

Massimiliano Lo Turco

Elisabetta Caterina Giovannini and Noemi Mafri

edited by

# DIGITAL & DOCUMENTATION

Digital Strategies for Cultural Heritage

Volume 2

PROSPETTIVE MULTIPLE  
STUDI DI INGEGNERIA  
ARCHITETTURA E ARTE

Massimiliano Lo Turco  
Elisabetta Caterina Giovannini and Noemi Mafrici  
edited by

# DIGITAL & DOCUMENTATION

Digital strategies for Cultural Heritage

Volume 2



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The volume consists of a collection of contributions from the seminar "Digital & Documentation: Digital Strategies for Cultural Heritage", realised at the Politecnico di Torino on June 14th, 2019. The event, organized by the "BIM Acquisition as Cultural Key TO Transfer Heritage of ancient Egypt For many Uses To many Users REplayed" - B.A.C.K. TO T.H.E. F.U.T.U.R.E. Project - team of DAD - Department of Architecture and Design of Politecnico di Torino, promotes the themes of digital modeling and virtual environments applied to the documentation of architectural scenarios and the implementation of museum complexes through communication programs of immersive fruition.

The event has provided the contribution of external experts and lecturers in the field of digital documentation for Cultural Heritage. The scientific responsible for the organization of the event is Prof. Massimiliano Lo Turco, Politecnico di Torino.

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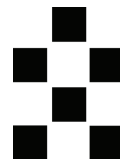
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The event “Digital & Documentation - Vol. 2” has seen the participation of professors, researchers, scholars and private institutions



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# PART III

DIGITAL REPRESENTATION FOR KNOWLEDGE,  
ENHANCEMENT & COMMUNICATION OF  
CULTURAL HERITAGE





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Graziano M. Valenti is Associate Professor in the Department of History, representation and restoration of architecture at University of Rome "La Sapienza". His research activities (divided into theoretical, design, implementation and testing of experimental models) are focused on the application of new digital technologies to the disciplines of the survey, drawing and visual communication, with the aim of anticipating future operating scenarios and solve contemporary application problems. Subject of special study, which crosses all his research, is the definition and representation of an integrated and dynamic model that consists by heterogeneous information. The most recent essays focus on issues of interactive virtual representation, rendering, digital and physical modelling. He teaches at the Faculty of Architecture of University of Rome "La Sapienza", in the degree courses in architecture and industrial design.

# THE SCIENTIFIC AND CULTURAL IMPACT OF DOCUMENTATION

CETTINA SANTAGATI, GRAZIANO MARIO VALENTI

The fundamental basis of all science is the theoretical apparatus. Documentation, i.e. knowledge management, being the subject of ever-increasing theoretical contributions, has now consolidated its position in the sphere of science. It is difficult, perhaps impossible, to place it within a specific research area, because knowledge management concerns any researcher. It, therefore, appears to be the most multidisciplinary of all sciences.

The theory of science is not born from anything: it is the result of a process of synthesis and abstraction inspired by the experience, produced by observation and experimental practice.

Therefore, in addition to the specifically dedicated research, studies and experiments that have a different main objective but dedicate particular resources to documentation processes are of fundamental importance. In particular, we refer to those researches that have a particular interest in the communication of knowledge, today declined in the 'primary' and 'distinct' objectives-channels of dissemination and scientific divulgation. When we say 'primary' we refer to the fact that they are the driving energy of thought and therefore the stimulus of new knowledge; on the other hand when we say 'distinct' we want to specify that the term "disseminate" indicates the processes of peer communication, whilst the term "divulge" has as its objective the generalized spread of knowledge, to a wide and heterogeneous public.

Dealing with dissemination, the quality, completeness, interoperability, and stability of information are the main

critical issues of communication because the transmission of knowledge allows building new knowledge.

In the case of divulgation, where the transmission of knowledge is aimed at its simple acquisition, the values to be focused are instead the synthesis, simplicity, and accessibility for all.

In addition to these first mentioned qualities, it is desirable that they are always accompanied by several others, capable of enriching and specializing in the communication scenarios.

