

Software technology adapted to scholarly needs allows new information to be extracted from artistic works. In identifying an elementary building block in Filippo Juvarra's (1678–1736) perspectival representation of a royal palace, it becomes possible to reconstruct a full 3D digital model.

ECHO – A Vision for European Culture

Three MAX PLANCK INSTITUTES in three European countries – FOR THE HISTORY OF ART in Rome; FOR PSYCHOLINGUISTICS IN NIJMEGEN; and FOR THE HISTORY OF SCIENCE in Berlin – each with their international partners, have founded an initiative to bring European cultural heritage online and to foster, at the same time, a new infrastructure for the humanities adequate to the Internet Age and competitive with similar ventures in the US. Under the label ECHO (European Cultural Heritage Online) the Max Planck Society has proposed this initiative for support by the European Commission. It has now been extensively discussed at a recent workshop on “Humanities, Research and Cultural Heritage in Europe,” organized by the European Commission in Brussels. The keynote speech by JÜRGEN RENN (Director at the Max Planck Institute for the History of Science) is documented here in a slightly abridged form.

This is a time in which technology and the values of European humanist culture seem to be as decoupled from each other as they have ever been in the recent past. Technological visions of progress, in particular, have lost their appeal of being guarantors of the progress of culture into the bargain. While catchwords such as “information society” or “postgenomic society,” not to speak of “traffic of the future,” have lost glamour and credibility as promises of a better civil society, scepticism, if not hostility, with regard to science and technology are spreading in Europe. European culture, jointly created by the *homo faber* and the *homme des lettres*, faces a crisis: while it provided the foundation for magnificent technological achievements in a long-range development reaching back to antiquity, the cultural heritage of Europe and its values are dramatically losing ground in the techno-scientific world that has emerged from it. European cultural heritage is, in particular, strikingly absent from the medium of the future, the Internet. It is precisely the few shining examples of culture on the Web that make evident the potential of the bulk of information constituting our cultural memory, which is still not represented within the new medium. What we need is, in my view, a vision exploiting the new technological possibilities for the creation of a public culture of science, a vision that includes the humanities and thus keeps alive the roots of our techno-scientific world in European cultural heritage. Such a vision guides the ECHO-initiative, aiming at a massive effort to bring European cultural heritage online.

On closer inspection, ECHO must address a double challenge presenting itself to European culture in the age of the Internet, a quantitative and a qualitative one: the need to make a substantial amount of the sources constituting the European cultural memory electronically available, and the need to create an adequate intellectual, technological, and social infrastructure rendering this cultural

memory accessible as a resource for addressing the questions of today, be they scholarly or from an orientation-seeking public. Just imagine you could address the crisis of science education in Europe by creating the possibility of exploring the historical and cultural contexts of scientific and technological knowledge in a digital repository offering pathways from the questions of a student to the original historical sources documenting the emergence of this knowledge.

Just imagine, you could understand how human gestures are shaped by nature and nurture, how they have developed historically, and how they are embedded in language and cultural contexts, and you can discover connections within in a digital repository comprising a browsable corpus of films documenting human behaviour as well as a digital archive of the great European works of art.

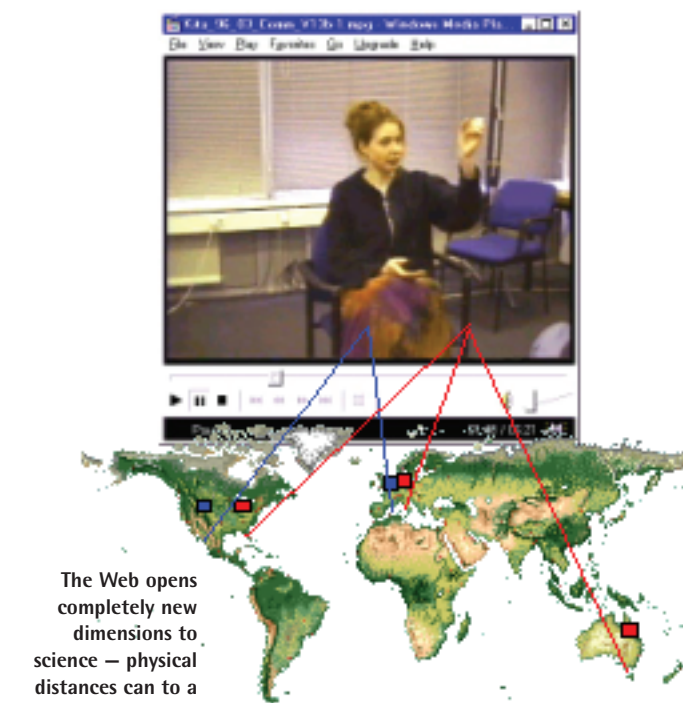
Just imagine, you could understand how administrative structures have evolved in our civilization, and you are able follow your enquiry from digital representations of the ancient Babylonian state archives to databases in which the administrative records of the great engineering ventures of the Renaissance are stored.

