

Events

3D MODELING & BIM

Data Modeling & Management for AECO Industry

A virtual meeting for real scenarios

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At the present time, connection, collaborative work and digital management tools are becoming increasingly important: in a sort of rush to digitization, in different and various fields, new technologies and strategies become mature. In the construction industry, as well as in the design world and in cultural heritage valorization, it is necessary to use digital and advanced tools and processing, which are based on digital modeling, in all its forms.

Digital management of an architectural work, whether it is a new building or an existing one, cannot do without information modeling (based on Building Information Modeling processes) and without systematization of data. This in fact optimizes remotely exchange of information, it increases data reliability, it simplifies planning phases, it improves safety for staff and workplaces, respect of the times and of quality workmanship. If before BIM protocol was an opportunity, today, more than ever, it becomes a necessity, also in view of the mandatory introduction of BIM in public procurement, as indicated by Legislative Decree No. 50/2016, as provided for by Law Decree No. 109/2018 and as confirmed by the recent Law No. 120/2020 contain-

ing "*Misure urgenti per la semplificazione e l'innovazione digitale*". To this panorama we must add the need to resort to digital tools for the cataloging, valorization and communication of built heritage. I am talking about both HBIM and virtual reconstructions, which often represent an adequate response to the remotely accessibility and management, of the tangible heritage, transporting it to an intangible level.

In this context it is appropriate to talk about the 3D Modeling & BIM Workshop, organized by the Department of History, Representation and Restoration of Architecture of the Sapienza University of Rome, the Faculty of Architecture, the Master in Heritage Building Information Modeling and the BIM Master of Sapienza, with the collaboration of the *Ordine degli Architetti Pianificatori e Paesaggisti e Conservatori* of Rome and Province and with the *Ordine degli Ingegneri* of the Province of Rome (whose president of the BIM Commission, Massimo Babudri, present at the meeting, also held the position of BIM Manager of ISTAT). The congress, directed by Tommaso Empler, reached its sixth edition and was concentrated in a single day, on May 14 2020.

The congress was held in a virtual classroom which represented a successful meeting place between scholars and industry professionals in design and construction fields, as evidenced by the presence of the two keynote speakers Francesca Fatta (President of the Unione Italiana per il Disegno) and Christian Florian of Permasteelisa Group, respectively representatives of academic and professional world.

The participation of Francesca Fatta, as well as the introduction of Carlo Bianchini (both as scholar and as Director of Department of History, Representation and Restoration of Architecture) are emblematic in underlining centrality of scientific disciplinary sector ICAR-17 in the theme of the conference: it is clear from the debate the central role of digital processing and modeling, both as a modeling process (and / or reverse modeling that represents, from visual communication point of view, a design idea and that enhances the formal values of architecture and built heritage), and as an engineering process (and / or reverse engineering, in which you investigate the construction processes, which form the structure of the architectural organism).

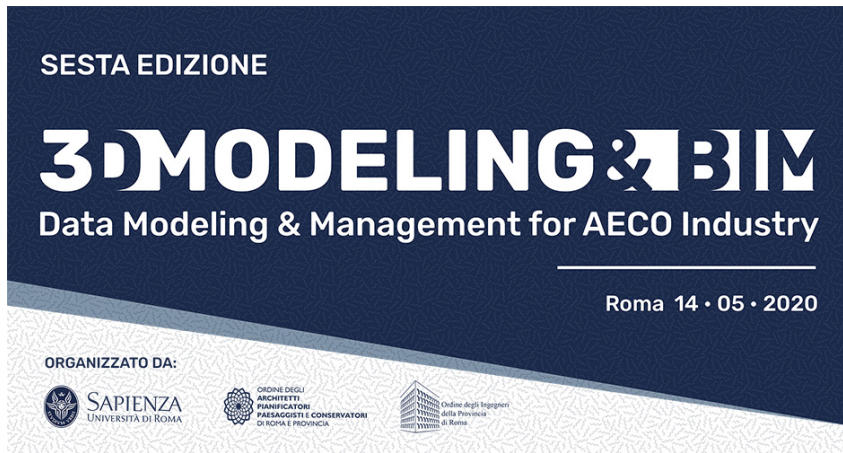


Fig. 1. Event flyer.

The interventions were divided into three main topics: Computer Graphics and 3D Modeling, Digitalization and Data Acquisition and Building Information Modeling. The contribution deriving from didactic experiences was very interesting and underlined the aim to make students understand methodological principles of processes (BIM, HBIM, modeling and representation), instead to make students understand instrumental and software principles.