Another quality is the availability of information: the data freely available to the scientific community today are still too few compared to the amount produced; similarly, the cultural heritage that can be enjoyed today is only the most emerging part of a considerably larger heritage. While there is a need to refine the legislation on open access and open data in terms of research products and more generally of cultural assets, it is equally appropriate that there should be actions aimed at changing the cultural vision of both individuals and communities; actions aimed at the democratization of science that make it clear that sharing knowledge in the long term makes it worthwhile.

Two other important qualities that should be mentioned together are the accuracy and repeatability of the data acquired and processed into information: any act of documentation should always be accompanied by metadata specifying the level of reliability and the survey methodology used to define it.

Correct and full dissemination provides for the transfer

of data and methodologies so that - among peers - it is possible to repeat the same investigative activity and confirm, refine or refute it.

The integrability of the data, perhaps today better expressed by the term "interoperability" is the quality that expresses the possibility for different users to analyse and process together heterogeneous sets of information. The integration of information is the main way to exploit digital aid in a congenial way, producing new information from the simple elaboration of the pre-existing ones.

Each of these above-mentioned qualities is in the investigative background of the authors who have contributed to this session dedicated to Theory, and in addition, they are enriched by personal interpretations that show the fertility and liveliness of this field of research.

Donato Maniello in *"Digital anastylosis in augmented digital spaces: Spatial Augmented Reality applied to cultural heritage"*, literally immerses us in a careful selection of digital anastylosis highlighting the duplicity of the pervasive and at the same time the persuasive character of the experience. He also suggests how these knowledge-sensitive environments allow a natural hybridization of analog and digital technologies.

The portions restored and reconstructed through digital anastylosis, of an immaterial nature, in these environments assume consistency and configure a sort of "materiality of information".

Andrea Marraffa in *"The material culture of theatre: analysis of liparote theatre masks for the compilation of a digital protocol of integration and anastylosis"* illustrates a complete research experience, which is a real operational protocol suitable and repeatable for the investigated case study. A methodology that originates from the collection and analysis of documents and then passes through the survey, digital modeling and arrives at the physical prototyping of the models, intended as a valuable set of communication.

Leonardo Baglioni and Marta Salvatore in *"Digital models for the analysis and communication of perspective space"*, show how an accurate use of digital representation can give new value and revitalize analog representation and open new fields of study and applications. In particular, through parametric modeling of the perspective space, they show how it is possible to dynamically explore projective transformations, reveal their theoretical principles and understand their perceptive implications.

Daniele Rossi, Federico Orfeo Oppedisano and Carlo Vinti in *"Food and wine heritage in the Marche region: digital storytelling through virtual and augmented reality"*, present a research project in which a key role is played by the "narrative" integration of data, a set of historical, cultural and artistic information that supports and enriches the communication of a remarkable Italian heritage concerning "Food and wine heritage". Particularly interesting and

courageous is the experimentation of unusual VR and AR systems for this kind of documentation.

Four researches, therefore, of considerable innovation and scientific and cultural impact, which can only provide the reader with useful food for thought and innovation.

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Cultural Heritage is as rich as complex and its documentation is an increasing challenge. The digital solutions are numerous and their potential is a topic of constant investigation by the scientific community, that is requested to deliver digital strategies to make heritage permanently open and shared. The volume collects the contributions to the second conference of the 'Digital & Documentation' series, extending the debate to a multidisciplinary network of experts. It presents a frame of strategies for the documentation of Cultural Heritage in a wider perspective, stimulating reflections on: the relationships between physical and digital assets; the consistence of digital data and its management; digital representation as a mean to the transfer of cultural heritage. It comprehends theoretical studies and best practices on tangible and intangible heritage, taking into account applications for the research and the communications of Cultural Heritage as 3D representations, digital anastylosis, Augmented and Virtual Reality, Artificial Intelligence, semantics and databases. Aiming to give a comprehensive view on digital and documentation, the volume involves multiple perspectives from cultural institutions and universities, from experts in representation, geomatics, history, architecture, archaeology and ICTs for a multidisciplinary outcome.

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