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Context

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WP Leader	CULTNAT
Task 3.2	Workshops
Task Leaders	Jordan Department of Antiquities
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0.1	31/03/2012	Maria Teresa Natale	First draft version
0.4	24/04/2012	Mercè López	Internal review
1.0	30/4/2012	Antonella Fresa	Final version submitted

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1 Executive Summary

This deliverable aims to describe the workshop on Virtual Exhibitions held in Amman on 11 December 2011.

The scope of the workshop was to present best practices in the field of virtual exhibitions and virtual performances, to discuss how e-Infrastructures can be useful in the building of virtual exhibitions, to analyse which resources e- Infrastructures offer and how they can be deployed to deal with virtual exhibitions and virtual performances.

The workshop was targeted to cultural heritage and tourism institutions, universities, cultural heritage decision-makers, archaeologists, librarians, ICT providers and experts and academics Web developers.

The deliverable is composed by six chapters and one annex:

- Chapter 1 is this executive summary
- Chapter 2 introduces the scope of the workshop
- Chapter 3 provides information about the agenda of the workshop
- Chapter 4 provides some images taken during the workshop
- Chapter 5 lists the participants
- Chapter 6 provides all speakers' biographies, a short abstract and the link to the INDICATE website where the presentations are available for download
- Chapter 7 is dedicated to some conclusions
- Annex 1 hosts the text of the keynote speech

All the PowerPoint slides are available in PDF format on the project website at the following URL:

http://www.indicate-project.org/index.php?en/22/events-archive/66/amman-virtual-exhibitions-workshop

The day after the workshop, 12th December, the work continued with the project partners from Jordan, Italy, Spain, Egypt focusing on the next activities to be carried out in the framework on the project, and in particular on the content of D5.2, the use case study on Virtual Exhibitions, to be produced shortly after the Amman workshop.

The minutes of this meeting are available in the reserved area of the project website.

2 Introduction

The theme of the virtual exhibitions is one of the case studies of the INDICATE project.

This case study foresaw two activities:

- the organisation of this workshop in Amman, in cooperation with the Jordanian partners, to be reported in this deliverable,
- the production of a case study report, D5.2 Virtual Exhibitions**.**

The Amman workshop was the follow up of a survey conducted in the countries participating to the project and on the results of the national working groups, with particular regard to the work done by the Italian group.

Its main goals were to:

- present best practice examples of virtual exhibitions,
- discuss how e-Infrastructures can be used to enhance virtual exhibitions and virtual performances,
- analyze the resources which e-Infrastructures offer, and how they can be deployed to deal with virtual exhibitions and virtual performances implementations,
- put in contact INDICATE partners and Jordanian cultural heritage experts with the local NREN and e-infrastructure provider.

The workshop took place at the Department of Antiquities in Amman. It was an open event and hosted about 40 participants.

After the welcome message of the Director of the Department of Antiquities, who underlined the importance of e-infrastructures in the future of digital cultural heritage, Rossella Caffo, INDICATE project coordinator, presented an overview of digital cultural heritage in the last ten years, explaining also the role of Europeana within this scenario, and the current needs for memory institutions. Antonella Fresa, INDICATE technical coordinator, illustrated the objectives and activities of the project. Large space was given to the key-note speech of Prof. Ioannis Kanellos, from Telecom Bretagne, who gave a presentation on user-centered digital museology (see Annex 1). His presentation raised much interest among participants and stimulated a huge discussion after the speech. Afterwards, all the speakers gave their presentations. Abstracts and biographic profiles are reported at Chapter 6.

After the workshop, the results were analysed and included in deliverable D5.2 Case Study Report - Virtual Exhibitions. The main objective of this case study was to review the current situation of virtual exhibitions and virtual performances processes, the state of the art of the technology used and the relation between cultural institutions and e-Infrastructures. This Case study report is fully available in the INDICATE project website at the following URL: http://www.indicate-project.org/getFile.php?id=359.

3 Programme

Date: 11 December 2011
Venue: Department of Antiquities of Jordan, Amman

Programme

10.00 : Registration

10.30 : Welcome Messages by Jordanian Authorities

10.45
Digital Cultural Heritage infrastructures background
Rossella CAFFO, Director of the Central Institute for the Union Catalogue of the Italian Libraries - Italian Ministry of Culture; Project Manager of the INDICATE project

11.00
The Indicate project
Antonella FRESA, Technical Coordinator of the INDICATE project, ICCU, Italian Ministry of Culture

11:30 : *Coffee Break*

12:00 : Keynote speech

User-Centered Digital Museology: Towards Profile Adapted Virtual Expositions
Prof. Ioannis KANELLOS, École Nationale Supérieure des Télécommunications de. Bretagne

13.00 : Questions & Answers

13.30 : Lunch

14.30 : Presentations of best practice and examples of virtual exhibitions in the participating countries

Italy - Guidelines for virtual exhibitions
Maria Teresa NATALE, ICCU, Italian Ministry of Culture

Jordan - Ancient Theatres Enhancement for New Actualities (ATHENA) project
Al Adarbeh NIZAR, Project Manager of the Ancient Theatres Enhancement for New Actualities (ATHENA) project

Spain - i2CAT - Virtual performances
Artur SERRA, Deputy Director i2CAT

Egypt - CultNat experience in the virtual world
Ayman KHOURY, CULTNAT Center for Documentation of Cultural and Natural Heritage

Research and Education Networks in the Arab World
Anwar AL YOUSEF, Junet

16.30 - Discussion

17:00 - Conclusions of the workshop

4 Images

Workshops participants

Workshops participants

Workshops participants

Workshops participants

Workshops participants

Workshops participants

Workshops participants

Rossella Caffo, the project coordinator

Antonella Fresa, the project Technical coordinator

Prof. Ioannis Kanellos, the key-note speaker

5 Participants

The workshop was targeted to cultural heritage and tourism institutions, universities, cultural heritage decision-makers, archaeologists, librarians, ICT providers and experts, academics Web developers.

