Constructing Memory in the Digital Era

EXPERIENCE, EXPECTATIONS AND INSIGHTS FROM THE FIELD OF PRESERVATION OF THE CULTURAL HERITAGE

Marinos Ioannides, 15.9.2014 – Verdun, France

Preservation of Records, Knowledge and Memory of Radioactive Waste Across Generations

Acknowledgement:
The research project has received funding from the People Programme (Marie Curie Actions) of the European Union's Seventh Framework Programme FP7-PEOPLE 2007-2013 under REA grant agreement ITN2013 ITN-DCH no 608013.
CYPRUS...

the crossroad to three continents...

...over 13,000 Years of history beginning with the roots to Mesopotamia

...traces of Hellenistic, Roman & Byzantine Culture

Since March 2013

Since 1\textsuperscript{st} of Jan. 2008

Since 1\textsuperscript{st} of May 2004

...influenced by the Pharaohs...

Population: ca 970,000

Acknowledgement:
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Cyprus University of Technology


Faculty of Engineering and Technology

Department of

Electrical, Computer Engineering and Informatics
A budget of 1.2 M Euro within the last Year from European Funds

Digital Heritage Lab (CUT-DHL)

The scientific themes on DHL research agenda relate to the basic mission of the lab, which currently are:

✓ Heritage Documentation and Semantics
  • Archaeological records
  • Data acquisition (2D / 3D / 4D) and management
  • GIS and remote sensing
  • Standards and digital libraries

✓ Visualization and Heritage Communication
  • Multimedia

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30 Years ago...

On 22 September 1984 Bundeskanzer Kohl met the French president François Mitterrand at Verdun, where the Battle of Verdun between France and Germany had taken place during World War I.

366 Years ago...

The Peace of Westphalia in Muenster (1648), ending the Thirty Years War, confirmed Verdun in French possession. Fortified by Sébastien Vauban during the reign of Louis XIV, Verdun thereafter became important strategically.

100 Years ago...

...an estimate in 2000 found a total of 714,231 casualties, 377,231 French and 337,000 German, an average of 70,000 casualties for each month of the battle. It was the longest and one of the most costly battles in human history; other recent estimates increase the number of casualties to 976,000.

33 Years ago...


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The Inventor of Radioactivity died

Marie Skłodowska-Curie, (†1934) was a Polish and naturalized-French physicist and chemist who conducted pioneering research on radioactivity. She was the first woman to win a Nobel Prize, the first person (and only woman) to win twice, in multiple sciences, and was part of the Curie family legacy of five Nobel Prizes. She was also the first woman to become a professor at the University of Paris, and in 1995 became the first woman to be entombed on her own merits in the Panthéon in Paris.
"Access to information is critical to successful disaster risk management. You cannot manage what you cannot measure."

Margareta Wahlström,

United Nations Special Representative of the Secretary-General for Disaster Risk Reduction

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Measuring the Time

The dating of radioactive carbon has helped to define the history of life on this planet.

Any living organism takes in both radioactive and non-radioactive carbon, either through the process of photosynthesis or by eating plants or eating animals that have eaten plants.

When the animal dies, however, uptake of carbon stops. As a result, radioactive carbon atoms are not replaced as they decay, and the amount of this material decreases over time. The rate of decrease is predictable and can be described with accuracy, vastly increasing our ability to date the biological events of our planet.
When was the first known Preservation/Protection of Human Memory – Cultural Heritage??

TIMAEUS

by Plato
'O Solon, Solon, you Hellenes are ever young, and there is no old man who is a Hellene.' 'What do you mean?' he asked. 'In mind,' replied the priest, 'I mean to say that you are children; there is no opinion or tradition of knowledge among you which is white with age; and I will tell you why. Like the rest of mankind you have suffered from convulsions of nature, which are chiefly brought about by the two great agencies of fire and water...
ΠΛΑΤΩΝΟΣ

