

# Net 4 Society

## ISSUES *e-magazine*



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### Introduction



**Dr. Marinos Ionnides, the Director of UNESCO Chair on Digital Heritage**



## Horizon Europe

### Introduction

This edition of the ISSUES e-magazine continues with our outreach to the topic of future prospects of the next European Research and Innovation Framework Programme. In the previous ISSUES we provided the overview of the two out of three dominant themes (Democracy and Social and Economic Transformation), within the Inclusive and Secure Society cluster: Democracy, Cultural Heritage and Social and Economic Transformations, which is placed in the second pillar on Global Challenges and Industrial Competitiveness of the forthcoming Horizon Europe 2020 framework. Now, last, but not least we are moving the focus of our special edition of ISSUES e-magazine to cultural heritage. Cultural heritage is a complex issue, as among its facets it may be viewed as a resource, expression of the historical and cultural development, a foundation for European citizenship and a legacy for the generations to come. In order to discuss the current state of the art in the research on cultural heritage, its key challenges, success stories and future developments, ISSUES reached out Dr. Marinos Ionnides to address these topics.

**Guest contributor to ISSUES e-Magazine, Dr. Marinos Ionnides, the Director of UNESCO Chair on Digital Heritage**



Dr. Marinos Ionnides, the Director of UNESCO Chair on Digital Heritage gave his contribution to the discussion on the research on Cultural Heritage today and the view on the future developments focusing on the digital and technological application and specific subpart of the Digital Cultural Heritage. His recommendations are based on the priorities identified by the Horizon 2020 project on Virtual Multimodal Museum. European Commission recently also published the policy review (Zoltan Krasznai, policy officer) based on the assessment of the fourteen funded projects that deal with cultural heritage and assess the role of Social Sciences and Humanities. (The projects such as COURAGE, HERA, MEMOLA, RICHIES, TRACES that all have dealt with cultural heritage and SSH are to be included). It is Innovation in Cultural heritage conference report.

**What is the status of cultural heritage research today, challenges and success stories?**

Cultural heritage (both tangible and intangible) is a strategic resource for Europe with high cultural, social, environmental and economic value. The cultural heritage (CH) of the European Union (EU) is a rich and diverse mosaic of cultural and creative expressions, it is our story, our inheritance from previous generations of Europeans and our testimony and memory and legacy for the generations to come. It encompasses natural, historical buildings and archaeological sites; museums, monuments, and artworks; historic cities; and literary, musical, folkloric and audio-visual works. It tells of our origin, the story of Europe, the knowledge, practices and traditions of all European citizens. It enriches the individual lives of citizens, it is a driving force for the cultural and creative sectors and plays a role in creating and enhancing Europe's social capital. It is also an important resource for economic growth, employment, new skills and social cohesion, offering the potential to revitalise urban and rural areas and promote sustainable tourism.

The era of Digital Cultural Heritage (DCH) is now well underway. Revolutions in e-commerce, e-business, e-learning, Big Data, Artificial Intelligence and Machine Learning, Virtual and Augmented Reality and Cloud computing present new opportunities to CH stakeholders.

To maximise the benefits of the application of digital technologies to CH, important challenges and obstacles need to be addressed through research in order to develop a holistic approach which meets the needs of all existing and potential user/experts groups and thereby increases the social and economic value of DCH.

Culture - and the heritage which derives from it - is an economic and social asset. The ideas defined for Culture 3.0 have identified key links to innovation, welfare, sustainability, social cohesion, new entrepreneurship, soft power, local identity and the knowledge economy. Policies are needed leading to initiatives which gain maximum effect, moving from public patronage to a system-wide competitiveness strategy through strategic investment.

Society becomes increasingly technology driven: cultural heritage organisations must adapt and become engaged with this development. Clear and tangible policies are needed from governments and management of cultural heritage institutions to inspire novel implementations and stimulate investment.

In order to improve cost/impact efficiency and achieve greater sustainability, effective operational and business planning is needed. An important gap can be identified between investments in implementation of digital projects on the one hand and 'backbone' actions, on the other.

This demands, urgently, collaboration among all the stakeholders: policy makers, heritage managers and urban and regional planners, tourism and construction sectors, civil society groups and, above all, among researchers, conservators and industry.

