

The „hybrid“ digital Library

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I shall propose some reflections upon the open access topic which is at the heart of our meeting, focussing upon its implications in the domain of cultural heritage. I will insist especially on the transition of museums in the web.

When compared to the scientific production published in books and journals, the transition of museums into the cyberspace poses different challenges both in the production and organization of digital information and in the modalities of granting it access.

I shall first focus upon the way in which the virtual museums should be conceived in the web. In the second part of my presentation I shall then introduce my view of the compromise we will have to accept when dealing with museums in the perspective of an open access policy to cultural heritage.

I am obviously aware that it is extremely daring to formulate a long-term vision of the transition of cultural heritage in the web, and that I risk being engaged in an exercise of purely wishful thinking.

Visibility on the web is today one of the major concerns for museums the world over. Many efforts are devoted to web presentations of Museums and their collections and of cultural heritage at large. The transition of museums in the cyberspace is still largely conceived as a linear development of traditional procedures. This means that the style and traditional conception of documentation and information tends to exhibit a strong inertia in the new medium. As a consequence of this inertia, the museum world seems still to be a long way from having fully exploited the potential of the web revolution.

In this new dimension it becomes ever more difficult to accept the constraints which characterize the traditional activity of documentation and information. Let me schematically remind you of two of the basic constraints which are at work in the documentation strategies of the museums of the real world:

- a) Catalogues are conceived as rigorously confined to the objects preserved by individual museums.
- b) Objects are treated as isolated items; only limited attention is devoted to the cultural and social context to which they pertain, and to enhance their conceptual genesis and meanings.

It may be worth recalling that Museums, libraries and archives of the real world are the result of a process which began many centuries ago. Museums started out in 16th century Europe as promiscuous bodies where art objects, instruments, artifacts of various nature, natural items, books and documents were intrinsically integrated and displayed alongside one another. The conceptual glue of what we would today rate as a promiscuous ensemble was the exceptional character and the uniqueness of all the collected entities and the curiosity that they aroused in the visitor.

Later evolution of museums might be portrayed as a story of ever stronger specialization. First, the separation of art collections from scientific collections (during the Enlightenment). Then art collections underwent a further process of specialization with the separation of paintings (this marks the origins of the Pinacotheca) from sculpture (sculpture galleries), from drawings (print and drawing rooms) and from minor arts (decorative arts departments).

The same process took place with regard to scientific collections. After their separation from art collections, specialization progressed through the division of mathematical and physical objects from natural history items; moreover, in the mid-19th century, technological and industrial collections gave rise, under the impulse of the Universal Exhibitions, to new independent museums. Later on, new institutions devoted to the preservation and presentation of bio-medical and ethno-anthropological collections were founded.

This evolution has produced a fragmentation of cultural documentation and cultural heritage according not only to disciplines, but also to the various categories of objects (books, documents, drawings, paintings etc.) and to their different material supports (canvas, marble or stone, paper, fabrics, timber, metal etc.).

This specialization and fragmentation process has placed all museums in a difficult position, when it comes to making explicit to visitors the value of the collection they preserve. The same holds true for libraries and archives.

These limitations derive from the fact that objects are presented in museums atomized and de-contextualized. This makes it almost impossible for visitors to grasp their real meaning and to perceive their importance.

When dedicating our energies to the digital conversion of cultural heritage, we have first of all to avoid the mistake of reproducing the fragmentation of objects and records in the different containers of all real world, and their isolation in specialized and totally unrelated structures (as museums, archives and libraries are today).

The new format of the humanities in the digital Age will have then to coincide with the re-composition of what the material history of cultural patrimony has fragmented. Once the information has been processed and transformed into a digital entity, it has no more to follow the fate of its physical support. There is thus no reason to store it according to the same systems used to preserve the object it emulates.

The logical consequence of what I have been saying is that we can finally re-arrange the records which digitally mirror the real objects in a totally new orderly architecture. We will thus build new hybrid repositories. Hybrid not in the sense that this adjective has in the librarian jargon (where hybrid library means a combination of digital and analogical contents), but hybrid because the web repository is heterogeneously populated by a variety of different digital objects, which represent material objects, preserved in different containers.