Participants' list		
No.	**Name**	**Organization**
1.	Mr. Zaid mohammed ajlouni	Ministry of Culture
2.	Ms. Ameera Saied al Zaben	Jordan Museum
3.	Ms. Luma Al-Khatib	Jordan Tourism Board
4.	Dr. Rafe Harahsheh	Department of Antiquities
5.	Ms. Rossella Caffo	MiBAC-ICCU
6.	Ms. Maria Teresa Natale	MiBAC-ICCU
7.	Arch. Amer Qimash	Department of Antiquities
8.	Ms. Antonella Fresa	MiBAC-ICCU
9.	Mr. Artur Serra	I2cat
10.	Mr. Ayman Khoury	CULTNAT
11.	Mr. Nizar AlAdarbeh	Department of Antiquities
12.	Dr. Mahmoud Na'amneh	Yarmouk University
13.	Dr. abdel Halim Al-Shiyab	Yarmouk University
14.	Dr. Khaled Abughanimeh	Yarmouk University
15.	Ms. Samia Al-Falahat	Petra Archaeological Park/PDTRA
16.	Mr. Mohammed Al-Marahleh	Petra Archaeological Park/PDTRA
17.	Mr. Sabri Al-Fdool	Petra Archaeological Park/PDTRA
18.	Dr. Mohammed Tarawneh	Al-Hussein Bin Talal University
19.	Ms. Noha Mubaideen	Jordan Applied University
20.	Dr. Mahmoud Arinat	University of Jordan
21.	Dr. Younis Shdaifat	Mutah University
22.	Mr. Muafag Al-Fayez	Department of Antiquities
23.	Ms. Sahar Nsur	Department of Antiquities
24.	Ms. Qamar Fakhoury	Department of Antiquities
25.	Dr. Sahar Mansour	Department of Antiquities
26.	Ms. Samar Al-Habahbeh	Department of Antiquities
27.	Eng. Nadia Okasha	Department of Antiquities
28.	Mr. Faeq Qudah	Department of Antiquities
29.	Mr. Asem Asfour	Department of Antiquities
30.	Mr. Ashraf Al-Khrisha	Department of Antiquities
31.	Ms. Hanadi Al-Taher	Department of Antiquities
32.	Mr. Ahmad Lash	Department of Antiquities
33.	Mr. Atala Al-Rowahne	Department of Antiquities
34.	Ms. Huda Kilani	Department of Antiquities
35.	Mr. Jehad Haroun	Department of Antiquities
36.	Mr. Adeeb Abushmais	Friends of Archaeology and Heritage society
37.	Dr. Mohammad Al Khalili	Hashemite University
38.	Ms. Maysoun Al-Qatarneh	Department of Antiquities
39.	Prof. Ioannis Kanellos	Telecom-Bretagne
40.	Ms. Aysar Akrawi	Petra National Trust Society
41.	Eng. Anwar Al-Yousef	JUNET

6 Speakers and Presentations

In this chapter a short biographical profile and abstract is given for each speaker, as well as the URL where the relevant PPT presentation is downloadable. The speakers are listed on the basis of the workshop programme.

ROSSELLA CAFFO

Biographical profile
Director of ICCU; entrusted by the DG for the Technological Innovation and Promotion of the Italian Ministry for Cultural Heritage and Activities to follow ministerial initiatives dealing with new technologies applied to cultural heritage. In this capacity she coordinates national and international projects, such as SBN, Internet Culturale, and CulturaItalia, and the European projects MINERVA, MinervaPLUS and MinervaEC, MICHAEL and MichaelPLUS, and ATHENA. Rossella Caffo is appointed by the Ministry for Cultural Heritage and Activities as Italian representative in the framework of the Member States' Expert Group on Digitisation and Digital preservation set up by the European Commission. She coordinates DC-NET and INDICATE projects within the e-infrastructure domain, and other European initiatives as Linked Heritage.

Abstract
The project's coordinator illustrated ICCU Departments and Activities; then she illustrated the past, present and future scenario in the field of digital cultural heritage: 1) Europeana, the European Multilingual portal with over 20 M data, showcase for over 1,500 museums, libraries, archives across Europe, Supplied with data from national aggregators or EU projects, a flagship project of the European Commission and the European Parliament; 2) the results of MINERVA, a Network of policy makers and professionals from cultural ministries and national institutions; 3) MICHAEL: the Multilingual Inventory of Cultural Heritage in Europe; 4) ATHENA and Linked Heritage, two European Project who contributed large quantities of new content to Europeana and aimed at demonstrating improved search, retrieval and use of Europeana content; 5) DC-NET, a network of European ministries and national/regional agencies working together to coordinate programmes development in digital cultural heritage; 6) the birth of the INDICATE project.

Slides
http://www.indicate-project.org/getFile.php?id=318

ANTONELLA FRESA

Biographical profile
Engineer at Olivetti at the research centres of Pisa, Ivrea and Cupertino (Califormia) from 1980 to 1989 and at the Tower Tech engineering company in Pisa from 1990 to 1994. She has been involved in EU projects since 1993, writing proposals, managing projects and taking part in reviews and evaluation. From 1998 to 2002 she worked as Project Officer at the European Commission in Brussels. In the last ten years she has personally managed several projects in FP5, FP6, FP7, eTEN and eContent+. She has acted as evaluator and rapporteur for the RTD Framework programmes of the EU. She has extensive personal experience of digital humanities, acting as a consultant to the Italian Ministry of Culture since 2002 and contributing substantially to the work of the Minerva, Michael, Europeana, ATHENA, LINKED HERITAGE, DC-NET and INDICATE projects.

