Editorial: Special Issue on Digital Infrastructures for Cultural Heritage

What do you think when you hear the word “infrastructure”?

Outside the digital context, some hypotheses could be: highways, power plants, telecommunications, schools, and so on. In other words, it is always something complex and related to fundamental services shared by a country, a city, or a community of people. Infrastructures are the result of a collective effort, made in order to further develop economy, exchanges, and traveling.

Within the digital realm, the word infrastructure is related to the idea of digital services in terms of networking, computing, and data management. Examples of digital infrastructures are the *Internet*, the various existing *Content Delivery Networks*, and the different *Cloud* services that are available today. In the research context, we often think of e-infrastructures, which refer to a combination and interworking of digital technology (including both hardware and software), resources (data, services, digital libraries), communications (protocols, access rights, and networks), and the people and organizational structures needed to support modern, internationally leading collaborative research. Even in the digital case then, we are facing complexity and the concept of *sharing* something that is needed by a community to allow the possibility to build new things *on it*. As an example of this idea, just consider what happened to our lives when the *World Wide Web* was built on the Internet.

The Special Issue of JOCCH was born when, after many years of working in this field, we started to think that it was the right time to investigate the state of the art of the infrastructural application of digital technologies to Cultural Heritage. For us, this included both our tangible heritage, in the form of buildings, monuments, and artifacts, as well as the intangible heritage, such as literature, dance, and music. All of us had already participated in many projects focusing on different aspects of the same problem: how to use the most advanced technologies to improve access to, and understanding of, our Cultural Heritage. We agreed that it was time to take stock of the collective understanding of best practices around the world.

Current challenges include the consequences of changes in technology and changing rights, ownership, and responsibilities around Cultural Heritage given the changing forms of access to heritage (digital) and new forms of heritage itself (digital-born). There is a need to investigate the ways in which people interact with digital Cultural Heritage and the changing role of digital archives and memory institutions. Further challenges include the ways in which digital methods can be exploited to generate new knowledge and understanding around Cultural Heritage and the impact of digital methods on publication and other dissemination outputs in the heritage sector. At a policy level, a significant challenge is the development of sustainability strategies for existing services, databases, and practices.

We decided to explore four main dimensions of this complex universe, namely the use of digital technologies for building infrastructures devoted to *improving knowledge*, *preservation*, *valorisation*, and *sustainable exploitation* of Cultural Heritage.

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1556-4673/2017/04-ART1ee
DOI: <http://dx.doi.org/10.1145/3047266>

ACM Journal on Computing and Cultural Heritage, Vol. 10, No. 1, Article 1ee, Publication date: April 2017.

Knowledge is always the first step; it is impossible to recognize the value of anything without knowing it. Improving knowledge of Cultural Heritage is probably the most important single thing digital infrastructures can provide.

Once you start to be aware of it, the second most important (and in some sense *natural*) step is to preserve the heritage. The Cultural Heritage, whether in tangible or digital form, is fragile, and management and preservation are essential. Here, recent technologies for *diagnostic monitoring* are also now necessary, together with the current world-wide effort to build an Internet-of-Things.

Then, the third step is to *valorise* the Cultural Heritage, making the entire world aware of its existence as a step that anticipates the final phase, that is, to facilitate *exploitation* (e.g., through the activation of touristic circuits) that is *sustainable* and will not lead to the destruction of the Cultural Heritage itself.

Keeping these steps in mind, we prepared our Call for Papers with the hope that at least a few researchers would accept the challenge. The response has been overwhelming: we received 65 submissions, and given the high quality of the papers, our special issue needed to be split into two parts, together comprising twice as many papers as the initial plan.

Our selection covers the full spectrum of Cultural Heritage—from archaeology, art history, and conservation, through history to musicology. The papers range from discussion of one-off specific research projects aiming to develop infrastructural tools, such as DADAISM, to major European or National research infrastructures, such as ARIADNE, EHRI, CHIS, and CENDARI, as well as the use of crowd-sourcing in applications such as Wikipedia. We also look at the challenges of integrating legacy data in infrastructures, such as the archaeological heritage of Chaco Canyon or the Zeri photo archive. Important issues of data standards and interoperability are shown to be key to successful outcomes. As a whole, the collection demonstrates the rich contribution that cutting-edge information technology can make to research and public access to Cultural Heritage and leaves us optimistic for the future.

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