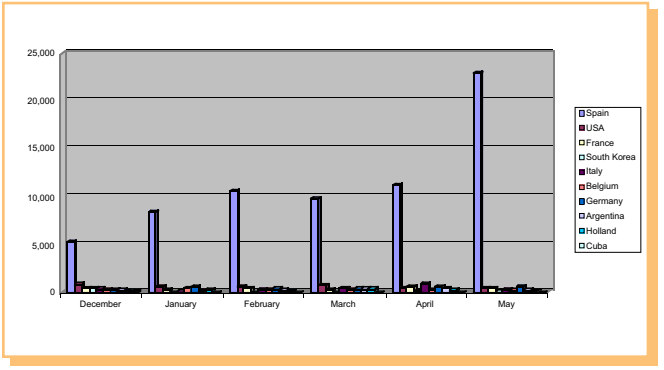


Fig 2. Histogram of the number of pages visited from each country (from December 2003 to May 2004).

The histogram shows the wide variety of different places from which people visit our resource, for whom we have qualitative information from their answers to the virtual questionnaire. Though the percentage of answers does not reach even 0.1% of visits, they do offer information worthy of consideration. Over 50% of messages stated that they knew of the existence of Barcelona's Botanic Gardens, but that they had never been, which meant that the website was their first contact with the institution.

Some of the messages stated that more information and more effective communications with the centre over the internet were required. To a degree, they justify the need to redesign the web space, incorporating more interactive sections. Likewise, most of the suggestions asked for more content on the website dealing with plants and their setting, such as J. P., from Colombia:

"I would recommend you include information on the architectural designs: a map, more complete views and of the different areas, maybe animations of the itineraries…"

Likewise, the subjects of gardening and botany were raised, as in this contribution from J. A., from Barcelona:

"More photos of the plants are needed and there should be more on gardening and botany."

There are even foreign visitors who, following a physical visit, have decided to relive the experience by visiting the website, and who have been left wanting more, as can be seen with A. and S. G., from Manchester:

"We feel that your website could be improved by including a list of all the plants in each area and maybe more photographs. Well done, keep up the excellent work."

Some more specialised comments in terms of gardening asked for details on how to organise the maintenance of the gardens, the people working there, etc.

The portal for the Boí valley[www8]

The project for a portal for the heritage in the Boí valley was carried out during the years 2001-2002, and was probably the most ambitious undertaken to date by the Òliba group, both in terms of the multimedia applications and the size of the contents[4] and in terms of the number of institutions and people that had to be coordinated. At this point in time, the second phase of development of the project (2003-2004) has been completed, which has seen the production of thee versions of the portal, in Catalan, Spanish and English, the latter being a reduced version.[5]

One of the highlights of the project is, without doubt, the definition of a model for a virtual platform for the broadcast of natural and cultural heritage for a community that is located faraway from the country's main technological and economic centres, known as the **galaxy model**. Furthermore, it allows for the virtual presentation of objects and structures that are currently to be found in museums and institutions that are far from the valley (such as Catalonia's National Museum of Art (MNAC), Lleida's Diocese Museum or Vic's Diocese Museum). Likewise, the virtual platform has been designed to be a meeting point for people interested in the Romanesque and medieval history, a means for communicating for the local community and an educational space for primary and secondary schools, universities and, even, tourists.

This project began in the spring of 2000, when the Òliba group contacted the Boí valley's Tourist Board so as to make a joint bid for the regional grants offered by the CIRIT (ACOM-2000), aimed at developing regional research projects in areas far from the country's main R&D and university centres. At this time, Barruera town council, as the legal representative for the Boí valley, had presented the valley's candidature as World Heritage to UNESCO, given the artistic value of its Romanesque churches. The awarding of the grant by the CIRIT was confirmed in October 2001 (ACOM-2000-026),[6] and a few weeks later the Boí valley was also designated World Heritage – an ideal time for a portal to encourage greater broadcast, education and understanding of the valley's natural and cultural heritage.

What were the initial objectives for the project and why was it deemed pertinent to create a portal for the valley on the internet?

The Boí valley, despite its rich heritage, currently only has an interpretation centre with a small exhibition space and similarly sized space for resources to aid visits for all those who might be interested in the valley's natural, artistic and historical heritage. A great many of the valley's most emblematic objects are in museums in Barcelona (MNAC) or elsewhere in Catalonia, or even abroad, which means that they cannot be viewed in their original architectural and historical setting. For this reason, the creation of a virtual space that placed the objects and historical events within their geographical context would greatly aid educational visits to the Boí valley.

The web space is designed to act as a meeting point for all kinds of people, from specialists in any area of heritage linked to the Boí valley to tourists who know nothing about its treasures. There are a range of itineraries and hierarchies for navigation to meet the different user profiles and personal interests, which allow for both in-depth and superficial perspectives, offering basic introductory or more detailed information.

