

Introduction

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Laura Inzerillo & Francesco Acuto

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The volume consists of a collection of contributions from the seminar "Digital & Documentation: The New Boundaries of Digitizing", realized at the University of Palermo on the day of September 2<sup>nd</sup>, 2021. The event, organized by the experimental laboratory of research and didactics MetaLab 3D of DIING- Department of Engineering of University of Palermo 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 provide 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 Laura Inzerillo, University of Palermo.

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The event "Digital & Documentation" has seen the participation of professors, researchers and scholars from University of Palermo, University of Pavia, University of Bolzano, University of Rome "La Sapienza", University of Roma3, University of Catania, Politecnico di Torino, Politecnico di Milano.



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“Ogni uomo confonde i limiti del suo campo visivo  
con i confini del mondo”

*Arthur Schopenhauer*



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SESSION - I

BIM



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# INTRODUCTION

The contributions critically reflect on the characteristics and uses that the three-dimensional digital models set up through an HBIM approach and referred to the built heritage can be usefully employed not only to support the design activity but also for integrated multidisciplinary approaches related to conservation and documentation initiatives.

The reflections that emerge from the critical analysis of the various case studies illustrated by the invited speakers are particularly interesting: the authors measure themselves on a multiplicity of themes all referable to the discipline of Drawing, such as the scale of representation and their relationship with the granularity of the model. Moreover, the quantification of the deviation between the numerical model -intended as the outcome of the sampling of representative parts of an artifact or part of it- and its conversion into a mathematical model, in which the numerical codes are structured and organized to describe geometric shapes, dimensions or qualitative information useful for their representation.

In the BIM approach, the mathematical model assumes the additional connotation of information model, where some workflows can provide algorithmic approaches that integrate Visual Programming Language systems, highlighting strengths and weaknesses of the most recently designed workflows. This allows to outline future research perspectives, in relation to the exploration of the potential of automatic classification through Artificial Intelligence

algorithms, which constitute the boundaries of research and, although of extreme interest, cannot yet be considered as fully defined and shared standards.

Another issue discussed in the following contributions is the opportunity to integrate the alphanumeric attributes of the BIM virtual environment with an ontological structure of data, aimed at the production of a more structured database and able to fully define the logical relationships between the parts.

With regard to the restitution of reality-based artifacts, it is more appropriate than ever to dwell on the evaluation of the best technologies for the optimization of mobile scanning survey protocols and the three-dimensional representation of the historical built heritage, to be adopted for an effective process of measurement and subsequent restitution of the artifacts. For specific activities characterized by a high level of complexity such as those illustrated below, it is crucial to define strategies, approaches and structured protocols to implement shared work actions, so as to obtain elaborations of a very high-quality level consistent with the limited time that projects and consultancies foresee.

Through interoperable practices it is therefore possible to conceive operational scenarios in which all the actors involved can directly implement the data recorded in situ in an agile and accessible way. To do this, it is essential to support the object-oriented paradigm with the conceptual aspects of relational approaches useful for the management

of heterogeneous, numerous and constantly updated data. From a more scientific point of view, the application of these principles will allow us to face and define new methodologies for the knowledge (and representation) of the Cultural Heritage through more transparent processes. Therefore, the reflections on integrated approaches of investigation leading to new forms of Drawing able to expand the frontiers of our discipline in the direction of a greater formal qualification and in the permanent relationship between architectural space and information space appear extremely interesting. In this regard, the London Charter defines the principles to be followed for the three-dimensional representation of Cultural Heritage, in line with the values of transparency, communicability and repeatability of the methods and results of the modeling processes. We agree that knowledge is the first stage of preservation, and the described research fully confirms this assumption.