These are just some examples of concrete perspectives that would open up if the vision of ECHO were pursued.

What needs to be done in order to realize this vision? Let us take a closer look at what presently are the two principal ways of dealing with the challenge of the information revolution for the cultural and scientific heritage of Europe.

THE BIG-PLAYER SOLUTION

The basic assumption of the first solution to be considered is that the dominating forces of the market, in particular the big players represented by large publishing houses and software firms, will take care of bringing the cultural heritage to the Internet. This “big-player solution” is most familiar from the present debates on electronic journals. While the few publish-



The Web opens completely new dimensions to science – physical distances can to a certain extent no longer impede close collaboration and different disciplines can move closer together. ECHO would therefore like to develop working environments that allow collaboration on widely dispersed data, for example, information about the world's different sign languages. In doing so the required data could be saved distributively and the partners could develop at different institutes thereby facilitating the discovery of interesting resources on the Web and cross-disciplinary work with multi-media information.

ers who hold a near monopoly in certain areas of scientific publishing, are indeed offering more and more material on the Internet, their approach has been rightly characterized as a “Faustian deal”, in which a fatal price has ultimately to be paid by the scholarly community. In fact, although electronic dissemination is considerably cheaper than print dissemination, journal prices – in general still coupled to those of print subscriptions – not only continue to increase but, what is worse, the revenue accumulated by the publishers is in general not reinvested in a future-bound infrastructure for scientific information on the Web. On the contrary, the great challenges for such an infrastructure, for example the archiving problem or the problem of an integrated retrieval environment, remain, for the time being, largely unsolved – menacing the longevity and interoperability of scientific and scholarly information in the electronic medium. This is the fatal price of the Faustian deal. There will be no escape from it as long as the scholarly community has to repurchase from the big players the infor-



mation it produced in the first place, at the same time being left responsible for its infrastructure on the Web. The situation of the digital availability of the primary sources of cultural memory, that is, of historical documents, of the great works of art and literature, or of language corpora is even more problematic. While sceptics are still debating the compatibility between culture and the Web, the big players have long since begun to secure exclusive rights on the reproduction of cultural artefacts, and even to purchase important documents and collections with the intention of commercialising their digital images. It has become particularly evident that the big players have failed, in spite of their eagerness to control large domains of cultural heritage, to create an infrastructure that guarantees a steady and reliable flow of this heritage from the old medium into the new. On the contrary, they have contributed to an increasing inaccessibility of cultural heritage – not only because of the restrictive copyright laws they seek to impose, but also because sources are now

often held back by museums, archives, and libraries in the dim hope of future commercialisation. This hope can, however, hardly be sustained by a practice that amounts to a ruinous exploitation of limited resources rather than representing a concerted effort to augment them.

THE SCOUT SOLUTION

This solution is based on the assumption that the transfer of cultural heritage to the new medium can essentially be achieved by pilot ventures in combination with an establishment of standards for production and dissemination. In contrast to the “big player solution,” it amounts to the realization that bringing culture to the Internet actually means settling a new continent rather than just exploiting its resources in a gold rush. But it also amounts to the assumption that this can be done by merely sending out a few scouts to survey the new territory and setting up a model farm here and there.

Looking back at the successes and failures of the projects funded by national agencies as well as by the European community, we find indeed that so many of the feasibility studies, pilot projects, test beds, and proofs of concept, however impressive they are if taken by themselves, have actually failed to launch such a self-sustaining dynamics. The dead links, blind alleys, and empty databases characterizing some of the most ambitious homepages of such projects signal that they did not succeed in making a difference for the humanities at large, let alone for the role of cultural memory in an Internet society. To me, such projects are like chip factories in the jungle, incapable of leading off productive development because even the most basic infrastructure is lacking.