Yet CH is a fragile and non-renewable resource: during the 20th century, including two World Wars, it is considered that nearly 50% of Europe's tangible cultural heritage was lost. Much of what remains is under pressure from environmental factors. Looting (illicit trafficking) in art is a multibillion dollar industry.

European CH has benefited from a range of EU policies, programmes and funding. The need to document, protect and preserve CH has been recognised since the first EU research initiatives began in 1986. In all, the EU has supported more than 200 CH projects involving both tangible and intangible CH assets covering a very wide range of areas of investment: archaeology, agriculture, climate change, culture, education, environment, development, research, technology, etc. In July 2014, the European Commission adopted a Communication: *Towards an integrated approach to cultural heritage for Europe*. And 2018 is designated as European Year of Cultural Heritage.

Globally, other important initiatives have been launched by UNESCO, ICOM and ICOMOS and by major information companies such as Google and Microsoft. In Europe, the 'standardising' effects of these efforts are paralleled in some respects by the EU Digital Library Europeana initiative.

The European research resource for DCH has grown significantly in recent years. But the visible contribution of the 'Widening' countries to this effort remains relatively weak. The Digital Heritage Research Laboratory (DHRLab) at Cyprus University of Technology, has been an exception in this respect, becoming a beacon in the Eastern Mediterranean and for Europe in general, in particular through its leadership of key initiatives in DCH research training and in policy support, in particular:

#### **How do you see the future of cultural heritage research and why does it matter?**

The research challenges faced cover a lifecycle of DCH facets, including those concerning:

- Data acquisition (tangible and intangible/stories)
- Data processing (enrichment of metadata)
- Data modelling
- Knowledge management (interpretation)
- Preservation

Currently DCH objects (e.g. monuments) are not e-documented adequately to provide the knowledge and data needed by many of its potential target audiences. For example, in e-documentation studies of monuments and/or 3D artefacts/museum objects, experts usually digitise the tangible aspects, but not the intangible. Yet in many cases, the outstanding value of cultural heritage assets are their intangible stories. In general, archaeological sites are often only be fully represented in a 3D geometrical record (static information). Their story and historical value is not documented. As a result, experts, professional and others accessing Europeana, the EU digital cultural heritage library, are not able to discover this kind of information.

Obstacles which need to be overcome include:

- A lack of standards and proven approaches, particularly in areas such as 3D, intangible heritage and digital storytelling;
- The need to establish greater interoperability with developments in technical fields such as Big Data infrastructures, the use of open data and Artificial Intelligence/Machine Learning, innovations and advances in the state-of-the-art in VR/AR, to better enable their application to Cultural Heritage resources;
- Simplification of technology pipelines for end-users, including those working in local digitisation initiatives across Europe;
- Optimisation of the use of geospatial technologies in the field of Cultural Heritage to improve the impact and audience reach of projects such as Europeana;
- Scarcity of trained and qualified human resources and the resulting skills.

The H2020 COOP8 CSA Project Virtual Multimodal Museum is working intensively with the help and support of a multidisciplinary team with more than 800 experts from all over the world to help the European Commission to develop the roadmap, manifesto and agenda for the Horizon Europe Framework Programme on Digital Cultural Heritage ([www.vi-mm.eu](http://www.vi-mm.eu)).

#### **What should policy makers have in mind, looking past 2020 into the future?**

The ViMM CSA has identified the following priorities for Digital Cultural Heritage in the period after 2020:

##### **1. Positioning the DCH sector**

Europe is the most culturally rich continent in the world. Culture is becoming increasingly a precondition of all kinds of economic value generation, processes driven by two concurrent streams of innovation: digital content production and digital connectivity. It is critical to Europe's economy and society in the context of future funding programmes that Cultural Heritage and more specifically that Digital Cultural Heritage within Cultural Heritage, are positioned and described to benefit from well-structured investment at the EU, national, regional and local levels

##### **2. Improving audience participation**

It is important that citizens are not restricted to being just consumers of DCH, but that they should be enabled to participate actively and empowered to take ownership of their cultural assets. By focusing on interaction and conceptual design, DCH will be able to offer diversified, collaborative, and tailored experiences that adapt to the different needs of audiences and stakeholders.