Abstract
INDICATE is a project whose main objectives are from one side the coordination of cultural heritage research opportunities opened by e-Infrastructures in countries all around the Mediterranean and from the other side the development of consistent policies and best practices governing such research. The use of e-Infrastructures by researchers in Arts, Humanities and Social Sciences (AHSS) is still a relatively new phenomenon. However, e-Infrastructures enable exciting and valuable new research in AHSS, and in cultural heritage in particular. New regional, national and EU initiatives continue to emerge, but there is still a lack of coordination structures for sharing best practice and experience and a lack of usable guidelines and best practice documentation. INDICATE project aims to establish and nurture a network of common interest made up of experts and researchers dedicated to policy and best practice in the complementary domains of e-Infrastructures and e-Culture, whose sustainability will be planned on a long term beyond the project duration. The network shares experience, promotes standards and guidelines, seeks harmonisation of best practice and policy and acts as a conduit for knowledge transfer from countries with more experience of e-Infrastructures-enabled e-culture to those who are just beginning to investigate this area. The project is rooted in the reality of research pilots and case studies which act as exemplars and demonstrators of the issues and the processes which are relevant to establishing cultural initiatives on the e-Infrastructures platform. In the first year, on the one hand the design and set-up of two pilot applications have been started: e-Infrastructure-enabled semantic search for cultural repositories and e-Infrastructure-enabled e-Collaborative Digital Archive protected by access control and rights management. The De Roberto Digital Repository, the Digital Repository of the Architectural and Archaeological Heritage in the Mediterranean Area and the Digital Repository of China Relics were the first e-culture applications which have been ported and integrated into the INDICATE e-Cultural Science Gateway. On the other hand, a number of Working Groups have been established in each country to examine how the facilities and resources offered by e-Infrastructures can be used to address long-standing R&D issues in the cultural heritage domain through the analysis of three detailed case studies: virtual exhibitions of cultural content, preservation of digital cultural content and processing and management of geo-coded digital content. The policy results are meant to be widely disseminated by a wide-reaching dissemination work-package, which includes two major public best practice deliverables, one international conference, three technical workshops and one policy workshop: the first technical Workshop on long term Digital Preservation has been organised in Ankara (Turkey) on 7th of July 2011, this is the second one on Virtual Exhibitions and a third one on GIS is planned in Ljubljana in February 2012. The participation of Ministerial partners (ICCU, MCC, CULTNAT, DA, MCT) from Mediterranean countries (both EU and non-EU) represents an important mean to reach the highest political level in the cultural heritage field, as well as to involve the widest number of cultural institutions in the dissemination and awareness actions organised by the project.

Slides
http://www.indicate-project.org/getFile.php?id=312

IOANNİS KANELLOS

Biographical profile
Professor at the Computer Science Department of TELECOM Bretagne, France. He studied mathematics, philosophy and linguistics. His scientific interests concern applied semiotics, rich media technologies, e-learning, anthropocentric human/machine interactions and digital museology. His work tries to furnish theoretical evidences and technological issues for interpretive approaches of the accessibility requirement to cultural, scientific and/or educational resources, noticeably in learning situations. Such accessibility is thoroughly conceived as a broad understanding challenge (of

students, visitors, the general public, etc.); the reading process prevails in modelling and development of systems. In the domain of digital museology, he tries to explore alternative implementations of the notion of user-centered thematic museums; there, flexibility addresses various profiles and levels of reception (and thus, of reading). He developed, in particular, the Annunciation virtual museum (www.annunciation.gr).

Abstract
When educational prerogatives meet museums wills and plans for extensively shared heritage (cultural, technical, scientific...), show and scene is not the adequate answer. The problem of accessibility is not only practical or material (how to accede to or how to deal with digital resources), but rather semantic: the public needs exhibition contexts, methods and tools that help in enhancing its understanding. Thus, in digital museology, exhibitions have to internalize specific issues able to reconfigure a presentation by adapting it to different visiting profiles and aims. Clearly, adapted exhibitions need to be supported by specific, upstream knowledge organization, sensible to different refinement levels and various points of view of exhibited objects. In this communication, we precisely intend to present some issues for these ideas, based on an implementation attempt of a thematic virtual museum (i.e., an on-line museum that offers exhibitions of a determined theme). After a quick summary of knowledge representation exigencies, we demonstrate by some selected hints the adaptability questions and solutions underlying the Annunciation virtual museum.

Slides
http://www.indicate-project.org/getFile.php?id=337

Full paper: Annex 1

MARİA TERESA NATALE

Biographical profile
Since 1985 she works in services for cultural institutions and the Italian Ministry of Cultural Heritage; from 2002 to 2008 she participated in the national and European activities of the 3 MINERVA projects (MINERVA, MINERVAplus, and MINERVA eC), being content manager of the relevant website, and responsible for the project Museo & Web, born in the framework of Minerva; she cooperated with the MEDCULT project funded by UNESCO, and coordinated the 'Digital Heritage' work package of STACHEM. Since the beginning (December 2009) she was technical coordinator of the ATHENA project. She takes part in Europeana Working Group on users and one of the authors of the Italian Guidelines for online virtual exhibition.

Abstract
One of the main goals of public and private cultural institutions is the promotion and dissemination of knowledge. They accomplish their mission thanks to knowledge dissemination tools that include temporary and permanent exhibitions and exhibits that follow codified models, whose goal is to expose citizens to the national and international cultural heritage. The meeting between the languages and methods of traditional cultural promotion (non-virtual exhibits and exhibitions) and the promotion and dissemination of knowledge through web-based methods (online virtual exhibitions) have made it necessary to edit guidelines that encourage the use of the web and maximize its potential. Exhibits designed with IT languages and destined for the web are increasingly acquiring institutional relevance and a strong public profile: museums, archives, libraries, and cultural institutions all should recourse to them and be considered an important strategic activity and as such must be well-planned and supported to foster their long-term growth. Virtual online exhibitions are not merely aimed at specialists, but rather at an audience that is larger and more

heterogeneous than ever before, and which is difficult to frame in traditional profiles. This is the reason why project choices must arise from a careful analysis of modes of expression, architecture, and language. The exhibition's architecture must be designed according to effective management models that can generate diversified virtual routes while keeping production costs acceptable, in order to meet the needs of the various user groups. A document is presented which illustrates the state of the art in online virtual exhibitions, both on the basis of the actual experience accrued by various Italian institutes and the observation and analysis of international products. It documents the outcome of collective deliberation on the part of experts and operators from all cultural sectors, who discussed their experiences in an ad hoc Italian working group within the Italian Ministry of Cultural Heritage.