If we analyze all the contributions, we note that the approach to the issues is changing from previous editions, and it passes from more philosophical topics to more operational problems. In particular, if we talk about BIM and HBIM, it seems that we are close to using a shared protocol, which uses different processes of conscious modeling.

However, critical issues still emerge regarding the so-called interoperability, around which resolves the com-

parison between the procedures. This is a feature that BIM models have always aspired to. In fact, the use of the IFC format has no expected results, due to the software houses are still too focused on keeping their data structure for purely commercial reasons, forcing users to take that proprietary format as a standard.

This is still an open topic on which, I believe, future editions will have to focus: the interoperability of a system, i.e. the ability to exchange information without data loss, cannot be resolved in an output format, on the contrary it is necessary to work with a series of input formats and software that interface each other to ensure that all information, geometric or not, is not lost during the process. In order to overcome this problem, procedures are oriented towards responsive or adaptive models that provide for an open, modifiable and implementable process with new information entering the workflow.

The evolution consists in a constant integration between computational design, data modeling, BIM, ICT, cloud platforms tools and data sharing.

It is in fact clear that the figure of the computational designer or the use of generative algorithms and visual programming assume value in the panorama of parametric modeling, and it is clear that they are proposed as a consolidated practice to give solutions to complex problems, especially in the field of built heritage.

This fact becomes relevant if we consider that the tendency is to act (I would to say almost exclusively) on the built heritage: even in the BIM field, the project takes a medium and long-term vision, which determines the importance of the maintenance of an architectural object. Massimo Babudri, during his presentation, in fact proposes an integration or modification of the BIM acronym, introducing Management as a fundamental component of the process, however he underlines that, in our field, there is still a great distance between UNI standards and the *Codice dei contratti pubblici*, and there are no guidelines from MIT and from *Ministero dei LL.PP.*

From the debate we deduce there is a tendency to go beyond the concept of BIM as traditionally understood, even not by studying a single architectural object, but also by studying urban context and infrastructures. In fact, there was some contributions that analyze urban shape modeling, which manage information and model both common buildings and the emerging building within the urban fabric. The process just described serves to determine useful tools for administrations and for urban planning, and it allows

continuous collaboration with all the players in the process, and not only with those who work directly in the construction industry. Some scholars based their research on the digital representation of the city for the enhancement of urban spaces. They investigate the perceptual aspects and the relationship between the observer and the image of the city with completely innovative methods: through generative algorithms, heterogeneous data, deriving from cognitive, spatial, and psychological-emotional investigations, become information that can be viewed in a three-dimensional model.

A consideration is born thanks to all the research presented: the three-dimensional model, (parametric or not) which represents a real or prefigured space, becomes more and more as an interface to access other information; it becomes a place to enter data and the interpretation of data, in order to create integrated docu-

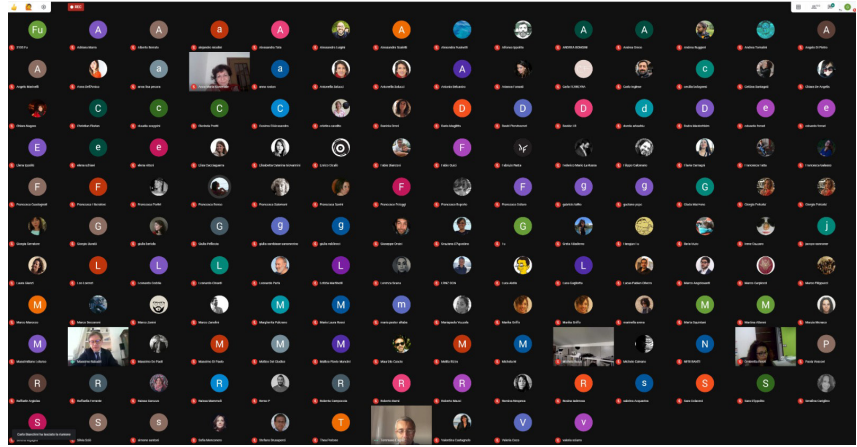


Fig. 2. Screenshot of participants on google meet platform.

mentation, management and communication systems. The creation and management of these models goes beyond the procedural approach and, although we are slightly far from

identifying standard process, a never ending dialogue between all the players of the process is profitable to reach real scenarios based on parametric, semantic and interoperability.

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