The treasures of natural and artistic heritage are always at risk from mass tourism, and, for this reason, the web space looks to raise awareness in potential visitors of the fragile nature of the val-

4. To give a general idea, the number of files on the Boí valley portal is twice as great as any other project developed to date (the Catalan version has more than 2,000 HTML files with text content), with the increased difficulty that we have had to create the majority of the content ourselves.
5. The production costs for a web space of the dimensions of that for the Boí valley would not be viable without the presence of a project collaborator who spoke the language to be translated to or without being able to make use of automatic translation programs.
6. The second phase of the project also received a further grant from the CIRIT for the regional development of research (2002ACOM0003).

[www8]: http://oliba.uoc.edu/boi/portal

ley's natural and cultural setting. Indeed, visitors need to take special care of this heritage in order to help maintain and preserve it, ie, to safeguard the valley's defining characteristics. In the words of UNESCO: "memory is vital to creativity: that holds true for individuals and for peoples, who find in their heritage – natural and cultural, tangible and intangible – the key to their identity and the source of their inspiration."

Both people from a range of Catalan institutions interested in the valley's heritage and people from the valley itself have taken part in creating content for the web space. Indeed, some of the sections are managed exclusively by people from local institutions (for example, the Tourist Board, Aigüestortes National Park, the secondary school in Pont de Suert), making use, thus, of information and communication technologies (ICT) to publicise their activities and acting as vital agents in the conservation project.

Likewise, the space is also seen to be an educational resource for students at primary and secondary school or universities who wish to find out more about medieval history, Romanesque art, Pyrenean ethnography or the natural heritage. They learn interactively not only about the Boí valley, but also about medieval Catalonia and, in turn, about the Middle Ages in western Europe.

The portal is based on the same single design, though the contents are held on a number of servers, which makes it an innovative experience in terms of the decentralisation of information, given that each institution is responsible for the management of its own content. The level of collaboration between institutions and companies varies: in some cases, the institutions themselves directly control the content in a given section; in other cases, they provide texts or images that they own or have as part of their collection, and for which they have the copyright, or they help in the portal's creation process. As the APME (Spanish Association of Museologists) defends, the priority is to make heritage accessible, and, in this sense, the internet can be very useful, above all in terms of broadcasting content (objects) spread between a number of centres.

The web content is physically located in at least three or four servers: one managed by the Aigüestortes National Park, another by the school in Pont de Suert,[7] a third by the Boí valley Tourist Board, and finally the last one by the Òliba group from the UOC. This flexibility makes it easier to update the various sections, based on a series of shared templates and structures. There are sections of the portal that are kept relatively static, whilst others undergo continuous updating.

Alongside those responsible for the servers and the various sections, the following institutions also currently collaborate on the project: the Institute of Catalan Studies (IEC), Enciclopèdia Catalana, Dortoka, Catalonia's National Museum of Art (MNAC), the Alta Ribagorça County Council, Barcelona's Ethnological Museum, the Mas Archive, the Catalan public TV channel TV3 and the Generalitat de Catalunya (Autonomous Catalan Government).

An initial version of the website in Catalan and Spanish was started up in January 2003 and, though it took some time to consolidate its positioning on the internet, it now enjoys a very stable level of visits, with between 90 and 120 a day, which is sure to increase once people find out about the English version (from July 2004). The following table shows the monthly evolution of access to the website:

Evolution	Number of visitors
December 2003	2674
January 2004	2760
February 2004	2468
March 2004	3623
April 2004	3342
May 2004	3014
June 2004	3226
July 2004	3759
August 2004	3779
September 2004	3231

A certain seasonal nature has been seen in access to the website, corresponding to the times of the year when there is most on offer for tourists. Thus, the number of visits increases in winter (ski resorts) until the month of May; subsequently, in the month of June, there is a slight drop, with numbers increasing again in July and August. They go down again in September and the increase begins again in October (the season for mushroom collecting).

Publicising of the initiative has been carried out jointly with the Boí valley Tourist Board with press releases and public presentations, both at conferences and travel trade fairs. Thus, the news appeared on the UOC's portal on January 23rd, 2003. As a result of the press releases, news of the portal's existence was publicised for a wide audience in newspapers such as *El País* (February 15th, 2003) and *Segre* (February 14th, 2003) and journals including *El Semanario de Hostelería y Turismo* (February 18th, 2003).

Subsequently links have been added regularly to a number of educational portals (Universia, XTEC), those specialising in the Romanesque (Románico Navarra), or tourism (Lleidatur, Diputació de Lleida, Turisme de Catalunya) and heritage (UNESCO). All this has aided the general broadcast of the resource, despite the fact

7. Teachers and students have received training so that they themselves can manage a section: life in the valley. They are, thus, responsible for one of the most dynamic sections of the website. Likewise, this activity allows them to use ICT in a practical scenario and see the possibilities they offer a region such as the Alta Ribagorça.

that it was initially only available in Catalan and Spanish. It is assumed that the introduction of the version in English, with its respective metatags, will aid greater broadcast of the resource in international search engines. The provisional data available for the last few months shows a 50% increase in visitors.