##### **3. Harnessing technologies**

The harnessing of additional technologies will have increasing relevance for all cultural heritage institutions and providers including: artificial intelligence; computer vision; deep learning/machine learning; and adaptive cognitive methods. To this end, the use of technologies should be documented as well as the extent of their success or failure. Cultural heritage organisations and everyone involved in handling, exploitation, research and valorisation of DCH should

be aware of the usefulness of XR (Extended Reality) technology that can support their internal and external processes, not only by extending existing formats but also by exploring new ways of presenting cultural content.

#### 4. Incentivising funding

While there is evidence of a solid demand for virtual multimodal museums and DCH in general, there is a lack of resources and also great imbalances between institutions in relation to their scale, legal statutes, location, and content. In order to address these imbalances, policies for the incentivisation of funding from both public and private sources need to be developed including a mixture of direct public subsidies, tax incentives for private funding, sponsor visibility and crowdfunding

#### 5. Opening up

For achieving sustainability, digital cultural information should be based on open formats and metadata standards, supporting long-term availability. Such an approach will enhance the benefits to creative industries and strengthen developments such as Citizen Science, Crowdsourcing and Open Science.

#### 6. Giving the whole picture: data, documentation and semantics

Increased awareness and acceptance of the "Digital Turn" and the primary importance of data, especially structured and harmonised data, is central to the future of DCH, a sector where the data, contents and formats are heterogeneous. Cultural heritage data can be an important and revealing source for big data analytics.

#### 7. Powering contextualisation

Further momentum is needed to ensure that everyone involved in creating virtual objects provides information to support contextualisation to accompany their products. Storytelling is an important example of contextualisation. New technologies e.g. 3D and XR offer opportunities to engage, to teach, and to involve. Methods of visualisation based on new technologies need to be exploited to support the integration of new technologies in digital exhibitions and other storytelling applications. Immersive storytelling through XR playful learning (learning through story, play and interaction) in cultural heritage experiences is an important objective. New areas of creating and representing meaning, in order to provide for personalised experience should be explored along with increased interaction. This involves aspects such as cultural values, recognition and significance, representation of emotional intelligence, semantic time, space, provenance and uncertainty and emotion-based user interfaces.

Automated information extraction on a large scale is needed as an enabling technology, underpinned by comparative analysis of different technologies as a prelude to further development, especially as more data becomes available.

Human-machine collaboration will enhance our understanding and enjoyment of cultural heritage, for example by interlinking metadata/data across domains and capturing knowledge directly from the human brain and body activity. New immersive environments are required that enhance interaction between human and machine activity, together with efficient interfaces for semantic tagging by humans.

#### 8. Frameworks and standards: a navigable map

Emerging open interoperable frameworks and standards which support, create and share DCH such as the International Image Interoperability Framework (IIIF), Copernicus for Cultural Heritage and others, should be promoted and fast-tracked. However, current standards should be preserved and continuity through backward-compatibility sustained. Standards need to be agreed on, so that digitised content (tangible and intangible) and the related metadata become seamlessly accessible in the long term to all.

#### 9. Driving organisational change

Cultural heritage institutions are not working in a vacuum and should ensure openness to the outside world. For them to be able to make the most of new technology there needs to be organisational change. It is important for museums to develop strategies for inclusive technologies and to invest the needed resources in hardware and software solutions as well as training and support. Accessibility, sustainability and interoperability should be prioritised

#### 10. The Human Resources

To assure the skills and capacities of the next generation of digital curators and virtual museologists, the question 'who needs to be trained, for what purpose and at what level' should be directly addressed from a lifelong learning perspective, taking into account secondary, undergraduate, postgraduate, professional and vocational training as well as the engagement of volunteers and the public community in general. Remote and e-learning can play an important role. Training offers, accompanied by meaningful certification, should be stimulated, addressed to the different target groups involved in CH and their position in the 'digital workflow', broken down into different steps or stages and distinguished between technology skills, curatorial issues and decision or policy making needs.

The current Smart Specialisation Strategy (S3cy) provides a basis from which the potential of DCH can be exploited to make an important contribution to the achievement of the national priorities for Cyprus in key areas of society and the

economy and to its goals of sustainable and balanced growth in line with the environmental, political, cultural, social individual characteristics of the country. Cultural Heritage is one of the four specific aspects identified by S3cy (along with climate change, natural resources and 'blue development') which can impact on several of the sectoral priorities including Tourism, Energy, Construction and Built Environment and more indirectly): Transport; Agriculture and Health, stimulating new digital strategies for society and the economy.



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