Slides
http://www.indicate-project.org/getFile.php?id=317

AL ADARBEH NİZAR

Biographical profile
Project Manager of the Ancient Theatres Enhancement for New Actualities (ATHENA) project (www.athenaproject.eu), which is funded by the European Commission under the Euromed Heritage IV Program (www.euromedheritage.net). Al Adarbeh holds a Master degree in Cultural Resources Management and other international certificates in Destination Management and Professional Events Management. He was involved in different projects (2004-2011) related to the conservation and management of cultural heritage in Jordan and worked in several international funded projects.

Abstract
Ancient theatres represent one of the most significant cultural heritage remains of Mediterranean civilizations. A number of these ancient monuments are still being used for various activities. Such current uses of theatres create a continuous impact on their structures originally designed for needs very different from contemporary ones. Thus, the need for a common strategy seems to arise, involving the design, testing and implementation of a management plan. ATHENA project aims to minimize the progressive decay of ancient theatres in terms of physical, cultural and socio-economic aspects, to support the revival of these monuments as a part of a wider archaeological site or urban context and to establish an overall strategy for dealing with tangible and intangible heritage aspects. ATHENA project will have a major contribution in INDICATE through providing 3D modelling and interactive Theatre models. Several digital surveys for the theatres were implemented using 3D laser scanner in Jordan, Tunisia, Algeria, Spain, and Italy.

Slides
http://www.indicate-project.org/getFile.php?id=322

ARTUR SERRA İ HURTADO

Biographical profile
Deputy Director of the i2cat Foundation and Research Director at Citilab (Catalonia, Spain). The i2cat project started in 1999 and was one of the first European programs on Future Internet. He got the Ph.D. in Cultural Anthropology in the Universitat de Barcelona in 1992, after completing a three years fieldwork at Carnegie Mellon University, doing an ethnographic fieldwork about the "Design Culture" of this American university, specially its School of Computer Science. During last decades he has focused in the convergence of media, Internet and people with projects like Opera Oberta, Megaconference, Dancing Q, Cultural Ring, and other developed in collaboration with Liceu de Barcelona, GEANT, Internet2, Cinegrid, KAIST, CANARIE, RNP from Brazil and other institutions

globally. Dr. Serra is founding member of European Network of Living Labs, and organizing public-private-citizens partnerships fostering open innovation projects in Spain, like Citilab, inaugurated in 2007. This center is becoming an international reference in engaging digital innovation processes with citizens.

Abstract
Over the last 15 years museums, libraries and archives had been using the Internet to develop virtual exhibitions projects and disseminate their collections. The available e-infrastructures let us to think on new exhibitions formats and uses, as the ones that had already been developed on the field of performing arts. The virtual performances projects carried out by the i2cat Foundation since 2001 like the Open Opera, DancingQ event, Pansori/Flamenco demo and the Cultural Ring constitute an example of the new uses and formats that can also be applied to the cultural heritage sector. The Cultural Ring (Anella Cultural) is a digital cultural network which, with the intensive use of the new possibilities of second generation Internet, activates the exchange of contents and the co-production of events on-line and promotes research activities about new uses of the net in the cultural production field, while improving their diffusion and offering to creators a new platform to experiment with applications in digital art.

Slides
http://www.indicate-project.org/getFile.php?id=321

AYMAN KHOURY

Biographical profile
Deputy Director of CULTNAT, Head of the Egyptian Folklore and Audio-Visual Documentation Department. Expert in the field of digital documentation since 1994, he joined CULTNAT in 2000, where he has founded two documentation programs: the Egyptian Folklore and the Photographic Memory of Egypt, in addition to establishing the Audio-Visual Documentation Department. Milestones of his career include: developing the first Thesaurus of Egyptian folklore, thus paving the way for the development of the first thesaurus and database for the Arab folklore, in contribution with the ALECSO. He is also a photographer and movie director and managing the digital photo archive of CULTNAT.

Abstract
Egypt's Heritage is of a worldwide interest and importance due to its continuity over a period of more than five thousand years. It encompasses various aspects of the human civilization, monitors the development of human heritage and represents a cultural as well as natural heritage of national and international value. CULTNAT mandate is to document the various aspects of Egypt's tangible and intangible cultural heritage as well as its natural heritage, using the last IT technology, and also to increasing public awareness of Egypt heritage.

Slides
http://www.indicate-project.org/getFile.php?id=323

ANWAR AL YOUSEF

Biographical profile

Senior System Engineer at JUNet.

Abstract
The presentation explained what are Research & Education Networks; the main drivers for research networks; major objectives for R & E networks; NRENs: major services; national efforts in Jordan; JUNet services and activities; the features of the Arab States Research and Education Network (ASREN); ASREN vision, mission and objectives.

Slides
http://www.indicate-project.org/getFile.php?id=319

7 Conclusions

The Jordanian workshop in Amman was successful and it was a good opportunity to start a dialogue between national memory institutions and e-infrastructures providers.

The Jordanian participants were very interested in learning good practices in the field of virtual exhibitions and virtual performances and the opportunities offered by e-infrastructures. In fact, each presentation was followed by a series of questions and the discussion continued also in the break moments.

The workshop participants agreed on the needs of:

- developing performing informative systems that assure quality, reliability, data long-term preservation, security and sustainability, large scale access for the final users, with the support of e-Infrastructures;
- continuing the dialogue between memory institutions and e-Infrastructures to explore how e-Infrastructures can add value to the activities connected to digital cultural heritage and how joint activities may be implemented;
- learning from International and European good practices and widening the discussion at Mediterranean level;
- implementing the lessons learnt in the framework of virtual exhibitions and virtual performances realised at national levels;
- promoting the access of memory institutions to e-Infrastructures considering that they do not know each other and do not know the level of expertise owned in the respective areas.