THE AGORA SOLUTION

In order to initiate the far-reaching upheaval, that a comprehensive digitisation of the cultural heritage would amount to for the humanities, neither brute force nor missionary efforts will do. What is needed

is rather an infrastructure that enables each single participant in this process to pursue his or her specific interests while contributing, at the same time, to a shared body of electronically represented knowledge. This brings me to a third approach, that has so far not been seriously pursued and which we have labelled the “agora solution.”

It aims at launching a dynamics that combines the development of the whole with the benefit of the individual, a combination that has actually been the hallmark of all great civilisatory enterprises in Europe, beginning with the foundation of the Greek polis which achieved such a synthesis of interests in its agora. Imagine that every scholarly project in Europe, every archive, museum, or library could join a network of digital libraries by making resources available on the Web with only a minimum effort, using a set of standard formats and the corresponding tools allowing their implementation. Imagine a universal electronic working environment for these resources and imagine that it would provide you, first of all, with an overview of what is presently available within the distributed network; that it would automatically combine all available texts with language tools comprising grammatical analysis and dictionaries; that it would offer interactive tools for studying texts as well as images of art and architecture; that it would allow us to show video scenes of human behaviour or scanned images of historical sources in combination with transcriptions and commentaries. Imagine that such a growing network of digital libraries would also include an interactive collaborative environment for multimedia annotation, that it would automatically establish as many meaningful links as possible between the heterogeneous bodies of knowledge stored within the network, and that it would offer options for converting the results of scholarly work on these bodies of knowledge into new ways of accessing the primary sources of European cultural heritage, opening up new vistas not only for spe-

cialists but also for the public at large. Then you get an idea of the new quality this cultural heritage may acquire, if a concerted effort along the lines of the agora solution succeeds.

THE IMPLEMENTATION OF THE AGORA SOLUTION

But how can this solution be implemented? Clearly a self-accelerating dynamics leading to an ever-more comprehensive electronic representation of European cultural heritage can only emerge if certain minimal conditions are fulfilled. Among them are the requirements of open access, interoperability, modularity, and interactivity. Only if digital sources are made freely available on the Web, only if the same tools can be applied because they share compatible structures, only if diverse digital collections can be integrated to yield an interconnected whole, and only if it is possible to combine the power of computing with the power of the human mind in the analysis of sources, a set of data will turn into a digital athenaeum of European culture.

The essential elements for a successful pursuit of this approach do exist. Three Max Planck Institutes, representing – each together with its international partners – three different areas of the humanities, have accumulated considerable experience not only in making sources from European cultural heritage available online, but in developing essential building blocks of the electronic working environment sketched above. The three groups have also engaged, within the limits of their possibilities, in efforts to share their experience with other scholars and institutions and to spread the usage of computer-assisted methods in the humanities. It is precisely on the background of this experience that the ECHO-initiative has been formulated. It has turned out, as a matter of fact, that even the most convincing standards, models, or tools will remain island solutions as long as those scholars and institutions in the humanities who are

still lacking a comparable expertise in electronic information management are unable to join in.

It would, however, be an error to consider the implementation of the agora solution simply as a matter of technological developments which, once completed, have to trickle down from the initiated to the laymen. Even the realization of the universal working environment sketched above can hardly be completed without addressing a combination of technical, scholarly, and social issues.

It is our experience that it makes just as little sense to develop standards without the tools to implement them, as it makes sense to develop tools without an understanding of the scholarly questions they should help to answer. The real challenge of the agora solution is thus to achieve an integration of scholarly and technical work. Its realization therefore presupposes an environment in which not only technology is spreading, but also the knowledge about its innovative application to the intellectual problems of the humanities.

In order to realise such an environment, we propose to create a somewhat unusual structure that combines support for a network of projects and institutions, capable of substantially enhancing the presence of European cultural heritage on the Internet, with the creation of an innovation centre. This centre would have the task of defining standards, of providing the network with tools developed on the basis of the accumulated experience of its participants, and of helping them to implement the standards as well as the tools.