Thanks to these very specialised metatags, for the geography and medieval art, there are a great number of visitors accessing the site from the main search engines. Some sections, such as the glossary, are used by a number of communities for education, historians and linguists. Every day sees an increasing number of repeat visitors and, thus, the site can be seen to have become a stable educational resource.

In terms of where visitors come from, users have accessed the site from 40, mainly Spanish-speaking, countries. The following map of visit frequency for March 2003 offers a general view of their distribution.

Fig 3. Distribution of access to the Boí valley portal (March 2003), interpolation in Idrisi 4.1.

At that time, the lack of an English version only highlighted the fact that the majority of users were Catalan and Spanish, as could be seen in the language selection and user names. The following histogram aids comparison of the visitors in the last few months, where it can be seen that there are a good number of French and German visitors, despite the language problems.

The majority of visitors are Spanish, and only in recent months have numbers begun to increase for French, US and German visitors.

As has been mentioned, the assessment of the portal for the Boí valley is still in its early stages, due to the lack of time to evaluate the English version. Once this version has been up and running for a longer period of time, it will be easier to determine the site's positioning on the internet on an international scale. Although we can already analyse the behaviour of the local audience, we now need a better understanding of audiences from further afield.

In the specific case of physical visits, we know that the portal is actively used as educational material in university and secondary school courses. Indeed, even some classes at these institutions are carried out in computer rooms, as part of a series of activities. We have been present at some of these classes so as to indirectly assess the response from students and teachers (Subías, 2004), which, generally speaking, has been very positive in terms of interactive learning, given that it represents a change in the normal routine of the course.

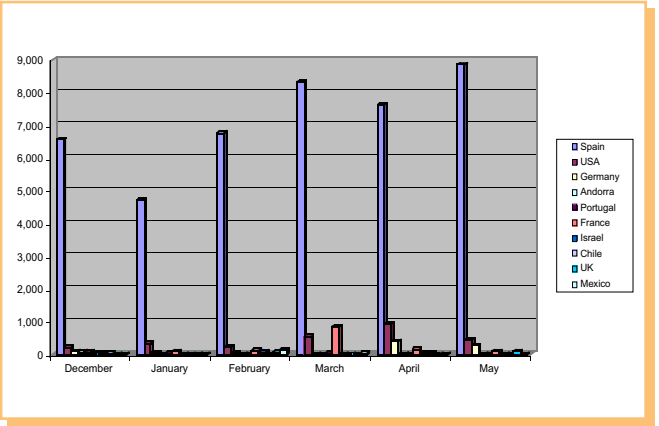


Fig 4. Histogram of the number of pages visited from each country (from December 2003 to May 2004).

Likewise, we have the comments made by visitors as part of the website's virtual questionnaire, which, despite not being statistically representative, provide interesting documentary information nonetheless. Some comments valued the site and requested more information, especially in terms of tailor-made complementary visits. Criticism has to be accepted with regard to the updating of certain content, where the processes have not been configured correctly.

In most cases, the comments are extremely positive on a wide variety of the contents and the ease with which the site can be navigated. On occasions, graphic documentation and videos are requested, indeed, some comments even propose the incorporation of webcams. Certain messages show how the contents have been used in courses on art or history, as is the case with a Mexican professor at the University of Laguna, who uses them in his classes on Romanesque architecture.

Final comments

This article aims to explain the reasons behind the success of a cultural resource on the internet. It is not always the number of hits that determines this success, instead they need to be used by specialist groups and in the context of cultural dissemination, education and research. The aim in defining the key concepts of cybermetrics, the science that produces a quantitative description of the internet, is to show how the narrowcasting of cultural resources to groups of interest is more important than general broadcast over the internet.

It is not always easy to carry out this narrowcasting of a virtual cultural resource, as the internet does not yet have the necessary mechanisms. Generalised portals and search engines with quantitative algorithms cannot always distinguish between different levels of specialisation or quality. The evolution of the internet may lead to the creation of monographic spaces that more accurately reflect the real diversity of humanity, instead of the generalised or global spaces that simply reproduce models that do not exist in the real world.

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Cèsar Carreras is currently full professor of Humanities and Philology at the UOC. He has a PhD in Ancient History (1995) from the University of Barcelona and Archaeology (1994) from the University of Southampton (UK). He also has an MSc in Archaeological Computing (1991) from the University of Southampton (UK). He now gives classes on computer applications in the Humanities and Ancient History at the University. Furthermore, he is co-director of the Òliba research group,[www9] which looks to assess information and communication technology applications for cultural heritage. Likewise, he coordinates and takes part in European projects such as COINE (Cultural Objects in Networked Environments) and **SEE Arch-Web**[www10] (An interactive web-based presentation of Southeastern European Archaeology).

[www9]: http://oliba.uoc.edu
[www10]: http://nomos.csd.auth.gr/