We like to conclude this deliverable stressing on the last words of Prof. Ioannis Kanellos in his keynote speech: “the INDICATE project, by overemphasizing the importance of the virtual exhibitions, seems to restitute the forgotten actor in the new ICT museological challenges: the visitor. Furthermore, it stresses the importance and the urgency to force educational and patrimonial logics to converge. Clearly, methodologies for adapted virtual exhibitions are not only new ways of doing low-cost exhibitions. Visitor adapted museology is not less expensive than traditional museology. However, it is perhaps an opportunity to reformulate the exigency of a democratic culture under new but sustainable technological paradigms”.

8 Annex 1: Key-note speach

Visitor-Centered Digital Museology: Towards Profile Adapted Virtual Expositions

Amman INDICATE Workshop
Ioannis Kanellos
ioannis.kanellos@telecom-bretagne.eu
TELECOM Bretagne
France

What is a visitor-centered digital museology?

Exhibitions seem to be the disinherited member of the family of ICT developments addressing digital libraries or museums. Perhaps because the main challenge was (and still is) to set up standards, policies, systems and devices providing solutions for institutional needs. Such preoccupations were (and still are) certainly necessary; but they often remain far away from public's general demand, mainly focusing on access and appropriation of contents.

It is not astonishing nowadays to observe that the notion of "virtual museum" is yet essentially thought as a digital extension of some existing institution. (Just when these lines are written, more than 75% of the existing virtual museums on the internet are digital windows of real, "mortar" museums; I confess, I hardly ever visit such virtual museums with the intention to discover artworks or to refine my competence on them.) As visitors, we could expect more, of course. Building virtual museums goes further than the spitting image of a real museum, graced with some new look functionalities to fit to our information society practices and expectations. There is a real need of setting up methodologies and techniques for an authentic digital museology where the visitor is considered as the main actor in shaping the nature and the level of proposed pieces of information. This last means, there is an insistent need for a museology where the collections may be exhibited satisfying diversified accessibility demands.

Information and communication technologies may offer such a valuable opportunity by "adapting" the exhibition material to different visitor profiles (i.e. to different educational levels, visiting intentions, time budgets, knowledge exigencies, etc.). Moreover, they can enhance observation conditions and even give elements concerning aspects of the invisible building up of the exhibited objects (for instance, for a painting exhibition, reflectographies explicating the preparation of initial and final drawings, stratigraphies giving images of the painting layers, chemical analyses offering a precise qualification of the used painting pigments…). In other words, they can give new solutions to the accessibility requirement in visiting exhibitions; such solutions go beyond the senseless dilemma between original and digitally reproduced objects ("Is it better to see Da Vinci's *Mona Lisa* directly, in the Louvre museum, or a high resolution, digital reproduction of it? Can digital reproductions replace the value of a natural encounter with the artwork?"). Indeed, they can support innovative, tailored reading strategies of the visitor; and even, "intelligent" assistance through different

visiting scenarios. Nothing, of course, can replace the privileged, natural, unobstructed encounter with the real artwork. Nevertheless, well-developed digital exhibitions may enhance and furthermore adapt such encounters.

I shall sketch in the sequel the guiding lines for setting up what I would like to call "*thematic* virtual museums". A thematic virtual museum is actually an alternative way of speaking of virtual exhibitions organized under a particular idea. It is a special kind of museum, where the collection is determined by a theme argument (which underlies some museological project). Such museums have, of course, not a real counterpart; they may contain digital reproductions of pieces coming from various institutions. I shall try to give some elements illustrating in which sense patrimonial logics may (and have to) join learning missions.

The ontology argument

The first step is the knowledge architecture. Let us say it straightforwardly: it is not possible to build interesting, adaptable exhibitions without ad hoc knowledge bases. Indeed, such a knowledge has to correspond both to various and upstream accessibility wishes and to a set of downstream services (educational, social, for entertainment and, more generally, cultural). The ontology argument is clearly prevalent today, insofar as Semantic Web is growing around us. On the other hand, many of the services built, especially services founded on information retrieval, need systems with reasoning capabilities. My private opinion is that such ontologies may sometimes implemented into classical data bases, as far as information retrieval may be reduced for some types of exhibition with limited interactional schemata. I shall not argue about it here. Whatever it may be, knowledge is necessary.

However, for a really adapted museology, such knowledge has to be split into complementary classes and levels. Indeed, not all pieces of knowledge are equivalent; neither are they always necessary for a specific accessibility requirement, which translates different intentions and different acceptability criteria. In few words, it is important to distinguish between different qualities of knowledge (corresponding to different aspects, points of view, analysis domains, categories…) and different knowledge deepness or refinement levels (corresponding to different visitor profiles or exigencies in appropriation of the artworks). By a personalized combination of these categorizations, both syntactic and paradigmatic, it is possible to fine down the exhibition material and offer accessibility conditions adapted to different reading strategies. Indeed, such a knowledge categorization allows having at disposal large and pre-structured informational chunks that may mutually combine and support assorted exhibition scenarios.