1) Τά έδει έκτιθησαν περί περιοδικό κατακλύσμων διαφέρονταν άποϊ διακειμένης τόν όλον τον νόσον περίπον εσόξιαν Πελοπικον (309 c—ε). Αι άσθενείαν πού κατά κανονικά διαστήματα μάτο μεσαίας κατά ποσολού είναι ο πορετός! (Τίμαιος) 86a
...The MEMORIALS which your own and other nations have once had of the famous actions of mankind perish in the waters at certain periods; and the rude survivors in the mountains begin again, knowing nothing of the world before the flood. But in Egypt the traditions of our own and other lands are by us registered for ever in our temples. The genealogies which you have recited to us out of your own annals, Solon, are a mere children's story. For in the first place, you remember one deluge only, and there were many of them, and you know nothing of that fairest and noblest race of which you are a seed or remnant. The MEMORY of them was lost, because there was no written voice among you. For in the times before the great flood Athens was the greatest and best of cities and did the noblest deeds and had the best constitution of any under the face of heaven...
διότι διεσώθη ἐλλεύμα σπέρμα τὸ ἀγγείωτε δὲ, διότι ἐπὶ πολλὰς γενέσεως, οἱ ἐξακολοθοῦσαι διαδοχικοὶ πρὸ γονοῦ σας ἀπέγέννησαν χωρὶς νὰ δυνηθῆσαι νὰ ἐκφράσωμεν γραπτῶς. Διότι, ὢνομ, πρὶν ἀπὸ τὴν μεγάλην καταστροφὴν που ἔγινε ἀπὸ τὸ ωδόπ, ἡ πολιτεία ἢ ὅποια σήμερον εἶναι τῶν Ἀθηναίων, ἡ ἀριστεία εἰς τὸν πόλεμον καὶ ἐκείνους κατὰ τὸν τελευταίον τρόπον, ἀπὸ κάθε ἀποφοί. Καθός δὲ λέγεται, ἐπροκειμενοποιήθησαν ἀπὸ τὴν ὁραίοτερα καταρροματικά καὶ αἱ καλύτεραι πολιτικαὶ διαταξέες ἀπὸ δᾶς διδασκαλία ἄκουσες νὰ μιληθεῖ κατά ἀπὸ τὸν ωδόπον.

Ὅταν λοιπὸν ἔκρυψε αὐτὰ ὁ Ὠστός, εἶπε δι’ ἐκλήμας, καὶ γεμάτος περιέργειας, παρεκάλεσε τοὺς ἱερεῖς νὰ τὸ ἐκθέσων ἄκροβις καὶ κατὰ σειράν τὰ περὶ τῶν πολιτικῶν συμπολιτίων του. Καὶ ὁ ἱερεὺς ἀπεκρίθη: «Δεῖν θά σοτο τὸ ἀποκρύφιον καθόλου, ἀλλὰ ἃ θέλως σοτο τὸ εἰπόν χάριν σοι καὶ τῆς πόλεως σας, καὶ πρὸ πάντων χάριν τῆς θεᾶς, ἡ ὅποια καὶ τῆς ἱδικής σας πόλις καὶ αὐτὴν ἐδώ τὴν ἱδική μας ἔλαβε ὑπὸ τὴν προστασίαν της καὶ ἀνέθρεψε καὶ ἔπαιζε, πρὸδων μὲν τὴν ἱδική σας κατὰ χλεῖς ἐν ἐνωρίτερα, παραλαβότα σῶς τὸ σπέρμα σας ἀπὸ τὴν γῆν καὶ τὸν Ἡρασίο, ἢ τείκε ἀπὸ πρὸ τὴν ἱδική μας. Ἀριτού δὲ ἐπολύσπισθα δὴ τοὺς μας, ἔχον περάνεσθε, καθὼς ἐρευνᾶς χρησμοῦνεις νὰ τὰ ἱερὰ βιβλιά, ὅτι χιλιάδες ἐτη. Περὶ τῶν συμπολιτίων σοι λοιπῶν, οὔτος: ἔγραψαν πρὸς ἐννέα χιλιάδας ἔτη, ἢ θάνος νὰ φανερώσως δῆλον καὶ τῶν νόμων τῶν καὶ ἀπὸ τὰ ἐργά την ὁ ὁραίοτερον ποὺ ἐκμαίνει. Τας λεπτομερείας δὲ δὴ ἑλα αὐτὰ δὴ τὰς διεξελλόμενα κατὰ σειράν ἄλλοτε μὲ τὴν ἔσχηκαν μας, ἀρότι λάξωνες εἰς χειρὰς τὰ ἑταὶ τὰ γραπτά. Σύγκρινε λοιπῶν κατὰ ἄρχας τοὺς νόμως σας πρὸς τῶν ὑδωρῶν πολλὰ παραδείγματα καὶ ὑπογυπονομένοι, μετα τὴν τῶν ἱδικής ἱερεῖς νὰ διακοιμέομεν, μετὰ τὸ να τῶν ἱμποροφορίας, ὅπως καὶ αὐτὸ ἕκαστον ἄλλο νὰ ὑπογυπονομένοι, τὸ τε τῶν νόμων καὶ τὸ τῶν ἱερεῖων ἐν τοῖς γενοῦς καὶ δὴ οἱ τὸ μάχης γενοῦς ἔστερος σοι πνεῦμα ἀπὸ πάντων τῶν γενοῦς κεραυνομένων, μετὰ τὸ να ἐκληρίωτα τὸν μύθον τῆς γενεσίας τοῦ Ἡρασίου, καθές τὸν ἀναφερόν ὁ Εὐσεβίς εἰς τὸν Ἰσογ. τὸ Ίσογ. τὸ Μικρόν ἡ τὴν ἴχνης ἡ τὸ τῆς πολεμιστοῦ ἡ ἔκρυβεν καὶ οὐτὸς καὶ τῶν ἡ ἱδική ἐναντίον σας.
Darius Victory - 500BC
(Prof. Zolfaghari, Iran)