In recent years, growing use has been made of information technology especially through the development of so-called virtual museums model. The idea of the virtual museum which seems to be asserting itself, is, in fact, the idea of the digital clone of the real museum, accepting all of its structural features. To have meaning and utility, the “virtual” museum of the web should rather be constructed with a radically different configuration from the ‘real’ museum. In cyberspace the real museum should constitute only the point of departure and return of journeys that are confined

neither to the internal perimeter of the museum, nor to the same typology of items or the same discipline or genre to which it relates. The visitor should be permitted explorations not only of objects, but also of ideas and persons, of places and events, of books and documents, whenever this information is preserved.

The transition of cultural heritage in the cyberspace has thus to be conceived as the creation of a totally new architecture of knowledge: a meta-museum/library/archive, with no walls nor physical separations. A totally different construct from the way in which cultural heritage is arranged in the real world. In order to make this vision of the future of virtual museum to come true, the keywords and guidelines to keep in mind will thus be *hybridisation* (in the sense described above), *re-composition*, and *systematic enhancement of the network of meaningful connections* among the items of the cultural heritage.

On the sociological ground, one of the corollaries of this new vision of the future web of cultural heritage is that the traditional division of labour will have to be re-balanced. There is no question that in the cultural institutions of the real world (in museums, above all) curatorial concerns have played a crucial role in shaping the physical organization of the heritage. The understandable priority of the curatorial vision has also deeply affected the development of traditional documentation and communication strategies, with their strong selective emphasis upon the patrimony preserved in individual institutions.

In the cyberspace the documentation and communication strategies can be finally conceived independently of the curatorial priorities and vision. The autonomy of documentation activity from curatorial concerns will permit to stress the connections and conceptual relations among items of cultural heritage which in the real world are preserved in different places and containers. In the long run, this new perspective will produce an unheard of integration of knowledge, thanks to the enhancement of the enormous multiplicity of threads which connect the various digital items stored in the immense repository of the web. All this obviously implies the establishment of new forms of programmatic cooperation among content providers.

It will obviously be necessary to offer the possibility of vertical exploration of collections preserved in individual institutions. But the crucial step is represented by the possibility of an effective horizontal navigation in the endless virtual shelves of the web repository.

We have vertical exploration often at hand in the actual web. Much more challenging appears the solution of the problem of an effective horizontal navigation among the digital surrogates of cultural heritage items in the web space. In order to achieve this goal, a strong change of paradigm in the standard procedures of web content production has to be put into practice. Only the adoption of common standards of classifications on the part of content providers – which is still a rare phenomenon – will permit the user to navigate among data stored in different archives.

Today interoperability among different digital archives is guaranteed on a large scale only by search engines; that is by a third party (the other two being content-providers and users), which has no role in the content production. Search engines work from the outside, ignoring the conceptual structure of data that they filter. As everybody well knows, search engines use above all statistic methods and string search.

Because of their extrinsic filtering procedures, search engines cannot guarantee content-driven search.

I fully agree with Jürgen Renn presentation in our conference and with the ECHO Network Agorà vision that the schizophrenia between content and link providers is one of the major limits of the actual web. It represents a serious obstacle to the exploitation of the web as a universal and hybrid repository of cultural heritage. We need then first of all to integrate and tune these two crucial functions. Moreover, in order to be really satisfactory, especially in the cultural heritage, links among the documents which are disseminated in the web should adhere to the representation of knowledge embedded in them.

Search engines filter the web using words and strings, that is textual elements. But textual search is very inadequate in order to filter conceptually coherent content in a federal digital repository, like the web.

First of all, it is ambiguous, suffering the misleading effects of word polisemia (both in queries and in answers); moreover, it is almost impossible to effectively manage the multi-linguistical character of the web; finally, it is not appropriate to represent and filter extra-textual documentation (sounds, images, audiovisual materials etc.), which constitute an ever growing dimension in the web.

Even if some of these limits can be overcome by the adoption of community multilingual controlled dictionaries, textual classification and search in the web repository remains inadequate if we look for content-sensitive linking. In fact content-sensitive linking constitutes a fundamental challenge for the development of a web of cultural heritage intended as a universal and hybrid repository.

In order to achieve this goal we will have to shift emphasis in document description and hyper-linking from words and textual elements to meanings. It is at this very point that the semantic web comes appropriately into play.

In the scenario which I have sketched of the future web as a universal hybrid meta-repository of cultural heritage, the shift from textual elements to associations based upon meanings has to be considered as a crucial step. The re-composition and re-contextualization of the fragmented items of cultural heritage in the cyberspace implies in fact the systematic production of content-sensitive hyperlinks. The latter will be fully effective only if they are based upon semantic relationships. Ontological system of classifications, shared by the specific web community involved in cultural heritage exploitation - a community formed by subjects who are, at the same time, users and providers, clients and servers - will guarantee both the rational construction of a universal hybrid repository and the possibility of effective navigation in it.