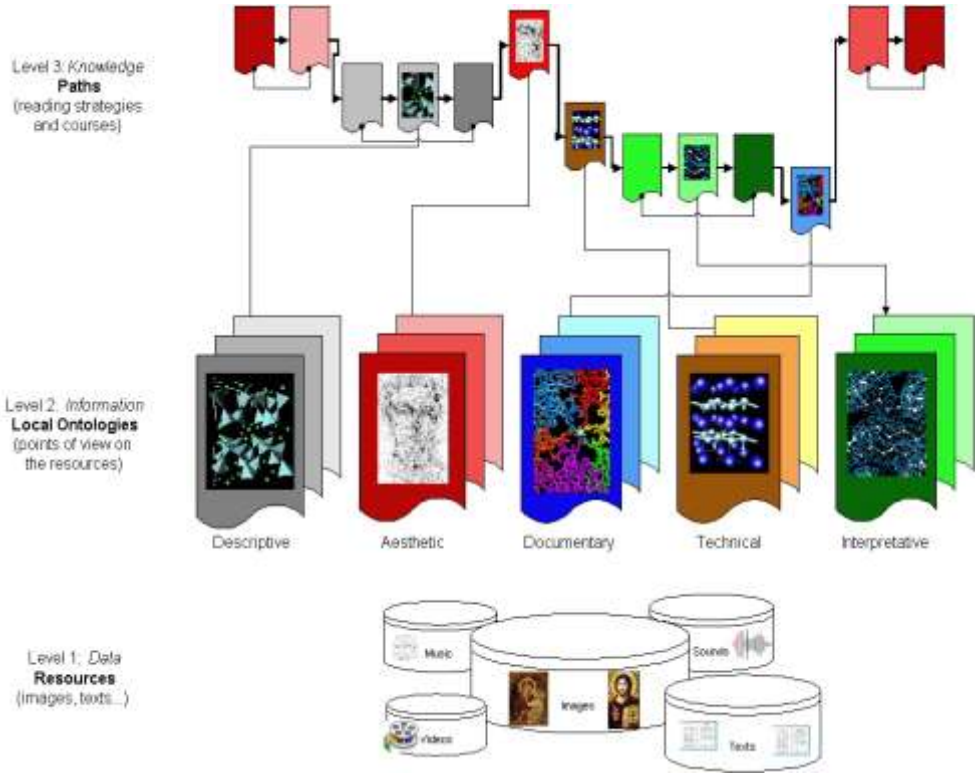

Figure 1. *Resources are indexed under different refinement levels (here, three) and different points of view (here, five) addressing categories of knowledge for determined visitor profiles. Visiting scenarios are built over all possible combinations between levels and points of view.*

The scenarios

Once the knowledge architecture set up, it is necessary to define the visiting scenarios. Actually, there are plenty, covering all the space between the two extreme poles (an exhibition offering completely free visit possibilities, or a strictly guided one). Clearly, each of them offers specific accessibility means to the visitor. Generally, the knowledge structure makes it possible to define them completely (off-line) or even to configure them dynamically (on-line). In other words, it is possible to calculate all feasible scenarios and filter the adequate one on demand, or to implement some generation mechanism and leave the rest to an interaction schema. Again, the choice depends on the designed set of services (and, of course, the calculation power and the storage capacities of the used machine).

Roughly speaking, a visiting scenario invokes a path made up from selected points of view and deepness levels. Such a path supports a narrative schema underlying the exhibition intention.

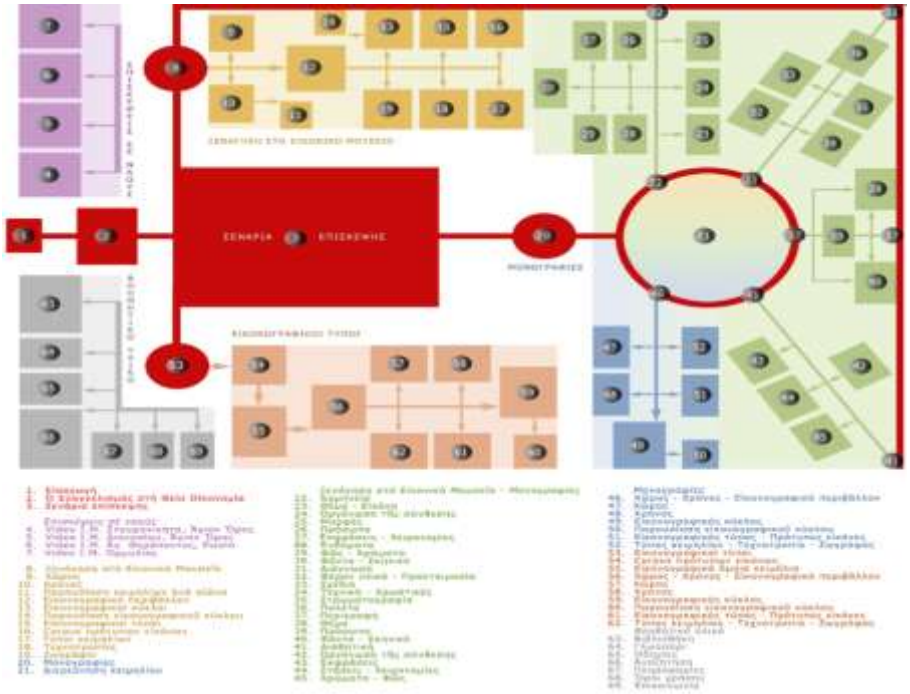

Figure 2. *Spatial representation of the visiting "spaces" of the Annunciation virtual museum (cf. below).*

The representation of all visiting paths may metaphorically be seen as a real visit. Anyway, a visit in a virtual museum is essentially metaphorical. Such a knowledge architecture allows to fit a scenario to a defined visiting intention (visitor profile) insofar as the combination of the knowledge chunks produces numerous scenarios for precise tunings. For instance, with *n* deepness levels and *m* points of view, there are $(n \times 2^m)-1$ possible exhibition scenarios for an artwork. Clearly, for a collection of artworks, this number may sensitively increase.

Implementation issues

Let us quickly see a possible implementation of these ideas. My example will be the Annunciation thematic virtual museum (www.annunciation.gr). It concerns Byzantine iconography on the Annunciation theme. It can, therefore, be seen as a thematic exhibition (the visitor finds at this site only Annunciations of different areas, periods, techniques, schools, function, material, etc.).

In this implementation there are, precisely, three levels of knowledge deepness; they correspond to three distinct profiles, which, generally, testify different reading strategies ("discovery", "study" and "scholarship").