The Documentation of the Past

Long Term of Data Validation

Free of Charge
Open Access
What does this means for the future?

I. No WW standards for the digitalization, modeling, archiving, harvesting and re-use of CH content!

II. One of the largest investments in the world: Cultural Heritage

According to FBI / Interpol:

A total reward of 420 M Euro is still being offered for information leading to the return of CH items
What does this mean at the present?

Looting and theft of cultural property is the 3rd worldwide criminal industry often associated with money laundering and terrorist activities!

http://www.fbi.gov/2013

“War is good for us. We buy antiquities cheap, and then sell weapons expensively.”

Abu Khalid, smuggler

http://world.time.com/2012/09/12/syrias-looted-past-how-ancient-artifacts-are-being-traded-for-guns/#ixzz26HxWHV1T

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Why do we care about the Cultural Heritage?

- The Treaty on the functioning of the European Union (*the so called Lisbon Treaty - 2010/C 83/01*) on article 3 and article 167 *(28 countries)*

- Council of Europe in Strasbourg *(43 countries)*

- UNESCOs conventions *(193 countries)*
Why do we care?

...or we don’t care?..
Digital Documentation with ?
The reconstruction of the Cathedral of Dresdner 1992-4
The Risks

Anna Amalia Bibliothek in Weimar, Germany
UNESCO WHL Library – Partially destroyed in 2004

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The Risks

A Day before…

After the Earthquake in 2003
(6.6 Richter scale)

The city of Bam in IRAN

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Why do we need the e-Documentation?

Thanks to the Bildportal der Kunstmuseen, Berlin (bpk-images.de)
Why do we need the e-Documentation?
The Archive of Cologne

1971

2009
The Risks

National Museum of IRAQ in 2003

Deputy curator
Mohsen Hassan

...The National Museum of Iraq has been almost completely pillaged. Over 170,000 artifacts have been stolen or destroyed from the museum, which once boasted an irreplaceable collection of artifacts from Mesopotamia dating back as far as 7,000 years...

(New York Times 13\textsuperscript{th} of April 2003)
Mali - Timbuktu

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Why do we need the e-Documentation?
Museum Artifacts

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Reconstructions of the East Pediment of the Temple of Zeus at Olympia
The original Antikythera Mechanism
Bust of Nefertiti – 3D Printing
The Challenges

“People the world over are creating memories in forms that are less and less permanent - be it sound recordings, books, drawings, films, videotape, newsprint, magazines, photographs, monuments, 3D or computer-based documents. It must be said that the output of the present century alone is probably greater than the total output of all previous centuries put together; and ironically and tragically, it is being lost faster than ever before. It is a tragedy indeed, for what is at stake is the recorded memory of mankind!”

Dato’ Habibah Zon, Director-General of the National Archives of Malaysia

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The EU Policy on Digital Cultural Heritage

- **2005** – *Letter of six Heads of State and Government* advocated the creation of a virtual European library

- **2005**: European Parliament and the Council decision on establishing a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable

- **2005**: Commissions communication ‘i2010-Strategy for Information Society and the media working towards growth and jobs

- **2005**: Commissions communication: ‘i2010: digital libraries’

- **2006**: Commissions communication on the digitization and online accessibility of cultural material and digital preservation

- **2008**: Council conclusions: *European Digital Library*

- **2008**: Commissions communication: *Europe’s cultural heritage with a click*
The EU Policy on Digital Cultural Heritage

- **2009**: Commissions communication: Europeana – next steps
- **2010**: Decision of the European Parliament on Digitization
- **2010**: Council conclusions on Digitization
- **2010**: Commissions communication: Digital Agenda for Europe
- **2012**: Commissions recommendations on digitization
- **2012**: Council conclusion on digitization
- **2013**: Directive on orphan works
- **2013**: Directive on reuse of Public Sector Information (PSI)

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What we are doing?

