

Events

Workshop 3D Modeling & BIM. Information and 3D Modeling for the Cultural Heritage

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Given the continuing emergency due to the Covid-19 pandemic, the *Workshop 3D Modeling & BIM* was held on 7 April 2022 for the third consecutive time on a telematics platform; this limitation, however, allowed for a more significant number of participants. The seventh edition subtitled *Information and 3D Modeling for the Cultural Heritage*, in addition to maintaining its role as a privileged observatory on the use of Building Information Modeling (BIM) in architectural design, also explored the fields of investigation of surveying and visualization tools for the dissemination of the architectural built heritage and, more generally, of built heritage.

The day opened by Tommaso Emler, Director of the Workshop, who, after a brief introduction, left the stage for the institutional greetings to Carlo Bianchini, Pro-Rector of Architectural Heritage and Director of the Department of History, Design and Restoration of Architecture of Sapienza Università di Roma.

The works were opened by keynote speaker Michele Calvano from the Institute of Heritage Sciences of the National Research Council, with a speech entitled *Il Visual Programming Language per l'indagine e l'arricchimento dei modelli 3D* (Visual Programming

Language to investigate and enrich 3D models). The speaker illustrated the approach of the *Built Heritage Innovation Lab* for the documentation, conservation, and management of historic buildings with a focus on the simulation of their building systems and the recognition and semantic enrichment of 3D objects within HBIM models.

Postponed for technical reasons, the greetings of Francesca Fatta, President of the Unione Italiana per il Disegno, became an opportunity for debate with the keynote speaker on the prospects of BIM, which from an experimental technology has evolved into a tool entirely attributable to the traditional contents of the scientific-disciplinary field of Drawing. The six speeches of the session highlighted the variety of activities related to the documentation and management of the built heritage and historical buildings in which our country is prosperous. With the presence of research laboratories from different Italian universities, the first session showed the versatility of application cases in the field of information modelling for the built heritage. In the first speech, Fabio Bianconi, Marco Filippucci and Giulia Pelliccia (Università degli Studi di Perugia) illustrated some research concerning the experiments

developed on the value of digital modelling for the programming of the response of materials printed through additive procedures. Following this, Flavia Camagni (Sapienza Università di Roma) and Sofia Menconero (Roma Tre University) presented the results of a didactic experience that, starting from the image-based 3D survey, leads to the digital representation and 3D printing, to then move on to the communication phase that includes the augmented and virtual reality visualization of the surveyed objects. Greta Attademo (University of Naples Federico II) then presented the experimentation of a new Cultural Game for the Marino Marini Museum in Florence, revealing how the conscious use of drawing can contribute to the innovative narration of museum cultural contents. Giuseppe Amoruso and Giorgio Buratti (Politecnico di Milano) similarly showed how some *Game Engine* applications applied to the digital reconstruction of artefacts and architecture can be helpful for the enhancement of cultural heritage. Then, Anna Lisa Pecora (University of Naples Federico II), starting from the case study of the Ascension Chapel in Carditello, presented some guidelines on the autism-friendly representation of virtual space. At the end of



Fig. 1. Poster of the event.

the session, the group coordinated by Massimiliano Lo Turco (Politecnico di Torino), which also involves some members of the Fondazione Museo delle Antichità Egizie in Turin, illustrated the development of an HBIM to re-functionalize the Egyptian Museum, starting from its modelling and representation capable of recording change.

The end of the morning session was also the occasion to present volume 9 of the journal *D^o. Building Information Modeling, Data & Semantics*, which once again questions the innovative solutions for the HBIM sector and the

objectives towards which future experiments should be directed.

The afternoon session, coordinated by Graziano Mario Valenti, saw the presentation of some contributions showing the application of 3D and Information Modeling in contexts ranging from the scale of the architectural object to that of the territory.

Massimiliano Benga and Maria Antonia Russo (Arsarc Studio) illustrated the procedures for the creation of the BIM information model of the MAXXI Museum in Rome, which also required the implementation of the model for the maintenance of the plant systems

and some building components. In their report, Emanuele Carlo Bussi, Matteo Del Giudice and Anna Osello (Politecnico di Torino) highlighted the need to adapt traditional procedural standards to those introduced by technological innovation, enhancing the role of information modelling capable of connecting graphic and alphanumeric contents in a single BIM model. Following this, Michele Valentino, Amedeo Ganciu and Andrea Sias (University of Sassari) showed the first phases of research that foresees the construction of a Digital Twin of the island of Asinara to obtain a man-

agement tool for the Park area. Carlo Bianchini, Marika Griffò and Luca James Senatore (Sapienza Università di Roma) presented some methodological arguments that in the model see the direct integration of the duality between the characters of ideality and those related to the object in its actual configuration. Oscar Roman (University of Trento) and Kelly Pagan, Carlo Zanchetta, Elvis Cescatti and Maria Rosa Valluzzi (University of Padua) presented two case studies in areas at high seismic risk. Suppose in the first intervention, HBIM aims to examine some preservation and digital management techniques of historical buildings in the second one. In that case, the study is directed toward documenting historical evolu-

tion and damage to obtain a model in an 'open' and implementable format. Similarly, but with different aims, Alessandra Tata, Luisa Capannolo, Stefano Brusaporci and Pierluigi De Berardinis (University of L'Aquila) illustrated the role of the BIM methodology for the construction of a digital identity card of the buildings capable of documenting the state of conservation of the modelled buildings.

In the last part of the session, some works developed by the students of the *Master HBIM* of Sapienza Università di Roma were illustrated. They showed some experiences related to the procedures of Visual Programming Language linked to the HBIM methodology for the analysis, documentation, and management of restoration inter-

ventions of some case studies developed within the educational path.

From the variety of experiences presented during the Workshop emerged the overcoming of the pure procedural approach in the construction of the information model and greater attention to the documentary one that necessarily passes from the semantic structure of the document that the virtual model constitutes and that becomes an opportunity for a profound interpretation of reality, overcoming even the simple geometric measurement. Once again, the opportunity for comparison made possible by the *3D Modeling & BIM Workshop* was an opportunity to compare experiences that open up new prospects for the interoperability of these documentary repertoires.

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