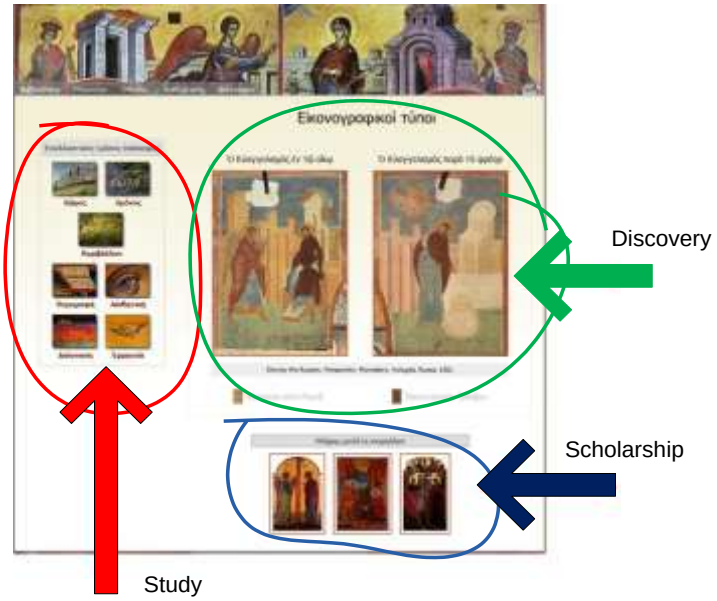

Figure 3. *The definition of the three possible approaches of the artworks (discovery, study and scholarship).*

On the other hand, the underlying knowledge is entirely split into five points of view: “description”, “contextualization”, “aesthetics”, “physical and chemical profound analysis” and “interpretation”. The whole corpus at this site is categorized on the basis of a limited number of typical artworks (i.e. artworks that entertain similarity relationships with other artworks; these categories may be understood as sub-galleries of the museum).

The discovery approach of the artworks gives only succinct information about the artwork under view (like the information we generally find in real museums by the artworks). The visitor progresses incrementally, from an artwork to another, generally by association whose she/he is the sole master. The only complementary possibility she/he has is to see the artwork in detail, since all images are of high resolution. Of course, at any moment, she/he can ask for extended information by switching to the study approach.

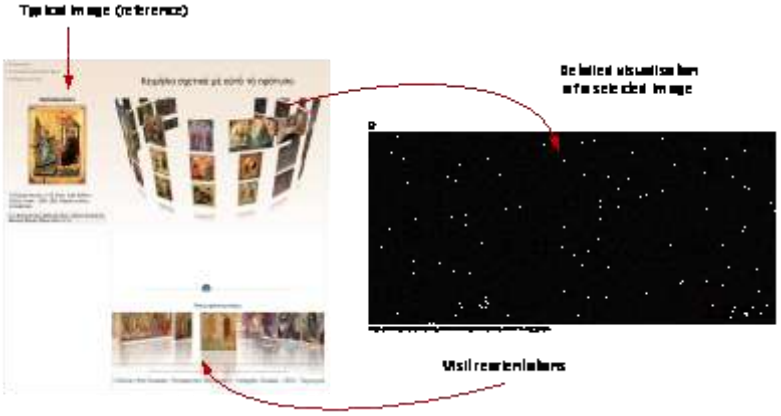

Figure 4. *Artworks are presented in a 3D interactive carousel. The artwork may be selected and viewed in detail. If the accompanying and rather basic information is not judged enough, the visitor may switch to a more profound level (e.g. the study level). Or, even, she/he may choose to change the sub-gallery in order to visit another artwork category.*

The study approach gives more detailed information concerning the artworks. Here, the visitor is constrained to follow more or less traditional art history categories with a particular emphasis on contextual, intertextual and interpictural relationships between artworks. The visitor, in this case, is supposed to pursue a project (typically, she/he is thought to be a student).

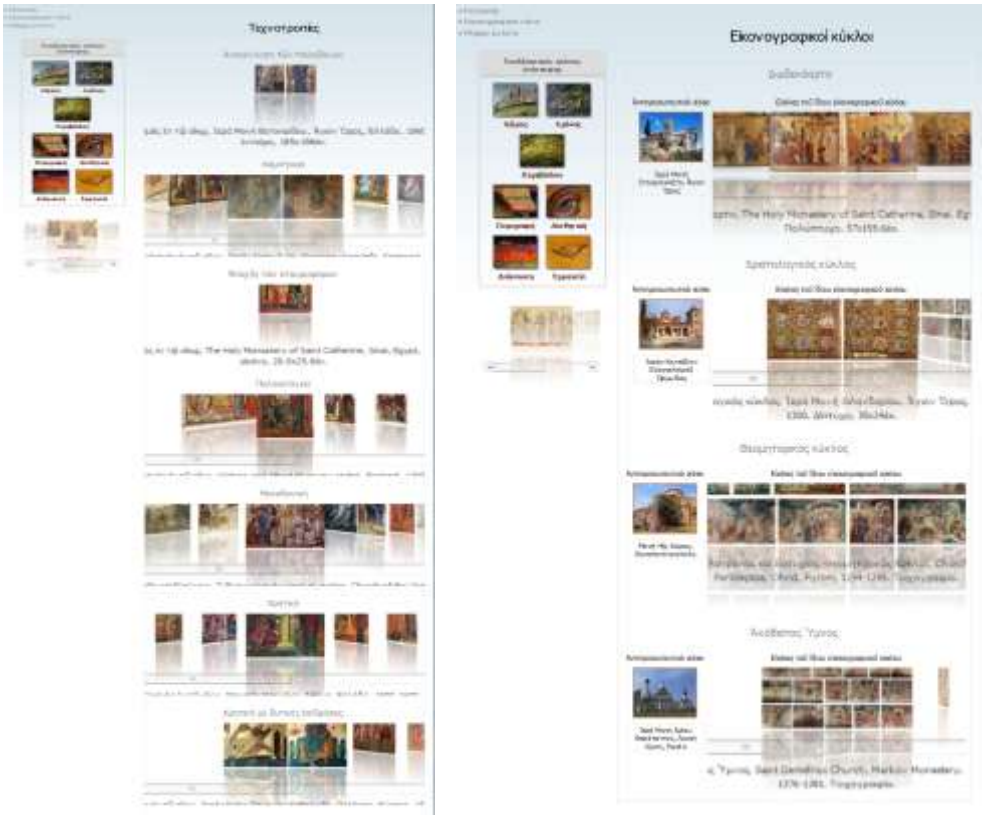

Figure 5. *Some of the possible interpictural/intertextual generated relationships between artworks (on the left, interpictural relationships concerning the painting style; on the right, interpictural relationships concerning the narrative iconographic cycles in which the artwork belongs). Videos are also displayed in order to better understand the place of an artwork in the iconographic program of a church. Rich comparisons are possible and new intelligibilities may emerge.*