Ontologies will serve both as content-sensitive search engines and as effective representations of the structures of knowledge embedded in the web repositories, thus paving the way for their use as tools for e-learning activity and giving the users the possibility of designing personal itineraries. Users will also have the chance of improving the efficacy of ontologies, by producing standardized descriptive meta-data which will become shared knowledge for the community. They will not simply

access data provided by others, but will be able to create added value to be exploited by the community. Content-sensitive hyper-linking is a need strongly felt by members of the international community who work in the humanities and in cultural heritage. This crucial need inspires the vision of the ECHO Network project, with its strong emphasis upon a shared service infrastructure to help intelligent and interoperable implementation of the web of Cultural Heritage.

I come now to my second point. Once we have been able to effectively promote in the web the heritage preserved in the museums, will it be possible to grant open access to it?

It is obvious that the vision of the web of the virtual museums which I have schematically outlined presupposes a largely open access to the web of cultural heritage. The fantastic cumulation of knowledge in the shared environment of the web produced by different actors would be much less productive and profitable within the framework of commercial copyright or in the so-called “deep web” model. This is certainly true, but we cannot utopically remove the economical dimension of the complex process with which we are dealing. We are in a phase in which everywhere – and very strongly also in Europe – national policies (and also European Union policy) are insisting upon the need to reduce public investments in the preservation and promotion of cultural heritage and upon the necessity of involving private entrepreneurs in the management of museums in order to obtain the best commercial exploitation of cultural patrimony. In this conjuncture a radical emphasis upon open access policy might turn out lacking a firm grounding and appear without concrete prospects.

We cannot simply ignore these political trends and the reason and expectations behind them. So, in my view, we have to work in order to find a way of integrating our open access vision with a strategy of cultural, educational and touristic services provided on payment by museums through the web. One of the possible strategic directions might thus be that of granting free per view access to the information published by museums in the web, providing payment services for advanced

interaction with the published content (like unloading images, publishing unloaded material for commercial purpose, e-learning activity and so on).

I have no detailed proposal to advance here, but I want to stress once more that the view of a fully open access policy to cultural heritage in the web will have very little chance of imposing itself, unless we find a balanced solution between the moral duty of granting universal access to cultural heritage and the need of at least partially recovering the costs of producing, maintaining, updating and integrating the digital representation of cultural heritage in the web. This is, to my mind, a crucial point. I fear that we will not cover any distance by simply contrasting the present commercially driven national and communitarian policies for the promotion of digital cultural heritage through information technology with our noble vision of open access. We have to operate in order to find an acceptable compromise and a sustainable economic model between these diverging opposite conceptions.

Otherwise, we might well obtain good results in our battle for open access to research papers and journals in the web, but we will receive little satisfaction in the crucial area of museums - especially of the great art museums – where commercial interests, due to the enormously superior number of potential customers, are much stronger. In this area we will have to guarantee the user new services, opportunities and creative access strategies without a commercial approach, even if this will involve some fair form of payment.

I would like to go back, in my concluding remarks, to the vision of the virtual museum of the future which I have sketched in the first part of my presentation. The real world museums, archives and libraries tell us incomplete, fragmented and often incomprehensible stories. The items that they preserve are organized according to extrinsic criteria (format, physical supports, typological categories, state of preservation, and so on) which do not help to catch their conceptual value and relationships.

In the future web of cultural heritage museums will have to be, at the same time, individual entities (that is faithful representations of the real museums) and global

and hybrid repositories. *Global*, in the sense that the items they preserve will be linked to all conceptually connected items. *Hybrid*, because those connections will not be limited to items of the same typology but will include all kinds of documentation.

If the cultural heritage in the web does not look something like this, let us say, ten years from now, and if we will not have been able to guarantee a fair level of open access to this shared repository, we will have to candidly acknowledge that the revolutionary potential of the transition of cultural heritage in the cyberspace has not been fully exploited. I am personally convinced that the vision of the future of museums in the web which I have proposed will prove to be more than wishful thinking. This vision will represent a real cultural revolution, on condition that we are able to avoid the risk both of ignoring the concrete economical constraints and of passively accepting the transferral of the pay per view model to the web of cultural heritage and research.