



An ICT Platform to support Decision Makers with Cultural Heritage Protection against Climate Events

Jürgen Moßgraber (1), Gaëlle Lortal (2), Francesco Calabrò (3), and Marco Corsi (4)

(1) Fraunhofer IOSB, Karlsruhe, Germany (juergen.mossgraber@iosb.fraunhofer.de), (2) Thales Research & Technology, Palaiseau Cedex, France (gaelle.lortal@thalesgroup.com), (3) Homeland Security & Critical Infrastructure, LEONARDO, Rome, Italy (francesco.calabro@leonardocompany.com), (4) e-geos, Rome, Italy (marco.corsi@e-geos.it)

Almost 400 UNESCO cultural heritage (CH) sites are located in Europe in different Climatic European Regions. Environmental factors, worsened by the increasing climate change impact, represent significant threats to CH assets as monuments, historic structures and archaeological sites.

An information and communication platform able to provide a timely up-to-date situational awareness about the site, thus supporting decision makers to plan the actions necessary for long term and short-term maintenance, intervention and risk management against the threats of the climate change. The approach will benefit from a multidisciplinary methodology, which will bridge the gap between the two different worlds: the CH stakeholders and the research/technological experts since protecting cultural heritage assets and increasing their resilience against effects caused by the climate change is a multidisciplinary task. Experts from many domains need to work together to meet their conservation goals.

The presented ICT platform is able to integrate heterogeneous data from multiple sources, analyses the data to evaluate the state of the Cultural Heritage (CH) assets and related risks, integrates predictive models, and supports decision makers to plan long and short term maintenance and restoration actions with the aim to mitigate the effects of climate change.

The basis of the system consists of two data stores: The BigData store and the Knowledge Base (KB). The BigData store handles the raw and pre-processed sensor data and will be useful for the sensor data storage in view of subsequent (more sophisticated) processing and to learn more about the possibility to correlate outputs from different sensors by looking at past events. The purpose of the KB is twofold: on one hand, the KB provides facts in machine readable form to be used by other services of the platform; on the other hand, it provides information for end-users that can be navigated and visualized through a graphical user interface (GUI).

The models used by the ICT platform operate in different ways: some of these models are continuously in operation and produce updated results on a regular basis or when new input data, e.g. sensor measurements, are ingested in the models. Other models require explicit activation in order to be run and produce results. The Open Geospatial Consortium (OGC) defines a number of widely adopted standard APIs that can be used to expose geo-referenced data and models to other components of the system.

The management of workflows and standard operating procedures (SOPs) is another important component of the platform. Workflows enable site managers and domain experts to systematically deal with the onset of a potentially hazardous event impacting CH structures. They guide the users in the tasks, which need to be carried out during different phases: 1) the initial identification of the problem, 2) the evaluation of its severity and possible causes, 3) the design of mitigation and remediation actions, and 4) their implementation and the final evaluation phase.

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