Finally, the scholarship approach is an expert approach. It sets up specific exigencies for unlimited observation conditions that may also go further than the visible spectrum. The museum makes explicit three examples. Each artwork is viewed under the five points of view (cf. above) that appear under a five-faced interactive carousel.

Figure 6. *The selected artwork (on the left) is envisaged under five points of view (on the right): description, contextualization, aesthetics, physical and chemical profound analysis and interpretation. The visitor may also perform cross-point of view investigations, supported by additional texts and multimedia material.*

The visitor may also have access to technical, non-visible information that necessitates high technology instrumentation.

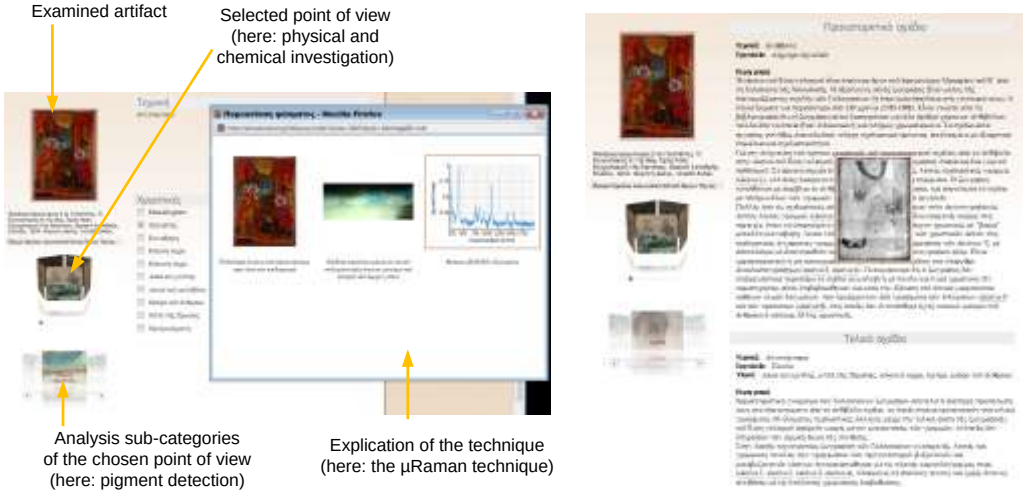

Figure 7. *Pigment detection (μRaman technique) and reflectographies (giving precious elements on the initial preparation of the icon).*

Here, the images allow to access to the intimacy of the artwork: not only the way it was technically painted, but also how it appears when the traditional distances of real museums are suppressed and details may comfortably observed (images are of a very high resolution).

Figure 8. *The added value (and the unexpected pleasure) of unconstrained observation conditions.*

The interpretation synthesizes the four remaining points of view and proposes analyses and explications in a textual manner.

Conclusion

I tried to sketch the basic steps for an authentic visitor-centered museology. It can be resumed by the following, last Figure:

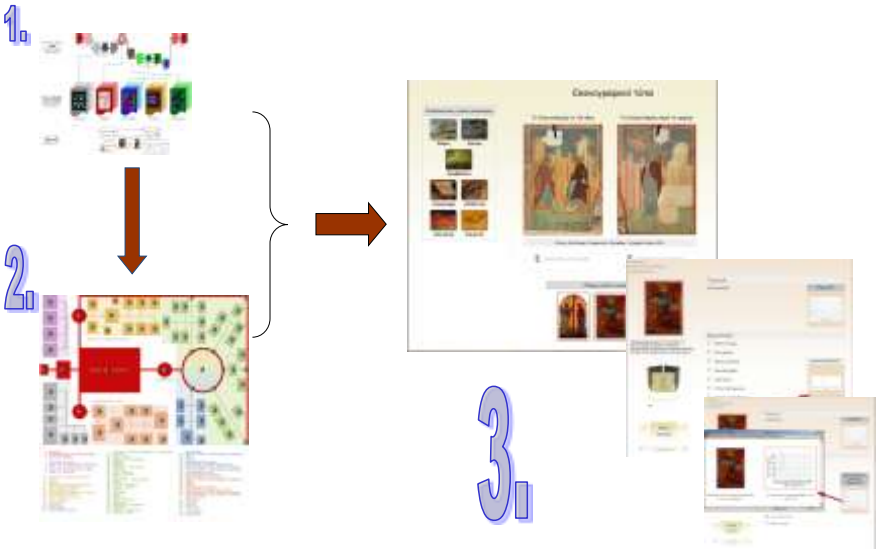

Figure 9. *Steps in setting up visitor-centered virtual exhibitions: 1. Multi-level and multi-point of view knowledge architecture; 2. Scenarization; 3. Implementation through interactive schemata.*

The INDICATE project, by overemphasizing the importance of the virtual exhibitions, seems to restitute the forgotten actor in the new ICT museological challenges: the visitor. Furthermore, it stresses the importance and the urgency to force educational and patrimonial logics to converge. Clearly, methodologies for adapted virtual exhibitions are not only new ways of doing low-cost exhibitions. Visitor adapted museology is not less expensive than traditional museology. However, it is perhaps an opportunity to reformulate the exigency of a democratic culture under new but sustainable technological paradigms.

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