The innovation centre would have the responsibility for developing the central building blocks of the infrastructure envisioned by the ECHO initiative, for instance the universal working environment mentioned above. It should be capable, at the same time, of boosting the technological competence of projects and institutions willing to contribute to a digital athenaeum of European culture, but which are lacking the infrastructure to do so on their

The Max Planck Institute for the History of Science and its partners have developed an electronic environment for scholarly work with historical sources across various languages. A digital facsimile can be physically located anywhere in the world and linked with various commentaries that may be stored elsewhere, thus realizing the possibility of an Internet-based collaborative network. The example shows the link with an electronic transcription. The transcription in turn is linked to a morphological analyzer allowing the identification of the given grammatical form and the root of the word. From here a further link leads to a dictionary entry providing an English translation and further explanations.

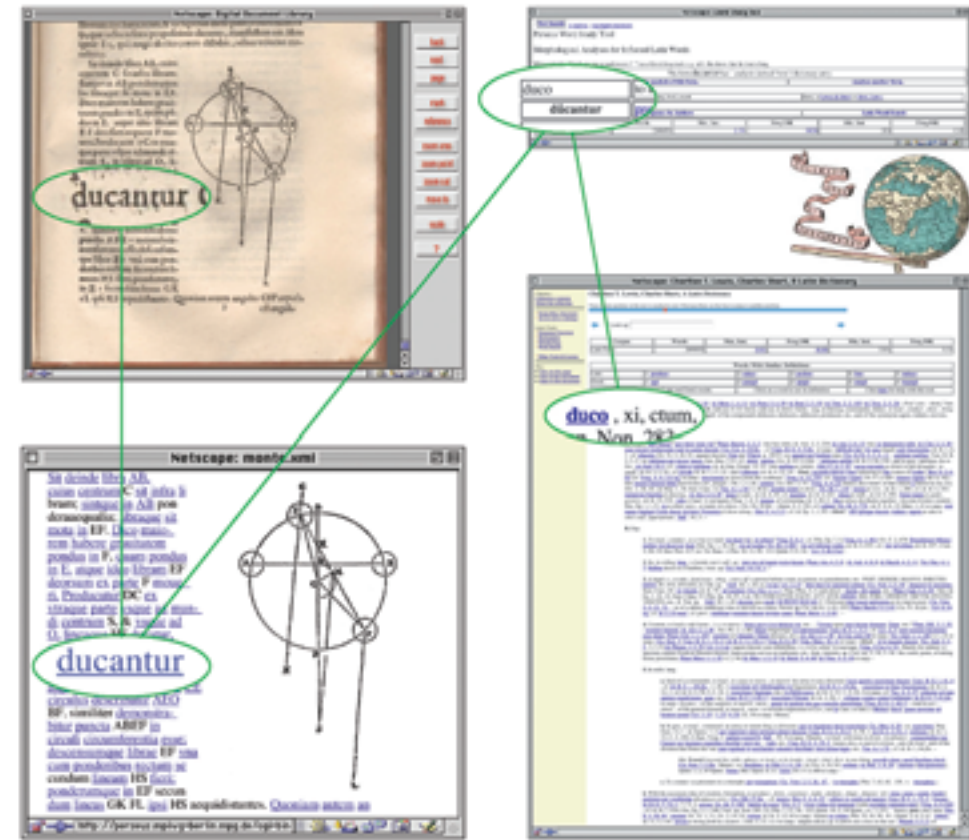


ILLUSTRATION BY MARKUS SCHNIDPF

own. Support by the innovation centre could include, for instance, the option to temporarily delegate collaborators to institutions within the network, where they would participate in concrete projects and then bring their experience back to the centre. The innovation centre would thus constitute, almost literally, the agora of the network, that is, the central marketplace where information is being exchanged and experience accumulated.

THE POTENTIAL IMPACT

My account would miss an essential facet of the present situation without acknowledging that cultural heritage also represents in turn both a challenge and a resource for the further development of the Internet as well as of the society whose backbone it has become. It is, in fact, hardly imaginable that the present efforts to create a semantic web, to improve the

interfaces between humans and computers, or to establish ever-more sophisticated metadata standards will really succeed without taking into account the knowledge accumulated over centuries by the humanities about the relation between signs and meaning, about the functioning of language, about the way meaning is stored by images, and about structures organizing human knowledge. And what is even more important: when the development of technology and its social implementation confronts us with moral dilemmas or at least with the necessity to decide between alternatives that cannot be distinguished just by criteria of efficiency, we have to be able to reflect upon the past experiences of our societies as they are stored in the European cultural heritage. But even as a source of reflection on our present situation, it had better be available online.