We are trying to document (a digital set)

We are trying to archive

We are trying to preserve the data set

Any interpretation?

WHAT?
WHERE?
HOW?

Digital Libraries
Metadata
Semantic cap

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Documentation of Monuments

WHAT ?

WHERE ?
The challenge for the next decades

Linked Data for Libraries, Archives and Museums

Libraries

- provide finding aids
- publish

Books

- contain narratives made from
- illustrate, exemplify
- are about refer to

Archives

- provide finding aids

Primary Documents

Museums

- document features & context
- exhibit

Sites

- using

Objects

SMRs

- document manage

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Documenting the Interior

Photogrammetric measurements

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Some examples using BIM
HBIM Model of the church with stratigraphic information related to the singular object
Photo-Album Cyprus
Europeana: The EU Digital Library

It is the common access point to the different kind of collections of European libraries, archives and museums from all around Europe. The Library has to provide direct online access in a Multilingual and Multimedia Form.

(The Archive of all the EU Digital Libraries/Archives…)

An open access European digital library for all researchers, professionals, students and the public…

Since 2012 Europeana is harvesting the first 3D objects
Digital Libraries

- EU Digital Library - Europeana (EU)
- World Digital Library (USA)
- Memory of the World (UNESCO)

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An encyclopedia is a type of reference work, a compendium holding information from either all branches of knowledge or a particular branch of knowledge.

"ἐγκυκλοπαιδεία“, == well rounded education" or "general knowledge".

Digital Encyclopedias==„Multimedia Presentations“
“Indeed, the purpose of an encyclopedia is to collect knowledge disseminated around the globe; to set forth its general system to the men with whom we live, and transmit it to those who will come after us, so that the work of previous centuries will not become useless to the centuries to come; and so that our offspring, becoming better instructed, will at the same time become more happy, and that we should not die without having rendered a service to the human race in the future years to come.”

Denis Diderot (1713 – 1784) French philosopher, Chief editor of and contributor to the creation of the Encyclopédie.
Efficient Data Acquisition

FP7 PEOPLE IAPP 4D-CH-WORLD
Data Presentation
Intangible Cultural Heritage

• What is it?
• Who set the definition?
• Whom ever it affects?
• Why to document it digitally?
• Why to preserve it?
• How to re-use the content? and
• Who are the end users?
In ancient times, the library of Alexandria was said to contain up to 70% of all human knowledge. The challenge for the digital age is to do even better than that – and make the data/results last longer...
Advantages

• No physical boundary.
• Round the clock availability.
• Multiple access.
• Information retrieval. The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection(s).
• Preservation of Data.
• Storage Space.
• Added value (Resolution, Improvement of quality, etc)
Long-Term Validation of the Data

...The challenge for the digital age is to do even better than that – and make the data/results last longer.

Preservation of Data $\rightarrow$ e-Preservation

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Problems of the Search-Engines

Can we receive data about a specific topic in the form of an Encyclopedia?...

The dimension of the problem...and the Challenges!
FP7-PEOPLE 2013 ITN-DCH
* A Marie Curie Project *

Project Partners
(Academia, Industry, Research) = Triangle of knowledge

- 23 **Partners** (Academia, Industry, Research and CH Institutions)
- 4 Years Project with 3.72 M Euro budget
- To train 20 **high caliber** PhD-Fellows in the area of Digital Heritage
- Research Training on Tangible and Intangible CH

- The calls for the positions are available: [www.itn-dch.eu](http://www.itn-dch.eu)
This worldwide unique project aims for the first time to analyse, design, research, develop and validate an innovative framework, integrating the latest advances in different scientific disciplines that cover the whole lifecycle (chain) of Digital Cultural Heritage (DCH) research (such as data acquisition/capturing, data pre (post)-processing, modelling, semantics and symbolic representation, metadata description (including material and composition/construction documentation), repository and archiving, visualization and media production through mixed/augmented enabled technologies, personalized and interactive multimedia interfaces) for a cost–effective preservation, documentation, protection and presentation of cultural heritage.
EuroMed2014 and Work to be done

www.euromed2014.eu
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